

Fonoaudiólogos doutores no Brasil: perfil da formação no período de 1976 a 2008****

Speech Pathologists and Audiologists with Ph.D. in Brazil: profile from 1976 to 2008

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Abstract

Background: keeping data about Ph.D.s of speech pathologists and audiologists updated allows the retrieval of what has been developed in these fields of knowledge, besides giving a dimension of the development of the Speech, Language and Hearing Sciences in our country. **Aim:** to analyze the educational background of Brazilian speech pathologists and audiologists with Ph.D. within the period of 1976-2008. **Method:** doctorate dissertations presented by Brazilian speech pathologists and audiologists during the period of 1976 (first presentation) to the end of 2008 were selected through information provided by post-graduation offices and also by consulting data published on Plataforma Lattes (online curriculum vitae for professors and scientists). For each finding the following variables were registered: author's gender, year of presentation, educational institution and post-graduate program where the dissertation was developed (according to the areas of knowledge determined by National Council of Scientific and Technological Development) and chosen theme (Language, Hearing and Balance, Motricity and orofacial functions, Voice e Public Health). The statistical analysis involved the description of the selected parameters, a regression analysis to verify increase of Ph.D. presentations, area of development and chosen theme, and application of the chi-square test to verify possible associations. **Results:** a total of 504 dissertations were analyzed. The results were: 97.0% of the dissertations were presented by women; State Institutions were chosen by almost half (47.62%) of the speech pathologists and audiologists to obtain their Ph.D.; the Sciences of Life programs were the most prevalent (57.54%); concerning the chosen theme, most of the dissertations were developed in the field of Language (34.52%) and Hearing and Balance (32.34%). The regression analysis indicated an increase of all of the studied variables with significance mostly related to the year of presentation, choice of the area of Applied Human and Social Sciences and Sciences of Life and themes of Language and Motricity and Orofacial functions ($p < 0,001$). There was also an increase related to the option for Public Institutions, mostly State Institutions ($p < 0,001$). **Conclusion:** there was a significant increase of speech pathologists and audiologists with Ph. D., which enables major insertion of these professionals in research activities and qualified scientific production.

Key Words: Speech-Language Pathology; Audiology; Publications

Resumo

Tema: manter atualizado o levantamento de doutores fonoaudiólogos brasileiros permite recuperar a memória do que foi desenvolvido na área, além de explicitar um indicador importante do amadurecimento da Fonoaudiologia no país. **Objetivo:** analisar a formação dos doutores fonoaudiólogos brasileiros, no período correspondente a 1976 - 2008. **Método:** as teses defendidas por fonoaudiólogos brasileiros, no período compreendido entre 1976 (primeira defesa) até final de 2008, foram selecionadas, por meio de contato com as secretarias de programas de pós-graduação e consulta à Plataforma Lattes. Para cada achado foram registradas as variáveis: sexo do autor; ano de defesa; instituição de ensino e programa de pós-graduação em que a tese foi desenvolvida, além da temática escolhida. A análise estatística compreendeu descrição dos parâmetros, análise de regressão para evidenciar o crescimento referente ao ano de defesa, área e temática escolhida e teste de qui-quadrado para verificar associação. **Resultados:** as 504 teses localizadas, 97,0% foram defendidas por mulheres; em maior número foram escolhidas as instituições estaduais (47,62%) e os programas inseridos na área de Ciências da Vida (57,54%); quanto à temática desenvolvida na tese, maior número correspondeu à Linguagem (34,52%) e Audição e equilíbrio (32,34%). A análise de regressão evidenciou o crescimento do número de teses segundo o ano, sendo que tal tendência foi também evidenciada na escolha do Programa e para as áreas de Linguagem e Motricidade e Funções Orofaciais ($p < 0,001$). O incremento se dá principalmente devido ao aumento das teses defendidas em instituições públicas, mais particularmente, as estaduais ($p < 0,001$). **Conclusão:** houve um crescimento significativo dos fonoaudiólogos doutores, fato que possibilita maior inserção do fonoaudiólogo em atividades de pesquisa e produção científica qualificada.

Palavras-Chave: Fonoaudiologia; Audição; Indicadores de Produção Científica.

Introduction

Literature has been valuing the survey of scientific production in certain knowledge areas, aiming to explicit their accomplishments, and allowing a greater level of reflection about the directions of this production 1-3.

