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PhD Programs in Communication Sciences and Disorders: Innovative Models and Practices

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PhD Programs in Communication Sciences and Disorders: Innovative Models and Practices

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Executive Summary

To investigate innovative educational models and practices used by communication sciences and disorders (CSD) PhD programs, ASHA's Academic Affairs Board (AAB) members interviewed 73 of the 76 PhD coordinators from existing research-doctoral programs in the discipline. The interviews were conducted from February 2016 to April 2016 and covered content related to (a) important factors in recruitment, admission, and retention; (b) coursework, teaching, and research activities; (c) unique program features; and (d) strategies encouraging students to take postdoctoral and faculty positions. This report presents the interview results along with a brief discussion of the findings, and it provides a list of recommendations made by the AAB. The goal of the project is to help guide current and future research-doctoral programs in providing exemplary preparation for their students, with a particular focus on helping decrease the shortage of PhD-level faculty who assume research and teaching positions in CSD programs.

In regards to **recruitment and admission** of PhD students, two of the largest challenges to CSD PhD programs are securing funding for students and the availability of a qualified applicant pool. To address these challenges, a range of strategies were reported. Many programs stressed the importance of consistently making personal contacts with applicants throughout the process as well as making concerted efforts to get applicants to know more about their program and what is expected at the research-doctoral level. Program coordinators highlighted efforts to (a) recruit from "within," (b) mentor undergraduate and graduate students in research, and (c) develop creative, streamlined, and integrated programs such as BA/PhD, MS/PhD, or AuD/PhD tracks. In terms of **retention,** 65 of 73 programs reported that they have had students leave before completion, however we did not specify a time frame for this attrition, and results should be considered in this context. The two most common reasons for noncompletion were personal issues or a student's "fit" with the program and/or mentor. Helpful strategies to reduce attrition included providing more support (e.g., peer, mentor, university-based); clearly communicating—at admissions and throughout the program—the program's expectations and what being an academic researcher entails; developing enhanced admission processes and dedicating more attention to the student/mentor match; making increased use of guidelines/annual reviews to ensure that students are on track and receive regular feedback; ensuring program flexibility; and establishing increased funding opportunities.

In terms of **required coursework** (beyond research design and statistics), the median number of courses was 3, whereas the range was 0–16. Although all programs required research design and statistics courses, only half required coursework in grant writing or teaching. In addition, training students for academic life through coursework was mentioned by only 15 programs. Regarding teaching experiences, although most programs provide students with opportunities to serve as teaching assistants, less than one half *require* this experience. In addition, whereas more than one half of the programs provide students with the opportunity to co-teach or teach independently, less than one third *require* either of these experiences. To enhance students' preparation for

taking academic positions, programs are encouraged to analyze the amount and types of teaching preparation that are provided. Further, with expectations for grant productivity continuing to increase on many campuses, additional attention to preparing students in grant writing may be needed.

When programs were asked to describe their **unique features,** most programs noted several. One apparent theme across programs was the emphasis on interdisciplinary experiences offered to PhD students. Whereas all programs indicated that their students take interdisciplinary courses, a majority noted that their students work on research projects with students/faculty from other disciplines and that most include interdisciplinary colloquia/seminar series. Further, the intensity of interdisciplinary experiences ranged from some programs that offer a few interdisciplinary courses to those that have merged their programs with other disciplines. Further, a few additional programs reported that due to their current low number of graduates, they are considering joining with another PhD program on campus. Another strategy used by several programs to enhance interdisciplinary experiences among students and faculty is the development of cross-disciplinary training grants that can also increase recruitment and retention.

Other unique program features included specialized research experiences for students, such as having multiple lab rotations and/or working with multiple mentors. Programs also commented on the positive value of the availability of clinical populations, access to medical facilities, or their emphasis on clinical research. Interviewees also discussed innovative curricular approaches such as specialized training in grant writing; professional seminars and professional development courses designed to prepare students for scholarly careers in general, or teaching in particular; and specialty tracks within programs.

When asked about **strategies to encourage graduates to seek academic or postdoctoral positions**, programs reported collaborating with students, advising and informing students of academic positions, making use of faculty mentoring and modeling, involving students in teaching, and providing networking opportunities. Also, several programs stated that they had built a culture or expectation that students would pursue a postdoctoral and/or academic position. Other innovative approaches included faculty doing all or some of the following activities: modeling a positive work/life balance; collaborating with other universities (e.g., participating in joint distance forums, connecting students at conferences); interacting with PhD alumni who return (or Skype) to campus to talk to current students about their academic/research/postdoctoral positions; offering a "Life in the Academy" course or a certificate program in "Preparing Future Faculty"; and encouraging involvement in career development programs, such as ASHA's Lessons for Success. Specific to postdoctoral positions, strategies involved faculty encouraging students to apply for postdoctoral grants or to submit Predoctoral F31 grant applications; offering local postdoctoral positions through training grants; and making personal connections with colleagues at institutions offering postdoctoral experiences.

In summary, after compiling the data represented in this report, the AAB developed a list of recommendations for consideration by PhD programs that highlights the many strengths and unique strategies used by CSD PhD programs to recruit, admit, retain, and graduate PhD students and to encourage them to seek academic and postdoctoral positions after graduation. Please see the full report that follows and the full list of recommendations in the Summary and Recommendations section of the report.

Introduction

This report stems from the work of the American Speech-Language-Hearing Association (ASHA) Academic Affairs Board (AAB) to "identify and showcase (and disseminate in 2016–2017) an array of PhD educational models that prepare future scientists in CSD." This initiative is one of several being implemented by ASHA and the Council of Academic Programs in Communication Sciences and Disorders (CAPCSD) to address the shortage of PhD-level faculty to fill academic positions in communication sciences and disorders (CSD) programs. The initiative is part of an overarching plan, _Strategic Plan to Increase the Student Pipeline and Workforce for PhD Researchers and Faculty Researchers_ [PDF], established in 2013 for implementation in 2015–2018.

With the increased interest in research-doctoral programs and the large investment in research-doctoral education by individuals and institutions comes the need for accountability—because the future of the discipline relies heavily on the quality of knowledge and skills achieved by the nation's PhD recipients and the translation of that knowledge and skills to address critical issues in the discipline. Therefore, data regarding the makeup of and models used by CSD PhD programs are needed to support such programs' existence, to communicate to others the high quality of education provided by these programs, and to advocate for recommended practices in future PhD preparation.

