2021

Lifting the Heavy Vocal Load: SLPs and Their Vocal Habits

Sydney Sedlock

LIFTING THE HEAVY VOCAL LOAD: SLPS AND THEIR VOCAL HABITS

A Thesis
Presented to
the Faculty of the Department of Communication Disorders
Murray State University
Murray, KY

In Partial Fulfillment
of the Requirements for the Degree
of Master of Science in Speech-Language Pathology

by Sydney Sedlock
May 2021

ACKNOWLEDGEMENTS

I would first like to thank God and my family for providing me with strength and support during this process. Thank you, Mom, Dad, Kole, and even Rigby, for your unconditional love and support not just through graduate school, but throughout my entire life. I wouldn't have made it this far without you all. Thank you, Nana and Granny, for giving me support when you knew I needed it the most. I miss and think of you both every single day. Thank you for showing me what a strong and intelligent woman is.

To my friends, thank you for handling my constant worrying and for always being there to talk me through difficult times. I don't tell you all enough, but thank you for everything. You truly don't know what it means to me. To my classmates, WE DID IT! I am so glad to have had the opportunity to work alongside you all and to continue our dreams of becoming speech therapists. This journey wouldn't have been the same without you all, and I'm so glad to call you all colleagues.

To my thesis supervisor, Nikki Gaylord, thank you for pushing me to begin this process. Thank you for believing in me and for challenging me in the best way possible to create something so important to me, and for providing the best feedback and knowledge. To the committee, Stephanie Schaaf and Alison Brown, thank you all for going on this journey with Nikki and me. I truly appreciate it more than you ever will know!

I am so grateful for everything that has led up to this to make me the person that I am today. All of these people, and many more, I will never be able to repay. I am so thankful for this opportunity and cannot wait to continue my knowledge to grow after graduation and as I begin my career as a speech therapist. SHOES UP FOREVER!

ABSTRACT

Novice speech-language pathologists (SLPs) are a vulnerable population that is at-risk for dysphonia. Previous literature has highlighted the high vocal-demand occupations of teaching and entertaining but there is minimal research to understand the prevalence of dysphonia in SLPs. The purpose of this investigation was to determine the prevalence of vocal fatigue and vocal loading in novice SLPs in western Kentucky to increase awareness of the vulnerability for dysphonia in this population. This investigation was descriptive in nature using a survey format and was sent to SLPs in the western Kentucky region. A total of 21 SLPs responded to the survey. Results indicated that while novice SLPs in western Kentucky are at risk for vocal fatigue, vocal loading, and dysphonia, these SLPs often do not prescribe to the same recommendations and strategies provided to clients with dysphonia. This investigation adds to the growing body of literature regarding the prevalence of dysphonia in SLPs.

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Chapter 1: Introduction

Speech language pathologists (SLP) are professionals in the field of communication disorders, providing assessment and therapeutic services to those individuals with speech, language, voice, and swallowing issues. SLPs work to prevent, assess, diagnose, and treat those with speech, language, cognitive, social, and swallowing deficits. More specifically, SLPs work with those whose communication is impaired, ranging from individuals at birth to those at the end of their life. SLPs rely on their voice to provide services to individuals and often, their days are long and arduous (ASHA, 2020). Joseph et al. (2018) liken voice use of SLPs to that of teachers and according to Hume (2018) teachers use their voice an average of 49 hours per week.

SLPs are trained in vocal hygiene and voice care although many SLPs may be in danger of experiencing voice deficits secondary to overuse and poor vocal hygiene. As with most teachers that experience vocal fatigue or vocal loading, a lot of SLPs do not practice appropriate vocal hygiene skills. Vocal rest and maintaining hydration as well as other vocal hygiene practices are extremely important to SLPs to ensure that their voices do not deteriorate and ultimately impact their ability to provide services. SLPs may be teaching their clients the proper techniques in maintaining a healthy voice, however, they may not take the same advice that they provide (Joseph et al, 2018).

With strenuous days filled with constant voice use, SLPs may experience vocal loading, or an overuse of the vocal folds, resulting in a voice disorder, or dysphonia (Sapienza & Hoffman-Ruddy, 2018). Novice SLPs are more susceptible to these voice disorders due to a lack of extensive knowledge of proper vocal habits and reduced ability to identify symptoms of voice disorders in themselves (Joseph et al., 2018). Without the proper knowledge, young SLPs can become prone to extensive damage to their voices and could impact their ability to provide

adequate voice therapy to their clients. Continued improper use of their voices may cause premature retirement and voice issues that may require surgery if not properly addressed (Joseph et al, 2018). Voice disorders resulting from improper use or poor vocal hygiene can significantly impact job performance as well as quality of life at home. McCabe & Titze (2002) found from informal interviews for their study that teachers experiencing extreme vocal fatigue have to miss days of teaching and start to become frustrated in their jobs due to vocal fatigue. The frustration comes from the perceived discrepancy of the severity of vocal fatigue they are experiencing and the thought that vocal fatigue is not ranked high on the list of health issues.

Research in the area of vocal use among SLPs is lacking. There is very little research that demonstrates the prevalence of vocal fatigue and vocal loading in SLPs. Most research supports other professions such as teachers and performers, and how vocal hygiene coaching can help in maintaining a proper voice (Davis, 2020; Fuentes-Lopez et al., 2017; Jones et al., 2002; McCabe & Titze, 2002; Phyland, 2017; Roy & Tanner, 2013; Sapienza & Hoffman-Ruddy, 2018; Searl & Bailey, 2013). Research that has been completed does not provide enough information to properly identify how vulnerable SLPs are to dysphonia and vocal loading. The purpose of this research investigation was to determine the prevalence of vocal fatigue and vocal loading in novice SLPs in western Kentucky to increase awareness of the vulnerability of dysphonia in this population.

Chapter 2: Literature Review

Speech-language pathologists (SLP) devote their careers to helping others who have communication disorders. While assisting others to improve functional communication, SLPs often experience vocal loading and vocal fatigue which can then lead to a voice disorder. Speech-language pathologists use their voice more than the average person because their job is dependent on voice to provide therapy for individuals with communication disorders. Speech-language pathologists working with pediatric clients in the school setting are at an even higher risk of vocal loading and vocal fatigue for the same reason that teachers are more susceptible to these voice disorders. Bovo et al. (2006) indicated "...they must speak over high background noise levels, [and because of this] they naturally increase their vocal loudness, which causes an increase in the mean fundamental frequency and a strained or hyperfunctional vocal behavior" (p. 706). Current research, however, does not provide enough information in understanding the SLPs overuse of voice.

