



Undergraduate and Graduate Communication Sciences and Disorders Students' Views regarding the Pursuit of a Doctorate of Philosophy Degree

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Abstract

Purpose: There is a recognized shortage of Communication Sciences and Disorders (CSD) professionals who hold a Doctor of Philosophy (PhD) degree in the field of CSD. The purpose of this study was to explore CSD students' views towards pursuing a PhD and to investigate the relationship between CSD students' exposure to research and their views regarding the pursuit of a PhD in order to understand and generate possible solutions to the PhD shortage.

Method: The quantitative cross-sectional survey study included undergraduate ($n = 49$) and graduate ($n = 51$) CSD students from 12 Midwestern CSD institutions in the United States. The CSD PhD survey was administered via an online survey tool. Data analyses included descriptive statistics, correlational analyses, and the nonparametric Friedman's test with a series of post-hoc Wilcoxon signed-rank tests.

Results: Participants most frequently ranked research interest, desire for knowledge, and making a contribution to the discipline as the most important reasons why one would pursue a PhD. Participants most frequently ranked lack of research interest, satisfaction with current degree and position, and cost of doctoral program as the most important reasons why one would not pursue a PhD. There was a statistically significant positive relationship between CSD students' interest in research and their views about pursuing a PhD.

Discussion: The implications of this study support the need to further investigate the relationship between students' exposure and interest in research and their views about pursuing a PhD in order to optimize PhD recruitment efforts.

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1. Introduction

The disciplines of speech-language pathology and audiology fall within the field of Communication

Sciences and Disorders (CSD). Speech-language pathologists (SLPs) require a master's degree in speech-language pathology and audiologists require a clinical doctoral degree, known as a Doctor of Audiology (AuD), to earn credentials and licensure within the United States.¹ There is a critical shortage of CSD professionals who hold a Doctor of Philosophy (PhD) degree in the field of CSD.^{2–7} Evidence for the

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PhD shortage in the field of CSD has primarily originated from data, which compared the age and number of PhD students who were pursuing a doctoral degree with the age and number of PhD-level CSD faculty members who were currently employed in CSD academic programs.^{3,5,6} There is a disproportionate ratio of CSD faculty with PhDs who are nearing the age of retirement as compared to CSD professionals entering PhD programs, in that approximately a third of faculty openings in the field of CSD between 2012 and 2017 were projected to remain unfilled.⁶

Ingham et al.³ identified possible negative repercussions associated with a shortage of CSD professionals with a PhD: CSD faculty shortages, smaller CSD graduate program sizes, fewer practicing clinicians in the CSD field, and a decline in CSD research. Furthermore, the Bureau of Labor Statistics^{8,9} projected the demand for both SLPs and audiologists in the workforce is anticipated to increase at a faster than average rate by the year 2024. An additional 3,800 audiologists and 28,900 SLPs will need to enter the workforce between 2014 and 2024 to accommodate the projected increased demand in services as per the Bureau of Labor Statistics.^{8,9}

In the United States there are 78 institutions that offer a PhD in the field of CSD: audiology, speech-language pathology, or speech and hearing sciences.¹⁰ Within the 2016–2017 academic year, there were 164 first-year PhD CSD students.¹¹ When exploring first year doctoral student capacity in PhD CSD programs (first year enrollment divided by PhD CSD program capacity), first year capacity ranged from 30.6% in the 2009–2010 academic year to 61.6% in the 2014–2015 academic year. Within that nine-year span, the average first year doctoral capacity was 43.2%. With respect to the number of students who earned a PhD in CSD, between the 2008–2009 and 2016–2017 academic years, there was an average of 150 PhDs awarded annually. Moreover, there were 160 students who graduated with a PhD within the field of CSD within the 2016–2017 academic year.¹¹

