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# Program of graduate studies in Speech Language Pathology and Audiology of Pontifícia Universidade Católica de Sao Paulo, Brazil: analysis of four decades of production

Programa de estudos pós-graduados em  
fonoaudiologia da Pontifícia Universidade  
Católica de São Paulo, Brasil: análise da  
produção de quatro décadas

El estudio de post graduados em  
fonoaudiología Pontifícia Universidade  
Católica de São Paulo, Brasil: análisis de  
cuatro décadas de producción

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## Abstract

The Program of Graduate Studies (PEPG) in Speech Language Pathology and Audiology of the Pontifícia Universidade Católica de São Paulo (PUC-SP) celebrated its 40th anniversary in 2013. The projects developed in that program follow one of five lines of research: Child Hearing, Voice Evaluation and Intervention, Language and Subjectivity, Body and Psyche, and Diagnostic Procedures and Psycho-Social Implications of Hearing Disorders. Objective: to analyze the theses and dissertations defended in the PEPG of PUC-SP according to their research topics and methods. Method: the secondary data were collected on the PEPG's website and included 739 abstracts of theses and dissertations defended between the years of 1978 and 2012. These were categorized according to: year, author, supervisor and abstract, followed by a classification by research area (Voice, Hearing, Language, Orofacial Myology, Public Health and Clinical Methods) and research method (evaluation/diagnosis/observation, intervention and literature review). The descriptive analysis took into consideration both absolute and relative frequencies, and, subsequently, central tendency and dispersion measures were taken. Results: there was a significant increase in production over the years, especially in the years 2000 and 2001. The most researched areas were Hearing (39.4%) and Language (19.2%), and the most adopted research methods were evaluation/diagnosis/observation (50.5%) and intervention (22.3%). Conclusion: when analyzing the production of theses and dissertations over the 40 years of the Program of Graduate Studies in Speech Language Pathology and Audiology of PUC-SP, the 739 studies showed a growing trend across all the methods (evaluation/diagnosis/observation, intervention and literature review), predominantly in the Hearing area, followed by Language.

**Keywords:** Speech Language Pathology and Audiology; Master's Theses; Research

## Resumo

*Introdução: O Programa de Estudos de Pós-Graduação (PEPG) em Fonoaudiologia da Pontifícia Universidade Católica de São Paulo (PUC-SP) completou quatro décadas em 2013, e os projetos ali desenvolvidos estão atrelados a cinco linhas de pesquisa: Audição na Criança, Voz: Avaliação e Intervenção, Linguagem e Subjetividade, Linguagem, Corpo e Psiquismo e Procedimentos e Implicações Psicossociais dos Distúrbios da Audição. Objetivo: Analisar as dissertações e teses defendidas no PEPG da PUC-SP, segundo temática e método de pesquisa. Método: A coleta de dados secundários partiu de busca no site do PEPG, em que foram registrados 739 resumos de dissertações e teses defendidas entre os anos de 1978 e 2012. Estes foram categorizados segundo: ano, título, autor, orientador e resumo, seguido da classificação quanto à área (Voz, Audição, Linguagem, Motricidade orofacial, Saúde coletiva e Métodos clínicos) e Método de pesquisa (Avaliação/Diagnóstico/Observacional, Intervenção e Revisão de literatura). A análise descritiva considerou frequências absolutas e relativas e na sequência foram realizadas medidas de tendência central e dispersão. Resultados: Ao longo dos anos houve um aumento expressivo de produções, mais evidenciado nos anos de 2000 e 2001. As principais áreas abordadas foram Audição (39,4%) e Linguagem (19,2%), e quanto ao método destacam-se Avaliação/Diagnóstico/Observacional (50,5%) e Intervenção (22,3%). Conclusão: Na análise da produção de dissertações e teses do PEPG em Fonoaudiologia, nos 40 anos de seu funcionamento, os 739 estudos denotaram tendência crescente, em todas as modalidades de método (avaliação/diagnóstico/observação, intervenção e revisão de literatura), predominantemente na área de audição, seguida de linguagem.*

