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Perception And Identification Of Voice Disorders: A Comparison Study Between Hispanic And Non- Hispanics

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PERCEPTION AND IDENTIFICATION OF VOICE DISORDERS: A COMPARISON STUDY
BETWEEN HISPANIC AND NON-HISPANICS

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PERCEPTION AND IDENTIFICATION OF VOICE DISORDERS: A COMPARISON
STUDY BETWEEN HISPANIC AND NON-HISPANICS

by

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THESIS

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Abstract

The extent of public education in the Hispanic population regarding voice disorders has been unidentified thus far, motivating the current study to assess knowledge and perception of functional and organic voice disorders among Hispanic individuals in the El Paso region. The project involved an experimental research design to investigate whether demographic variables influenced the accuracy of knowledge of voice disorders in the general population residing in the Greater El Paso Region. Results indicate that the majority of the participants perceive articulation, fluency, and voice disorders as interchangeable and are unaware of the role of medical and rehabilitation professionals in the treatment of voice disorders. Although statistically significant differences exist between Hispanic and non-Hispanic cohorts on certain tasks, low composite scores exemplify the need for increased awareness of voice disorders and medical and rehabilitative options in both Hispanic and non-Hispanic populations.

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Literature Review

Voice disorders are classified as atypical voice productions in pitch, quality, and volume when compared to individuals of a similar background (Ramig & Verdolini, 1998). Similarly, the American Speech-Language-Hearing Association (ASHA, 1993) defines a voice disorder as “the abnormal production and/or absences of vocal quality, pitch, loudness, resonance, and/or duration, which is inappropriate for an individual's age and/or sex” (p. 40). Abnormal vocal quality may present as hoarseness or breathiness; pitch which may be above or below fundamental frequency; or difficulty generating sufficient subglottal air pressure to manipulate volume. Perceptual indicators of voice disorders include: monopitch (lack of fluctuation in pitch while speaking), inappropriate pitch, pitch breaks, mono-loudness, difficulties in loudness variations, hoarseness and roughness, breathiness, tension, tremor, strain, sudden interruption of voicing, and diplophonia (presence of two pitches) (Colton & Casper, 1990).

Voice disorders are defined as functional or organic, depending on etiology or cause. Functional voice disorders result from unknown physical cause, whereas organic disorders are evidenced as a result of a known etiology (Shiple & McAfee, 2004). Causes of voice disorders may include habits of phonotraumatic behaviors (e.g., yelling, inordinate throat clearing), neurological disorders (e.g., Amyotrophic Lateral Sclerosis, Parkinson’s disease, Muscular Dystrophy, stroke, trauma, vocal fold paralysis), and/or psychological factors (e.g., excessive stress, personality changes) (Ramig & Verdolini, 1998; Shipley & McAfee, 2004).

Rehabilitation of voice disorders requires that a group of specialists collaborate to address the needs of the patient. Typically, a voice team is comprised of an otolaryngologist specializing in laryngology, a speech-language pathologist, neurologist, and a psychologist (Boone, 2004). On this interdisciplinary team, the speech-language pathologist and otolaryngologist (also known as Ear, Nose and Throat physician or ENT) have specific roles in the prevention, assessment, and rehabilitation of

voice disorders. Although the speech-language pathologist may receive the initial referral for a vocal disorder, it is the otolaryngologist whose assessment ascertains the necessity for medical treatment, including laryngeal surgery or medication. Boone (1991) emphasized the importance of collaboration between the fields of speech-language pathology and otolaryngology, and the necessity of a medical evaluation prior to the initiation of voice therapy, emphasizing the importance of both disciplines.

The speech-language pathologist maintains an ethical responsibility to uphold public education on avoidance of phonotraumatic behaviors, vocal hygiene, and the implications for voice disorders. Inability to avoid or limit phonotraumatic behaviors or partake in appropriate vocal hygiene may cause perceptual changes in voice production. Atypical fluctuation in pitch, volume, or quality is often identified perceptually, prior to the initiation of treatment. Perceptual assessments are initial indicators in the evaluation phase warranting a referral to an otolaryngologist for a medical diagnosis. The assessment should also involve a comprehensive evaluation to determine the presence of a voice disorder and a need for behavioral voice treatment (DeJarnette & Holland, 1993).

