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PROFESSIONAL VOICE:

Integrated Practices of Teaching,
Research and University Extension

Maria Fabiana Bonfim de Lima-Silva
Aline Menezes Guedes Dias de Araújo
Patrícia Brianne da Costa Penha
Gabriella Lucena Feitosa
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PREFACE

Maria Fabiana Bonfim de Lima-Silva

This e-book is a collection of experiences from my insertion, in 2011, as a professor in the Department of Speech Therapy at the Federal University of Paraíba (UFPB). Upon joining this institution, I developed an extension project called the Voice Advisory Program for Teachers (ASSEVOX), based on the knowledge I gained during the period in which I took my master's and doctorate, at the Pontifical Catholic University of São Paulo (PUC-SP), under the guidance of the Professor Dr. Leslie Piccolotto Ferreira and Prof. Dr. Zuleica Camargo.

So, in the following year, with the desire that extension students could experience the reality of professors through practical experiences that went beyond the walls of the university, I submitted ASSEVOX to the UFPB 2012 Probex Notice, but unfortunately we did not receive the scholarship. Even so, with a pioneering group of six students, we started our actions through a Fluex project (Project only with volunteer students) in a private school with the objective of promoting vocal health for teachers and the school community. I remember that we went through several challenges, because the room that the school gave us for collection was not a clean, pleasant environment, however, we did not get discouraged and cleaned, painted the walls and renovated the entire room. Shortly after the renovation, we started our vocal health assessments and workshops. I remember to this day that many teachers were surprised by our act of cleaning the room, as no one had ever done anything to improve that room, and they said: "*It was an abandoned room*"; "...it was a real storage room for the school, now there is another room, well *organized and clean*".

It is worth noting that in the first meeting with the director of this school, it was emphasized that we would carry out vocal assessments of the teachers, but that after these procedures, the teachers participating in the project would receive the reports with the diagnosis and then participate in voice experience workshops with content theoretical and practical, within the school. In addition, our team inserted vocal health actions in the school calendar events (student day, teacher's day, family day, among others).

Then, in 2013, we took an important step towards ASSEVOX, we managed to get the project approved with a grant in the Probex 2013 Notice, and we entered into a partnership with the Department of Education and Culture of João Pessoa (SEDEC-JP). Thus, between 2012 and 2019, with the support of the Edital Probex and Fluex (UFPB), more than 60 extension workers participated in our project, from undergraduate, graduate and other courses (Psychology, Physiotherapy, among others). Currently, ASSEVOX has managed to cover 15 schools in the public and private network, including kindergarten, elementary and

high school. In addition, during these seven years, in person, we carried out an average of 420 vocal screenings, 44 voice experience workshops and 21 lectures. In the last lecture, held in 2019, we were invited by SEDEC-JP to talk about the importance of voice in teaching work and handling voice amplifiers, in which my doctoral student Patrícia Penha and I presented relevant data from the research developed by ASSEVOX and strategies correct handling of microphones (voice amplifiers). It is worth noting that more than 500 amplifiers were delivered to the teachers participating in this event.

Such actions carried out during this period, yielded us several products, including participation in local, regional and national events (congresses, seminars, meetings), 10 publications of scientific articles in national and international journals, 14 book chapters, 73 complete, expanded abstracts and annals, 21 course conclusion works, 31 scientific initiation works, 5 dissertations, among others.

However, in the first months of 2020, we were surprised by the onset of the SARS-CoV-2 pandemic, a rapidly spreading respiratory syndrome. Since then, several measures by the World Health Organization (WHO) have been taken to prevent the spread of this virus, including social distancing. This fact brought as the main impact to the ASSEVOX project the impossibility of carrying out the actions (workshops, screening and attendance) in person. As a result of these various changes, the project had to reinvent itself and adapt to the new reality, using digital platforms to continue developing its activities and contributing, more than ever, to society and the academic community. In addition, the project, which was previously aimed only at teachers, expanded its target audience to all voice professionals (teachers, telemarketers, digital influencers, actors, singers, telejournalists and others) and thus came to be called Vocal Advisory Program for Voice Professionals (ASSEVOX).