Many novice SLPs do not fully understand the importance of vocal hygiene in their own vocal habits and the long-term effects that vocally abusive habits can cause. Although these SLPs are taught and trained to understand these habits, it can sometimes be more difficult to implement these strategies in their own lives. Studies have shown that using vocal hygiene tracking logs can aid in a better understanding of the deeply rooted causes of vocal fatigue in teachers and could prove to be beneficial for novice SLPs (Bovo et al., 2006). However, using a combination of voice therapy and vocal hygiene education could prove to be more effective in decreasing the risk and prevention of voice disorders. Novice SLPs have an increased propensity to demonstrate vocal loading or hyperfunctional voice because of the high use of their voice (Joseph et al., 2018). Research has shown a correlation between hyperfunctional use of voice and

vocal fatigue. According to Solomon (2008), hyperfunctional voice use can lead to vocal fatigue and use of compensatory strategies that do not alleviate the overall effect on the voice musculature. A primary compensatory symptom in those with hyperfunctional voice use is the overuse, and therefore, tiring of the muscles used for vocal production. This can lead to other neuromuscular changes and issues such as fatigue of respiratory and laryngeal muscles, changes in vocal fold viscosity, and muscle-tension dysphonia. and then a steady decrease in vocal quality and production (Solomon, 2008). Researchers have stated that even without the presence of a voice disorder, periods of extensive voice use, and inaccurate vocal techniques can contribute to vocal discomfort, a reduced voice quality, and/or decreased vocal endurance (Hunter et al., 2020). Therefore, vocal abuse, vocal loading, and vocal fatigue are more prevalent in those individuals that use their voices extensively without proper care and vocal hygiene.

Phonotrauma

Phonotrauma, also known as vocal abuse or misuse, is defined as "...the behavior(s) that contribute to laryngeal/vocal fold tissue injury, inflammation, or other forms of damage" (Sapienza & Hoffman-Ruddy, 2018, p. 59). Recurrent phonotrauma has been associated with detrimental effects to the voice and increased prevalence of vocal fold pathologies (Sapienza & Hoffman-Ruddy, 2018). There are two types of factors that play a role in vocal health and vocally abusive behaviors. According to Sapienza & Hoffman-Ruddy (2018), intrinsic factors are those that an individual may not have control over (i.e. anatomical responses to the female vocal folds during menstruation), whereas extrinsic factors are those that one may be exposed to (i.e. alcohol consumption). Extrinsic factors may be associated with the environment or from an individual's own habits. Smoking can be vocally abusive whether it be direct smoke inhalation or being around those that smoke, resulting in secondhand smoke. Alcohol and various drugs

may have a diuretic effect, meaning they create a decrease in the amount of water that the body contains. In this case, the vocal folds may become dehydrated, which can then increase the incidence of vocal pathologies (Sapienza & Hoffman-Ruddy, 2018). Other types of extrinsic factors are gastrointestinal reflux disease, caffeine intake, and allergies. However, there are many other behaviors that one not trained in proper vocal care may not consider as phonotraumatic or vocally abusive but can be just as damaging to the vocal fold structure. These behaviors include excessive throat clearing or coughing, talking loudly for long periods of time, and not warming up or cooling down the voice prior to long periods of talking or singing (Sapienza & Hoffman-Ruddy, 2018). With chronic phonotraumatic behaviors, vocal loading, vocal fatigue, and hyperfunctional voice may result.

Vocal Demand

Vocal demand, also known as vocal loading, is a term that has been described as, "greater than usual phonatory activity and durations" (Phyland, 2017, p. 80). It is often used interchangeably with the term *vocal load,* which differs from vocal loading. Hunter et al. (2020) reported that vocal loading has consistently correlated with a decrease in vocal quality and limitation of job performance. A vocal load, however, correlates to the physiological and perceptual symptoms caused from vocal loading (Hunter et al., 2020). Hunter et al. (2020) found that there is ambiguity when using *vocal load and vocal loading* and proposed use of *vocal demand* and *vocal demand response* to reduce confusion between the terms, as well as further define the terms more accurately. By using *vocal demand* in place of vocal loading, the definition becomes more clinically functional when treating those with voice disorders. The definition of vocal demand, otherwise known as vocal loading, is then interpreted as the "vocal requirement for a given communication scenario; it is independent of the vocalist's physiology,

voice production, or perception of the scenario" (Hunter et al, p. 516). The definition of vocal demand response, also known as vocal load, is then interpreted as, "the way voice is produced in response to the perception of a communication scenario (*vocal demand)*; it is individual as no two vocalists would respond in the same way" (Hunter et al, p. 516).

Vocal demand response occurs in those who overuse their voices, such as teachers and SLPs, and may be phonotraumatic. To prevent or decrease phonotraumatic behaviors, individuals may be educated to employ vocal hygiene techniques taught by SLPs (Joseph et al., 2018).

Vocal Fatigue

Nanjundeswaran et al. (2014) defined vocal fatigue using two separate definitions, one that encompassed a broader view and one that was more specific to the feeling of fatigue. The more specific definition states that vocal fatigue is a "…feeling of local tiredness and weak voice after a period of voice use" (Nanjundeswaran et al., 2014, p. 1). The broad definition, which is more consistently used in the literature, is described as:

> "…a global syndrome identified by a series of symptoms during or after speech, including a person's perception of increased vocal effort, laryngeal discomfort, neck or shoulder tension, throat or neck pain, reduced pitch range, loss of vocal flexibility, reduced vocal projection or power, reduced vocal control, voice loss, increase in symptoms across the speaking day, and, typically, improvement of symptoms with rest" (Nanjundeswaran et al., 2014, p. 1).

The Vocal Fatigue Index (VFI) was created to identify the habits of those that experience vocal fatigue or complain of voice discomfort (Nanjundeswaran et al., 2014). Nanjundeswaran et al. (2014) created the VFI to improve the identification of vocal fatigue and its effect on the overall voice and developed a questionnaire that included a list of statements that describe

symptoms related to voice problems as well as vocally abusive habits that may increase those symptoms. The scale instructs the user to rate each statement using a Likert scale from zero to four, with zero representing *never* and four representing *always*. The VFI was developed by a panel of SLPs that provided information as to common complaints from individuals with dysphonia. Participants for this study were included if they presented with voice complaints but were excluded if they had a history of botulinum toxin injections to treat voice deficits. Participants were instructed to complete two different forms of the VFI and the results were analyzed. The results from the VFI showed that vocal fatigue is not one singular problem, rather it is made up of three factors which include the following: "…tiredness of voice and avoidance of voice use, physical discomfort, and improvement of symptoms with rest" (Nanjundeswaran et al., pp. 6). This study also found that the VFI was able to discriminate between those that have healthy vocal habits with no voice disorders and those that have voice complaints and unhealthy vocal habits. Some limitations in the study were noted. Important information regarding the medical and professional history of each participant should have been gathered and only current diagnoses were included in the information for each participant. It was not determined if any of the participants had a history of voice surgery or worked in a profession in which they may overuse their voice. Implications from this study showed that the VFI can be used to identify those with vocal fatigue, evaluate treatments effects with individuals with vocal fatigue and understand the impact of vocal fatigue on the function of the individual with a voice disorder. The VFI is a viable tool to use when assessing those with complaints of vocal fatigue to improve the clinician's ability to understand the vocal habits and mechanism of the individual they are treating.