Earlier research estimated that 3-9% of individuals residing in the United States have a voice disorder (Wilson, 1972). Roy, Merrill, Thibeault, Parsa, Gray, and Smith (2004) suggested that a large percentage of the general population will experience a voice disorder for at least four weeks during their lifetime. Data from the aforementioned epidemiologic study suggested that 43% of their participants reported experiencing a voice disorder at some point during their life. More recently, statistics compiled by the National Institute of Deafness and Other Communication Disorders (NIDCD, 2009) reported that approximately 7.5 million individuals living in the United States presently experience some extent of voice problems. Due to the prevalence of voice disorders, an increase in the general public's awareness of preventative measures, the ability to identify a voice disorder, and knowledge of medical and rehabilitation professions are crucial in the initial phases of rehabilitation.

A number of studies have described the ability of focus groups to accurately distinguish between disordered and non-disordered voices. Davis and Harris (1992) studied teachers' ability to identify disordered voices among school-age children. Elementary teachers were required to listen to 30 recordings of children's voices and identify the 15 disordered voices. Results indicated that 82% of the elementary teachers accurately identified disordered voices among children, and thus, provided appropriate referrals to a speech-language pathologist. Additionally, Kreiman, Gerratt, and Precoda (1990) determined that inexperienced listeners differentiate between voice disorders based on dissimilar vocal quality characteristics less accurately than trained speech-language clinicians. Naïve listeners relied less heavily on pitch when delineating between disordered and non-disordered voices and more heavily on quality (hoarseness or breathiness). Naïve listeners also failed to encompass the three components of voice (pitch, volume, and quality) when delineating between disordered and non-disordered voices.

Only a limited number of studies have researched knowledge of voice disorders and related issues among minority groups. Mayo, Mayo, and Brock (2006) administered a 14- item questionnaire to 490 African Americans in a North Carolina metropolitan area to assess their knowledge of voice disorders, knowledge of possible causes of voice disorders, whether a voice disorder warranted treatment, and knowledge of professionals who specialize in voice disorders. Results indicated that 83% of the participants have been in contact with an individual with a voice disorder, whom they commonly described as having a "hoarse" or "high-pitched" voice. Only 27% of participants were aware that excessive throat clearing was a potential cause of a voice disorder. Interestingly, 61% of the participants expressed that a voice disorder did require treatment of some sort. Finally, 85% of the participants identified a speech-language pathologist as the provider of voice rehabilitation. The data suggests that this minority population had some knowledge of vocal disorders and the rehabilitative process.

The exponential increase in the minority population in the United States and the potential for an associated increase in voice disorders is of great concern. Specifically, in El Paso, Texas, 74% of the population is self-identified as Hispanic of Mexican descent (US Census Bureau, 2005). The National Cancer Institute (1985) identified Hispanics as the minority group with the second highest incidence of laryngeal cancer. Haynes & Pindzola (2008) describe potential ethnic risk factors that increase the risk of laryngeal cancer, such as "...diet, lifestyle choices, cultural attitudes toward illness and health care providers, and differences to medical services" (p. 353). The Hispanic population is more prone to initiate self treatment methods than to seek medical attention. Poor dietary choices and the custom of seeking alternative methods of rehabilitation rather than to seek evidenced-based medical remediation increases the Hispanic population's risk of developing laryngeal cancer and vocal disorders (Salas-Provance, Erickson, and Reed, 2002).

Minimal research has been conducted regarding knowledge of vocal hygiene in the general population. Fletcher, Drinnan, and Carding (2007) administered a 28-point questionnaire to address the knowledge of vocal education and health between two cohorts: 17 individuals with dysphonia and 17 individuals with healthy voices. Results indicated that the dysphonic cohort presented with less knowledge of vocal disorder precursors than did the healthy vocal control group. The control group identified phonotraumatic factors to consist of excessive coughing and throat clearing, speaking at fundamental frequency that is not optimal, consumption of alcohol, excessive caffeine, speaking too loudly, and whispering. Fletcher and his colleagues omitted the influence of demographic variables (age, sex, education, and culture) on the knowledge of phonotraumatic factors that negatively affect voice. Identification of cohorts with limited knowledge of voice disorders may guide the profession of speech-language pathology in education and preventative measures to increase public awareness.

Public awareness of voice disorders is of importance among the Hispanic population primarily because of the negative cultural perception regarding traditional physician-based medical assistance.