Methodology

To investigate innovative PhD educational models, the AAB members proposed to interview all PhD coordinators of the 76 existing CSD PhD Programs. The AAB members developed a question set; used an iterative review-and-refine process; and then gained input from survey experts, the ASHA Science Advisory Board, and CAPCSD. The AAB members used two guiding principles: First, avoid duplicating ASHA's annual _CSD Education Survey,_ and second, gather qualitative information on each PhD program. The interview questions covered content related to (a) important factors in recruitment, admission, and retention; (b) coursework, teaching, and research activities; (c) unique program features; and (d) strategies encouraging students to take postdoctoral and faculty positions.

The interview questions were entered into Survey Monkey by ASHA staff, and a template of the questions was available so that AAB members could enter the data during each interview. AAB members divided up the 76 CSD PhD programs, and each member contacted seven to eight PhD program coordinators (or program directors, as appropriate) to set up telephone or Skype interviews. Of the 76 potential programs, three were not included in this report: one currently has a moratorium on admissions, one is a new program without any graduates, and one did not respond to repeated requests to be interviewed. Thus, 73 PhD coordinators or program directors were interviewed. The interviews took place from February 2016 to April 2016. The data were compiled and summarized, and the initial report was drafted at the AAB meeting in April 2016, with edits made through Fall 2016.

Report of the Interview Data

This report first reviews the collective results across the key areas of the interview, and then it draws conclusions and provides recommendations to CSD PhD programs. The report also links the data to the broader literature related to identifying strategies for successful doctoral recruitment, retention, and program completion.

Recruitment and Admission

In any PhD program, the issues of recruitment and admission are major components contributing to the ultimate success of the program. Seven questions were used to probe the critical issues facing programs regarding recruitment and admission. Figure 1 illustrates the 73 programs' ratings of 16 factors relative to their importance in admitting students to their PhD program.

Figure 1. Importance of 16 factors in the admission process.
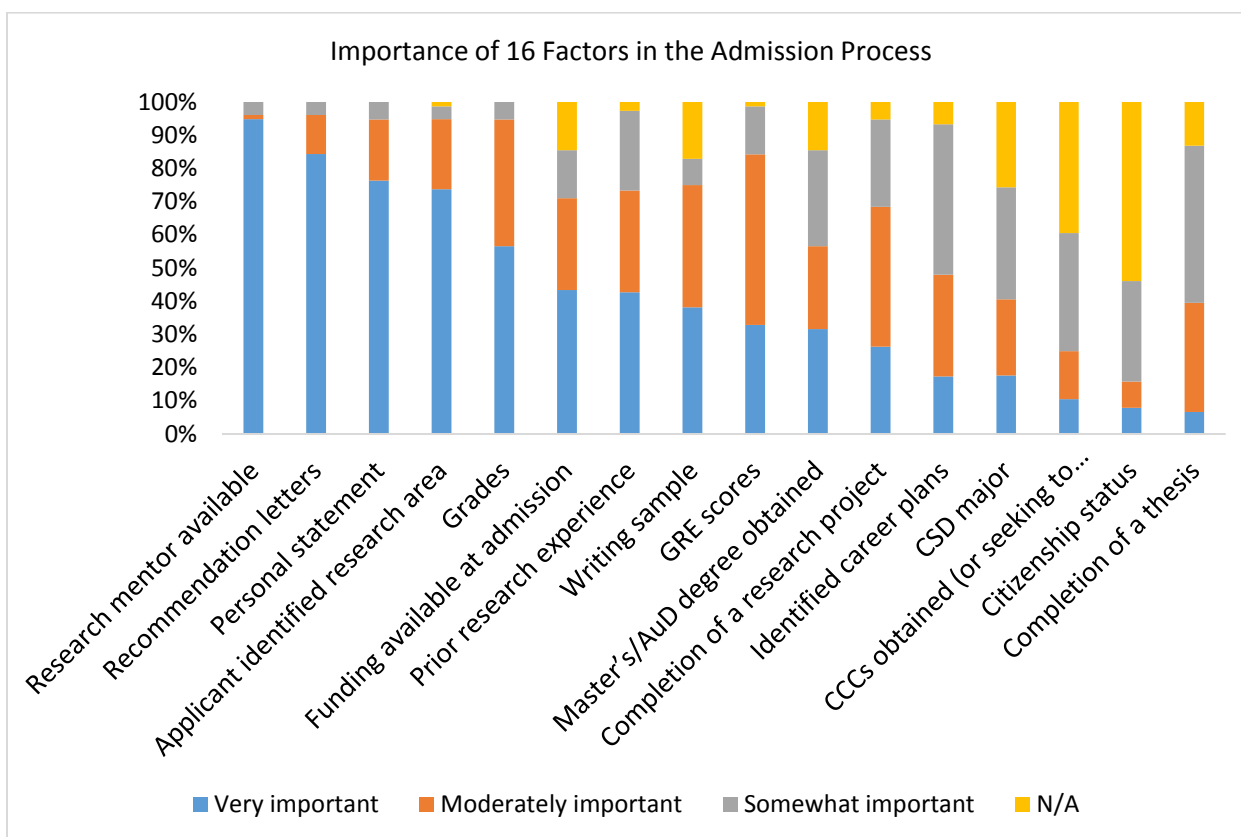
GRE = Graduate Record Examination; AuD = doctor of audiology; CSD = communication sciences and disorders; CCC = Certificate of Clinical Competence; N/A = not applicable.

The most important factor of the 16 shown above was the availability of a research mentor at admission. Accordingly, in a related question, 88% of programs reported that they typically assign mentors before admission to the program. The other top five factors in the recruitment and admission process (aggregating *very important* and *moderately important*) were recommendation letters, personal statement/writing sample, identification of research area at admission, grade point average (GPA), and Graduate Record Examination (GRE) scores. Factors considered *somewhat important* or *not important* in the admission process included identified career plans at admission, CSD major, Certificates of Clinical Competence (CCCs) obtained, and citizenship status. Completion of a research project or thesis, prior completion of a master's/AuD degree, availability of funding at admission, and prior research experience received mixed ratings.