**Palavras-chave:** Fonoaudiologia; Dissertações; Pesquisas.

## Resumen

El Programa de Estudios de Posgrado (PEPG) en fonoaudiología, de la Universidad Católica de São Paulo (PUC-SP) completó cuatro décadas de 2013 y los proyectos desarrollados aquí están relacionados con cinco áreas de investigación: la audición en los niños, Evaluación y Voz habla, el lenguaje y la subjetividad, la lengua, el cuerpo y Psi y Procedimientos e implicaciones psicosociales de los trastornos de la audición. **Objetivo:** Analizar las disertaciones y tesis en PEPG en la PUC-SP, de acuerdo con el método temática y la investigación. **Método:** la recopilación de datos secundarios vino de PEPG búsque da em el sitio, se registraron 739 resúmenes de disertaciones y tesis entre 1978 y 2012. Estos fueron clasificados de acuerdo a: año, título, autor, entrenador y corto, seguido de clasificación de acuerdo a la zona (Voz, Escuchar, Lenguaje, Motricidad Orofacial, la salud pública y los métodos clínicos) y el método de la investigación (evaluación / diagnóstico / observacional, Intervención y revisión de la literatura). El análisis descriptivo incluyó Se realizar on las frecuencias absolutas y relativas y medidas de tendencia central y de dispersión de secuencia. **Resultados:** Con los años se ha producido un aumento significativo de la producción, más evidente en los años 2000 y 2001. Las principales áreas abordadas fueron la audición (39,4%) y el lenguaje (19,2%) y en el método, se destacan Evaluación / observacional de diagnóstico (50,5%) y de intervención (22,3%). **Conclusión:** el análisis de la producción de disertaciones y tesis PEPG en terapia de lenguaje, em los 40 años de su funcionamiento, los estudios 739 denotan la creciente tendència en todos los modos de método (evaluación / diagnóstico / observación, intervención y revisión de la literatura), predominantemente en el área de escucha, entonces el lenguaje.

**Palabras clave:** Fonoaudiología; Disertaciones; Investigaciones..

## Introduction

The increase in scientific production in Brazil has led several research fields to conduct a periodical analysis of the features and trends of this production, focusing specifically on studies and research that have been disclosed since their publication<sup>1,2</sup>.

This type of analysis provides a historical overview of knowledge production in a given area, and supplies the necessary information for such production. If, on one hand, a quantitative and qualitative increase in scientific production is fundamental, on the other hand it is also essential to disseminate this knowledge so as to make it available to society in general and the scientific community specifically, thus fulfilling its transforming role<sup>3</sup>.

The scientific production generated in a Graduate Program, in addition to consolidating a science, allows to outline trends, needs, and lines of research, boosts publications, and, consequently, scientific productivity<sup>4</sup>. Nowadays, much is discussed about the assessment of scientific knowledge production, and one of the main topics of this discussion regards productivity, i.e., the quantitative measurement of the ability to create.

This productivity is assessed based on criteria that value scientific publications, especially indexing on Brazilian and foreign databases for the health research area<sup>5,6</sup>.

Studies have been conducted with the aim of assessing the scenario of knowledge production in the Communication Disorders area, emphasizing the need for reflecting on the topics and the theoretical-methodological aspects that characterize its bibliographical production<sup>3,7,8,9</sup> by outlining studies that focus on analyzing knowledge production, particularly through specific topic areas<sup>10,11</sup>.

Carrying out that research depends on the actions developed in Graduate Programs, given that among its missions is the adequate training of professor-researchers, who perform the main role in the production of scientific knowledge and academic leadership for teaching<sup>12,13</sup>, as well as in outlining new intervention and research proposals<sup>7</sup>.

In that regard, we may mention a study conducted in 2004 with the aim of updating the doctoral dissertations defended by Brazilian speech and language therapists between 1976 and December 2003. That study showed that 203 dissertations had been written mostly by women doctoral candidates in Speech Language Pathology and Audiology



particularly in the research areas of Audiology, Language, Voice and Oral Myology<sup>7</sup>.

In 2010, another study was conducted with the purpose of analyzing the increase in the number of doctoral candidates in Speech Language Pathology and Audiology in Brazil between the years 1976 and 2008. The findings demonstrated that there was significant growth in the number of speech and language therapists with doctor's degrees, which indicates an increased insertion of speech and language therapists in qualified research and scientific production<sup>14</sup>.