Review of the literature suggests that Hispanics' medical beliefs are influenced by religion and generations of home remedies. In analysis of medical beliefs of four generations of Hispanic members of one family, Salas-Provance, Erickson, and Reed (2002) found differences in the beliefs of folk medicine across generations. Researchers devised a series of open- and close-ended questions to identify if rehabilitation of speech-language and hearing disorders were influenced by cultural folk remedies. Open-ended survey questions included, "What do you think can cause people to have trouble with their speech?", "What would you do or use to cure a speech problem?", and "What do you think can cause people to have trouble with their hearing?" The researchers found that older generations placed more emphasis on folk beliefs as a cure for disability, including praying a novena, *pagando una manda* (i.e., paying a debt when asking God a favor), and seeking the intervention of a *curandero* (folk doctor) than the younger generations. Although folk and medical remedies have been employed by Hispanic populations over the generations, no research has been conducted thus far on the ability of Hispanics to accurately identify voice disorders, awareness of options when seeking rehabilitation of voice disorders, or the success or failure of folk medicine cures for voice disorders.

Several researchers have investigated the influence of patient perception and beliefs of voice disorders on treatment adherence and outcome. Portone, Johns, and Hapner (2008) attempted to identify the reasons individuals with voice disorders fail to adhere to otolaryngologists' recommendations to seek behavioral rehabilitation from a speech-language pathologist. They proposed a lack of compliance with treatment could be attributed to an unfavorable perception of voice disorders, in addition to cultural, familial, and self-efficacy variables. In a similar study, Leer and Connor (2009) describe factors that influence the adherence of patients with voice disorders to rehabilitation in terms of internal and external variables. Internal factors are portrayed as cognitive, emotional, and physical variables within the individual. External factors consist of environmental and social influences, including the influence

that cultural perception has on the medical and rehabilitative process of voice disorders, as will be addressed in this paper.

Purpose

There is a dearth of literature concerning the general population's knowledge of and ability to accurately identify disordered voices. The ASHA Code of Ethics (2010) speaks to speech-language pathologists' "responsibility to promote public understanding of the profession" (pg.3). The necessity for Hispanic public education on voice disorders has not been addressed thus far, motivating the current study to assess knowledge about prevention, identification, and rehabilitative options for functional and organic voice disorders among Hispanic individuals in the Greater El Paso region, including Ciudad Juarez and Las Cruces, New Mexico. The project involved an experimental research design to investigate if demographic variables influenced the accuracy and knowledge of voice disorders in the general population residing in the Greater El Paso Region. This study addressed the need to educate the Hispanic and non-Hispanic community in El Paso on prevention including the speech-language pathologist's role in the rehabilitation of functional and organic voice disorders.

Operating on the hypothesis that there is a difference between Hispanic versus non-Hispanic populations' knowledge and identification of disordered and non-disordered voices, the research questions addressed were the following:

1. Do Hispanic and non-Hispanic individuals differ in their definition of a voice disorder?
2. Does one ethnic group identify disordered voices more accurately than the other?
3. Are Hispanic and non-Hispanic individuals in the Greater El Paso Region aware of the speech-language pathologist's role in rehabilitation of voice disorders?

Methodology

Auditory Stimuli

Twenty healthy and disordered voices were recorded to serve as auditory stimuli in the study. Ten non-Hispanic individuals, five of whom had identified voice disorders, were enlisted to read “The Grandfather Passage” in English. Diagnosis of the vocal pathologies in these individuals included hypokinetic dysarthria, unilateral vocal fold paralysis, and right hemisphere stroke. A total of 10 Spanish speaking Hispanic individuals were recruited to read the Spanish translation¹ of the “Grandfather Passage” to address the linguistic demands of the El Paso community. Five of these voice samples were also of individuals who were diagnosed with either a functional or organic voice disorder: Moebius Syndrome, amyotrophic lateral sclerosis, hypokinetic dysarthria, unilateral vocal fold paralysis, and post surgical laryngeal tumor re-section.

A digital voice recorder, Sony IC Recorder ICP-P620, was utilized to collect the 20 voice samples from Hispanic and non-Hispanic individuals reading the “Grandfather Passage” in English and Spanish. The recording was collected at the stimuli participant’s convenience at their home, office, or in the university clinic. Prior to the recording of auditory stimuli, each participant read and signed the Informed Consent Form as approved by the UTEP Institutional Review Board. The researcher explained to the participants that the recording would be used as auditory stimuli in the survey and heard by 60 research participants. The participant was allowed to read the passage aloud to become familiar with the text before recording. The Sony IC Recorder was set on high quality recording mode and was held within 6 inches of the participant’s mouth while reading. If an error occurred while reading, the participants were instructed to resume reading at the point where the error had occurred to provide

¹Note: The Spanish translation of The Grandfather Passage is not phonetically balanced as is its English equivalent, but this was used for the purpose of providing listeners with equivalent auditory stimuli in terms of length and complexity.

listeners with a natural auditory sample. Upon completion of the audio recording, participants were provided with a \$20.00 gift card to a local retail establishment as compensation for their participation in the study.