According to this new appearance, ASSEVOX showed itself to have solid foundations and an excellent potential to adapt to new situations. In this period, we idealized to make our *Instagram* profile a digital magazine, containing information accessible to voice professionals and the entire community. Through meetings, we create content, develop means of interaction and broaden our view of the most diverse forms of health promotion. With this, we continue with our scientific initiation projects, discuss book chapters, participate in open classes and regional events, publish scientific articles and, above all, drive our dreams!

Currently, we had the project "Analysis of the effects of a distance vocal health program for teachers in the state of Paraíba" approved in the Universal Demand Notice n° 09/2021, promoted by the Foundation for Research Support of the State of Paraíba (FAPESQ), which brings unprecedented insofar as there are no other proposals in force in the state with the purpose of assisting and supporting the essential professional for the development of our society, such as the teacher. issues related to the health and quality of life of several educators in the state, especially those who do not have the financial possibilities or conditions to be accompanied by a professional speech therapist.

This *e-book* is part of a beautiful journey full of challenges. A path traveled with dedication, responsibility and union. Therefore, we invite you, the reader, to know a little more about the work performed by the ASSEVOX group over these 10 years.

I wish you a good read and that this work is an inspiration for all those who wish to tread the paths of university extension, teaching and research.

PRESENTATION

This *e-book* entitled “**Professional Voice: Integrated Teaching, Research and University Extension Practices**” is the result of an extension project called “Vocal Advisory Program for Voice Professionals” (ASSEVOX), which has been developed since the year of 2012 with the support of the public notice for the Extension Scholarship Program (PROBEX) of the Federal University of Paraíba (UFPB), whose main objective is to promote vocal health and prevent voice disorders in the most diverse professionals who depend on it to perform their work.

In this work, 14 chapters were gathered that explain from the experience of students and teachers who participated in the voice advisory program, to themes related to the prevention of voice disorders, vocal health promotion and around expressiveness. In them, there are studies about teachers, telemarketers, telejournalists and digital influencers. The purpose of this e-book is to expand the knowledge of undergraduate, graduate and Speech-Language Pathology professionals, as well as all those interested in studying voice professionals. In addition, we hope to encourage and drive the development of research through the vision and experiences of a university extension.

It is important to highlight that this work is composed of results of scientific initiation research and experiences around the ASSEVOX university extension. The chapters were prepared by students (undergraduate and graduate students) and by professional researchers from UFPB and other institutions (UNIPÊe PUC-SP) who, in a responsible and qualified way, proposed to explain their studies with current and relevant themes for the scientific community and society as a whole.

We wish you a great read!


Maria Fabiana Bonfim de Lima-Silva
Aline Menezes Guedes Dias de Araújo
Patrícia Brianne da Costa Penha
Gabriella Lucena Feitosa
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PERCEPTUAL ASPECTS OF THE SPEECH EXPRESSIVITY OF TELEOPERATORS IN AN EMERGENCY CALL CENTER

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ABSTRACT: Emergency telemarketers are professionals subject to situations of stress, irritation and anxiety. Therefore, it is essential a speech therapy performance in relation to their expressiveness, knowing that this is an important attribute for effective communication. **Objective:** The study sought to analyze perceptual aspects

of the speech expressiveness of telemarketers at an emergency call center. **Method:** The study is observational, cross-sectional, descriptive and quantitative. It was approved by the Ethics Committee for Research with Human Beings, under process 0532/14. Nine vocal samples were selected, following the eligibility criteria. Afterwards, the samples were sent to an experienced judge in the VPAS-PB script. Then all data were submitted to statistical analysis. **Results:** There was a predominance of vocal quality adjustments, such as: decreased lips extension, closed jaw, lowered tongue body, decreased tongue body, lowered larynx and modal voice. As for vocal dynamics, there were: decreased pitch variability and fast speech rate. Teleoperator 4 (T4) presented the adjustments for decreased lip extension (grade 5), closed jaw (grade 5), increased pitch and loudness variability (grade 4) and rapid speech rate (grade 5). T8 has closed jaw adjustment (grade 5), decreased tongue body extension (grade 5) and rapid speech rate (grade 5). T1, T2, T3, T5 and T9 showed some adjustments to a moderate degree, from 1 to 3. T6 presented a closed jaw adjustment (grade 5) and T7: lowered larynx (grade 5) and lowered usual pitch (grade 5). **Conclusion:** It was found that most of the adjustments identified are inadequate and may favor the development of voice disorders.