Successful recruitment and admission strategies. When asked about strategies that have been implemented successfully in the recruitment and admission process, the 73 programs provided 98 unique comments. Those comments fell into six categories: *personal contact; recruiting from within; streamlined, integrated, and creative programs; networking and visibility; funding;* and *specialized research activities.* Making personal

contact was a strategy noted in 39% of the comments for this section. Successful contact strategies included responding quickly to e-mails, maintaining effective communication throughout the admission process, holding an open house or recruitment fair, having booths/tables at conferences, encouraging visits and interviews, having students visit classes, and having faculty members demonstrate positive, encouraging attitudes about PhD education.

Two additional strategies for successful recruitment that received frequent mention (18%–19% each) were *recruiting from within* and *streamlined, integrated, and/or creative programs.* Respondents suggested that faculty should encourage undergraduate and graduate students (MS and AuD) to participate in research early on (e.g., completing an honors thesis/master's thesis/research project, conducting research seminars, engaging in independent studies, holding a "university research day"), thereby creating interest in research and providing a potential pipeline to the PhD program. One program reported requiring all MS students to complete 50 hours of research activities during their -year program. In this way, MS students learn more about research in a "hands-on" manner and gain one course credit, and some MS students become motivated to pursue a PhD. In addition, faculty gain additional help in their research projects. Success in some programs has been gained by establishing streamlined, integrated, and/or creative programs such as BA/PhD tracks, combined MS/PhD and AuD/PhD programs, part-time study, more flexibility, and interdisciplinary programs. Other successful strategies include networking and highlighting the visibility of faculty in national and international venues, pursuing funding sources for students (e.g., research or training grant funding), and implementing special activities targeting specific groups (e.g., T35 summer research programs).

Challenges to recruitment and admission. When asked about challenges that programs face in recruiting or admitting students, interviewees from the 73 programs provided 110 comments. The majority of comments fell into two broad categories— funding and the availability of a qualified applicant pool. In terms of funding (35% of identified challenges), respondents cited difficulties in both the availability and sustainability of funding streams. The adequacy of applicant pools (31% of comments) was reportedly poor, indicating a low number of quality applicants and few applicants from underrepresented or linguistically diverse groups. Concern was also expressed regarding the readiness of some applicants to meet the demands and rigor of a PhD program.

The next largest category of challenges was faculty/mentor availability (17% of comments). It was noted that some programs have a low number of faculty in specific areas and, therefore, cannot admit large numbers of PhD students. This limitation also results in difficulty finding faculty to serve as mentors and to serve on committees and restricts the available areas of expertise.

Other challenges included geography and life circumstances of students. Some students are unable to relocate or are unwilling to relocate to an "undesirable" geographic area to pursue a PhD. Other students find it difficult to leave an existing

position and otherwise balance family, marriage/relationships, spousal careers, and part-time jobs.

As requested by ASHA and CAPCSD, interviewers also asked a question about the potential interest of PhD programs in using the CSD Central Application System (CSDCAS). The responses were split across the three response choices, with 37% of programs indicating "Yes," 40% indicating "No," and 24% indicating "Unsure." When asked about the opportunity for students to gain ASHA certification during the PhD program, 39 programs (54%) reported that they offer this opportunity. However, half of these programs strongly encourage applicants to gain certification prior to starting the PhD program. Three programs noted that obtaining ASHA certification may help students be more qualified and/or immediately employable during the program or upon graduation.

Program Completion and Attrition

To understand attrition in PhD programs, interviewers asked how many programs had experienced attrition; interviewers also asked about the reasons for—and strategies to address—attrition. However, we did not specify a time frame for this attrition, and results should be considered in this context. Eighty-nine percent of programs (65 of 73) noted they had had students leave the program before completion, and their reasons varied. The most common reasons included family/personal issues (30.5%; 40 of 131), such as marriage, pregnancy, moving, and other family commitments. Of equal mention was a student's fit with the program and/or mentor (30.5%; 40 of 131). Examples of poor fit included changing career goals, lack of a good match with their mentor, or departure of their mentor without an adequate replacement. Eleven of those who responded (17%) noted that some students who had left did not have a clear understanding of what doctoral study entailed. Other reasons mentioned were inadequate academic progress (17%; 22 of 131); physical or mental health (10%; 13 of 131); finances (9%; 12 of 131); other issues such as inadequate advisement (6%; 7 of 131); and unknown reasons (3%; 4 of 131).

Strategies for reducing attrition. Strategies for reducing attrition were reported by 60 programs (100 responses, many with multiple strategies identified); these strategies included increased support mechanisms—for example, peer, mentor, university-based (41%; 41 of 100); more effective communication of expectations of students and what being an academic researcher entails provided at admissions and throughout the program (36%; 36 of 100); enhanced admission processes and attention to the student/mentor match (18%; 18 of 100); increased use of guidelines/annual reviews to make sure students are on track and receive regular feedback (13%; 13 of 100), program flexibility (12%; 12 of 100); and increased funding opportunities (11%; 11 of 100). The AAB noted that there was a range of suggested strategies that were related to program flexibility. For example, several programs indicated that they were shifting to part-time status, whereas others reported that they were shifting away from part-time attendance because full-time enrollment had been found to result in higher completion rates.

It was of interest that despite family/personal issues being one of the most common reasons for student attrition, only 12% of the reported strategies addressed program flexibility. Whereas, for the issue of personal fit with the program/mentor, strategies for addressing attrition—namely, providing better communication of expectations at admissions (i.e., what doctoral life is like) and throughout the program (i.e., more transparent guidelines, benchmarks, and reviews)—were some of the most common strategies identified.

Coursework and Course of Study

When asked if there were specific courses required of PhD students (beyond statistics courses), 61 of 73 interviewees reported that their program requires at least one course, whereas 12 said that their program does not require any specific courses. Across the programs, 273 separate required courses were reported; however, there was a great deal of overlap across programs. Figure 2 illustrates the range in the number of required courses across programs, with a mode of 3.