Research Participants

A convenience sample was taken of 30 self-identified Hispanic and 30 non-Hispanic individuals who resided in the Greater El Paso region during the time of the study. Participants were recruited from public establishments in the El Paso region and were matched by age, gender, and education. Participants ranged in age between 24- 29 years old, with a mean age of 26.1 years (SD=1.36). Level of education was described in a hierarchy comprised of five levels: 1- some high school, 2-completed high school, 3- some college, 4-obtained Associates degrees, 5-obtained Bachelors degree. Modal education level was 3 as noted by 50 percent of the respondents, indicating that most participants had at least some post-secondary education.

Table 1. Participants matched by age, gender, and education.

Participants	N=60 (30 Hispanic, 30 non-Hispanic)
Age	Mean= 26.1 (SD=1.36)
Gender	N=30 male (15 non-Hispanic male)
Education	Mode= 3 (some college)

Instrument

The survey instrument consisted of five questions, four of which were open ended. Table 1 lists survey questions in English and Spanish. Question 1 required that the participants exhibit their understanding of voice disorders by providing their operational definition of a voice disorder. As previously stated, Ramig and Verdolini (1998) defined a voice disorder in terms of three components: pitch, quality, and volume, and the expected responses would include one or more of these variables.

This question was utilized to identify whether participants had some degree of knowledge of the components that comprise a voice disorder.

Question 2 was a close-ended question that required the participants indicate whether any of the twenty voice stimuli presented with a voice disorder. Participants responded “si/yes” when they believed that a voice disorder was present, and “no” in the absence of a voice disorder. Similar to Davis and Harris (1992), the current research investigated whether the participants can accurately identify disordered voices without previous intensive perceptual training. Accurate perceptual identification of voice disorders has implications for the initiation of appropriate referrals to the proper medical and rehabilitation professionals.

Question 3 asked participants to identify the steps that they would take to “fix” a voice disorder. Salas-Provance, Erickson, and Reed (2002) asked their participants “What would you do to cure a speech problem?” and found that their responses were influenced by medical and folk beliefs. This question was asked particularly to address the notion that the Hispanic population practices self-remediation of medical issues rather than seeking medical or rehabilitative intervention.

Question 4 and 5 allowed participants to list medical and rehabilitation professionals that specialize in voice disorders. Mayo and colleagues (2006) assessed their participants’ knowledge of professionals who provide services for voice disorders. Interestingly, in that study, 85% of their participants identified the speech-language pathologist for rehabilitation of voice disorders but failed to identify the otolaryngologists as the primary medical professional. Boone (1991) stressed the importance of collaboration between the laryngologist and speech-language pathologist in the rehabilitation of voice disorders, specifically, the importance of a thorough laryngeal evaluation as a prerequisite prior to the initiation of vocal therapy.

Table 2. Survey questions in English and Spanish.

1. How do you define a voice disorder? <i>1. ¿Cómo definir un trastorno de la voz?</i>
2. Identify voice disorders: Circle yes-voice disorder present/ no- voice disorder is not present <i>2. Identificar los trastornos de voz: Sí: trastorno de voz presente/ No-trastorno de voz no presente</i>
3. What would you do to fix a voice disorder? <i>3. ¿Qué haría usted para solucionar un trastorno de voz?</i>
4. If you would seek medical attention for a voice disorder, who would you go to? <i>4. Si busca atención médica por un trastorno de la voz, con quien iría?</i>
5. If you would seek rehabilitation for a voice disorder, who would you go to? <i>5. Si busca servicios de rehabilitación de un trastorno de la voz, con quien iría?</i>

Procedure

Research participants were recruited from local public establishments in the Greater El Paso Region (e.g. coffee shop, fitness gym). Prior to administration of the survey, all participants read and signed the Informed Consent as required by the Institutional Review Board at the University of Texas at El Paso. The researcher explained to the participants that the purpose of the study was to identify Hispanics and non-Hispanics' perception toward voice disorders and their ability to accurately identify a voice disorder when presented. To ensure reliability, consistency in standardized instruction was rigorously maintained by the researcher and a graduate student trained in protocol, including the order of presentation of the stimulus items, and adherence to the scripted questionnaire. Survey administration was conducted in a face-to-face interview and lasted approximately 10-15 minutes, depending on the individual's responses and whether they requested to re-listen to the auditory stimuli. Participants were required to answer four open-ended questions and discriminate 20 audio samples of individuals reading

“The Grandfather Passage” as pathological or non-pathological. Headphones were connected to the Sony IC Recorder ICP-P620 for the presentation of the auditory stimuli. The researcher transcribed all responses verbatim on-line. Upon completion of the survey, each research participant was provided with a \$20.00 gift card as compensation for their participation in the study. Inter-rater reliability between the researcher and graduate assistant was calculated by dividing the number of agreed upon survey questions by the total number of participant questions, to ensure accuracy of coding in participants’ responses ($r=.90$).