More recently, a study researched articles published in periodicals specializing in Speech Language Pathology and Audiology (*Revista Distúrbios da Comunicação*, *Revista da Sociedade Brasileira de Fonoaudiologia*, *Revista Pró-fono e Revista Cefac*) between 1986 and 2009, with the aim of analyzing part of the knowledge production regarding the interface between Speech Language Pathology and Audiology and Education. The study took into account the variables Time, Topic, and Research Area, selected based on the title and the abstracts of the articles that approached the topics Speech Language Pathology and Audiology, School, Education, Schoolchildren's Health, and Teachers' Health. The findings evidenced the continuous growth of these publications since the 1980's; an upward trend in the number of publications related to the interface between Speech Language Pathology and Audiology and Education in each five-year period; and an emphasis given to studies approaching developmental aspects in schoolchildren, reinforcing the prevalence of research and papers based on the clinical perspective<sup>15</sup>.

The Program of Graduate Studies (PEPG) in Speech Language Pathology and Audiology of PUC-SP corroborates the above-mentioned research findings. The PEPG focuses on the clinical practice in Speech Language Pathology and Audiology, and research projects are concentrated in the following five lines of research: Child Hearing, Voice Evaluation and Intervention, Language and Subjectivity, Language, Body and Psyche, and Diagnostic Procedures and Psycho-Social Implications of Hearing Disorders. The Child Hearing line focuses on research into prevention, identification, diagnosis of hearing losses, and rehabilitation for both babies and children. The Voice line studies the relationships between the organic, psychological and social-cultural

dimensions of the human voice. The Language and Subjectivity line prioritizes the clinical practice and considers language as a symbolic object, which may not be separated from subjectivity, whose symptoms are reflected in both the Self and the Other. The Language, Body and Psyche line associates the clinical practice in Speech Language Pathology and Audiology with psycho-analysis, neurosciences and philosophy. Lastly, the Diagnostic Procedures and Psycho-Social Implications of Hearing Disorders line focuses on the procedures adopted in audiological diagnosis, programs for preservation of auditory health, and intervention procedures in individuals with hearing disorders, contributing to the speech and language therapist's clinical practice.

The main goal of the PEPG is to develop advanced research and studies in Speech Language Pathology and Audiology, encouraging publications in the field, in addition to preparing professionals of Speech Language Pathology and Audiology for activities involving teaching and scientific investigation<sup>16</sup>.

The Program was graded 4 in the evaluation conducted every three years by the Brazilian Federal Agency for Improvement of Graduate Education (CAPES), and has opened its admissions process every semester. Once admitted, candidates may submit their research projects to both the CAPES and the CNPQ (Brazilian National Council for Scientific and Technologic Development) to compete for a scholarship. The research projects are then evaluated according to established criteria (technical ability, analysis of the candidate's CV on CNPQ's Lattes Platform, and assessment of the Work Plan) by a commission composed of 5 professors, one from each of the lines of research<sup>17</sup>. The Program also has published its own periodical – *Revista Distúrbios da Comunicação* – since 1986.

On the thirtieth anniversary of the Program, a quantitative and qualitative analysis of its production was carried out, highlighting the changes and trends in the studies conducted from 1972 and 2003<sup>18</sup>.

On the Program's fortieth anniversary, the faculty once again analyzed its scientific production, believing that researching into scientific production allows academics to get familiarized with the main investigative trends and to develop future plans.



The purpose of this study is to analyze the theses and dissertations defended in the PEPG in Speech Language Pathology and Audiology of PUC-SP over the last 40 years, according to their topics and research methods.

## Method

This is a retrospective, transversal study, conducted within the Program for Graduate Studies (PEPG) in Speech Language Pathology and Audiology of the Pontifícia Universidade Católica de São Paulo (PUC-SP).

The researchers looked into the abstracts of theses and dissertations defended over the 40 years of the PEPG (1972 – 2012). All the abstracts are available on the Program's website<sup>17</sup>, and 739 studies were recorded. These were analyzed and categorized in a specific table, containing the year, title, author, supervisor and abstract. Subsequently, a second analysis classified the studies into two categories: 1. Research method: Evaluation/Diagnosis/Observation, Intervention, and Literature Review; and 2. Area: Voice, Hearing, Language, Oral Myology, Public Health and Clinical Methods. As to the research method, the classification took into account studies associated with evaluation instruments, diagnosis and observation studies, such as case studies or descriptive research. It is important

to point out that several studies approached more than one area and research method.