Of those who graduated with a PhD within the field of CSD in the 2016–2017 academic year, 42.2% pursued a faculty or academic position as their first employment.¹¹ The second most popular career path following graduation was a postdoctoral position (21.1%). Both pursuing a clinical position in a non-academic setting (8.6%) and pursuing a research position (8.6%) were tied as the third most popular career paths following completion of a PhD. Furthermore, postponing employment (5.9%), pursuing a clinical position in an academic setting (4.6%),

employment within an administrative position (3.9%) and unknown (3.9%) were the other first employment options for PhD graduates.¹¹

Given the imminent and growing concern about the PhD shortage in the CSD field, the American Speech-Language-Hearing Association (ASHA) and the Council of Academic Programs in Communication Sciences and Disorders (CAPCSD) formed a joint ad hoc committee in 2002.³ The joint ad hoc committee probed and predicted consequences of the PhD shortage and formed initiatives to address the PhD shortage.³ The joint ad hoc committee recommended increasing the effectiveness of PhD recruitment and retention by bringing awareness of the PhD shortage and providing resources about a PhD career track in both undergraduate and graduate CSD programs.³ As per previous recommendations by the ASHA and CAPCSD joint ad hoc committees in 2002, 2008, and 2013, bringing awareness of PhD opportunities and providing research opportunities to undergraduate and graduate CSD students were important initiatives for continuing efforts to increase enrollment and interest in PhD programs.^{3,5,6}

Within the United States, the Council of Academic Accreditation in Audiology and Speech-Language Pathology (CAA) of ASHA accredits graduate speech-language pathology and audiology programs.¹² Per the CAA graduate accreditation standards that went into effect August of 2017, the CAA noted that the majority of academic content must be taught by doctoral faculty who hold appropriate terminal academic degrees of either a PhD or a doctor of education (EdD).¹² Although the CAA and ASHA acknowledges both a PhD and EdD as acceptable terminal degrees to teach within CSD programs, recruitment efforts with respect to the PhD CSD shortage have specifically focused on PhD CSD recruitment strategies.^{3,5,6}

Moreover, Ingham et al.³ offered recommendations to address the PhD shortage, which targeted undergraduate and graduate CSD students and practicing CSD professionals. The recommendations offered by the ASHA and CAPCSD joint ad hoc committee included creating a structure to continue the momentum in addressing the PhD shortage and increasing the visibility of the CSD field, research opportunities, and promote higher education as a career.³ Further data collection and analysis of the CSD PhD shortage was also recommended. In addition, enhancing the research training experience in the field of CSD and supporting a PhD leadership program were additional recommendations as delineated by the joint ad hoc committee.³

Despite ASHA and CAPCSD joint ad hoc committees repeated decade long efforts to bring awareness of the

PhD shortage, there continues to be a doctoral shortage. For example, first year enrollment in CSD PhD programs has fluctuated from year to year: In the 2010–2011 academic year there were 195 first year PhD students and in the 2016–2017 academic year there were 174 first year PhD students.¹¹ Although there is a continued PhD shortage, some gains have been made toward reducing the PhD deficit.¹¹ There has been an increase in the number of doctoral degrees within the CSD field that have been granted.¹¹ Within the 2009 and 2012 academic years, 533 CSD doctoral degrees were granted with an average of 133 doctoral degrees granted annually within that timeframe.¹¹ In contrast, within the 2013–2016 academic years, 693 CSD doctoral degrees were granted with an average of 173 doctoral degrees granted annually within that timeframe.¹¹ CSD programs have the closest contact with CSD students and CSD programs should focus their efforts on increasing students' interest in pursuing a PhD in the CSD field.^{3,5,6} The current research provides valuable information to CSD university institutions on formulating strategies to promote and educate students about PhD opportunities in the CSD field.