Analysis

Participants' responses were analyzed utilizing corpus analysis, qualitative descriptive measures, and chi-square test of statistical significance. The Chi-square test of independence provides analysis of frequency sets to identify whether statistical differences exist between selected variables. Non-parametric statistics were utilized because the study design did not meet requirements for parametric statistical tests of normal distribution, homogeneity of variance, and linearity (Martella, Nelson, and Marchand-Martella, 1999).

The cohorts' definition of a voice disorder (question 1) was analyzed utilizing a corpus analysis to reveal the most frequently occurring terminology and the Chi-Square test of independence was used to compare group accuracy means to identify if a statistically significant difference existed between cohorts. The participants' definition of a voice disorder was rated on a 4 point scale to observe whether the definition included three key elements pertaining to voice: pitch, volume, and quality. A score of 1 indicates that the participant did not include any of the three components of a voice disorder, 2 indicates the inclusion of one component, a score of 3 indicates that the participant included two of the three key components to define a voice disorder, and a score of 4 indicates that the participant included all three key components in their definition.

The perceptual identification task (question 2) was analyzed to reveal whether a significant difference existed between the accurate identification between the Hispanic and non-Hispanic cohort. Qualitative analysis of survey question 3 identified commonly occurring responses among participants on self-remediation of voice disorders. The final two survey questions (4 &5), regarding medical attention and rehabilitative options, were analyzed to calculate the percentage of participants that include an otolaryngologist and/or a speech-language pathologist in their answer. Statistical analysis was conducted utilizing the Chi-Square test of independence.

Results

Question 1: Comparison of Voice Disorder Definition between Cohorts

No significant difference was found in the inclusion of vocal components (pitch, quality, and volume) between the Hispanic and non-Hispanic cohort ($p = .922$, $df = 2$, $n = 60$). One cohort did not identify more vocal characteristics than the other. Three percent of participants in both the non-Hispanic and Hispanic group included two variables in their definition, while 13% of the non-Hispanic group and 10% of the Hispanic group included one variable in their definition.

Definition (frequently occurring terminology)

The first question required that the participants provide an operational definition of a voice disorder. Descriptive analysis revealed that 71% of the participants' definitions failed to include any of the three components of voice disorder: pitch, volume, and quality. Twenty-nine percent of the participants mentioned either "pitch", "tone", or "volume" in their definition, but none of the participants made reference to all three components of a voice disorder. Data was coded by the primary researcher and assistance and inter-rater reliability, number of disagreement in coding divided by the total number of surveys.

A corpus analysis addressed the most frequently occurring terminology in the participants' definitions of a voice disorder. Fifty-one percent of the participants included "difficulties with speech" or "difficulties speaking". Twenty-eight percent participants understood voice disorders to include "stuttering", "someone who stutters", "difficulties with pronunciation" or "someone who has a lisp". Interestingly, the ability to comprehend speech, reported as "someone who can't understand", was described by 15% of the participants.

Question 2: Identification Accuracy between Cohorts

Chi-Square was utilized to compare accuracy of identification of voice disorders among non-Hispanic and Hispanic cohorts. The non-Hispanic cohort identified disordered voices with 77.66% accuracy, while the Hispanic cohort identified voices with 76.5% accuracy, reflecting a minimal, but statistically significant difference ($p=.001$, $df=9$, $n=60$) between cohorts. Figure 1 reflects the cohorts' percentage of accurate identification for the twenty stimuli voices when compared to a composite mean score for both groups.