KEYWORDS: Voice, Voice quality, Occupational Health, Advertising.

1 | INTRODUCTION

The voice professional is the individual who depends on certain production and / or specific vocal quality for their professional survival (BEHLAU, 2005). Among the voice professionals, we highlight the telemarketer, a category that is on the rise, since telemarketing companies are among the largest employers in the country (NOGUEIRA, 2009). These workers employ the call answering system using the telephone as the only form of contact, and thus, they present only verbal communication as a way to represent the company they work for, which can be in the commercial or care area (ANDRADE; AZEVEDO, 2006).

In the assistance category are the teleoperators who answer emergency calls (ANDRADE; AZEVEDO, 2006), which consists of: firefighters, civil and military police officers who, through their information, pass on orientations that involve life-threatening situations (ALENCAR et al., 2019).

According to Silva et al. (2006), these professionals go through situations of irritation, stress and anxiety, requiring emotional self-control, to be able to deal with often difficult personal demands. Because of this, it was seen that it is essential to invest in expressiveness, knowing that verbal communication is the only possible at that moment and the quality of the teleoperator's work depends, most of the time, on these two aspects: voice and expressiveness.

From a phonoaudiological point of view, working with expressiveness requires the integration of verbal expressiveness (textual content) with vocal resources (vocal quality, voice types, vocal parameters and resources such as: pitch, loudness, speed, articulation, resonance, modulation, pneumophonoarticulatory coordination) en non-verbal (postures, positions, movements, dislocations, dances, gestures, looks, facial and articulatory expressions; head shaking, physical appearance and clothing) and all these aspects reflect on the effects of communication (COTES; KYRILLOS, 2011; PENTEADO; PECHULA, 2017).

This work aims to analyze perceptual aspects of the speech expressiveness of teleoperators of an emergency call center, using the adaptation to Brazilian Portuguese of the Vocal Profile Analysis Scheme (VPAS-PB) (CAMARGO; MADUREIRA, 2008).

2 | METHODS

The present study is observational, descriptive, cross-sectional, and quantiquitative in nature. It was approved by the Ethics Committee on Human Research of the institution of origin, under the process number 0532/14 (CAEE: 36516514.0.0000.5188) approved on May 28, 2021. It was carried out from the selection of nine voices from a bank of calls from emergency teleoperators working at the Integrated Police Operations Center (CIOP). This

institution belongs to a public agency, where firemen, civilian and military police officers work as teleoperators. These professionals answer emergency calls in the metropolitan region of João Pessoa.

The teleoperators selected fit the following eligibility criteria: being male; having worked in the field for at least three months; not being away from their jobs and not being under speech therapy; not having cognitive, auditory and/or neurological problems that somehow hinder their communication.

The samples were taken from the database after permission was given by the institution, and then edited so that only the voice of the teleoperator remained, without interruptions. In addition, 20% of the sample was repeated to analyze the reliability of the judgments.

Subsequently, the samples were given, via Google Drive, to an experienced judge in the Vocal Profile Analysis Scheme (VPAS-PB) (CAMARGO; MADUREIRA, 2008), a protocol in which it is possible to analyze perceptual-auditory issues of voice and expressiveness of teleoperators. This version is an adaptation of VPAS written by Laveret al. (1981).

Through this script we analyze the set of factors that contribute to the quality of communication, such as vocal quality and dynamics adjustments. Vocal quality is characterized by the behavior of the combination of supralaryngeal (articulatory: phonoarticulatory organs), laryngeal (phonatory: phonation mode; laryngeal friction and laryngeal irregularity) and muscular tension adjustments.

And as for prosodic elements of vocal dynamics, the VPAS-PB evaluates prosodic elements such as: pitch (habitual, extension and variability), loudness (habitual, extension and variability), tempo (interrupted continuity), elocution rate (fast or slow). And other elements such as breath support (adequate, inadequate and present).

To measure quantitatively, the script counts on a scale that evaluates the aspects in six grades (from 1 to 6), considering the use of inadequate adjustments by moderate grade when scored 1, 2, and 3, and by extreme grade when scored 4, 5, and 6. This measurement is based on the idea that an unaltered voice uses neutral adjustments.

Data analysis was performed by a judge experienced in handling the VPAS-PB script, later described in a table and analyzed qualitatively.

