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PROFESSIONAL VOICE:

Integrated Practices of Teaching, Research and University Extension

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Aline Menezes Guedes Dias de Araújo
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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!

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SUMÁRIO

CAPÍTULO 8

RELATIONSHIP BETWEEN PERCEPTUAL PARAMETERS AND THE PLEASANTNESS OF THE VOICE OF TELEMARKETERS AT AN EMERGENCY CALL CENTER

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ABSTRACT: In emergency call centers in some Brazilian cities, professionals are generally firefighters and police. The auditory impression of telemarketers' voices perceived by service users can be admitted in aspects of vocal pleasantness and related to data from the Vocal Profile Analysis Scheme, adapted (*VPAS*-PB). **Objective:** to analyze whether there is a relationship between the auditory-perceptual aspects of vocal quality and dynamics and the findings of the voice pleasantness analysis of emergency call center operators. Methods: Observational, descriptive, cross-sectional, quantitative and qualitative study. Nine voice samples of telemarketers extracted from the calls of the calls from an emergency center were selected. Voice pleasantness data came from 24 lay judges who used a semantic differential scale, while the samples were also evaluated using the VPAS-PB script by a judge experienced in the application. All data were subjected to statistical analysis. **Results:** The voice that received the most negative impressions was that of the teleoperator T4 and, according to the VPAS-PB assessment: T4 has adjustments in lips extension decreased (grade 4), jaw closed (grade 5), decreased pitch variability and increased loudness (grade 4) and rapid speech rate (grade 5). T2 and T3: Only positive adjectives and showed most adjustments to a moderate degree. **Conclusion:** There was a relationship between the perceptual aspects of vocal quality and dynamics and the findings of the voice pleasantness analysis of emergency call center operators.

KEYWORDS: Emergency Medical Services, Voice, Speech, Language and Hearing Sciences, Auditory Perception.

1 | INTRODUCTION

In the emergency call center, the professionals in general are firemen and policemen, and do not receive any training or instruction before joining the service, except for the area itself (FERREIRA et al., 2008). The emergency call operators live in a very stressful situation, receiving numerous calls daily. They are constantly exposed to risk factors that can cause damage in various areas, being more common, by excessive use of the voice, the development of dysphonia or vocal disorders, which may significantly compromise their professional performance (AMORIM et al., 2011).

The voice being endowed with great significance, carries intrinsic and individual characteristics, they are the ones that from the perception of the listener, can describe this acceptance according to the positive or negative response that the voice can generate (YAMASAKI; BEHLAU, 2001). Such characteristics can be best described through a perceptual-auditory evaluation that involves the analysis of the parameters used by the individual in his vocal production.

According to a study (ANDRADE, 2003), people who have some vocal disorder report having a more negative social response, while people without or with milder alterations tend to have a more positive response.

Thus, this paper uses an adaptation of the Vocal Profile Analysis Scheme (VPAS) script, based on the phonetic model described by John Laver in 1980, in order to analyze whether there is a relationship between the perceptual-auditory aspects of vocal quality and vocal dynamics and the findings of the voice pleasantness analysis of emergency teleoperators.

2 | METHODOLOGY

The present study is characterized as observational, descriptive, cross-sectional, and quantitative and qualitative in nature. It was approved by the Ethics Committee for Research with Human Beings of the institution of origin, under process number 0532/14 (CAAE:36516514.0.0000.5188), approved on May 28, 2021. All teleworkers and students who participated signed the Informed Consent Form (ICF) before undergoing the procedures related to the research, in accordance with the recommendations of resolution 466/12 of the National Research Ethics Committee (CONEP).

Initially, the Integrated Operations Center (CIOP) was contacted to obtain permission to access the emergency call database. The nine samples were selected based on the following eligibility criteria: being male; having worked in the call center for more than three months; not being on leave or away from work and/or undergoing speech therapy; the voice sample must have at least 20 seconds of direct speech from the operator alone, with no

other voice overlapping.