A descriptive analysis of the data was used through absolute and relative frequencies, using central tendency and dispersion measures. For the trend analysis, linear, quadratic, exponential, polynomial and potential models were tested. For the statistical significance, a descriptive level of 5% was assumed. The analyses were made on the SPSS software, version 17.0 for Windows, and the charts were made on the 2007 version of the Excel software.

The data were collected in the period comprehended between February and December 2012 by the researchers responsible for this research.

## Results

Table 1 shows that the most researched areas were: Hearing (39.8%), Spoken Language, Reading and Writing (19.2%), Voice (16.5%), Clinical Methods (10.9%), and Orofacial Myology (6.2%). The most approached method was Evaluation/Diagnosis/Observation (50.5%), followed by Intervention (22.3%), Evaluation/Diagnosis/Observation + Intervention (13.5%) and Literature Review (9.3%).

Descriptive analysis of the data through absolute and relative frequencies.

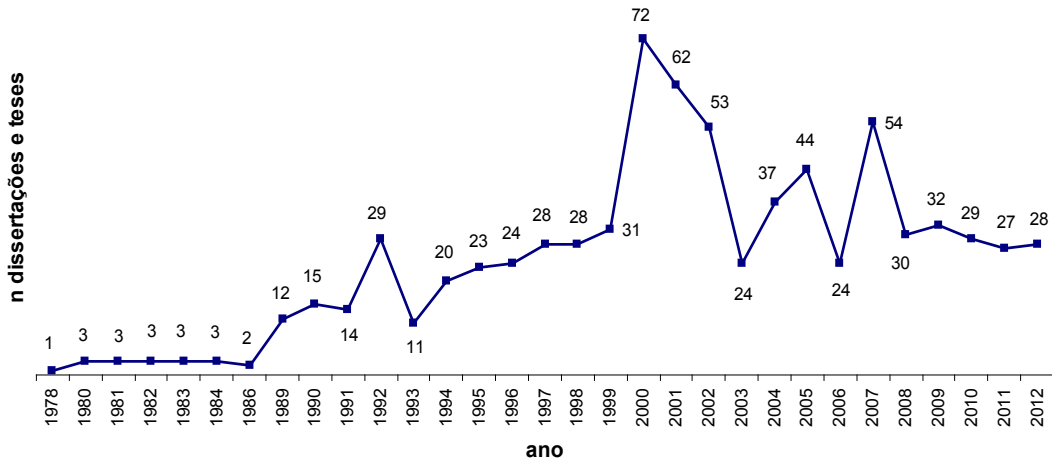
**TABLE 1 – NUMBER AND PERCENTAGE OF THESES AND DISSERTATIONS, ACCORDING TO RESEARCH AREA AND METHOD**

Variable I		
<b>Area</b>		
Hearing	294	(39,8)
Spoken Language, Reading and Writing	142	(19,2)
Voice	122	(16,5)
Orofacial Myology	46	(6,2)
Clinical Methods	81	(10,9)
Hearing + Spoken Language, Reading and Writing	27	(3,7)
Hearing + Voice	11	(1,6)
Spoken Language, Reading and Writing + Voice	6	(0,8)
Spoken Language, Reading and Writing + Oral Myology	8	(1,1)
Hearing + Spoken Language, Reading and Writing + Voice	1	(0,1)
Hearing + Voice + Oral Myology	1	(0,1)
<b>Method</b>		
Evaluation/Diagnosis/Observation	373	(50,5)
Intervention	165	(22,3)

Literature Review	69	(9,3)
Evaluation/Diagnosis/Observation + Intervention	100	(13,5)
Evaluation/Diagnosis/Observation + Literature Review	17	(2,3)
Intervention + Literature Review	3	(0,5)
Evaluation/Diagnosis/Observation + Intervention + Literature Review	12	(1,6)

When analyzing the production made between 1978 and 2012, the data showed that in 2000 and 2001 there was a substantial number of 72 and 62 theses, respectively. The annual average of

productions in these 40 years was 24 (dp=17.7), with a mean of 23, varying between 1 and 62 productions per year. **(Graph 1)**.