Figure 2. Range in the number of required courses.
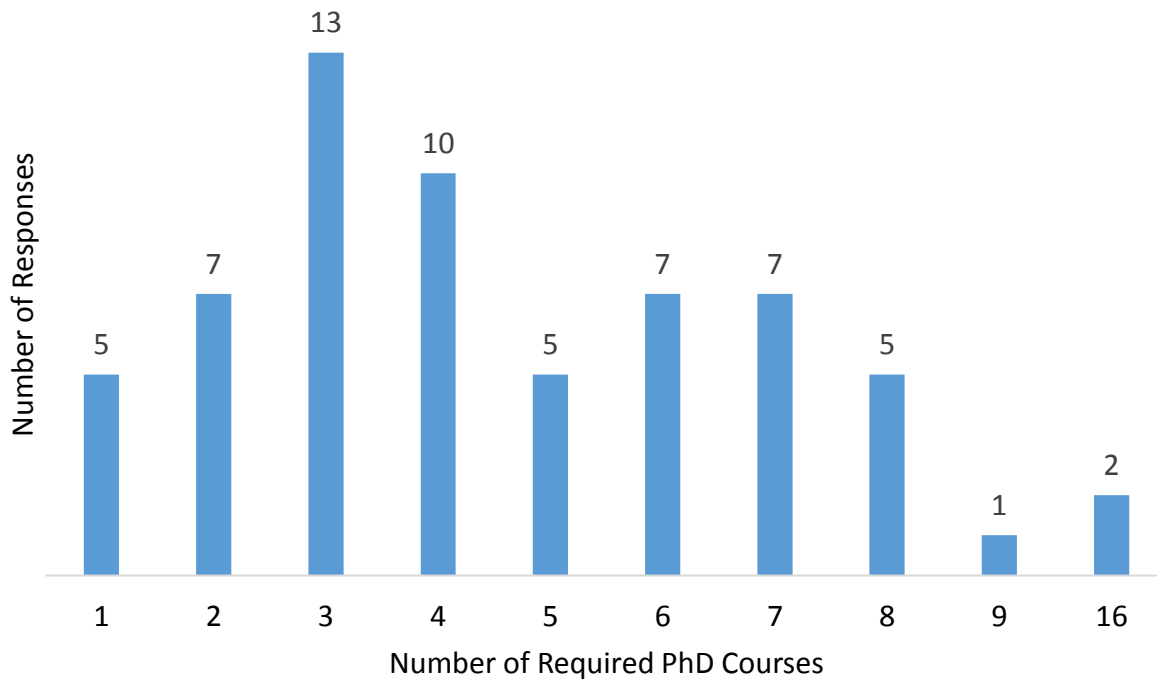
Of the 61 PhD programs mandating courses, the majority (45%) of required courses were related to research (more than 125 of 273 courses). Research courses covered topics that included research methods and design (33 courses), research seminars (25 courses), grant writing (24 courses), laboratory rotations (18 courses), ethics (10 courses), scientific writing (seven courses), instrumentation (5 courses), and a research-related computer course (3 courses).

Doctoral seminars that are typically designed around a student's *specialty area* accounted for 18% (49 of 273) required courses, ranging from 1 to 12 credit hours. Reported topics included speech, language, and hearing; teaching; education; health policies; pharmacology; public health/epidemiology; rehabilitation; and individually tailored courses.

Of the 273 courses, 31 (11%) were focused on cognition in adults and pediatric populations, acoustic perception of speech, literacy, experimental phonetics, multiculturalism, multilingualism, concepts in disability, the history of CSD, and humanitarian studies in CSD. Biological foundations—which focused on anatomy and physiology, neuroanatomy, neuroscience, and genetics—accounted for 16 of 273 courses.

Training students for academic life through coursework was mentioned by only 15 programs, and exposure was generally through some type of seminar series. Courses in academic teaching, supervising, and leadership accounted for 30 (11%) of the required courses. A few programs reported a very organized approach to career preparation, illustrated by the comment, "[We offer] a variety of 1-credit support courses that undergird the doctoral experience and prepare students for the demands of their careers. Support courses include Research Practicum, Dissertation Writing, Social and Professional Ethics, Grant Writing, Scientific Writing, Technology and Applications, and Academic Career Preparation."

The AAB was specifically interested in whether programs require a course in grant writing. Of the 73 programs, 39 (53%) indicated that they do so. However, when asked to list their required courses, only 24 programs mentioned grant writing. It may be that some programs include a grant-writing focus in their "professional seminars," whereas others may rely primarily on mentors to provide this content.

When asked if a student's course of study is typically developed in collaboration with the student and a planning committee, 83% (63) of the programs reported "Yes". Ten programs (14%) develop the course of study using other methods, typically between only the student and their immediate mentor.

Teaching Experiences

The AAB was specifically interested in whether programs require a course in teaching, and 49% (35) said that they do require a teaching course, whereas others indicated that some teaching was required but that there was no formal coursework to prepare students for this role. A few programs noted that students were also required to have a teaching practicum, and several other programs that do not require formal coursework require students to complete workshops on teaching, to engage in a variety of teaching activities, and to participate in mentoring students. Thus, some programs primarily offer students a more experiential approach to learning how to teach.

Table 1 outlines—from the choices provided—what were **typical** and/or what were **required** teaching experiences for students. Serving as a teaching assistant was common in 64 of 73 programs but was required by only 31 of 73.

Table 1. Typical versus required teaching experiences for PhD students.

Type of Teaching Experience	Typical		Required	
	% yes	#	% yes	#
Serve as a teaching assistant	86.5	64	43.1	31
Co-teach a course	59.7	43	30.6	22
Independently teach a course	60.9	42	26.0	19

Respondents were also asked to describe any **other** teaching experiences that their program offered. A total of 69 programs provided 63 comments; however, only 18 of these comments specifically related to *other* teaching experiences. For example, programs reported that their students participate in mentored teaching (6 programs), attend workshops on teaching (4 programs), earn a certificate in university-level teaching (2 programs), serve as guest lecturers (2 programs), do internships in teaching (1 program), do internships in supervision (1 program), take advantage of in-service opportunities (1 program), and teach online classes (1 program). Because the question included the example of "clinical teaching experiences," interviewers provided 45 comments about clinical teaching opportunities. From these, 78% ($n = 35$) indicated that they occasionally or sometimes offer supervision or clinical teaching opportunities (particularly to augment students' funding), 11% ($n = 5$) rarely offer supervision/clinical teaching opportunities, and 4% ($n = 2$) do not offer any "other" opportunities. Alternately, 7% ($n = 3$) require doctoral students who hold the CCC to provide some degree of clinical supervision.