Vocal Hygiene Techniques and Education

Behrman (2008) stated that the goal of vocal hygiene education is to reduce speech and non-speech factors that may contribute to phonotraumatic behaviors in an individual. Non-speech factors that can increase the risk of phonotraumatic behaviors include smoking, dehydration of the vocal folds, gastroesophageal reflux (GERD), and clearing the throat. Speech factors that can increase the risk of phonotraumatic behaviors include situations that may tax or increase overuse of the voice and increased need for projection of the voice in everyday vocal use. Vocal hygiene techniques strive to reverse damaging behaviors that may be causing phonotrauma. As these behaviors are often habitual, individual cooperation is important in decreasing the presence of phonotraumatic behaviors. The result of excessive phonotrauma and poor vocal hygiene is dysphonia. Sapienza and Hoffman-Ruddy (2018) describe dysphonia as "a disruption in vocal fold vibration that results in a voice quality that is perceived as abnormal" (p. 358).

When vocally abusive behaviors become habitual, it can be difficult to overcome or change these behaviors. Additionally, lack of understanding of the effect of these behaviors can reduce the motivation to change (Joseph et al., 2018). Vocal hygiene can mean many different things for different people. People who depend on their voice for their occupation are more susceptible to dysphonia than those who may not use their voice as much for their job and must be aware of vocal hygiene techniques that are beneficial for them (Joseph et al., 2018).

Vocal warm up and cool down exercises are important in those that use their voices excessively (Sapienza & Hoffman-Ruddy, 2018). De Faria Morias Nogueira and de Medeiros (2018) discussed the vocal habits and changes at work in teachers with dysphonia before and after inclusion in the Comprehensive Vocal Rehabilitation Program (CVRP), which has been proven to benefit teachers with dysphonia through self-perception and clinical aspects. The

researchers stated that teachers often work in inadequate conditions regarding the long hours worked, number of students they teach, and presence of various noises and inadequate acoustics in the classroom. Additionally, teachers often have little awareness about voice care and inadequate vocal adjustments that may be needed with excessive voice use. Because of this, the researchers concluded that teachers are more susceptible to dysphonia. De Faria Morias Nogueira & de Medeiros (2018) determined that the main complaints of voice problems in teachers included sore throat, hoarseness, temporary voice loss, and vocal nodules. The purpose of the study was to determine changes in vocal habits and perceptions in the work environment of teachers with dysphonia six months after engaging in the Comprehensive Vocal Rehabilitation Program (PIRV). Each participant underwent speech therapy treatment and answered a questionnaire six months after treatment ended. Treatment consisted of eight sessions with each session targeting one specific goal. The first session included building a rapport with the clinician and teacher, providing a questionnaire to gather demographic, voice, and behavior information, work environment questions, performance of perceptive-auditory and acoustic evaluation of the voice, and protocols. The questionnaire was standardized for all teachers and included the following: gender, teaching cycle, work shifts, profession time, and the Voice Activity and Participation Profile (VAPP). The VAPP assesses participants' self-perception of the vocal problem, effects of dysphonia on the teaching activity, daily communication, social communication, and emotion. The participants were re-evaluated through perceptual-auditory and acoustic assessment of the voice and received guidance on warm-ups and voice relaxation exercises in the eighth session. The results from this study indicated that teachers made changes in their behaviors and habits after participating in the study. Participants reported increased ability to perceive a poor work environment, including ventilation, temperature, and noise.

Additionally, participants were more aware of vocally appropriate behaviors as in increased hydration during class time and reducing intense voice use throughout class. Participants in this study also reported increased use of external voice aids such as microphones, after the study (de Faria Morias Nogueira & de Medeiros, 2018). This study gives evidence to show that teachers who were given more in-depth knowledge and understanding of dysphonia and the techniques to lessen the vocal load, those with dysphonia may be at a greater risk of decreasing their perceived experiences with vocal fatigue and dysphonia. Although novice SLPs are given that knowledge, they still may not use those techniques that they are knowledgeable on because vocal fatigue is multifactorial (Joseph et al., 2018).

Hosoya et al. (2018) investigated the success of vocal hygiene education programs that eliminated the need for phonosurgery in those with vocal fold polyps and nodules, the most frequently occurring lesions in those that overuse or misuse their voices. The authors created an education protocol to compare to other methods of education with participants that had a diagnosis of vocal nodules or polyps. The protocol included education regarding various topics such as the role of the larynx, the Bernoulli effect, important vocal hygiene techniques that may be used, the function of the nose (how it affects speech production and may play a role in vocal abuse), vocal fold vibration, and the effects of gastro-esophageal reflux (GERD) on voice (Hosoya et al., 2018). The results indicated that the vocal hygiene education protocol that was created by the authors improved the vocal lesions in participants of the study; however, it was not clearly determined that voice education affected the treatment outcomes for those individuals (Hosoya et al., 2018). This study adds evidence that vocal hygiene education is important in one understanding their own vocal habits and how to improve those habits. While vocal education may not be viewed as an overall factor in the resolution of vocal lesions in those that overuse or

misuse their vocal folds, it can be determined from this article that vocal education and proper hygiene can be beneficial for those individuals.

In contrast, vocal hygiene education should not be used as a sole treatment technique. A group comparison study by Rodriguez-Parra et al. (2011) found that a group of participants that were provided voice therapy treatment and vocal hygiene education demonstrated improvements over those that received only vocal hygiene education. It was concluded by the authors that vocal hygiene education did yield results of voice improvement, just not as significant with those who received voice therapy in addition to vocal hygiene education. With that knowledge, SLPs should consider how voice therapy and vocal hygiene education can be beneficial for individuals they treat. They should also consider implementing these techniques into their own lives because the best understanding of vocal hygiene is to create habits from these techniques and exercises.

Vocal Habits in Other Professions

There are many professions that can experience increased vocal demand, vocal fatigue, and phonotraumatic behaviors resulting in dysphonia, although current literature indicates that teachers most often experience voice issues that impact their occupation. Research has shown that teachers consistently overuse their voice to project over background noise with little time for voice rest (McCabe & Titze, 2002). The prevalence of voice disorders in teachers ranges from 20-50% (McCabe & Titze, 2002). Voice disorders in this population can increase emotional distress because of the impact on their ability to perform their job. These individuals may be unable to teach to the best of their ability and may have to take time off to get the proper rest that their voice needs. Early retirement becomes the final option due to years of voice strain and teachers have difficulty continuing their careers due to vocal strain and dysphonia (McCabe & Titze, 2002).