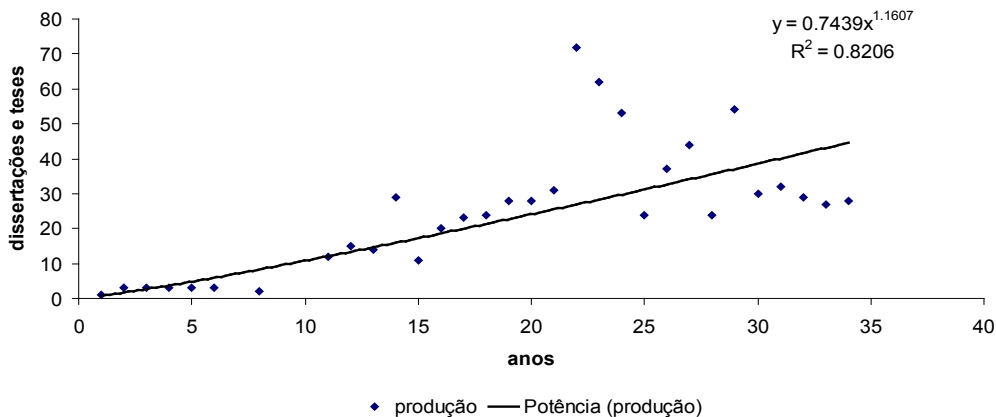


Potential and polynomial model test.

**GRAPH 1 – DISTRIBUTION OF THESES AND DISSERTATIONS ACCORDING TO YEAR**

In the general analysis of the productions, the Potential method showed the best capacity to predict the variability of the trend towards growth

in the number of theses and dissertations ( $R^2 = 0.82$ ), and this was an increasing and statistically significant trend ( $p < 0.001$ ). **(Graph 2)**.



Potential regression model test.

**GRAPH 2 – TREND ANALYSIS**

Table 2 shows the trend over the years. Note that the Orofacial Myology and Clinical Methods, according to the polynomial regression model, showed the best variability prediction (R2).

The research areas Hearing, Spoken Language and Reading/Writing showed a growth trend ( $p < 0.001$ ), whereas the Oral Myology ( $p = 0.033$ )

and Clinical Methods ( $p = 0.041$ ) showed a convex curve, with production peaks in 2001 and 2000, respectively. (Table 2).

**TABLE 2 – POTENTIAL AND POLYNOMIAL REGRESSION MODELS, ACORDING TO RESEARCH AREA AND RESEARCH METHOD FOR THE YEARS 1978 TO 2012**

Variable	n	period	equation	R2	p
General	739	1978 - 2012	$y = 0,7476x^{1,1468}$	0,82	<0,001
<b>Area</b>					
Hearing	332	1978 - 2012	$y = 0,7638x^{0,8605}$	0,61	<0,001
Spoken Language and Reading/Writing	184	1980 - 2012	$y = 1,6313x^{0,455}$	0,48	<0,001
Voice	141	1990 - 2012	$y = 1,0656x^{0,7095}$	0,65	<0,001
Oral Myology	57	1989 - 2012	$y = + 0,908 + 0,5026x - 0,0187x^2$	0,21	0,033
Clinical Methods	81	1986 - 2011	$y = + 0,1803 + 0,7342x - 0,0278x^2$	0,19	0,041
<b>Method</b>					
Evaluation/Diagnosis/ Observation	502	1980 - 2012	$y = 1,3515x^{0,8381}$	0,62	<0,001
Intervention	280	1983 - 2012	$y = 1,5973x^{0,6664}$	0,52	<0,001
Literature Review	101	1978 - 2012	$y = 0,7424x^{0,4653}$	0,28	<0,001

Polynomial and potential test. The number of theses was considered a dependent variable (y) and the year, an independent variable (x). For the statistical significance, a descriptive level of 5% was assumed.

## Discussion

The findings of this research indicate that over the last 40 years, the PEPG's scientific production has shown significant and statistically relevant growth. In total, 739 theses and dissertations have been defended, and the most researched areas were Hearing (39.8%), Spoken Language, Reading and Writing (19.2%), Voice (16.5%), Clinical Methods (10.9%), and Orofacial Myology (6.2%); regarding methods, Evaluation/Diagnosis/Observation was the most adopted (50.5%), followed by Intervention (22.3%), Evaluation/Diagnosis/Observation + Intervention (13.5%), and Literature Review (9.3%).

A study conducted on the Program's thirtieth anniversary<sup>18</sup> also pointed towards considerable growth in theses. This may be explained by the fact that students have begun to develop scientific activities at an earlier age, as most universities

give students the opportunity to do undergraduate research and final papers, encouraging them to proceed with their academic education. Other authors<sup>10</sup> claim that the increase in scientific production is due to a larger number of Speech Language Pathology and Audiology graduates; a growing demand for professors to teach in new universities; a higher investment from these institutions in the training of their faculty; stricter requirements from the CAPES; and an increase in the number of speech and language therapists enrolled in graduate programs.