Limited research has explored SLPs' views regarding PhD pursuits in the field of CSD.⁴ Madison et al. surveyed 305 master's level SLPs and 86 doctoral faculty members in the field of CSD to explore the reasons why SLPs who earn a master's degree might choose or not choose to pursue a PhD in the field of CSD. Two surveys were utilized to obtain both SLPs and faculty members' views regarding doctoral pursuits. The master's level SLP survey contained 15 items and the faculty survey included six items. Both surveys included a multiple-choice format and two survey items required both SLPs and doctoral faculty members to rank designated statements as to why SLPs do and do not consider pursuing a doctoral degree in order of importance. Results of the surveys revealed that of the 305 master's level SLPs, 177 (58%) of the SLPs were not seriously considering pursuit of a PhD. In addition, 128 of the 305 (42%) master's level SLPs reported that they were seriously considering obtaining a PhD; however, merely 42 of the 128 (33%) SLPs had ever applied to a PhD program. Results indicated that the SLPs who were most likely to consider pursuing a PhD had strong research interests, and currently worked in higher education.⁴ SLPs who were least likely to consider pursuing a PhD primarily worked in the public school setting and noted that family obligations as a reason for not pursuing a doctoral degree. Survey results also revealed that doctoral faculty members ranked failure to complete a dissertation, program difficulty,

and family considerations as the most common reasons for failure to complete a PhD.⁴

No study has collectively explored both undergraduate and graduate SLP and AuD students' views regarding pursuing a PhD in the field of CSD. Two preliminary studies have investigated CSD students' views regarding the pursuit of a PhD in CSD.^{2,13} Davidson et al.² surveyed 10 AuD students and 45 master's in speech-language pathology students from three universities on their views regarding the pursuit of a PhD. Results of the surveys revealed that 22 of the 55 (40%) students noted that they were not considering a PhD, 21 of the 55 (38.18%) students reported that they were considering a PhD, and 12 of the 55 (21.81%) students were undecided about the prospects of pursuing a PhD.² Witter and Brackenbury¹³ surveyed undergraduate CSD students' knowledge and interest of a PhD in CSD. Witter and Brackenbury¹³ noted that undergraduate students have limited interest and knowledge in pursuing a PhD.

The purpose of the current study was to explore both undergraduate and graduate CSD students' views in regards to pursuing a PhD in CSD in order to increase understanding and create solutions to the PhD shortage. Given ASHA's efforts toward PhD CSD recruitment and their initiatives toward creating a direct pipeline from undergraduate and graduate CSD programs to PhD CSD programs,^{3,5,6} the current study expanded on previous PhD CSD research and specifically explored PhD efforts versus other terminal doctoral degrees, such as an EdD. Participants included undergraduate and graduate SLP and AuD students from institutions that both offered and did not offer a PhD in CSD to gain a better representation of the CSD student population. In addition, this study explored the relationship between undergraduate and graduate CSD students' exposure to research and their views regarding the pursuit of a PhD in CSD. By exploring both undergraduate and graduate students' reasons why one would choose to pursue or not to pursue a PhD and examining the relationship between undergraduate and graduate CSD students' exposure to research, valuable information will be obtained for CSD university institutions on formulating strategies on promoting and educating students about PhD opportunities in the CSD field.

2. Methods

2.1. Study design

The methodology utilized for this study was based on a quantitative cross-sectional survey design with both descriptive and correlational components. A questionnaire

was administered online between June 2016 and September 2016 to a convenience sample of CSD students. Participation was voluntary and confidential in that no identifying information was recorded in the survey responses.

The researcher created the CSD PhD Survey using two survey items from the Madison et al.⁴ survey tool, which included a set of eight reasons why one would pursue a PhD in CSD and an additional set of eight reasons why one would not consider pursuing a PhD in CSD. The eight reasons why one would pursue a PhD in CSD included: research interest, future salary possibilities, prestige and title, interest in higher education, desire to teach in university setting, desire for knowledge, interest in working with particular scholar, and making a contribution to the discipline. Moreover, the eight reasons why one would not pursue a PhD in CSD included: lack of research interest, distance and location of PhD program, criteria for getting accepted, satisfaction with current degree and position, lack of interest in teaching, cost of doctoral program, length of doctoral program, and lack of interest in working in higher education.