Research indicates that direct behavioral therapy and vocal hygiene education has proved to be the most efficient intervention for decreasing teachers' risk in obtaining a voice disorder (Roy & Tanner, 2013). McCabe & Titze (2002) completed a study to determine the benefit of behavioral chant therapy for rehabilitating vocal fatigue in public school teachers. Chant therapy uses Gregorian singing to elicit more projection of the voice, so that an appropriate pitch range can be found for each speaker using appropriate prosody and intonation. The singing pattern included in chant therapy involves increased use of the respiratory, phonatory, articulatory, and resonance systems, which can aid in the appropriate use of those systems while speaking. A total of four participants were included in the study. All the participants were public school teachers who met the following criteria: reported history of at least four years of vocal fatigue, reported a seven or eight (out of 10) on a "severity of impact" rating, had at least eight years of teaching experience, and had the ability to match a pitch when presented. Exclusion criteria for the study included participants that were receiving current vocal training and had presence of any vocal lesions or disorders.

Each participant went through six 1-hour sessions of chant therapy and two, 2-week blocks of Physiologic Recovery Treatment placebo therapy. All the subjects were given each treatment in different weeks and different times, and they were told that by altering the treatments back and forth the researchers could differentiate between the benefits of organic and functional vocal fatigue symptoms. Therapy sessions targeted normalizing the speaking pitch, which required an increase of the respiratory systems, and increasing prosodic loudness, which required an increase in the lung pressure. The Voice Range Profile (VRP) was used to find a more effective speaking pitch for the teachers. The Physiologic Recovery Treatment placebo therapy involved each participant pairing up and speaking normally to each other for the same

amount of time a chant therapy session would last (one hour) and were each given an exit questionnaire at the end of the study to state how they felt they benefited from those sessions. A fatiguing task was completed at the end of each therapy session, including the placebo group, to identify levels of fatigue to show either progression, regression, or stagnation in each participant's fatigue. Each participant was given their own log to rate their efforts and voice quality after the fatiguing task was presented. The results from this study showed that chant therapy positively impacted how the participants performed on the fatiguing tasks, concluding that chant therapy was beneficial to teachers that are experiencing daily vocal fatigue. Long-term carryover was assessed using a 10-point scale of severity of vocal fatigue. After therapy, all participants showed a significant decrease in vocal fatigue at four months and one-year post-treatment. The authors concluded that continuation of chant therapy would promote recovery from vocal fatigue, meaning that chant therapy is an appropriate treatment in public school teachers afflicted with symptoms associated with vocal fatigue. There were limitations to the study, which included small participant size and lack of physiological methods of measuring vocal fatigue, such as an assessment to formally diagnose vocal fatigue or diagnose the symptoms related to vocal fatigue. Further research using more participants and improved methods of measuring vocal fatigue may demonstrate that using chant therapy can be used as a treatment and possible recovery option for those teachers, and other professionals who experience extreme vocal fatigue (McCabe & Titze, 2002).

Another occupation with a high prevalence of voice disorders is vocal performers. Vocal performance requires a demanding use of the voice and respiratory system and voice use varies based upon vocal occupational demands (Sapienza & Hoffman-Ruddy, 2018). Vocal performers are at a high risk for voice disorders for obvious reasons, such as using their voice in ways that

may be unhealthy and performing in places where vocally abusive behaviors may occur more often. Vocal performers are at an extremely high risk of increased vocal demand response and vocal fatigue without proper training and use of appropriate voicing techniques (Sapienza & Hoffman-Ruddy, 2018). Just as with teachers, educating vocal performers could decrease the likelihood of later presenting with a voice disorder (Joseph et al., 2018).

Phyland (2017) provided an in-depth look at educating singers about vocal folds and their function to help singers in understanding how their vocal folds may be affected over time. The author related singers to athletes, in the fact that athletes warm up their muscles before practice or a game and singers should warm up their muscles before performing. Phyland (2017) provided an in-depth description of the exact physiology and function of important structures involved in speech production regarding the vocal folds. As with most studies completed investigating the effects of vocal hygiene instruction, Phyland (2017) found that anecdotal reports are the most prevalent in providing direct information as to why education is important in singers and how education should be approached in these populations. It was determined that voicing duration, frequency, and intensity are the most crucial in determining vocal demand. The author illustrated the need for proper stretches and exercises to warm up the voice for singers. Providing proper education of healthy vocal habits and a brief understanding of anatomy and physiology of vocal production may aid in the increase of vocally healthy habits and exercises (Phyland, 2017).

Searl and Bailey (2013) completed a study that provided insight into the voice behaviors of student actors/singers and SLPs. Actors may be susceptible to vocal demand response and vocal fatigue because of the amount of rehearsals and performances they participate in, as well as the environment in which they are using their voices (Searl & Bailey, 2013). Many actors are not

professionally taught how to use their voice in a healthy way. Searl and Bailey (2013) used younger actors and SLPs to show how education at the beginning of one's career may have a significant impact. There were three purposes to the research study including: describing an individual's habits over three weeks by voice logging, comparing the results between participant groups, and determining if a relationship exists between voice and vocal habits for both groups. To do this, the researchers were able to use eight, graduate acting students and 25 graduate SLP students to determine a correlation between voice and vocal habits. First, the participants completed a demographics form to give the researchers accurate information about the participants. The participants were then given a daily voice log and were instructed to complete the log daily for 21 days. After 21 days, the participants turned in the log to the researchers and data was then analyzed. The voice log included various ratings and scales for a wide range of voice and lifestyles issues. The log was created by the researchers after various amounts of research was conducted to ensure that accurate data would be collected for the study. It is interesting to note that during the voice log period, only the student actors were given a separate questionnaire that asked about their warm-up activities and food or drink avoidances before periods of long voice use. The student SLPs could have been questioned about this to note specific food or drinks that may disturb their voice, as well as any noted warm-up activities that might be used to aid in a decrease in vocal fatigue. The last step in the study asked the participants to provide qualitative descriptions of their thoughts and interpretations from filling out the daily voice log. The SLP graduate students were asked to provide a reflection a month after the study ended. The student actors were asked to provide a reflection one week after the study ended and again six months after the study ended. The results demonstrated that actors were significantly more frustrated and anxious about their voice as compared to SLPs, and they

also reported having a known diagnosis of acid reflux or hiatal hernia (Searl & Bailey, 2013). The results showed that each of the students made correlations between their vocally abusive habits and their complaints regarding their voices, and, because of this, differences in their vocal habits occurred and became healthier. The acting students showed less days with a hoarse voice, which could be attributed to better vocal care. Ultimately, increased knowledge on how education of the difference between vocally abusive behaviors and healthy vocal behaviors can impact actors and singers on properly taking care of their voices was found. Searl & Bailey were able to show that SLPs do not often worry about how they are using their voice or the effects of overuse of the voice (Searl & Bailey, 2013). Instead, they may push their own health aside and continue to treat their clients. SLPs must ensure that healthy vocal habits should be instilled in their daily lives to ensure continued vocal health. With continued reinforcement and practice, SLPs can continue to keep their voices healthy to continue to treat their clients.