The calls were from the areas of police occurrences (investigation of suspicious behavior, disturbance of the peace and theft). A perception experiment was built on Google Drive for lay judges to evaluate the nine vocal samples. In addition, 20% of the sample was repeated for reliability analysis of the judgments. To collect the responses from the experiment, a form was designed for these judges with their impressions regarding the vocal samples. The method for collecting these impressions was by means of a semantic differential scale (OSGOOD, SUCI and TANNENBAUN, 1957).

Ten pairs of opposite adjectives were chosen, to be applied to each of the nine voices, for each pair, the judges marked on a likert scale from 0 to 4 (positive adjective), 5 (neutral) or from 6 to 10 (negative adjective), based on the impression conveyed by the voices of teleoperators. The lay judges were 24 first-year Speech Therapy students, with no previous experience in the voice field, who used a computer and personal headphones.

Then the vocal samples were also sent for perceptual-auditory analysis through the Vocal Profile Analysis Scheme for Brazilian Portuguese (VPAS-PB), which was carried out by a judge experienced in the area of voice and with more than 13 years of training and practice in this script. VPAS-PB is an adaptation proposed by Camargo and Madureira (2008a) of the original Vocal Profile AnalysesScheme (VPAS) (LAVER et al., 1981), so that it could be applied to Portuguese speakers. This analysis tool consists of two evaluation parts: the first investigates vocal quality and its tract adjustments, followed by tension and phonatory elements, and the second the aspects of vocal dynamics, which includes prosodic elements, as well as breathing support. This analysis was described by means of a grading where 0 is absence of adjustment, “P” is the presence of adjustment without grading, and from 1 to > 4 is the level of adjustment. Another characteristic analyzed was intermittency (i).

All data were tabulated in Microsoft Office Excel 2003 program. After that, a descriptive statistical analysis (proportions) of the data from the response form of the lay judges’ judgments was performed. As for the analysis of the evaluation data by the experienced judge, they were described in a table based on the VPAS-PB script and analyzed qualitatively.

3 | RESULTS AND DISCUSSION

As for the analysis of the judgments, the most recurrent negative adjectives in the voice samples per teleoperator were: unpleasant (T1, T4, T5, T7 and T8); and informal (T1, T4, T7, T8 and T9), followed by: disinterested (T4, T5, T7 and T8), harsh (T1, T4, T5 and T8) and confused (T4, T6, T7 and T8).

Moreover, of the nine teleoperators who participated in this study, the voice that received most negative impressions by lay judges was that of teleoperator 4 (T4): unpleasant

(62.50%), disrespectful (70.80%), impatient (87.50%), disinterested (66.70%), rude (87.50), confused (54.20%), informal (58.30%) and harsh (83.30%). Next was teleoperator 7 (T7), and her voice was seen as: unpleasant (58.30%), disinterested (45.80%), confusing (45.80%), redundant (45.80%), informal (66.70%) and insecure (45.80%).

On the other hand, of the nine teleoperators, the voices that received the most positive impressions were T2, T3 and T6. Teleoperators 2 and 3 (T2 and T3) had a vocal performance considered: pleasant, respectful, patient, interested, polite, clear, objective, formal, empathetic and safe. Teleoperator 6 (T6) received neutral judgments on most scales. T2 and T3 presented positive impressions in all 10 scales and T6 received only one negative adjective (confused).

Regarding the VPAS-PB responses, vocal quality adjustments predominated, such as decreased lip extension, closed jaw, lowered tongue body, recessed tongue body, lowered larynx, and modal voice. Regarding vocal dynamics, decreased pitch variability and fast elocution rate were observed.

The adjustments found in T1 were: advanced tongue tip (grade 3), lowered tongue body and lowered larynx, both grade 4, besides modal voice and crackling voice (grade 3, intermittent). T2, on the other hand, presented advanced tongue tip (grade 4), rough voice (grade 3), elevated larynx (grade 2), and laryngeal hyperfunction (grade 2).