Furthermore, the CSD PhD Survey included portions of the Witter and Brackenbury¹⁰ survey tool to assess participants' interest, exposure, and experiences with research. Specifically, eight questions were included to obtain participants' exposure to research, three questions were included to obtain participants' interest in research, and four questions were also included to obtain participants' views regarding pursuing a PhD. Lastly, the CSD PhD Survey included 10 demographic questions which provided pertinent information regarding age, gender, year in school, and type of CSD program pursued. Content validity was established by having a group of SLPs who work in higher education review the CSD PhD Survey.

2.2. Participants

The participants for this study included 100 undergraduate and graduate CSD students from 12 accredited CSD Midwestern institutions within the United States (2 men, 98 women; 49 undergraduates with 2 men and 47 women, 51 graduates with 0 men and 51 women; mean age = 22, age range = 19–33, $SD = 2.88$). The 12 CSD accredited Midwestern institutions were comprised of the following: one of the institutions offered undergraduate degrees in CSD, nine of the institutions offered both undergraduate and graduate degrees in CSD, and two of the institutions only offered graduate degrees in CSD. Furthermore, two of the 11 institutions that offered graduate degrees within the CSD field, also offered a PhD in CSD.

In addition, of the 100 undergraduate and graduate CSD students, 0 (0%) were freshmen, 10 (10%) were sophomores, 21 (21%) were juniors, 18 (18%) were seniors, 1 (1%) was a post-baccalaureate, 37 (37%) were first year graduate students, 9 (9%) were second year graduate students, and 4 (4%) were third year graduate students. Moreover, of the 100 undergraduate and graduate CSD students, 41 (41%) reported the CSD program they attended was clinically based, 2 (2%) reported the CSD program they attended was research based, 47 (47%) reported the CSD program they attended was both clinically and research based, and 10 (10%) reported an unknown status of CSD program they attended. Of the 51 graduate CSD graduate students who responded, 46 (90%) were enrolled in a Speech-Language Pathology program and 5 (10%) were enrolled in an Audiology program. Of the 100 total undergraduate and graduate CSD students, 12 (12%) noted they were interested in becoming an Audiologist, 89 (89%) were interested in becoming a Speech-Language Pathologist (SLP), 7 (7%) reported they were interested in becoming a speech, language and hearing scientist, and 5 (5%) noted they were unsure of future career prospects in the field of CSD. Please note, participants were able to select more than one occupational interest, hence, the sum of responses was greater than 100 percent.

2.3. Analytical methods

The Statistical Package for the Social Sciences (SPSS), version 24, was used by the researcher to organize and analyze the data collected during this study. Data were initially analyzed descriptively by calculating both the mode and median for each of the eight ranked reasons why participants would or would not pursue a PhD in CSD. The participants' most important reason why one would or would not pursue a PhD was provided a rank value of one and the least important reason why one would or would not pursue a PhD was provided a rank value of eight. Additionally, a Friedman's test was used to explore if any of the eight reasons why one would or would not pursue a PhD was preferred more or less as compared to the other designated reasons. The level of significance was set at $p < 0.01$. Furthermore, a series of post-hoc Wilcoxon signed-rank tests were run to explore specifically which of the eight reasons why one would or would not pursue a PhD was significantly more or less preferred as compared to the other designated reasons. Given the number of pairwise tests, the researcher adjusted the alpha level using a Bonferroni correction.

Composite scores for the predictor variables and outcome variable were calculated as follows. The first predictor, CSD students' exposure to research, was measured with eight questions that participants responded to via a yes or no response. A numeric value of one was designated for "yes" responses and a numeric value of two was designated for "no" responses. The sum of each participant's eight responses served as CSD students' exposure to research composite score. The second predictor, CSD students' interest in research, was measured with three questions that required participants to respond via five-point Likert scales from one "strongly disagree" to five "strongly agree". The numeric values associated with the five-point Likert scales for each of the three questions were summed to become the CSD students' interest in research composite score. Furthermore, a composite score for the outcome variable, CSD students' views in regard to the pursuit of a PhD, was obtained. CSD students' views in regards to the pursuit of a PhD were measured with two questions that required participants to respond via five-point Likert scales from one "strongly disagree" to five "strongly agree", one question that required participants to respond via a five-point Likert scale from one "never" to five "a great deal," and one question that required participants to respond via a five-point Likert scale from one "exceptionally unfavorable" to five "exceptionally favorable." The numeric values associated with the five-point Likert scales for each of the four questions were summed to become the outcome composite score. Cronbach's alpha was calculated to assess the reliability of the predictors and outcome scales prior to creating each composite.