Another profession that is at risk of vocal loading is telemarketers. Fuentes-Lopez et al. (2017) discussed vocal hygiene habits and how those might relate to vocal symptoms in telemarketers. Telemarketers often demonstrate phonotraumatic behaviors that are similar to singers and teachers; however, telemarketers specifically display behaviors such as inadequate use of breaks, vocal overuse, lack of professional voice training, and working in poor acoustic and air quality. The prevalence of voice disorders in the telemarketer population ranges from 33% to 68% (Fuentes-Lopez et al., 2017). The investigators used self-report as the primary data collection method, and this was similar to previous studies. The researchers in this study found that the most common phonotraumatic behaviors occurring with telemarketers included drinking more than three cups of coffee a day and speaking in noisy environments. This study concluded that vocal disorder symptoms increased when inadequate vocal hygiene behaviors were used in

telemarketers. As with teachers and actors, telemarketers are typically not provided with proper vocal hygiene education to maintain adequate vocal quality throughout their job duties (Fuentes-Lopez et al., 2017).

Jones et al. (2002) investigated the prevalence of vocal dysphonia in telemarketers and if dysphonia affected their ability to continue their line of work. They assessed the participants through an anonymous survey between six telemarketing firms. The results from the survey from the telemarketing firms were compared to the results from community college students to test the hypothesis that the telemarketing population is more likely to demonstrate a voice disorder than the general population. The survey contained 57 questions with varying topics, including work history/environment, concerns about health, social speech, previous vocal health education, quality of voice before and after shift, and demographics. The results showed that 68% of the telemarketers reported one or more symptoms of vocal abuse, and 31% reported that their work productivity was affected by their voice problem.

Another profession that may be vulnerable to dysphonia is fitness instructors due to a need to use increased loudness in their classes as well as speaking over noise (Davis, 2020). As with other occupations that overuse their voice, more education is needed in the management and care of vocal practices in fitness instructors. Davis (2020) stated that fitness professionals make up a large group of those with a high vocal demand, a lack of voice training and education, and a need to use their voices as instruments of motivation and inspiration. Davis (2020) completed a descriptive survey study that included 230 participants in the anonymous survey, with 20 questions that discussed voice care, demands, use, and self-reported voice difficulties in the fitness instructor role. The results demonstrated that 100% of the participants perceived the aerobic classes they teach to be affected by their voice. The results also showed that 78% of the

participants stated that they had never had any voice training; however, 82% reported they teach three or more classes every week. A perceived voice difficulty was reported in approximately 70% of the participants, stating they have experienced hoarseness at times during their classes. Approximately 60% of the participants stated that they have experienced straining of their voice or using effort during and after class instruction. Most of the participants stated that they would attend a voice education and training class to help improve the quality of their classes and prevent voice disorders. This study indicated that there is an evident need for voice education and training for fitness instructors to improve vocal hygiene and reduce the frequency of voice disorders (Davis, 2020).

Vocal Habits in SLPS

Similar to the occupations already discussed, SLPs are at risk for dysphonia due to the overuse of their voice and the lack of vocal rest. Ng et al. (2005) stated that those studying for vocally demanding careers may be at a higher risk for developing dysphonia or other voice problems than others who are studying non-demanding voice careers. Novice SLPs are at the most risk due to their lack of extensive knowledge of the long-term effects of vocal demand and phonotraumatic behaviors (Joseph et al., 2018). Speech-language pathologists are also required to be a model of appropriate vocal use for the clients they serve, meaning they may have to use their voice more often and may model pitches that are not habitual to them resulting in vocal fatigue or abuse (Gottliebson et al., 2006). According to Joseph et al (2018), young SLPs may have the basic theoretical knowledge of voice use but may not fully understand the effect of vocal demand and vocal fatigue on voice quality as it relates to their profession. Even with the knowledge of how phonotraumatic behaviors affect the voice, novice SLPs may not use appropriate vocal hygiene techniques. While Searl and Bailey (2013) discussed the vocal

behaviors of actors, they also discussed the vocal behaviors of SLPs and how they compared to student actors. The research showed that SLPs demonstrated significantly more symptoms related to vocal fatigue as compared to actors. These symptoms included having a hoarse voice in the morning and being thirsty or dehydrated regularly (Searl & Bailey, 2013). The student SLPs in this investigation believed the voice log was beneficial and stated that they did become aware of some of their vocally abusive habits and tried to make changes. College instructors of the student SLPs stated it was beneficial for their students to complete a voice log because it may help them to see the perspective of future patients or clients. If the students know how the voice log works and try to change their habits using the voice log, they can empathize with future clients or patients. Searl and Bailey (2013) concluded that SLPs and actors may learn from each other; the SLPs can learn about an under-treated population of people who overuse their voices and actors can learn more about proper care of their vocal folds and voice disorders. This can be important for novice SLPs to understand different populations that are affected with voice disorders and to understand how best to treat them. It can also be important for novice SLPs to begin healthy vocal habits. SLPs should be aware of the habits that will increase their vocal quality to ensure the upmost care for their clients.

Summary

Currently, there are very few research investigations that have been solely dedicated to understanding vocal demand and vocal fatigue in SLPs. Much of the literature available has focused on voice use and abuse of other professions such as teaching, acting, singing, and speaking on the phone daily. While it is important to understand vocal fatigue and abuse with those populations, it is vitally important to understand vocal fatigue and abuse in those who treat voice disorders. Previous research has indicated that SLPs are not often chosen for investigations

on voice disorders and dysphonia because of the training that they receive regarding how the voice works and the benefits of vocal hygiene (Ng et al., 2005). It has also been stated that SLPs are not considered a profession that has an increased risk of voice problems (Searl & Bailey, 2013). Further research is needed to bring awareness to the effects of vocal fatigue and vocal demand in SLPs as well as how those individuals deal with changes in their voice. The purpose of this research investigation was to determine if novice SLPs in the western Kentucky are are vulnerable to dysphonia and other voice problems and to increase awareness of the prevalence in this population.

Chapter 3: Method

Participants

After approval was obtained from the Murray State University Institutional Review Board (IRB), participants for this investigation were recruited via convenience sampling through email communication and social media posts using a predetermined recruitment script. A Google© forms survey link was sent and posted via these formats. An informed consent document detailing inclusion and exclusion criteria as well as risks and benefits of participating in the survey was accessed upon clicking the link to the survey. Once the participant agreed to participate in the study, they were redirected to the survey questions. No identifying information was requested in the survey. All information gathered in the survey was anonymous. Participants were able to stop the survey at any time with no repercussions.

Inclusion Criteria. Participants for this investigation were speech-language pathologists (SLP) who have been practicing in western Kentucky for 10 years or less. For the purposes of this investigation, western Kentucky was defined as 27 counties in the geographical western region of Kentucky (see Appendix A).

Exclusion Criteria. Participants were excluded from this investigation if they had a previously diagnosed voice disorder, received speech therapy for voice, or had vocal surgery to improve their voice.