In summary, only about one half of the programs require doctoral students to take a teaching course—whereas, for a large majority of programs, students participate as a teaching assistant. A moderate number of the programs have students co-teach and/or independently teach a course, but far fewer require these experiences. In addition, almost one half of the programs occasionally or at times offer clinical teaching or supervision opportunities.

Interdisciplinary Experiences

In investigating interdisciplinary opportunities available to students, interviewers asked programs to indicate from a series of options which ones' students typically participated in during their PhD studies. Table 2 indicates the program responses.

Table 2. Interdisciplinary experiences that students *typically* participate in during their PhD program.

Type of Experience	Yes		No	
	%	#	%	#
Taking courses with interdisciplinary students	95.9	70	4.1	3
Working on research project(s) with interdisciplinary students/faculty	86.5	63	13.5	10
Attending colloquia/seminar series with interdisciplinary students/faculty	83.6	61	16.4	12
Co-teaching with interdisciplinary students/faculty	13.5	10	86.5	63

When asked if their PhD students were required to take courses outside their department, 78% (57) reported "Yes." Of the 16 programs that do not require outside courses, 14 reported that 93% of their students do so. The number of required courses outside the department ranged from only two courses to a full one third of the coursework. Five programs noted that students need to identify courses outside the department that serve as a minor area of study. Common interdisciplinary courses offered in other departments are statistics, psychology, education, public health, nursing, medicine (e.g., neuroanatomy with the medical students), and four programs require their students to access outside courses in teaching and professional development or leadership (e.g., "Life in Academia," "Future Faculty Program").

Programs were also asked if they offer **other** types of interdisciplinary experiences, and 59 programs responded. There was a broad range of exposure, and a variety of mechanisms were used to give students opportunities to interact with professionals from other disciplines. The responses fell into the following categories: individual courses, a minor outside the department, research experiences, clinical teaching, their own interdisciplinary faculty, lecture series/colloquia, informal experiences, competitive fellowships, and training grants.

Examples of the varying levels of interdisciplinary experiences (ordered from more intensive to less intensive) included programs that:

a) provide all their courses in an interdisciplinary manner (5 programs);
b) have merged their CSD program with either psychology or special education (3 programs);
c) have dual degrees with neuroscience, cognitive science, or psychological sciences, where students take courses and gain a certificate in both areas (3 programs);
d) have a concentration in an area such as neuroscience, autism, language and literacy, Alzheimer's, or aging, where students across disciplines participate in joint coursework and research (9 programs);
e) are affiliated with interdisciplinary research centers, where students interact with a variety of other professions (5 programs);
f) span two campuses, where students participate in labs at each research center (2 programs);
g) require 12 credit hours from doctoral courses offered by the other two PhD programs in the school (1 program);
h) offer one or more courses (e.g., neuroscience, autism, aging, hearing, speech, cognitive science) that students from other disciplines take (8 programs); and
i) other programs (4 programs) that do not offer explicit interdisciplinary opportunities within their department but whose students informally attend colloquia in other departments.

Three programs require their students to participate in a Leadership Education in Neurodevelopmental and Related Disabilities (LEND) program, and two programs indicated that they provide PhD students with telehealth opportunities, where they collaborate with students from other majors in the college of health or health sciences. Several programs indicated that students need to have an outside person on their dissertation committee. There was also a range of disciplinary collaborators (from most to least often mentioned) from the fields of psychology; neuroscience; cognitive science; education or special education; rehabilitative sciences (occupational therapy, physical therapy, social work); otolaryngology; linguistics; engineering; kinesiology; pharmacy; MD; MD/PhD; nursing; translational sciences; and athletic training.

In addition, 11 programs (19%) indicated that their students participate in meetings, conferences, lecture series, writing groups, journal groups, and directed readings with students from other disciplines. Three programs reported holding interdisciplinary colloquia, where topics include job skills (interviewing, types of jobs, start-up lab issues, negotiating). Some programs also have CSD faculty from disciplines outside CSD, and students are given opportunities to interact with them. In addition, two programs reported that their PhD students are encouraged to engage in their communities, volunteer in schools, and take part in service learning on interdisciplinary teams.

Seven programs noted that they have training grants that include students and faculty from other disciplines (most commonly, special education, occupational science, and reading) that may include mentoring students from other disciplines. The students gain

interdisciplinary experience working on research projects, presenting their findings, and submitting manuscripts and grants. Three other programs noted that they have very competitive and interdisciplinary fellowships (e.g., cognitive science).

Finally, these high rates of required or selected interdisciplinary coursework and experiences demonstrate that CSD faculty and students recognize the benefit of an interdisciplinary education and are taking advantage of these kinds of opportunities to enhance learning. Further, four programs reported plans to increase the interdisciplinary opportunities that they offer—these plans include requiring (a) grant-writing and research design courses, (b) teaching experiences, and (c) brown bags with other departments on campus. One program recently started an interdisciplinary PhD program. Another will become part of a new health services college, which will afford students more interdisciplinary activities. And one program resides within a college that has just implemented an interprofessional education curriculum that *all* PhD students will follow, regardless of their individual program of study.

Program Characteristics and Challenges

To help identify and showcase an array of PhD educational models that prepare future scientists in the CSD discipline, we asked respondents to describe unique characteristics of their research doctoral programs. The majority of respondents (72 of 73) reported characteristics of their program that they believed to be unique or in some manner outstanding regarding the program's approach to doctoral training. A total of 192 comments were provided. The most commonly reported characteristic was having some type of interdisciplinary experience embedded within their program (17%; 33 comments).

The second most frequently reported unique program characteristic was offering specialized research experiences or opportunities (14%; 26 comments). The most common was multiple lab rotations and/or experiences with multiple mentors (13 comments). Multiple respondents also commented on the positive value of the availability of clinical populations (7 comments) or their emphasis on clinical research (6 comments). Respondents frequently referenced aspects of their training models and philosophy, with comments such as valuing "the importance of an apprenticeship approach to research training and active mentoring."