A multiple regression was then run to explore the relationship between two primary predictors (CSD students' exposure to research and interest in research), two covariate predictors (age and CSD students' views regarding research) and one outcome (CSD students' views in regards to pursuing a PhD). Participants' ages were obtained via a single response item. In short, a multiple regression provided insight into whether students' exposure to and interest in research would predict their views regarding the pursuit of a PhD in CSD when controlling for age and views regarding research.

3. Results

3.1. Reasons that undergraduate and graduate CSD students choose to pursue a PhD in CSD

Participants most frequently ranked research interest, desire for knowledge, and making a contribution to the

discipline, as the most important reasons why one would pursue a PhD in CSD as indicated by a score of 1. Also, with respect to mode, future salary possibilities (2) was the second most important reason why one would pursue a PhD in CSD, followed by interest in higher education (4), desire to teach in a university setting (6), prestige and title (7), and lastly interest in working with a particular scholar (8) (Table 1).

Similarly, calculated median scores revealed that research interest and desire for knowledge had the lowest median, 3, indicating the highest rank in regards to why one would pursue a PhD in CSD. Interest in higher education, desire to teach in a university setting, and making a contribution to the discipline had a median score of 4, followed by future salary possibilities with a median score of 5. Prestige and title revealed a median score of 6 and lastly, interest in working with a particular scholar received a score of 7, which noted the least important reason why one would pursue a PhD in CSD (Table 1).

Overall, the Friedman's test was significant $\chi^2(7) = 114.77, p < 0.01$. Since the Friedman's test revealed statistically significant findings, a series of post-hoc Wilcoxon signed-rank tests were run to explore specifically which of the eight reasons why one would pursue a PhD was significantly more or less preferred as compared to the other designated reasons. A Wilcoxon signed-rank test indicated that prestige and title was statistically significantly lower than research interest $z = -4.419, p < 0.01$, interest in higher education $z = -3.514, p < 0.01$, and desire for knowledge $z = -4.700, p < 0.01$. Similarly, a Wilcoxon signed-rank test revealed that interest in working with a particular scholar was statistically significantly lower than research interest $z = -7.092, p < 0.01$, future salary prospects $z = -4.941, p < 0.01$, prestige and title $z = -3.545,$

Table 1
Median and Mode for the Eight Ranked Reasons Why One Would Pursue a PhD in CSD.

Reason ^a	Median	Mode	n
Research interest	3	1	100
Future salary possibilities	5	2	100
Prestige and title	6	7	100
Interest in higher education	4	4	100
Desire to teach in university setting	4	6	100
Desire for knowledge	3	1	100
Interest in working with particular scholar	7	8	100
Make contribution to the discipline	4	1	100

^aIndividual items rated on a 1 (most important reason) to an 8 (least important reason) scale.

$p < 0.01$, interest in higher education $z = -6.540$, $p < 0.01$, desire to teach in a university setting $z = -5.852$, $p < 0.01$, desire for knowledge $z = -7.141$, $p < 0.01$, and making a contribution to the discipline $z = -6.695$, $p < 0.01$.

3.2. Reasons that undergraduate and graduate CSD students choose not to pursue a PhD in CSD

Participants most frequently ranked lack of research interest, satisfaction with current degree and position, and cost of a doctoral program as the most important reasons why one would not pursue a PhD in CSD as indicated by a score of 1. In addition, with respect to mode, length of a doctoral program (2) was the second most important reason why one would not pursue a PhD in CSD, followed by criteria for getting accepted (3), lack of interest in teaching (6), lack of interest in working in higher education (7), and lastly distance and location of PhD programs (8) (Table 2).