In the area of Speech-Language Pathology and Audiology, greater attention has been paid to this production, especially to scientific periodicals which are indexed in different data bases, over the last five years 4-5.

In particular, this study is based on a previous update survey 6 which aimed to improve the knowledge about the Brazilian Speech-Language Pathologists who had a Ph.D., according to the scientific program and year of thesis presentation.

We believe that aside from allowing the recovery of memory of the material which was developed and disclosed in the area, keeping this survey updated will aid in constituting an important indicator of the development of Speech-Language Pathology and Audiology in the country. Moreover, it may predict the potential for scientific productions which may be recognized by funding institutions.

There are many teaching, research and extension activities under the responsibility of a professor with a Ph.D. (advising undergraduate and graduate students, taking part as examiners in the processes of admission and career promotions of professors, as well as examining theses and dissertations; participation in planning and assessment activities, including academic management activities; consultancies; writing various reports, among others) and, only when the academic title is obtained is it possible to start a research group, with the responsibility of educating new researchers and thus consolidating the effective growth of a different area.

Therefore, the aim of this paper is to analyze the background of Brazilian Speech-Language Pathologists and Audiologists with Ph.D., from the presentation of the area's first thesis (1976), until the end of year 2008. In this search we aim to survey the year of presentation, institution and graduate studies program in which the thesis was developed and its chosen theme of interest. The hypothesis is that there is an increase in the number of presented theses, and a profile that is similar to the one described above 6.

Method

The survey of presented theses by Brazilian Speech-Language Pathologists and Audiologists began with a study previously developed and published 6. In this paper, the first known thesis dates back to 1976. Therefore, the established search period was from this first presentation until the end of year 2008. In order to update the previous survey, the Lattes Platform of the National Council of Scientific and Technological Development (CNPq) and searching for the terms "Speech-Language Pathologists", "Audiologists" and "Ph.D.", 1381 curriculums were found (consulted in 11.22.2008). When reading each of these resumes, it was clear that other professionals who have any kind of related activity to Speech-Language Pathology and Audiology were part of the list. Thus, it was necessary to access each and every resume, and only those presenting undergraduate degrees in Speech-Language Pathology and Audiology were considered.

The material was categorized according to variables: sex of the individuals with Ph.D., year of thesis presentation, Universities (Federal, State, Private and International institutions), insertion of the program in which the thesis was developed according to the areas established by the National Council of Scientific and Technological Development known as CNPq (Life Sciences; Human and Social Applied Sciences; and Engineering, Exact and Earth Sciences); and chosen theme (according to the five areas established in Brazilian Speech-Language Pathology and Audiology which are recognized by the Brazilian Society of Speech-Language Pathology and Audiology: Language, Hearing and Balance, Orofacial Functions and Motricity, Voice, and Collective Health).

The increase in the number of theses per year and according to the area of the program where the thesis was developed was assessed through models of linear, square, and exponential regressions. In all cases, the square regression model was the one which showed best values for predictive capacity (r^2), reason why it was chosen to adjust the data in the present study. The square model was determined based on the equation:

$$y = \hat{a}_0 + \hat{a}_1x + \hat{a}_2x^2$$

The equation estimates the best model to predict the number of theses (y) according to time (x). The independent variable ($x = \text{years}$) was patterned so that the value of \hat{a}_0 could represent the number of

theses in the first year of study (1976). Therefore $x^2 = x - 1976$. The r^2 and the statistical significance of each square model were determined.

The chi-square test (χ^2) was used to verify the association between the decade during which the thesis was written and the organizational structure of the University (Federal, State, Private or International Institution).

Results

In a descriptive analysis, the survey of Ph.D. theses presented by Speech-Language Pathologists and Audiologists in a determined period revealed a total of 504 studies.

Table 1 shows that a greater number of theses were presented by women, during the last decade, and in State institutions. Among the State Universities, 69.16% opted for the University of São Paulo (USP); among the Federal Universities, 59.1% for the Federal University of São Paulo (UNIFESP); and among the private institutions, 87.87% for the different Pontifical Catholic Universities spread throughout the country.

Regarding the different Programs, among those related to Life Sciences, 44.48% of the Ph.D. holders opted for programs related to Speech-Language Pathology and Audiology / Communication Disorders, among those pertaining to the Human and Social Applied Sciences, the ones in the field of Literature/ Linguistics were chosen in greater number (47.52%). Options for Engineering, Exact Sciences and Earth Sciences are observed only over the last five years.