The third most frequently reported characteristic was offering an innovative curricular approach (9%; 18 comments). Examples included offering specialized training in grant writing (5 comments), providing professional seminars and professional courses explicitly designed to prepare students for (a) scholarly careers in general (4 comments) or (b) teaching in particular (4 comments). Others (totaling 15) described specialty tracks in their curriculum, including an emphasis on areas such as neuroscience (4 comments), part-time study (4 comments), advanced clinical training (2 comments), bilingualism (2 comments), biostatistics (1 comment), autism spectrum disorder (1 comment), AAC (1 comment), literacy (2 comments), MS to PhD bridge program (2 comments), rural health care (1 comment), medical speech-language pathology (1

comment), translational research (1 comment), student competencies identified by level in the program (1 comment), and a joint PhD/AuD program (1 comment).

The fourth most frequently described unique feature was providing access to medical facilities and institutions (6%; 11 comments). The final category, which had a minimum of 10 comments, was faculty characteristics, with most respondents referencing the overall quality of their faculty or specific areas of faculty expertise. Other unique features that were mentioned related to the availability of adequate funding for students (6 comments); outstanding facilities (6 comments); strong focus on individualization (5 comments); optimal geographic region (5 comments); nontraditional comprehensive exams (4 comments); teaching requirements (3 comments); size of program (3 comments); opportunities for PhD students to mentor other students (3 comments); international opportunities (3 comments); strong research-doctoral culture (2 comments); institutional reputation (2 comments); and a nontraditional dissertation process (2 comments).

It is clear that research doctoral training programs have diverse missions, structures, and points of pride. The natural outcome of this diversity is that curricular and training experiences vary widely in order to meet each program's goals.

Programs were also asked to report on additional challenges that had not been discussed previously. Although some programs reiterated ones already mentioned, others reported "additional" challenges. Overall, 57 of 73 programs reported a total of 87 comments about challenges. Of these, the number one reported issue was funding (23%; 20 comments). Following this was size of the program being too small, either because of insufficient numbers of faculty or students (14% and 16%, respectively). Regarding students, reports that there is an insufficient or poorly matched applicant pool were the most common. A range of other challenges were mentioned by smaller numbers of program coordinators, including issues with consortium logistics (5 of 87 comments); clinical certification challenges (5 of 87 comments); time to degree completion (4 of 87 comments); geographic region posing barriers to student recruitment (3 of 87 comments); expectations of university administrators (2 of 87 comments); student retention (2 of 87 comments); limited opportunities for research (2 of 87 comments); lack of research infrastructure (2 of 87 comments); and bachelor's to doctoral program logistical challenges (2 of 87 comments). Each of the following challenges was reported by only one respondent: student mentorship issues, program leadership, space, and challenges in program design regarding the balance between research and teaching experiences. The AAB notes that the diversity of missions across programs observed in the reported unique features is also mirrored in the challenges that were identified; whereas some challenges were widely reported, others were specific to the institutional contexts of a few programs (e.g., managing a consortium or dealing with part-time student attrition).

Programs were also asked to report whether they had a joint degree program and, if so, to describe its nature. Of the 73 programs, 19 (26%) reported a joint program, and 9 (12.3%) reported that they are planning one. In contrast, a total of 45 programs, 61.6%,

stated that they neither have such a program nor are planning one. Of those that do have a joint degree program, comments about the nature of these collaborations included the fact that 6 programs were characterized as "joint degree" and 3 as "dual degree." The study did not ask respondents to strictly define what they considered to be joint degree programs; therefore, it is not possible to be sure of the exact nature of what was reported. Examples of joint or dual degree programs included AuD/PhD, MS/PhD, MD/PhD, and the ability to earn a PhD degree via distance at a remote campus. Other respondents described opportunities to earn a degree involving another discipline; these were not strictly defined but included neuroscience, child language, psychology, cognitive science, linguistics, health sciences, special education, aging, life sciences, and rehabilitation sciences. There were also degree collaborations reported in the following areas, with courses shared with another program: public health, education, reading, and teaching English as a second language.

Of the 9 programs reporting collaborative efforts in the planning stages, 7 described (a) collaborative efforts with health professions, linguistics, or medicine and (b) bridge programs for the AuD/PhD or MS/PhD. Another reported a possible cross-institutional joint program. Two commented on developing a clinical doctoral program. In addition, by report of the AAB member interviewers, a few of these programs noted that "low productivity" in their number of PhD graduates was forcing them to consider joining with other PhD programs on campus or at other institutions. These results show that in CSD, it is not uncommon to have some type of joint degree or collaborative program component in research doctoral training (26% of programs currently, with an additional 9% in the planning stage). The fact that 9 programs are considering such programming suggests this is a growing trend. Moreover, the importance of interdisciplinary training is a clear value of a large number of PhD programs in CSD, as we note that many respondents highlighted interdisciplinary experiences as "unique features" of their program.

Student Outcomes of PhD Programs

The interviewers asked respondents to report strategies that were successful in encouraging graduates to seek academic or postdoctoral positions; there were 93 responses from 70 programs. Seventeen comments specified that no strategies were used because their students all went into academic positions; therefore, the following percentages are reported on the 76 remaining comments identifying strategies. The most commonly reported strategy was collaborating with students (25%; 19 of 76 comments), 21% (16 of 76 comments) focused on advising and informing students of academic positions; 17% (13 of 76 comments) highlighted faculty mentoring and modeling; 16% (12 of 76 comments) reported using networking strategies; 9% (7 of 76 comments) stated that seeking an academic position was a prominent part of the culture or expectation of the program; 8% (6 of 76 comments) involved students in teaching activities; and 5% (5 of 76 comments) listed other strategies, such as requirements of training grants that have an expectation of an academic position. Some innovative examples that were reported included the following:

- A focus on faculty members modeling work–life balance and the positive quality of life that can be achieved in academia
- Collaborating with other universities during PhD training (e.g., joint distance forums, connecting students at conferences)
- Involvement in teaching opportunities early in the program
- Interaction with PhD alumni who return to campus (or Skype) for Q&A sessions with doctoral students
- Offering a "Life in the Academy" course or a certificate program in "Preparing Future Faculty"
- Encouraging involvement in career development programs, such as ASHA's Lessons for Success