Research Design

The design of this investigation was descriptive in nature using a survey format on the Google© Forms platform that was modified from the Vocal Fatigue Index (VFI) (Nanjundeswaran et al., 2014). The study used quantitative data to correlate statements from the

VFI. Permission to use a modified version of the VFI was provided by the authors via email confirmation.

Independent Variable. The independent variable of this investigation was the profession of speech-language pathology. Most current literature regarding vocal loading and vocal fatigue across professions has focused on teachers, telemarketers, fitness instructors, and those individuals in the performing arts (Davis, 2020; de Faria Morias Nogueria & de Medeiros, 2018; Fuentes-Lopez et al., 2017; Jones et al., 2002; McCabe & Titze, 2002; Phyland, 2017; Searl & Bailey, 2013). Minimal research has focused on vocal loading and vocal fatigue in speech-language pathology, although it is a profession with heavy vocal use (Joseph, Joseph, & Jacob, 2018).

Dependent Variable. The dependent variable of this investigation was the prevalence of vocal loading and vocal fatigue in novice SLPs that have been practicing 10 years or less in the field of speech-language pathology.

Procedure

After IRB approval was received through Murray State University, the survey was sent via the above-mentioned formats and accessed through Google© Forms. The survey consisted of 15 statements related to voice use and vocal fatigue, as well as one question regarding the use of birth control and another question regarding type of work setting (see Appendix B). The female voice may undergo many changes due to hormones, especially for women during menstruation and menopause (Kadakia et al., 2013). Birth control is used to change the hormonal balance within a female's body, which in turn may affect the voice. This can then affect use or strain of the voice, which is why the use of birth control is important for vocal hygiene research. With the portion of the survey that included the modified VFI, the participants were instructed to rate each

statement on a Likert scale ranging from 0 (never) to 4 (always). Both the demographic and work setting questions were multiple choice, with only one answer required for both. The completion of this survey posed no foreseeable risks to the participants. The benefits of this survey aimed to improve the understanding of novice speech-language pathologists' voice habits as well as incidence of vocal abuse and misuse.

Data Analysis

Data was analyzed using SPSS frequency data and descriptive statistics functions to determine frequency counts, percentages, means and standard deviations. SPSS, or Statistical Package for Social Sciences, is used to perform quantitative analyses and is most beneficial for comparative studies.

Chapter 4: Results

Recruitment for this study began after IRB approval was received from the Murray State University Institutional Review Board on June 9th, 2020 and recruitment continued for 13 weeks. Initial recruitment scripts were sent via email and through social media in June, 2020. Responses and engagement with the survey were low secondary to the novel coronavirus COVID-19. In September 2020, recruitment emails were again sent and posted on social media which helped to increase the total number of respondents. Data collected came from a total of 21 participants in the following 27 counties in western Kentucky: Fulton, Hickman, Carlisle, Ballard, McCracken, Graves, Livingston, Marshall, Calloway, Crittenden, Lyon, Trigg, Caldwell, Union, Webster, Hopkins, Christian, Todd, Muhlenberg, McLean, Henderson, Daviess, Ohio, Butler, Logan, Warran, and Simpson (see Appendix 1).

Participant Demographics

As the survey was anonymous, identifying demographic data about each participant was not gathered. Of the 21 total responses, 15 participants (71%) reported they work in public schools. Other settings were also reported though not by a significant number of respondents (see Figure 1). One participant stated that they were retired, so knowledge about their work setting is unknown.

Vocal Fatigue Index Results

The Vocal Fatigue Index (VFI) (Nanjundeswaran et al., 2014) was used in this study in a modified version (see Appendix 2). The VFI (Nanjundeswaran et al., 2014) is made up of negative and positive statements that participants rated on a 5-point Likert scale from zero (never) to four (always). The positive statements with the highest means for this investigation

included: “My voice feels better after rest” (*M* = 2.52); “I use vocal hygiene techniques to improve my voice” (*M* = 1.67); and “I use compensatory strategies to aid my voice use (i.e. a microphone)” (*M* = 0.48). The negative statements with the highest means for this study included: “Even if my voice is hoarse, I push through to speak” (*M* = 2.33); “I often have to speak in noisy environments” (*M* = 1.86); “It is hard for me to project my voice after long periods of voice use” (*M* = 1.24).

Speech-language pathologists responding to this survey reported that they often push through to speak even when their voice is hoarse (86%). While 86% of SLPs reported pushing through to speak, 71% reported they often must speak in noisy environments. Even though SLPs indicated that they push through to speak and must speak in noisy environments, 15 (71%) of the participants stated that they never use compensatory strategies (i.e. microphone) to aid their voice use and 21 (100%) reported that they do not seek out medical treatment for their voices when having difficulties.

Voice and Birth Control Usage

A previous study by Kadakia et al. (2013) demonstrated that the use of birth control or hormone medications may affect a woman’s voice. In this investigation, the participants were asked about their birth control medication usage. Twelve of the 21 participants (57%) reported use of birth control at the time of the survey. Of the 12 participants that stated that they were on birth control, 33% (4/12) stated that they experience throat pain, 8% (1/12) stated that they felt like using their voice was work, 25% (3/12) said their voices become hoarse during the day, and 17% (2/12) said their voice feels weak after a long period of use and have difficulty talking after a day of voice use.

Work Setting and Its Effect on the Voice

Each participant's employment setting was gathered in the survey to determine if the work setting impacted vocal fatigue and vocal load. Speech-language pathologists working in a school setting are often subject to the same environmental conditions that impact teachers' voices (Gottliebson et al., 2006). Of the 15 participants that stated they work in public schools, 73% (11/15) reported they often speak in noisy environments and 80% (12/15) push through to speak. However, 87% (13/15) indicated they use vocal hygiene techniques and 13% (2/15) use compensatory strategies, such as a microphone, to help lessen the vocal load. For the two participants working within the hospital, both agreed that they push through to use their voice even when they feel that it is hoarse. The one participant that reported working in a private practice also stated that they always push through to use their voice even when it is hoarse, as well as stating that their voice always feels better after rest. The Likert scale items of "My voice often becomes hoarse during the day" (M = 0.86, SD = 0.73) and "I often have to speak in noisy environments" (M = 1.86, SD = 1.01) were compared using a t-test two-sample assuming equal variances. The results were $t(40) = 1.68$, $p = <.001$ indicating a statistical significance between the scores for these two items. This significance shows there is a correlation between speaking in a noisy environment and the participants' voice becoming hoarse throughout a workday. This data can be carried over into practice for SLPs because most are speaking in noisy environments and overusing their voices, based on this study alone.

Use of Compensatory Strategies and Vocal Hygiene Techniques in SLPs

The participants from this study reported speaking in noisy environments and using their voice to the fullest extent as evidenced by the questions in the survey, where 67% (14/21) stated

that they worked in noisy environments. In understanding that SLPs are educated to voice care and vocal hygiene, it can be assumed that SLPs would be more apt to use compensatory strategies to aid in less voice use for projecting, such as a microphone. Only 14% (3/21) of the participants stated that they would use compensatory strategies to lessen the vocal effort when speaking.