Moreover, calculated median scores revealed that cost of a doctoral program had the lowest median, 2.5, indicating the highest rank in regards to why one would not pursue a PhD in CSD. Length of a doctoral program had a median score of 3, followed by satisfaction with current degree and position with a median score of 4. Lack of research interest and criteria for getting accepted revealed a median score of 5. Lastly, distance and location of PhD programs, lack of interest in teaching, and lack of interest in working in higher education all received scores of 7, which noted the least important reasons why one would not receive a PhD in CSD (Table 2).

Overall, the Friedman's test was statistically significant $\chi^2(7) = 93.423$, $p < 0.01$. Since the Friedman's test revealed statistically significant findings, a series of post-hoc Wilcoxon signed-rank tests were run to explore

specifically which of the eight reasons why one would not pursue a PhD was significantly more or less preferred as compared to the other designated reasons. A Wilcoxon signed-rank tests indicated that lack of interest in working in higher education was statistically significantly lower than lack of research interest -3.833 $z = -$, $p < 0.01$, satisfaction with current degree and position $z = -4.04$, $p < 0.01$, cost of doctoral program $z = -6.201$, $p < 0.01$, and length of doctoral program $z = -4.646$, $p < 0.01$. Similarly, a Wilcoxon signed-rank tests revealed that distance and location of PhD programs was statistically significantly lower than satisfaction with current degree and position $z = -3.998$, $p < 0.01$, cost of doctoral program $z = -6.175$, $p < 0.01$, and length of doctoral program $z = -4.722$, $p < 0.01$. Furthermore, lack of interest in teaching was statistically significantly lower than satisfaction with current degree and position $z = -3.858$, $p < 0.01$, cost of doctoral program $z = -5.913$, $p < 0.01$, and length of doctoral program $z = -4.062$, $p < 0.01$. Lastly, criteria for getting accepted was statistically significantly lower than cost of doctoral program $z = -5.421$, $p < 0.01$.

3.3. Relationship between undergraduate and graduate CSD students' collective exposure to research and their views regarding the pursuit of a PhD in CSD

A multiple regression was conducted to explore the relationship between multiple predictors (CSD students' exposure to research) and two covariate predictors (age and CSD students' views regarding research) and one outcome (CSD students' views in regards to pursuing a PhD). A composite score for the predictor variables, CSD students' exposure to research ($M = 1.56$, $SD = 0.29$), and CSD students' interest in research ($M = 3.26$, $SD = 1.00$), were calculated. Furthermore, a composite score for the outcome variable, CSD students' views in regards to the pursuit of a PhD ($M = 3.12$, $SD = 0.83$), was obtained. Cronbach's alpha was calculated to assess the reliability of the predictors and outcome scales prior to creating each composite. Cronbach's alpha for the composite of CSD students' exposure to research was 0.76, indicating a fair degree of internal consistency across the survey items. Additionally, Cronbach's alpha for the composite of CSD students' interest in research was 0.88, indicating a good degree of internal consistency among the survey items. Similarly, Cronbach's alpha for the composite of CSD students' views in regards to the pursuit of a PhD was 0.92, indicating an excellent degree of internal consistency among the survey items.

Table 2

Median and Mode for the Eight Ranked Reasons Why One Would Not Pursue a PhD in CSD.

Reason ^a	Median	Mode	n
Lack of research interest	5	1	100
Distance and location of PhD programs	6	8	100
Criteria for getting accepted	5	3	100
Satisfaction with current degree and position	4	1	100
Lack of interest in teaching	6	6	100
Cost of doctoral program	2.5	1	100
Length of doctoral program	3	2	100
Lack of interest in working in higher education	6	7	100

^aIndividual items rated on a 1 (most important reason) to an 8 (least important reason) scale.