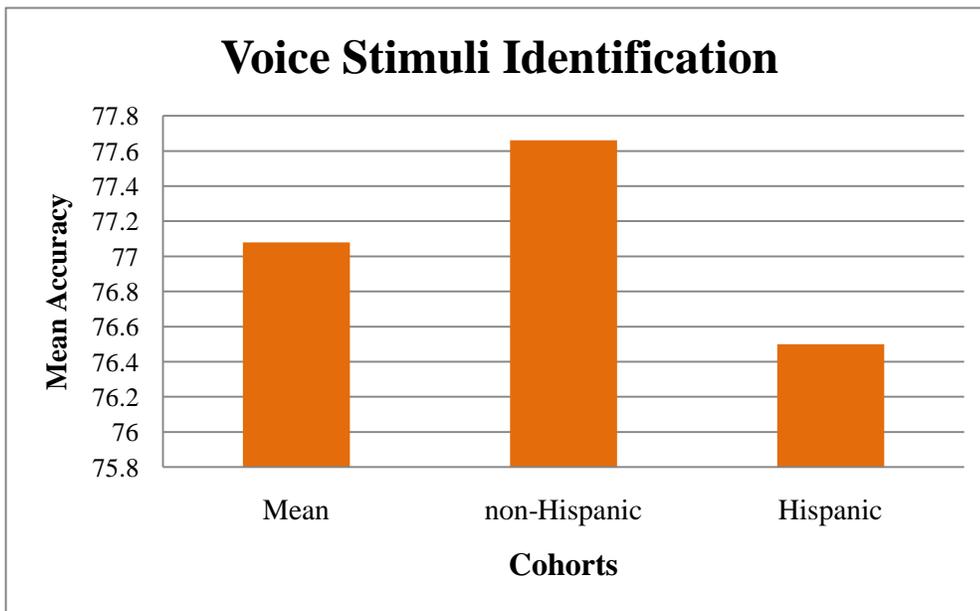


Figure 1. Percent accuracy of voice stimuli identification task. N=60 (30 per cohort); M= combined for both cohorts.

Individual Voice Stimuli Accuracy

In comparative analysis of individual voice stimuli, no difference was found in perceptual accuracy between the non-Hispanic and the Hispanic cohort.

Table 3. Perceptual accuracy between cohorts: non-Hispanic and Hispanic.

Stimuli	Diagnosis	M= combined cohorts	Non-Hispanic cohort	Hispanic cohort
Voice 1	Hypokinetic dysarthria	58.3%	53.0%	63.0%
Voice 2	Non- disordered	90.0%	93.3%	86.7%
Voice 3	Non-disordered	65.0%	70.0%	60.0%
Voice 4	Post surgical laryngeal tumor re-section	60.0%	60.0%	60.0%
Voice 5	Unilateral vocal fold paralysis	81.7%	83.3%	80.0%
Voice 6	Non-disordered	96.7%	96.7%	96.7%
Voice 7	Unilateral vocal fold paralysis	85.0%	83.3%	86.7%
Voice 8	Non-disordered	93.3%	96.7%	90.0%
Voice 9	Non-disordered	80.0%	83.3%	76.7%
Voice 10	Unilateral vocal fold paralysis	75.0%	76.7%	73.3%
Voz 11	Non-disordered	88.3%	93.3%	83.3%
Voz 12	Moebius Syndrome	85.0%	90.0%	80.0%
Voz 13	Non-disordered	81.7%	73.3%	90.0%
Voz 14	Amyotrophic lateral sclerosis	93.3%	96.7%	90.0%
Voz 15	Non-disordered	36.7%	46.7%	26.7%
Voz 16	Hypokinetic dysarthria	55.0%	46.7%	63.3%
Voz 17	Unilateral vocal fold paralysis	83.3%	76.7%	90.0%
Voz 18	Non disordered	95.0%	93.3%	96.7%
Voz 19	Right-side stroke	56.7%	50.0%	63.3%
Voz 20	Non-disordered	85.0%	86.7%	83.3%

Questions 3: Self-remediation of Voice Disorders

Analyses of composite responses indicate that 30% of the Hispanic and non-Hispanic participants indicated that they would seek some form of speech/ vocal therapy for remediation of voice disorders. Thirty-three percent of the participants included a component of articulation/ pronunciation as a form of self-remediation. Response included, “*practice speaking*”, “*reading aloud*”, “*pronounce each word*”, and “*try speaking clearly.*” Six percent of Hispanic and non-Hispanic participants resorted to augmentative and alternative means of communication, for example, “*find an apparatus to help them speak*”, “*a device to help you speak.*” The original hypothesis was that the Hispanic population would respond to this question with cultural remedies. However, no folk remedies were included in the responses; therefore, further analysis was not warranted.

Questions 4&5: Awareness of Otolaryngologist/SLP

The participants were asked to identify the professional from whom they would seek medical and rehabilitation services for a voice disorder. Responses were categorized as correct if they included an otolaryngologist and/or speech-language pathologist in their answer. Figure 2 illustrates the percentage of individuals who identified an otolaryngologist and speech-language pathologist in their responses. A significant difference between groups was noted ($p < .000, df=1, n=60$), as 10% of the non-Hispanic cohort and 16.7 % of the Hispanic cohort identified the otolaryngologist as the medical professional for vocal disorders. No difference was found in the cohorts’ response to the question regarding which professional who provides rehabilitation services for voice disorders ($p=.121, df=1, n=60$). Sixty-six percent of non-Hispanic and 53% of Hispanic individuals identified the speech-language pathologist as the primary professional for voice rehabilitation.