This expansion corroborates the data found by Damasceno and Friedman<sup>13</sup> and Trenche, Biserra and Ferreira<sup>15</sup>. The former study<sup>13</sup>, which investigated the Brazilian research into stuttering, observed that the fact that "Clinical Practice in Speech Language Pathology and Audiology" was the most approached topic may suggest the Brazilian speech



and language therapists' involvement in studying and seeking a better understanding of the issues involving the treatment of stuttering. The findings of the present research point toward a similar trend, by suggesting that speech and language therapists have devoted a great deal of effort to understand the several areas of their field.

The objective of the second study<sup>15</sup> was to analyze part of the knowledge production regarding the interface between Speech Language Pathology and Audiology and Education, by researching articles published in periodicals specializing in Speech Language Pathology and Audiology (*Revista Distúrbios da Comunicação*, *Revista da Sociedade Brasileira de Fonoaudiologia*, *Revista Pró-fono* e *Revista Cefac*) between 1986 and 2009. The study focused on the following variables: time, topic, and research area, selected based on the title and the abstracts of the articles that addressed the topics Speech Language Pathology and Audiology, school, education, schoolchildren's health, and teachers' health. The areas approached in that research (hearing, spoken language, reading and writing, voice, clinical methods and oral myology) are similar to these investigated in the research conducted by Trenche MCB, Biserra MP and Ferreira LP (2011)<sup>15</sup>, except for clinical methods and education. The continuous growth in publications that investigate these topics is evidenced by the two studies, as is the existence of a critical period of peak growth in research.

A general analysis of the scientific productions showed a statistically significant growth trend in the number of theses and dissertations, pointing towards a continuous increase in general production in the field of Speech Language Pathology and Audiology<sup>4,10,15,19</sup>. Despite still being smaller than that of other health-related areas with a longer tradition in publications, this growth percentage evidences the strengthening and consolidation of the field<sup>4</sup>.

The data found (Graph 1) show the average production in these 40 years, which point to a marked growth in research in 2000 and 2001, with 72 and 62 theses and dissertations, respectively. In a similar study, authors<sup>14</sup> aimed at analyzing the academic education of Brazilian speech and language therapists with doctor's degrees, from the year of the first defense (1976) to the end of 2008. Overall, 504 theses and dissertations were found, and the findings showed that, as to the topics addressed in

them, the largest number corresponded to Language (34.52%) and Hearing and Balance (32.34%), and the analysis was able to predict almost 94% of the variability of growth in the number of theses and dissertations from 1976 to 2008. Thus, these authors suggested that the increase in production in the period under analysis indicated that speech and language therapists are looking for a more comprehensive scientific education, a move that may also be seen in other science fields, particularly health-related ones<sup>1,2</sup>.

With regard to the area researched, the findings evidenced a larger number of theses and dissertations associated with Hearing and Language (spoken language, reading and writing). These data corroborate the literature<sup>7</sup>, as this fact may be explained by the very history of the Speech Language Pathology and Audiology with regard to the beginning of both undergraduate and graduate programs, when the Hearing and Language subjects were given priority in the course syllabus. It is important to note that the area of Audiology has a longer research tradition, as the Master's program in Speech Language Pathology and Audiology at PUC began in 1972 as a Master's in Audiology, and only in 1984 was it incorporated into the Master's in Communication Disorders. Accordingly, most of the professors-supervisors at that early stage were audiologists<sup>7</sup>.

The area of Orofacial Myology, although it does not constitute a specific line of research, but is inserted in the Voice line, has been recording productions since a previous study<sup>18</sup>. Approximately 5.8% of the students/supervisees have, with the help of their supervisors, found a very peculiar way to reflect on the issues affecting burn victims, atypical swallowing, babies, children, and the elderly in their eating habits, and even questions about the pain which accompanies some of these conditions.

## Conclusion

The analysis of the 739 theses and dissertations during its 40 years of PUC-SP's PEPG in Speech Language Pathology and Audiology showed a growth trend across all the research methods (Evaluation/Diagnosis/Observation, Intervention,





and Literature Review), particularly in the area of Hearing, followed by Language and Voice.

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