In short, a multiple regression provided insight into whether students' exposure to research would predict their views regarding the pursuit of a PhD in CSD. Overall, the regression was statistically significant $F(3, 91) = 21.14, p < .01, R^2 = 0.41$. A large effect size was noted ($f^2 = 0.69$). Of the predictors investigated, only CSD students' interest in research was statistically significant, $\beta = 0.63, t(91) = 7.81, p < 0.01$. Fig. 1 depicts a scatterplot that summarizes the positive relationship between CSD students' interest in research and their views regarding the pursuit of a PhD. CSD students' exposure to research was not statistically significant as a predictor. Similarly, CSD students' age was not statistically significant as a predictor.

4. Discussion

The findings from the current study add to the limited body of knowledge about the CSD PhD shortage in that this study provides insights into the perceived reasons why CSD students do and do not choose to pursue a PhD in CSD. Given the PhD shortage, understanding the reasons why CSD students pursue and not pursue a PhD provides greater understanding on how to recruit new PhD students. The current study provides additional information about which factors are more and less important in regards to why CSD students pursue a PhD. Results of the current study revealed that research interest, desire for knowledge, and making a contribution to the discipline appear to be more important reasons why CSD students would pursue a PhD as compared to prestige and title and interest in working with a particular scholar. The current study and the Davidson et al.² study both noted that prestige and title

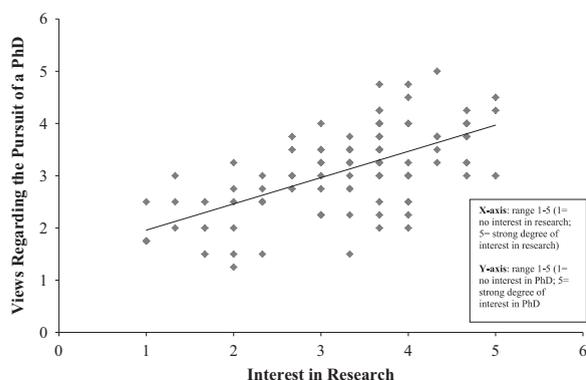


Fig. 1. Relationship between CSD students' exposure to research composite scores and CSD students' views regarding the pursuit of a PhD composite scores.

and interest in working with a particular scholar were significantly less important reasons why one would pursue a PhD in CSD. Moreover, findings noted that lack of research interest and length of a doctoral program appear to be more important reasons why CSD students would not pursue a PhD. In addition, there was no consensus about the least important reasons why CSD students do not pursue a PhD in CSD.

An additional purpose of this study was to explore if there was a relationship between undergraduate and graduate CSD students' collective exposure to research and their views regarding the pursuit of a PhD in CSD. Given the PhD shortage within the field of CSD, one possible solution to the CSD doctoral shortage may be undergraduate exposure and involvement in research.³ The results of the current study appear to support the notion that students interested in research are more likely to want to pursue a PhD,³ as there was a positive and significant relationship between interest in research and their views regarding the pursuit of a PhD. The results of the current study support the need for future investigation into the relationship between students' exposure and interest in research and their views regarding the pursuit of a PhD, especially since ASHA is targeting PhD recruitment through undergraduate and graduate CSD research initiatives. Based on the findings, understanding CSD students' perceptions about what a PhD entails and career outcomes following a PhD would be beneficial and assist in strategic marketing efforts.

The findings and implications of the current study should be interpreted conservatively in that there are study limitations. The first limitation was the sample size of the participants. While there were 100 total participants, the subgroups were disproportionate and small in number. Of the 51 CSD graduate students who responded, 46 (91%) were enrolled in a Speech-Language Pathology program and five (9%) were enrolled in an AuD program. The disproportionate sample size of graduate students may more so reflect the views of Speech-Language Pathology students' regarding the pursuit of a PhD and underrepresented the AuD students' views regarding the pursuit of a PhD.