As SLPs are trained in voice disorders and intervention, it may be assumed that those individuals would consistently use vocal hygiene techniques and avoid vocal abuse and overuse. However, only 57% (12/21) of the participants stated that they sometimes use these techniques and 10% (2/21) reported that they almost never use vocal hygiene techniques. Although the participants for this study indicated that they strive to practice vocal hygiene techniques, 86% (18/21) of participants stated that they push through to speak when their voice is hoarse. The questions of "Even if my voice is hoarse, I push through to speak" (M = 2.33, SD = 1.02) and "I use compensatory strategies to aid my voice use (i.e. microphone)" (M = 0.48, SD = 0.87) were compared using a t-test two-sample assuming equal variances. The results were $t(40) = 6.35$, $p = <.001$, indicating a statistical significance.

Medical Advice

As hypothesized by the researchers, none of the participants reported seeking out medical advice or treatment from a physician for voice issues. Out of the 21 participants, 86% (18/21) stated that their voices felt better after rest and 38% (8/21) stated that it is hard to project their voices after a day of heavy vocal use. The questions of "I often experience throat pain or tightness after talking" (M = 0.71, SD = 1.01) and "I have sought out medical treatment by a physician for my voice" (M = 0.00, SD = 0.00) were compared using a t-test two-sample assuming equal variances. The results were $t(40) = 3.25$, $p = .002$, indicating statistical

significance. The questions of “My voice often becomes hoarse during the day” (*M* = 0.86, *SD* = 0.73) and “I have sought out medical treatment by a physician for my voice” (*M* = 0.00, *SD* = 0.00) were also compared using a t-test two-sample assuming equal variances. The results were t(40) = 5.40, *p* = <.001, indicating a statistical significance.

Figure 1

Participant Demographics by Workplace

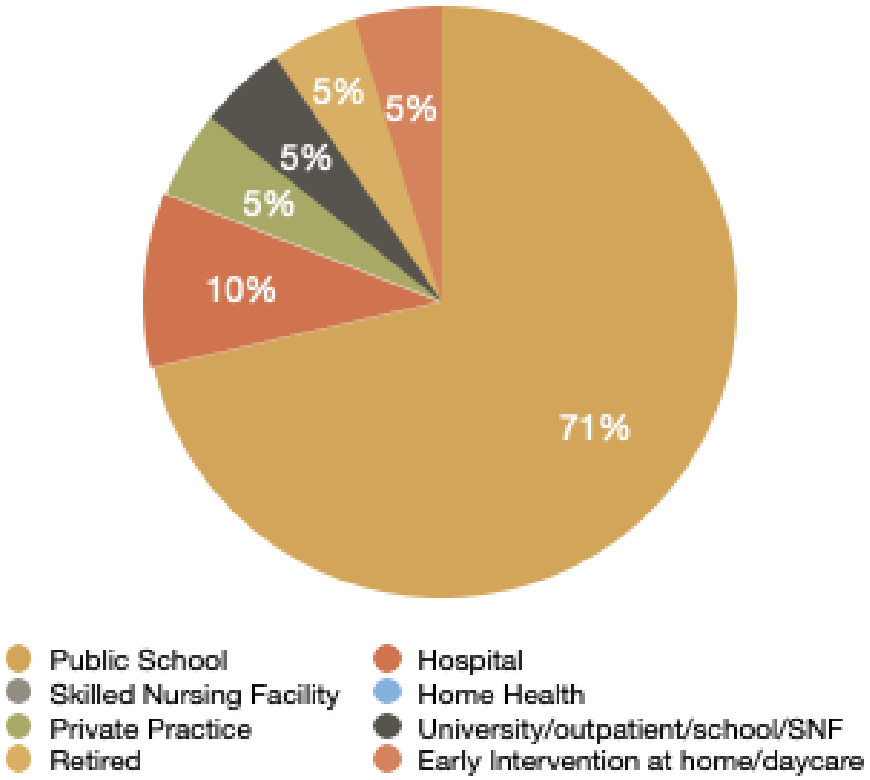

Table 1

Vocal Fatigue Index – Modified (Nanjundeswaran et al., 2014)

	Never		Almost Never		Some-times		Almost Always		Always	
Question	f	%	f	%	f	%	f	%	f	%
I have difficulty talking normally after a day of heavy voice use.	5	23.81	**12**	**57.14**	2	9.52	2	9.52	0	0.00
My voice feels better after rest.	2	9.52	1	4.76	**7**	**33.33**	6	28.57	5	23.81
I often experience throat pain or tightness after talking.	**13**	**61.90**	2	9.52	5	23.81	1	4.76	0	0.00
My voice often becomes hoarse during the day.	7	33.33	**10**	**47.62**	4	19.05	0	0.00	0	0.00
I use a lot of effort when speaking.	**9**	**42.86**	6	28.57	6	28.57	0	0.00	0	0.00
I avoid social situations whenever I may have to talk more.	**17**	**80.95**	3	14.29	1	4.76	0	0.00	0	0.00
I run out of air whenever I talk.	**14**	**66.67**	6	28.57	1	4.76	0	0.00	0	0.00
It is hard for me to project my voice after long periods of voice use.	5	23.81	**8**	**38.10**	7	33.33	0	0.00	1	4.76
It feels like work to use my voice.	**15**	**71.43**	4	19.05	2	9.52	0	0.00	0	0.00
My voice feels weak after a period of use.	**10**	**47.62**	7	33.33	2	9.52	2	9.52	0	0.00
I often have to speak in noisy environments.	2	9.52	4	19.05	**12**	**57.14**	1	4.76	2	9.52
I use vocal hygiene techniques to improve my voice.	4	19.05	2	9.52	**12**	**57.14**	3	14.29	0	0.00
Even if my voice is hoarse, I push through to speak.	1	4.76	2	9.52	**10**	**47.62**	5	23.81	3	14.29
I use compensatory strategies to aid my voice use (i.e. a microphone).	**15**	**71.43**	3	14.29	2	9.52	1	4.76	0	0.00
I have sought out medical treatment by a physician for my voice.	**21**	**100.0**	0	0.00	0	0.00	0	0.00	0	0.00

Chapter 5: Discussion

The purpose of this study was to determine the prevalence of vocal fatigue and vocal loading in novice SLPs in western Kentucky to increase awareness of the vulnerability of dysphonia in this population. According to statistical and visual analyses, results from this study demonstrated multiple correlations with the literature and previous studies completed. Although most previous research investigations regarding vocal loading and vocal effort looked at different occupations and work environments, the literature remains applicable to SLPs regarding the high use of voice in speech-language pathology.