As far as the themes among the Speech-Language Pathologists and Audiologists who opted to develop their theses in the area of Language, 70.11% presented their studies in programs of the Human and Social Applied Sciences, while 82.82% of the ones who chose Hearing and Balance as theme of study, and 92.86% of the Ph.D.s in Orofacial Functions and Motricity, opted for Life Science programs. In the other analyzed themes, there was no predominance in any area.

The square model was able to predict almost 94% of the variability in the increase of the number of thesis from 1976 to 2008 (figure 1 and Table 2). When considering the increase according program area, the square model predicted practically 88% of the variability in the Human, Social Applied and Life Sciences. According to the theme of the thesis, the variability explained by the squared model was of 61% when the theme was Voice, and up to 84% when the theme was Language. The probability for all models was $p < 0.05$, therefore, considered significant.

Table 3 shows the number of theses according to decade and structural organization of the University.

It is observed through the value of p determined by the χ^2 that there is association between the decade during which the thesis was developed and the organizational structure of the University. Thus, the data point towards an increase in the number of thesis in public institutions, especially State Universities, and a reduction of this number in International institutions.

TABLE 1. Numeric distribution and percentage of theses presented by Brazilian Speech-Language Pathologists and Audiologists, according to sex of the authors, institution and program where the thesis was presented, and chosen theme.

Variable	N	%
Sex		
Male	14	2,8
Female	490	97,2
Type of University		
State	240	47,62
Federal	169	33,53
Private	66	13,10
International	29	5,75
Program Area		
Life Sciences	290	54,57
Human and Social Applied Sciences	202	40,08
Engineering, Exact and Earth Sciences	9	1,79
Not specified	3	0,60
Theme		
Language	174	34,52
Hearing and Balance	163	32,34
Voice	58	11,51
Orofacial Functions and Motricity	56	11,11
Collective Health	15	2,98
Others	38	7,54
TOTAL OF THESES	504	100,00

GRAPHIC 1. Growth (adjusted by square regression model) of the number of theses presented by Speech-Language Pathologists and Audiologists with Ph.D., in the period comprised in between 1976-2008.

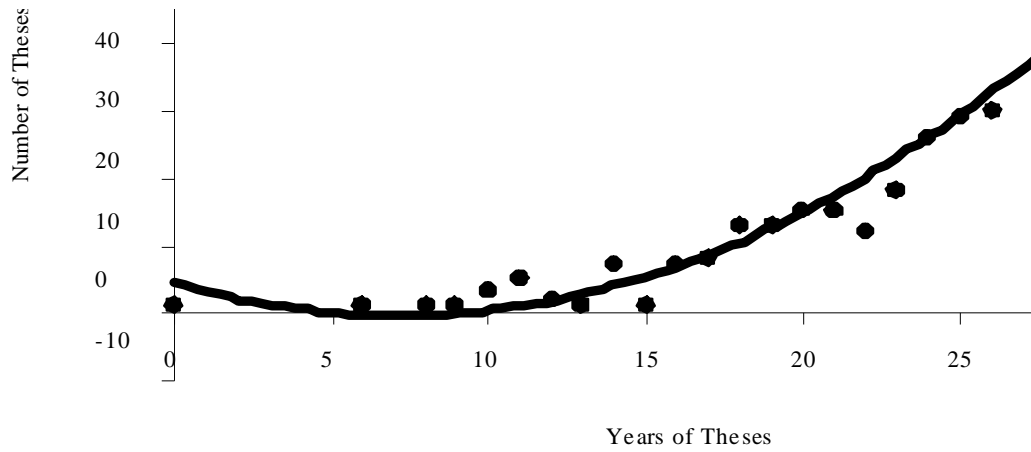


TABLE 2. Square regression model for the growth in the number of theses, considering year (all data), insertion of the program in CNPq areas, and selected theme.