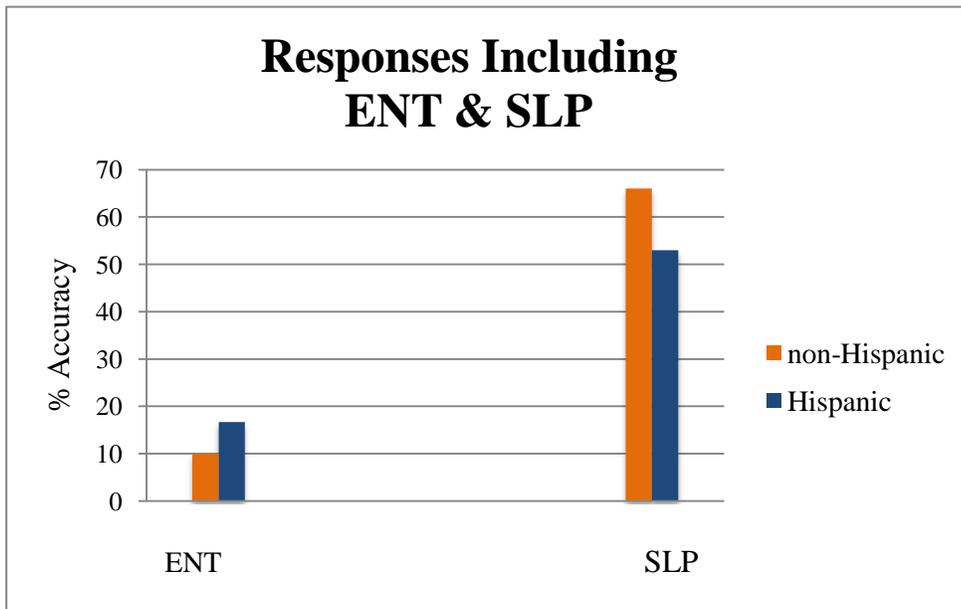


Figure 2. Percent of participants who identified an ENT/ SLP in responses.

Discussion

Analysis of the data indicates that the participants as a group, regardless of ethnicity, failed to include pitch, volume, or quality in their operational definition of a voice disorder. Corpus analysis revealed that the majority of the participants perceived articulation, fluency and voice disorders interchangeably. As previously noted, recent research has highlighted the ill-defined knowledge of voice disorders between individuals of disparate ethnicity. African American participants in the Mayo et al, study were asked to describe the associated characteristics of their voice disorder if they had ever experienced one. Although the researchers in that study made the definition of a voice disorder accessible to all participants before initiating the survey, the participants persisted in failing to differentiate between vocal, articulation, and fluency characteristics. Likewise, the current study investigated whether ethnic variables impacted preconceived knowledge of voice disorders. No differences were found between the non-Hispanic and Hispanic's knowledge of what a voice disorder entails, indicating limited knowledge across ethnic groups.

Statistical analysis identified a significant difference between non-Hispanic and Hispanics' perceptual accuracy when distinguishing between pathological and non-pathological voices. Accurate perceptual identification of voice disorder, as noted in the aforementioned Davis and Harris (1992) study, resulted in appropriate referrals to the school speech-language pathologist. Although a difference exists between the cohorts in the current study, the identification task reflected low perceptual accuracy percentages overall. Due to the minor disparity among group accuracy scores, a clinically significant difference between cohorts does not exist. Participants were unable to perceptually identify disordered from non-disordered voices, identifying a need for education of perceptual characteristics of voice for both ethnic groups.

Corpus analysis revealed that participants in this research project were more likely to initiate or seek rehabilitation, rather than resort to cultural remedies such as the participants in the study by Salas-Provance and colleagues (2002). Responses may have been influenced by the discrepancy in age among the participants in the current study and participants in the 2002 study.

Lastly, the results indicated that the participants in this study were unaware of the role of otolaryngologists and speech-language pathologists in the rehabilitation of voice disorders. Participants most commonly referred to their primary doctor as the medical professional who assesses vocal dysfunction. The limited awareness and understanding of the profession of speech-language pathology by the non-Hispanic and Hispanic population emphasizes the dearth of professional advocacy for the scope of practice. This study exemplifies the need for increased awareness of voice disorders; the potential causes and preventative measures; and the medical and rehabilitative option for the general population, regardless of ethnic background.