3 | RESULTS AND DISCUSSION

Some items were included for the voice samples, 9 calls that had at least 20 seconds of speech only from the teleoperator, without overlapping other voices. Thus, all participants were male, with an average age of 39.9 years, with a workload of 12 hours a day. It was verified a predominance of vocal quality adjustments such as decreased lip extension, closed

jaw, lowered tongue body, lowered larynx and modal voice. And as for vocal dynamics, we observed: decreased pitch variability and fast elocution rate.

Among the whole sample, the individuals who presented higher grades of adjustments were: Teleoperator 4 (T4) had the adjustments of decreased lip extension (grade 5), closed jaw (grade 5), pitch variability and increased loudness (grade 4) and fast elocution rate (grade 5). T8 has closed jaw setting (grade 5), decreased tongue body extension (grade 5) and rapid elocution rate (grade 5). T1, T2, T3, T5 and T9 showed some moderate degree of adjustment, from grade 1 to 3. T6 had a closed jaw (grade 5) and T7: lowered larynx (grade 5) and lowered pitchhabitual (grade 5).

The table below shows all the adjustments of teleoperators according to their grades.

		T1	T2	T3	T4	T5	T6	T7	T8	T9
Ajustes de qualidade vocal	Lábios extensão diminuída									
	Mandíbula fechada									
	Ponta de língua avançada									
	Corpo de língua abaixado									
	Corpo de língua recuado									
	Corpo de língua extensão diminuída			(I)						
	Denasal									
	Laringe elevada									
	Laringe abaixada									
	Hiperfunção Laringea									
	Voz modal	P			P	P	P	P	P	P
	Voz crepitante	(I)								
	Voz áspera									
Escape de ar		P	P						P	
Aspectos de dinâmica vocal	<i>Pitch</i> habitual elevado									
	<i>Pitch</i> habitual abaixado									
	Variabilidade de <i>pitch</i> diminuído									
	Variabilidade de <i>pitch</i> aumentado									
	<i>Loudness</i> habitual diminuído									
	<i>Loudness</i> habitual aumentado									
	Variabilidade de <i>loudness</i> aumentado				(I)					
	Variabilidade de <i>loudness</i> diminuída									
	Continuidade interrompida	(I)		(I)						
	Taxa de elocução rápida									
Legenda:	Intermitente (I)	Presente P (sem graduação)	Ausência do ajuste	1-2 grau	2,1-3 grau	3,1-4 grau	> 4 grau			

Table 1. Occurrence of vocal quality and vocal dynamics adjustments by means of the VPAS-PB script found in the nine vocal samples of emergency teleoperators.

Source: survey data, 2020.

The perceptual-auditory analysis of the voices showed that, predominantly, the professionals have some quality adjustment and vocal dynamics from moderate to extreme, corroborating the literature, which mentions the presence of these adjustments and states that they bring overload to the speech apparatus (MEDEIROS, 2019).

It was verified a predominance of vocal quality adjustments such as: decreased lip extension, closed jaw, lowered and retracted tongue body, lowered larynx and modal voice. And as for vocal dynamics, we observed: decreased pitch variability and fast elocution rate.

The population of this study consists of male public servants (policemen and firemen). This fact explains the high frequency of the lowered larynx setting in the results, since the male larynx is in a lower vertical position than the female larynx and its vocal folds are larger and wider (BRAZIL, 2005; BEBER, 2011). The low larynx allows an expansion of the total extension of the vocal tract and this causes a decrease in the frequency of acoustic formants, especially the lower ones, favoring the reduction of pitch (LIMA, 2007).

According to the literature, pitch is the psychophysical sensation of the frequency of a sound, which allows us to classify it in low or high pitch. From this, we can see that the variation in vocal frequency, for Boone (1996) is an element of identification of the speaker, which provides not only the presentation of the subject's unique characteristics, but also the communicative intention during speech.

Through the findings regarding the aspects of vocal dynamics of the sample, it is clear that the pitch variability decreased was a recurrent element in teleoperators participating in the study. This decrease in pitch variability can negatively impact the communication of these teleoperators, since through these prosodic parameters it is possible to express emotion and this monotonicity in speech can cause the listener the impression that the teleoperator is disinterested in solving their problem (MEDEIROS, 2019).