Variable	Equation	r ²
Year (all data)	$4.45 - 1.3575.x + 0,0944.x^2$	0.9327
Program Area		
Human and Social Applied Sciences	$2,97 - 0,7372.x + 0,0435.x^2$	0.8806
Life Sciences	$1,16 - 0,5505.x + 0,0473.x^2$	0.8792
Engineering, Exact and Earth Sciences	$0,50 - 0,1166.x + 0,0048.x^2$	0.4281
Theme		
Langugage	$2,87 - 0.6756.x + 0.0386.x^2$	0.8374
Orofacial Functions and Motricity	$0,80 - 0,2691.x + 0,0150.x^2$	0.7530
Hearing and Balance	$0,72 - 0,2619.x + 0,0243.x^2$	0.7289
Collective Health	$0,36 - 0,1046.x + 0,0051.x^2$	0.6990
Voice	$-0,327 - 0,0788 * 0,0087.x^2$	0.6183

TABLE 3. Distribution of the number of theses according to decade and Structural Organization of the University.

Year/Decade	Structural Organization of the University			
	Federal N (%)	State N (%)	Private N (%)	International
< 1979	0	1 (100)	0	0
de 1980 a 1989	6 (42,9)	3 (21,4)	3 (21,4)	2 (14,3)
de 1990 a 1999	44 (40,4)	31 (28,4)	14 (12,8)	20 (18,4)
de 2000 a 2008	119 (31,3)	205 (54)	49 (12,9)	7 (1,8)
Total	169 (33,5)	240 (47,6)	66 (13,1)	29 (5,8)

Discussion

The result of 504 theses in the studied period demonstrates the mobilization of the Speech-Language Pathologists and Audiologists in search of better scientific capacitating. This movement is also perceived in other areas of science, and especially in those related to Health 1-3. This increase may also explain the greater volume of published articles in the field, and this data is present in studies with this specific aim 4-5. In particular, a study developed in the field of Physical Therapy, a field which developed closely to Speech-Language Pathology and Audiology, which also aimed to trace a profile of the Physical Therapy researchers as far as their education, registered a close number of researchers with Ph.D.s (573)8.

When comparing this survey to the previous one6, one will notice an increase greater than double the previous one (year 2004 = 203 thesis) and which proved statistically significant, in yearly analysis. It is believed that in addition to the increase in theses by those presented between 2004 and 2008, the use of the Lattes platform contributed to this increase, since this platform allows access to those professionals who presented their studies in programs that are not specific of this field. This procedure may also account for the number of theses presented in the last analyzed decade, when filling in the data in this Platform became compulsory for all researchers.

Some of the first Speech-Language Pathologists and Audiologists with Ph.D.s had to seek their education in programs pertaining to other fields, since, at the time, the specific programs did not exist. Considering this fact, it may be concluded that nowadays, the Speech-Language Pathologist and Audiologist has been seeking education not only in specific programs (there are five programs that grant Ph.D. titles in the field, two private ones and three in public institutions), but also in others that have an interface with Speech-Language Pathology and Audiology, which may also provide more space for interdisciplinary collaborations.

This increase, however, is still small when compared to the total number of individuals with Ph.D.s in the country. In a survey carried out in the period between 2006 and 2007, the findings were of 78,155 researchers with Ph.D.s, while as, in the same period, according to the data in this study, there were 391 Speech-Language Pathologists and Audiologists who received a Ph.D. degree. This difference may be explained by the fact that Speech-Language Pathology and Audiology, is an

occupation still undergoing a process of growth and consolidation, as, likewise, the field of Physical Therapy.

Special emphasis may be placed on the comparison with the total of 33,400 Speech-Language Pathologists and Audiologists in Brazil10: the 504 withholding a Ph.D. only represent 1.5%.

When comparing this proportion to European countries, a wide advantage is perceived, as of the 25 countries that are members of the Comité Permanent de Liaison des Ortophonistes Logopèdes de l'Union Européenne, 18 reported having 349(0.52%) researchers with Ph.D.s, from a total of 66,869 professionals11. In Australia, the Australian Academy of Audiology presently counts 1650 members, but only 50(3%) have a Ph.D.12.

On the other hand, in the United States, a study carried out by the American Academy of Audiology showed that out of the 10,673 associated Audiology professionals, 943 (8.83%) have a Ph.D.13. This high proportion is due to the fact that the minimum level required for working in that country as an audiologist is a Masters' Degree. However, after the year 2010, all professionals of the field will be required to have an AuD, or a Ph.D. in Audiology, which will still provide an increase in this proportion.

The greater number of women is explained less by the demographic tendency towards an increase in the proportion of women when compared to men, and more by the higher number of women in upper education14 and, even more so in the field of Speech-Language Pathology and Audiology, fact which is a reality since the beginnings of this occupation.