When asked about strategies to encourage graduates to seek postdoctoral fellowships, there were 69 responses from 64 programs. Of those, 15 (22%) said they do not use any strategy and that most of their graduates go directly to academic positions. Forty-eight percent (33 of 69) reported advising or encouraging students to seek postdoctoral positions, 16% (11 of 69) reported using networking strategies, and 4% (3 of 69) noted that it was the culture of their department that students seek postdoctoral positions. Others (7%; 5 of 69) noted their consideration of factors such as financial, quality of the dissertation and mentor, and immediate opportunities available in recommending a postdoctoral position. Some innovative strategies included the following:

- Encouraging students to seek out former students who are currently postdoctoral fellows
- Encouraging students to apply for postdoctoral grants or submit Predoctoral F31 grant applications
- Offering local postdoctoral positions through training grants
- Making personal connections with colleagues at institutions offering postdoctoral experiences
- Having former students who are completing postdoctoral fellowships speak to current students about pros and cons

Summary and Recommendations

As part of ASHA's and CAPCSD's ongoing efforts to ensure a sufficient pipeline of PhD faculty to fill existing and future academic positions, ASHA's AAB undertook the task of gathering data from all PhD coordinators or program directors of the 76 CSD research doctoral granting programs. The intent was to identify innovative models and practices used by current CSD PhD programs. To gather detailed information about the programs, AAB members interviewed 73 of 76 PhD coordinators or program directors. The interviews covered content related to important factors in the recruitment, admission, and retention process; information about coursework, teaching, and research activities; unique program features; and strategies encouraging students to take postdoctoral and faculty positions. After compiling the data represented in this report, the AAB developed a list of recommendations for consideration by PhD programs that highlights the many strengths and unique strategies used by CSD PhD programs to recruit, admit, retain, and graduate PhD students and to encourage

academic and postdoctoral positions after graduation. The recommendations are organized following the major topics covered in the interviews.

Recruitment, Admission, and Retention

Doctoral education can be a highly fulfilling and worthwhile process for faculty, students, and programs, but it is also time consuming and costly. Although CSD PhD programs have a much higher rate of completion (close to 97%) than many other disciplinary PhD programs, understanding why students leave programs before completion is important. From the AAB interviews, 65 of 73 programs reported having had students leave their program before completion. However, we did not specify a time frame for this attrition.

To connect the interview data with the most recent *Communication Sciences and Disorders Education Survey National Aggregate Data Report for 2014–2015* (CAPCSD & ASHA, 2016), we highlight first some of their findings. Across the 71 programs responding to the survey for Academic Year 2014–2015, 23 programs had PhD students leave before completion, with a total of 29 students. Despite this small number of students, of the 919 enrolled (3%), the attrition rate represents a loss of resources that could be spent on students who *do* graduate and further represents a loss of potential faculty qualified to fill academic positions. Further, when compared with the "first-year" PhD enrollees (146) and number of graduates (156) across programs in the same academic year, the loss of 29 students becomes more significant. In addition, as noted in the AAB interviews, some CSD programs (and their higher-level administrators) are concerned about "low productivity" in terms of their number of PhD graduates and are actively seeking practical strategies to boost enrollment and completion rates. Indeed, the 2014–2015 report (CAPCSD & ASHA, 2016) also documented that only 45% of available PhD student slots in that year were filled.

- **Recommendation #1:** The AAB encourages programs to use the creative strategies outlined in this report to boost recruitment of well-qualified applicants.

- **Recommendation #2:** The AAB encourages programs to use ASHA resources (e.g., *Make A Difference: Make A Change With a Career as a College Professor in Communication Sciences and Disorders* brochure) and programs to aid recruitment of students to CSD PhD programs (e.g., the Students Preparing for Academic- and Research Careers [SPARC] Award, the Audiology/Hearing Science Research Travel Award [ARTA], the Student Research Travel Award [SRTA], and the PROmoting the next GENeration of Researchers [PROGENY] award).

Further, given that one third of the doctoral students who leave PhD programs do so because of a lack of "fit" with the program or mentor, changes in their own career goals, and/or a lack of understanding of what doctoral education entails, clearer communication with students before and throughout a doctoral program is vital to the goal of reducing attrition.

- **Recommendation #3:** The AAB considers it important that mentors provide timely, ongoing communication with potential students both within and outside their institution. In addition, keys to reducing attrition include (a) informing prospective students of the expectations, timelines, and benchmarks of research-doctoral study and (b) providing them with detailed information to make informed decisions about whether research-doctoral study is right for them. Accordingly, a great deal of emphasis should be placed on making timely and personal contact with prospective students and having multiple interactions with students before admission.

- **Recommendation #4:** The AAB recommends that additional attention to discerning prospective students' plans may be helpful in reducing attrition given that less than half of CSD programs rated "knowing about prospective students' career plans in the admissions process" as *very important* or *moderately important*. In particular, if potential students indicate an interest in clinical administration, private practice, or other nonacademic and nonresearch careers, programs may want to advise them to seek out clinical doctorate of speech-language pathology (e.g., SLPD, CScD) or doctor of audiology (AuD) programs rather than PhD programs.

CSD attrition concerns parallel the similar concerns of PhD programs across a range of disciplines. As suggested by Cassuto (2013) in working from the results of a Council of Graduate Schools (2010) study of doctoral education, more "thoughtful" admission practices are needed that (a) focus on the "fit" between the student and program and (b) consider all aspects of research-doctoral study, including financial support. Moreover, many sources recommend that programs provide detailed and balanced information about their program and its requirements—and that they encourage adequate interactions between prospective students and their potential mentors. Furthermore, mentors should provide a positive (but realistic) view of obtaining a PhD and working in academia.

In addition, Litalien and Guay (2015), from their study of PhD completers and noncompleters, have identified three major factors that distinguish between the two groups. The first and largest factor was the self-perceived competence of the students, with higher feelings of competence being correlated with greater persistence to finish.

- **Recommendation #5:** The AAB urges programmatic efforts to reduce attrition, including increasing the motivation of students and enhancing the support that they receive from their mentor(s) and other faculty.