Meanwhile, teleoperator 3 (T3) presented the following adjustments: advanced tongue tip, lowered tongue body, denasal and elevated larynx, all grade 3, besides intermittent decreased tongue body extension. The vocal dynamics adjustments of T3 were high habitual pitch (grade 2), increased habitual loudness (grade 3), increased loudness variability (grade 3) and fast elocution rate (grade 3). In teleoperator 4 (T4) were found as vocal quality adjustments: decreased lip extension, decreased tongue body extension and lowered larynx, all graded 4. There was a closed jaw adjustment in this voice of grade 5, besides the lowered and indented tongue body, both graded 3. He also presented modal voice. As vocal dynamics adjustments in T4, there was pitch variability decreased (grade 4), loudness variability increased (intermittent, grade 4) and fast elocution rate (grade 5).

In teleoperator 5 (T5) as for vocal quality adjustments, he presented: decreased lip extension and closed jaw - both in grade 4, lowered larynx (grade 3) and presence of modal voice. As for vocal dynamics in T5, two adjustments were found: pitch variability and decreased loudness (grade 3). Teleoperator 6 (T6) had a lowered and retracted tongue body (grade 3), lowered larynx (grade 4) and presence of modal voice, besides a closed jaw in extreme degree (5), when vocal dynamics, there was variability of decreased pitch (grade 3), decreased habitual loudness (grade 4) and decreased loudness variability (grade 3).

Three grade 5 adjustments were found in teleoperator 7 (T7): lowered larynx, closed jaw, and lowered habitual pitch. Others found were the lowered and recessed tongue body

and crackling voice (grade 4). It was also verified the presence of modal voice in T7 and decreased lip extension, pitch variability and loudness (grade 3).

As for the vocal quality of T8 and T9, they had adjustments of decreased lip extension (grade 4), indented tongue body (grade 3) and presence of modal voice for both. Regarding vocal dynamics adjustments, variability of increased loudness (grade 4), interrupted continuity (grade 4) and fast elocution rate (grade 3) was found in T9.

As for the relationship between voice pleasantness and the perceptual-auditory analysis through the VPAS-PB, the teleoperator who presented the most pleasant voice was T2 (95.80%), also presenting VPAS adjustments in a lower degree, unlike T4 which presented adjustments with higher degrees and his voice was referred to with a higher percentage in terms of unpleasantness (62.50%).

It is necessary to consider that each individual is endowed with a singular phonatory apparatus in its anatomy, and this makes some adjustments prevail more than others, taking into consideration sex, linguistic, paralinguistic and extralinguistic aspects.Each speaker tends to use, recurrently or not, some particular muscular adjustments, being part of his/her habitual speech style (LAVER, 1979), Since muscle adjustments are controllable, they can be learned and modified when necessary (MACKENZIE-BECK, 2005).

There was a prevalence of lowered larynx, present in six of the nine voices (T1, T4, T5, T6, T7, and T8). Pittam (1994) states that larynx height establishes a significant relationship with pitch characteristics; the lower the larynx is at the neck, the lower the pitch is. This occurrence of voices considered as low can be related to the fact that all nine teleoperators are male, which generally has a lower voice (GONZÁLES, 2002). Of these six teleoperators who had the low larynx setting, most (T1, T4, T5, T7 and T8) received many negative adjectives from lay judges. Contrary to the data found in this study, the study by Figueiredo et al. (2003) says that with regard to fundamental frequency, low voices are considered more pleasant. Moreover, four of these six voices were reported as “harsh” (T1, T4, T5 and T8), among them T4 and T8 were considered “disrespectful” and “impatient”. These vocal samples were judged with negative adjectives probably due to the influence of the vocal dynamics settings of decreased pitch variability and fast elocution rate, predominant in the teleoperators participating in this research.