The habitual pitch refers to the frequency that the individual generally uses in their speaking moments. In this research, habitual pitch of most teleoperators presented lowered, affirming the data exposed in the previous paragraphs and corroborating with Titze (1997) and Tom et al. (2001), who found a relationship of low pitch with lowered laryngeal adjustment. These results may be related to the fact that lower pitched voices tend to provide a more pleasant and secure appearance to the listener (CAMPOS; SALGADO, 2010).

One of the most present adjustments (occurred in five of the nine teleoperators), with higher grades and that most impacted the voice quality and expressiveness of the teleoperator was the closed jaw adjustment. This criterion interferes with expressiveness, since the articulation of sounds is distorted, interfering with the transmission of the message (BEHLAU, 2005).

As for vocal dynamics, a striking feature in teleoperators investigated was the rate of rapid elocution, six teleoperators presented this setting to a considerable degree, in some reaching even an extreme level. Such a fact was also found in the speech of emergency room teleoperators in the study by Medeiros (2019).

The elocution rate refers to the number of linguistic units present in a speech interval divided by the length of the interval, and can be measured both globally and locally

(GONÇALVES, 2013). Only a small part of the sample presented a high degree regarding high elocution rate, individual aspects and the environment are relevant parameters and high elocution rate is more adaptable to an emergency call center, as is the case of CIOP (MOREIRA-FERREIRA, 2005). However, the elocution rate of these workers must be fast, but in moderate degree, because for the problem to be solved quickly it is important that the worker's speech can be easily understood by the listener.

Regarding tongue position, it is known that the configuration of the tongue is one of the main aspects that dictate the characteristics of the supraglottic vocal tract (LIMA, 2007). Studies state that receding the tongue body is a strategy for the enlargement of the resonance cavities to happen, and this adjustment directly impacts expressivity (MEDEIROS, 2019). The findings of this research point to a minority of teleoperators with advanced tongue tip (T1, T2, and T3), but a majority with lowered and/or recessed tongue body adjustments.

The compatibility principle of the Phonetic Model of Vocal Quality Description ensures that one adjustment, by antagonism, can exclude the execution of the other (LIMA-SILVA et al., 2017; MEDEIROS, 2019). Affirming this principle, it was also found that most of the teleoperators who showed some tongue adjustment also presented of lowered larynx (T1, T4, T6, T7 and T8), which demonstrates the relationship between the tongue and larynx, since the former when moved, greatly influences the volume of the oral cavity and laryngeal movements (OLIVEIRA, 2004).

It is seen in the literature that to obtain a softer and more comfortable emission, the speaker uses low laryngeal adjustments and less mobile lips (CAMARGO, 2002; VILARIM, 2003; BRAZIL, 2005), which can be observed in most of the teleoperators analyzed (T1, T4, T5, T6, T7 and T8) and agreeing with Pittam (1994) who shows this relationship between tongue and larynx, it can be noticed that most teleoperators who have advanced tongue tip do not present lowered larynx, since they are incompatible adjustments according to Laver's theory (1980).

Analyzing the vocal quality, it was seen that the most frequent and highest graded adjustments were the closed jaw (with grade 5), and decreased extension tongue body (most in grade 4). And as for vocal dynamics, it was possible to notice: fast elocution rate (recurrent grade 5), decreased habitual pitch, increased pitch variability (most in grade 4).

Laver (1980) states that there is a possibility of vocal quality alteration in the speaker and it can be perceived through this script. So all the non-neutral adjustments mentioned may be related to some dysphonia, which can interfere with the teleoperator's expressiveness.

It was verified that most of the identified adjustments (elevated larynx, closed jaw, and elevated elocution rate) can favor the development of voice disorders, since they are usually used by the speaker, generating overload of the phonatory apparatus (LIMA-SILVA, 2012; SANTOS et al., 2016; MEDEIROS, 2019) and culminating in the difficulty of expressiveness

when exercising their function as an emergency teleoperator. Thus, it is possible to observe the importance of investigating the aspects that interfere with good communication and expressiveness of this professional.

4 | CONCLUSION

Through the VPAS-PB we detected speech expressivity adjustments (vocal quality and dynamics) that may be compromising the intention and meaning of the message transmitted by teleoperators and also the quality of the service provided by them. It was found that most of the adjustments identified may favor the development of voice disorders.

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