Ultimately, results of the study emphasize the lack of understanding and knowledge of vocal disorders among both ethnic groups. Although variable performance existed between groups, low percentages overall prevailed throughout the questionnaire. The discrepancies are prevalent among both

cohorts, questioning the hypothesis that the Hispanic ethnicity presents with more significant limitations in knowledge of medical and rehabilitative options of voice disorders when compared to non-Hispanic populations. Data suggests that no disparities exist among the Hispanic and non-Hispanic cohorts' knowledge and identification of voice disorders.

Clinical Implications

The primary concern is the inaccurate perception that the general population has of the profession of speech-language pathology. The profession is typically characterized as providing rehabilitation solely for articulation and fluency disorders. Speech-language pathologists are encouraged to educate the general population of the realm of speech and language disorders and the rehabilitative services provided. Public service announcements in a variety of languages are necessary to accommodate to the linguistic demand of the community and ensure that all ethnicities are informed of our services.

Although statistical differences exist between cohorts on the audio stimuli identification task (Question 2) and medical professional inquiry (Question 4), low composite scores suggest the need to augment the general population's knowledge of vocal characteristics to increase their ability to accurately identify disorders when perceiving vocal dysfunction. Perceptual identification of vocal disorders is of great importance as it is the initial phase of the referral process. Untreated voice pathologies may be exacerbated if appropriate medical and rehabilitation services are not provided in a timely manner.

Potential Limitations

Although the cohorts were matched by age, sex, and education, recruitment through a convenience sample survey may not have provided a sample that is representative of the Greater El Paso region in terms of demographic variables. Further, unlike participants in the Mayo et al(2006) study, who were provided with the ASHA definition and examples of disordered voices prior to the

administration of the survey, the participants in the current study were not provided with *a priori* knowledge of either. The study may have yielded different results if the participants had prior knowledge and familiarity with voice disorders. Another possible limitation of the study includes the usage of the Spanish translation of the “Grandfather Passage”, which consists of complex vocabulary. The vocabulary posed challenges for one of the individuals whose voice served as auditory stimuli in the survey. Some of the participants misinterpreted difficulties reading as a voice disorder. Although participants responses were transcribed online by the investigator and a graduate student trained in survey protocol, responses were not audio recorded, compromising intra-rater reliability.

Future Directions

Future studies require investigation of the effect that education of preventative measures has on increasing the general population’s knowledge of vocal pathologies. Recent studies have investigated the effects of vocal hygiene education on reducing vocal disorders among school-age teachers (cf., Chan, 1993; Yiu, 2001; Duffy & Hazlett, 2003). Results imply that direct instruction of vocal health, hygiene, and vocal exercises, significantly reduces the incidence of vocal pathologies among school teachers. Enhancing the general population’s knowledge of vocal pathologies, preventative measures, and scope of the speech-language pathology profession will adhere to the ASHA Code of Ethics (2010) “responsibility to promote public understanding of the profession” (pg.3). Another variable to investigate is the possible influence of bilingualism on perceptual identification task of individuals of the same ethnicity and language. Further data analysis includes the investigation perceptual identification accuracy among participants and auditory stimuli of the same ethnicity.

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Vita

Jacqueline Nicole Lopez, first generation college graduate candidate, was born of Joe Lopez and Ana Olivares September 28, 1985. Upon graduation from Del Valle High School in El Paso, Texas, she pursued her undergraduate basic studies at El Paso Community College in January 2004. She began her undergraduate coursework in Speech-Language Pathology at the University of Texas at El Paso in June 2007 and was inducted into Alpha Chi-UTEP Chapter Honors Society in May 2008. She was accepted to the Speech-Language Pathology Graduate Program in August 2008 with the Jimmie Vokes Bernard Endowed Scholarship. Throughout her graduate experience, she has prepared poster presentations for the Texas Speech-Language Hearing Association and American Speech-Language Hearing Association alongside her mentor Dr. Bess Sirmon Fjordbak. Jacqueline has participated in the TSHA – Cultural and Linguistically Diverse Task Force as student representative since August 2008. During graduate school she has worked for the Speech-Language Pathology Program as a Teaching Assistant for the University clinic and assisted Dr. Anthony Salvatore in a Language Development undergraduate course. She is a two-time recipient of a graduate student research grant funded by the Hispanic Health Disparities Research Center. She is expected to graduate May 2010 with a Master of Science in Speech-Language Pathology.

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