According to McCabe & Titze (2002), teachers frequently reported increased use of voice in the school setting and reduced use of vocal hygiene techniques. McCabe & Titze (2002) found that public school teachers overuse their voices to project over background noise with little vocal rest. This study also demonstrated that SLPs working in the public-school system must often speak in noisy environments. Although the participants from this research that work in the public-school setting stated that they use vocal hygiene techniques to prevent vocal loading, the results from this study demonstrated that SLPs within the public-school setting do not consistently use techniques to aid their voice during times of dysphonia although they must often speak in noisy environments. Joseph et al. (2018) reported that SLPs are at high risk for vocal fatigue and other voice disorders due to their lack of vocal hygiene and continuous overuse of their voice. The data from this investigation correlated with previous literature in that novice SLPs working in the public-school setting often experience hoarseness throughout the day.

Speech-language pathologists in this study reported that they use vocal hygiene techniques only sometimes and that they often push through to speak when their voices are hoarse. This finding correlated with the research completed by Joseph et al. (2018) that reported

that young SLPs have the basic knowledge of what they should be doing to protect their voices; however, they lack the full understanding of vocal demand and quality as it pertains to their profession.

Although a majority of participants in this study reported use of birth control, those individuals did not demonstrate significant changes to their voice based upon responses to the Vocal Fatigue Index (Nanjundeswaran et al., 2014). This data did not correlate with previous research by Kadakia, Carlson & Sataloff (2013) that indicated that the female voice undergoes many changes due to hormones, and birth control is used to change the hormonal balance within the body, which can affect the voice as well. This study did not determine the gender of each participant so it was difficult to correlate results of the question regarding birth control with responses on the Vocal Fatigue Index (Nanjundeswaran et al., 2014).

Limitations

Although the data gathered in this investigation correlated with previous literature, there were limitations to this research. One limitation of this study was the onset of the COVID-19 pandemic and its effect on the number of responses that were obtained through the survey as well as how the participants may have responded to each question. As the survey was sent out during two different times due to the low response rate after the first attempt, responses may have been affected due to unemployment and school closures secondary to COVID-19.

Another limitation of this study was the small number of participants. While the geographical area of the study was limited to western Kentucky, the amount of SLPs that responded to the survey was significantly less than the estimated number of SLPs in this area. An additional limitation of this study related to participants is the possible outlier participant. One

participant stated that they were retired. The inclusion and exclusion criteria of this investigation indicated that the participants must be practicing in the field of speech-language pathology and had to have less than 10 years' experience in the field. There was no way to ascertain whether this individual had only practiced 10 years or less and if they had retired, they more than likely were not practicing at the time of the survey.

One additional limitation of this study was the lack of demographic information collected. Although not collecting demographic data gave the participants anonymity, it would have been worth noting certain aspects of each participant for correlations as in gender. Understanding the gender of each participant would have increased the ability to correlate results from the VFI (Nanjundeswaran et al., 2014) with those individuals taking birth control. Understanding which birth control method was used would have provided greater information as to how the hormones may have affected the participants' voice.

Future research

Future research in the area of vocal fatigue and vocal loading in SLPs should be completed with larger populations. Speech-language pathology populations that encompass an entire state or region would provide information as to vocal practices of professionals in different areas. Additionally, it would be beneficial for future investigations to consider specific work settings to compare vocal habits and hygiene among SLPs in these settings. It would also be beneficial to compare the vocal habits of those SLPs who specialize in voice to those who specialize with other communication disorders or settings.

Conclusion

The results of this investigation provide insight and understanding to the vocal habits of SLPs in western Kentucky. The data obtained with this group of participants did not show a correlation between the response to the question about birth control and the responses on the VFI (Nanjundeswaran et al., 2014) although if a larger sample or more detailed information had been obtained, results may have shown a true positive or negative correlation. Research also found that SLPs working in the school system are more at risk for vocally traumatic behaviors and disorders of the voice, similar to public school teachers' voices. As predicted by the researchers, none of the participants from this study have ever sought out medical treatment for their voice disorders or symptom of voice disorders they may be experiencing, although many experience phonotrauma, such as having a hoarse voice at the end of the workday and difficulty projecting their voice after long periods of use. Overall, the researchers found that the novice SLPs in this investigation do not protect their voices in the same way that they educate their clients although they have the knowledge and understanding of voice disorders.

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Appendix 1


Kerton
Campbell
Gallatin
Boone
Robertson
Grant
Carroll
Bracken
Pend-leton
Mason
Lewis
Greenup
Trimble
Henry
Owen
Harrison
Nicholas
Fleming
Boyd
Carter
Oldham
Franklin
Scott
Rowan
Jefferson
Shelby
Fayette
Bourbon
Bath
Elliott
Lawrence
Spencer
Anderson
Clark
Menifee
Bullitt
Nelson
Washington
Mercer
Jessamine
Powell
Morgan
Johnson
Martin
Henderson
Daviess
Hancock
Breckinridge
Meade
Hardin
Madison
Estill
Lee
Wolfe
Magoffin
Floyd
Pike
Union
Webster
McLean
Ohio
Grayson
Larue
Marion
Boyle
Garrard
Lincoln
Rockcastle
Jackson
Owsley
Breathitt
Knott
Crittenden
Hopkins
Butler
Hart
Taylor
Casey
Clay
Perry
Livingston
Caldwell
Muhlenberg
Green
Adair
Pulaski
Leslie
Letcher
Ballard
McCracken
Lyon
Christian
Todd
Warren
Logan
Barren
Metcalfe
Russell
Wayne
Laurel
Knox
Harlan
Marshall
Carlisle
Graves
Trigg
Cumberland
Clinton
Whitley
Bell
Hickman
Fulton
Calloway
Simpson
Allen
Monroe
McCreary
County Seat
© geology.com

Appendix 2

Circle the number that describes your experience with these statements (0-never, 1-almost never, 2-sometimes, 3-almost always, 4-always).

1. I have difficulty talking normally after a day of heavy voice use.	0	1	2	3	4
2. My voice feels better after rest.	0	1	2	3	4
3. I often experience throat pain or tightness after talking.	0	1	2	3	4
4. My voice often becomes hoarse during the day .	0	1	2	3	4
5. I use a lot of effort when speaking.	0	1	2	3	4
6. I avoid social situations whenever I may have to talk more.	0	1	2	3	4
7. I run out of air whenever I talk.	0	1	2	3	4
8. It is hard for me to project my voice after long periods of voice use.	0	1	2	3	4
9. It feels like work to use my voice.	0	1	2	3	4
10. My voice feels weak after a period of use.	0	1	2	3	4
11. I often have to speak in noisy environments.	0	1	2	3	4
12. I use vocal hygiene techniques to improve my voice.	0	1	2	3	4
13. Even if my voice is hoarse, I push through to speak.	0	1	2	3	4
14. I use compensatory strategies to aid my voice use (i.e. a microphone).	0	1	2	3	4
15. I have sought out medical treatment by a physician for my voice.	0	1	2	3	4

Please indicate your primary work setting from the following (only check 1 box):

- Private Practice
- Public School
- Hospital
- Skilled Nursing Facility
- Home Health
- Other _____

Are you currently taking any form of birth control?

- Yes
- No
- Prefer not to answer