A recommendation for a future study would be to increase the size of the sample in order to provide a better representation of the designated population. Also, including a greater proportion of AuD students would provide a more accurate view of CSD students' views regarding the pursuit of a PhD. An additional limitation of the study was the relatively limited geographic region in which participants were recruited. Only 12 Midwestern institutions within the United States were

selected to obtain participants. Furthermore, within the states of the 12 Midwestern Institutions where participants were selected, there were in total two institutions that offer a PhD in the field of CSD. Accessibility to PhD programs, more specifically distance and location of PhD programs, was one of the eight reasons participants had to rank as to why they would not pursue a PhD. Geographic distribution of CSD PhD programs varies considerably across the country. For example, Ohio has six PhD programs and there are 13 states that do not offer PhDs in the field of CSD.¹⁴ Reasons why participants choose to pursue and not pursue a PhD may be influenced by geographically specific reasons and may not represent why CSD students in other regions of the country choose to pursue a PhD. Expanding a future study to include more CSD institutions from across the country may increase the number of participants and provide a better representation of the CSD student population.

An additional limitation of the study was the design of the survey tool to probe the reasons why undergraduate and graduate CSD students both choose and do not choose to pursue a PhD in CSD. Specifically, the two survey items in which participants were asked to rank eight designated statements as to why CSD professionals do and do not consider pursuing a PhD in order of importance were utilized in the current study may not represent all of the reasons why CSD student both choose and do not choose to pursue a PhD in CSD. The closed-ended question design limited the participants' responses and may not represent all of the factors that a CSD student may consider when deciding to either choose or not choose to pursue a PhD. There were no open-ended questions that allowed participants to provide any additional reasons why they would or would not choose to pursue a PhD.

A recommendation for a future study that would query CSD students' views regarding the pursuit of a PhD would be to include both close-ended and open-ended questions to better understand the reasons why CSD students choose to pursue and not pursue a PhD in CSD. An additional recommendation for a future study would be to include a qualitative component in which CSD students would be interviewed regarding their views and perceptions about pursuing a PhD in CSD.

In the current study, a limitation in regards to investigating the relationship between CSD students' exposure to research and students' views regarding the pursuit of a PhD was the sensitivity of the survey tool to both probe and quantify CSD students' collective exposure to research. The CSD PhD Survey did not specifically probe the specific amount and degree of

research exposure of the participants. Additionally, the closed-ended questions within the survey tool may have limited and not fully encompassed all research experiences of CSD students. A recommendation for a future study would be to have a more comprehensive survey tool that included both closed-ended and open-ended question that allowed students to quantify the type and extent of research experiences that they have been exposed to within their CSD programs.

An additional recommendation for a future study would be to explore solutions for increasing students' interest in research. Surveying CSD programs from around the country to better understand how various CSD programs, both with and without PhD programs, infuse and promote research within their CSD programs would be advantageous. Looking comprehensively at CSD programs from across the United States may highlight untapped opportunities and approaches in promoting CSD research with students and allow for other programs to try varying new approaches to promote research. Also, probing current CSD PhD students' perspectives on how they were introduced to research may be beneficial in fostering effective approaches in exposing future CSD students to research.

With the recognized shortage of PhD candidates in the field of CSD, the current study's examination into undergraduate and graduate CSD students' perceived views in regards to pursuing a PhD provided valuable insight to better understand and generate solutions to the PhD shortage. Additionally, understanding CSD students' perceived views regarding the pursuit of a PhD may assist CSD programs in recruiting future CSD PhD candidates. The purpose of this study was to explore both undergraduate and graduate CSD students' perceived views in regards to pursuing a PhD in CSD and examine the relationship between undergraduate and graduate CSD students' exposure to research and their views regarding the pursuit of a PhD in CSD. The findings of the current study indicated that there are varied and yet similar themes in regards to reasons why CSD student choose to pursue or not pursue a PhD in CSD. Furthermore, the current study provided preliminary evidence that there is a positive relationship between undergraduate and graduates' interest in research and their views about pursuing a PhD. The goal of understanding students' perceived views regarding the pursuit of a PhD and their exposure to research is to ultimately increase the number of CSD students who will pursue a PhD to alleviate the current PhD shortage in the field of CSD.

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Declarations of interest

None.

Ethical approval

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