When compared to other countries, Speech-Language Pathology and Audiology presents a similarity in the predominance of female professionals. In Europe the field is composed by 95% of women, with an average of 40 years of age15. In the United States, men prefer Audiology (18.3%) than Speech-Language Pathology (4.2%), and 26.7% of them work in both fields16.

The option in greater numbers by public State institutions, followed by Federal ones may be explained by the Speech-Language Pathologists' and Audiologists' financial difficulties to continue their studies in the field, and also, by the greater offer of institutions of this kind in Brazil - 1318 institutions9.

The programs offered by USP were chosen in greater number, probably due to their diversity, when considering field and city, a fact which favors the background and education of different Speech-Language Pathologists and Audiologists with

Ph.D. Among the Federal institutions UNIFESP is the most often sought certainly for offering the first Graduate Program in Human Communication Disorders - Speech-Language Pathology and Audiology Field, since 1982. The option for private universities, mainly the so-called community universities, highlights the choice for a human and social oriented program.

In the analysis of the chosen Programs for thesis development, if previously those related to the Life sciences were prioritized, in the present survey the ones pertaining to Human and Social Applied sciences are also evidenced, with a statistically significant increase in close percentage, and greater when compared to the first. This fact points towards the presence of both fields that compose the foundation of the occupation (health and human sciences), and there are similar numbers between them. It is important to draw attention to the theses presented in the fields of Engineering and Exact and Earth sciences; although there were few theses presented in these areas, they were not mentioned in the previous survey⁶.

As far as the themes chosen by the Speech-Language Pathologists and Audiologists for the thesis analyzed in this study, according to the specific areas defined by the Brazilian Society of Speech-Language Pathology and Audiology, there was an inversion between two of the most widely studied themes. In this survey, Language appears as the most researched area, followed by Hearing and Balance, while in the previous study⁶ the opposite was observed. It is important to note that in this previous survey the area of Collective Health was only in its beginnings, and, therefore, was not part of the analysis considering the different areas, which may account for the migration of a few of the titles to this new field. The creation of the Department of Collective Health by the Brazilian Society of Speech-Language Pathology and Audiology seems to have encouraged and strengthened the scientific production in this field, which articulates with knowledge and practices implied in working with human health. It was confirmed that, once more, the distribution by areas reflects the history of Speech-Language Pathology and Audiology as an occupation, as in the beginning of the Graduate Studies Programs, Language and Audiology issues were privileged in both the course syllabus and in the background of the faculty members who taught classes or advised

studies. Little by little new theme areas were incorporated. This growth may be observed in the regression analysis which highlighted the theme areas of Language and Orofacial functions and motricity, followed by Hearing and Balance, Collective Health, and finally Voice.

When comparing Speech-Language Pathology and Audiology theme areas with those pertaining to the university Programs, as proposed by the CNPq, it may be hypothesized that the researchers with Ph.D. have opted for Language themes due to its more humanitarian character, finishing their theses in Human and Social Applied science programs. On the other hand, those that opted for Hearing and Balance and Orofacial functions and motricity themes, are more drawn to organic issues, emphasized in Life Sciences programs.

In a parallel to the previous survey⁶, the total number of presented theses was compared to the 4523 specialists titled by the Federal Council of Speech-Language Pathology and Audiology¹⁰, a number which corresponds to 13.7% of the total of Speech-Language Pathologists and Audiologists who graduate in the country. Based on the specific numbers of each theme area (Audiology: 1504 - 33.25%; Orofacial Motricity: 1449 - 32.03%; Voice: 863 - 19.10%; Language: 696 - 15.40%; Collective Health: 10 - 0.22%) it may be concluded that the sequence is different than the option made by the Speech-Language Pathologist and Audiologist for his/her Ph.D., and is only similar in the areas of Voice and Collective Health. This fact shows that the Speech-Language Pathologist and Audiologist, when searching for greater specificity in his/her clinical practice, seeks different areas, when compared to those that will provide support for their scientific questions.

Conclusion

In the studied period (1976-2008), 504 Ph.D. theses presented by Speech-Language Pathologists and Audiologists were found. The increase was significant and occurred in greater number in public universities in Life Science and Human and Social Applied Sciences Programs, on themes: Language and Hearing and Balance. Some changes were perceived when comparing the period of 1976-2004 previously described by the authors of the present study.

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