On the other hand, according to Campos and Salgado (2005), low pitched voices convey a greater sense of security, agreeing with the present study, where it was seen that of the six voices with low laryngeal adjustment, a large part of the vocal samples (T1, T4, T5 and T8) were considered secure.It was found that the two teleoperators who presented grade 5 for the fast elocution rate adjustment (VPAS-PB), were the ones who also had more negative impressions by the perceptual-auditory evaluation of lay judges (T4 and T8). Agreeing with these results, a study by Fontana (2012) says that elocution rate contributes to promoting meaning effects and holding the listener’s attention. Therefore,

since this adjustment refers to the articulatory speed, the faster the movements, the higher the muscular activity tends to be, which can generate oscillations and tremors that affect communication and listener comprehension (ARCURI et al., 2009).

According to Oliveira (2004), the tongue presents itself as an important musculature, giving mobility and influencing the volume of oral cavity and laryngeal movements. In the current study, it was observed that six teleoperators (T1, T4, T5, T6, T7 and T8) presented low laryngeal adjustment, among these, only T5 did not present the lowered tongue body adjustment. Based on Laver's theoretical model (1980) there is a relationship between some adjustments, which can be by compatibility, where an adjustment excludes by antagonism the execution of the other; and interdependence in which an adjustment interferes, helping or facilitating the production of another, thus, it can be considered that the low larynx adjustment is interdependent on the lowered tongue body adjustment.

As for the predominant receded tongue body adjustment, since most teleoperators were born and raised in João Pessoa, it may be due to the accent in João Pessoa, since a study by Lima et al. (2007) showed the predominance of receded tongue body adjustment in male and female speakers.

As for the closed jaw fit, T4, T7 and T8 (all grade 5), presented unsatisfactory pleasantness results. On the other hand, T2, considered a voice with a positive impression and judged for transmitting clarity, showed no closed jaw adjustment. Thus, we can correlate the impression of clarity in transmitting information to the closed jaw setting, since Taucci and Bianchini (2007) bring in their study the fact that the reduction of vertical amplitude and articulation of speech more closed, hinders the accuracy of elocution and clarity of sounds.

According to Laver (1980), roughness is related to increased laryngeal tension, caused by irregular glottal wave, fundamental frequency disturbance and unpleasant sound characteristic. This idea is reinforced by Behlau and Pontes (1995) when they attribute to the rough voice an unpleasant and also irritating sound characteristic. From the analysis of the VPAS-PB, it was found that two teleoperators were judged with this adjustment ¬¬¬¬¬¬¬¬¬- T2 and T9. The findings of this research showed that both T2 and T9 obtained positive impressions when analyzed by lay judges, which suggests that, as far as pleasantness is concerned, the aspects of vocal dynamics proved to be more relevant than the vocal quality adjustments in the perception of lay judges. Another important fact to analyze is that the hoarseness adjustment is composed by the adjustments of air escape and rough voice, so the teleoperators T2 and T9, who presented these adjustments, are considered with the presence of hoarseness compound adjustment (LAVER, 1980; LAVER et al., 1981).

Adjustments such as harsh voice, air leak, laryngeal hyperfunction, elevated larynx, closed jaw, elevated tongue body, associated with the prevalence of aspects of vocal dynamics such as variability of decreased pitche loudness, pitch and loudness habitual high and high elocution rate are seen as typical occurrences in pictures of voice disorder (LIMA-

SILVA et al., 2012). As for the increased elocution rate present in six teleoperators (T1, T2, T3, T4, T8 and T9), it was considered as a factor of vocal hyperfunction (FIGUEIREDO, 1993). Another common finding among the results of this research was a closed jaw, a setting that limits range of motion, an alteration that can lead to Temporomandibular Dysfunction (TMD) (DWORKIN et al., 1990).

4 | CONCLUSION

There was a relationship between the perceptual aspects of vocal quality and dynamics and the findings of the analysis of pleasantness of the voice of emergency teleoperators. The emergency teleoperator, for using only the vocal resource, makes it so important the good use of such settings to convey a good impression. Thus, these data prove that the quality and dynamics of the voice of teleoperators participating in this research can compromise the quality of service and also, it appears that most of the adjustments identified may favor the development of dysphonia.

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