- **Recommendation #6:** The AAB encourages programs to foster participation in ASHA's mentoring programs that are designed to aid PhD student retention (e.g., Mentoring Academic-Research Careers [MARC] and the Pathways Program.

The quality of the mentor–student relationship was another key factor noted by Litalien and Guay (2015), with students who completed their PhD program being more likely

than noncompleters to view their previous interactions with their mentor as supportive. The third key factor noted by Litalien and Guay was the interactions that students had with other faculty, with completers being more likely to view their previous interactions with other faculty as supportive. Nelson and Lovitts (2008), and Gray (2011), who is on the CSD faculty at Arizona State University, all provide helpful strategies for addressing mentor–mentee monitoring and for reducing attrition.

- **Recommendation #7:** The AAB encourages all programs to have consistent means to monitor and enhance mentor–mentee relationships (and relationships with other faculty), especially to circumvent and/or deal with issues as they arise.

An additional issue that surfaced in the interviews and that is represented in the literature is the need for students, once admitted, to have clear metrics that they can use to measure their progress. Timely review and explicit feedback is important so that students can be informed about their status and whether they are meeting program and mentor expectations. Formal review helps ensure that faculty members have deliberated carefully about a student's progress; formal review also helps raise awareness of when modifications or added supports are needed. Several sources provide recommendations for progress monitoring (Gray, 2011; Litalien & Guay, 2015; Nelson & Lovitts, 2008). For programs seeking models for improvement, the Graduate School at the University of Georgia has undertaken a large campus-wide study and has implemented a range of strategies to lower PhD attrition (Grasso, Barry, & Valentine, 2007).

- **Recommendation #8:** The AAB recommends that all CSD PhD programs have consistent mechanisms for monitoring student progress and providing feedback throughout a student's program of study.

Other prominent reasons for noncompletion are related to family or personal issues and other family commitments. Nelson and Lovitts (2008) suggest that a welcoming, hospitable environment is important for retaining students.

- **Recommendation #9:** The AAB encourages faculty to design PhD programs that fit with students' personal lives and that creatively blend successful components to further enhance student recruitment, admission, and retention. Enhanced flexibility and an aim toward student-centered policies and practices are recommended.

Finally, most programs reported issues related to funding and limited application pools as large barriers to increasing enrollment in their doctoral programs.

- **Recommendation #10:** The AAB recommends that both ASHA and CAPCSD continue to work collaboratively with CSD programs to enhance funding and recruitment opportunities.

Teaching

Teaching can be accomplished through a variety of experiences, including elements such as (a) required coursework related to pedagogy, and/or (b) teaching experience. As reported, less than half of the programs required PhD students to take a course in teaching. Although a majority of programs offered teaching assistantships (e.g., assisting with a course, teaching a course, or engaging in clinical teaching opportunities), some programs reported that they did not provide teaching opportunities for students because they viewed such experiences as taking away from the students' time to focus on research.

- **Recommendation #11:** Given the number of CSD graduates who seek or who are employed in academic settings, the AAB suggests that programs analyze the amount and type of teaching preparation that is provided to students in order to best prepare them for taking academic positions. Further, having high-quality teaching experiences before taking an academic position may enhance a new graduate's ability to teach effectively and efficiently and may thereby enable them to focus sufficient attention and time on their other primary job responsibilities (e.g., lab setup, research and grant productivity).

- **Recommendation #12:** The AAB encourages programs to foster PhD student and new faculty participation in ASHA award programs that foster teaching preparation (e.g., Advancing Academic- and Research Careers [AARC] award, Mentoring Academic-Research Careers [MARC], and membership in Special Interest Group 10: Issues in Higher Education).

Coursework and Course of Study

Beyond statistics courses, most CSD PhD programs are not prescriptive in terms of academic coursework. Most require, at minimum, research-oriented courses across a range of research topics. Overall, a hallmark of PhD programs in CSD is *individualization*. All programs allow students to develop their course of study with a committee and/or mentor.

Because most CSD programs encourage their students to seek academic positions, it is of the utmost importance that PhD programs prepare students for the many roles and responsibilities of academic life (teaching, research, grant writing, manuscript reviewing and writing, committee work, service, etc.). Despite this stated focus by most CSD programs, only 15 programs explicitly mentioned preparing students for these kinds of academic roles. In addition, very few programs reported systematically providing students with content on résumé writing, job talks, salary negotiations, start-up lab needs, ethics, work/life balance, and other professional development issues. Overall, it appears that most programs rely on individual mentors to transmit this type of information to students, which may result in inconsistencies across students in the type and level of their knowledge and skills.

- **Recommendation #13:** In order to prepare students for academic life, the AAB encourages CSD programs to (a) provide detailed, consistent information related to obtaining and being successful in an academic position and (b) encourage prospective and existing PhD students to participate in ASHA award, mentoring and research education programs [PDF] designed for this purpose.

- **Recommendation #14:** Given the increasing demands for grant productivity for CSD graduates who take academic and/or research positions, the AAB recommends that CSD programs consider the amount and type of grant-writing experiences provided to students. In so doing, programs will ensure that students are well prepared in this key area. In the current funding climate, high-quality training in grant writing is critical. Training could be accomplished through a range of options—including a formal grant-writing course or other innovative approaches as well as ASHA-sponsored programs for grant writing (e.g., Lessons for Success, Pathways Program, Clinical Practice Research Institute) and grant review training (Grant Review and Reviewer Training)—but likely should not rely solely on transmission by a student's mentor.

Interdisciplinary Experiences

Most CSD programs are providing a number of opportunities for students to engage in interdisciplinary experiences. With the increased federal and institutional emphasis on team science and collaboration with researchers from other disciplines, provision of multiple opportunities for students to engage with students and faculty from a range of disciplines is optimal.

- **Recommendation #15:** The AAB encourages CSD PhD programs to examine their current opportunities for students to engage with professionals across disciplinary boundaries. Creating systematic, meaningful interdisciplinary opportunities for students can lead to graduates who are better prepared and more motivated to seek out and work successfully with colleagues across disciplines.

Outcomes of PhD Programs

When all academic faculty, researcher, and postdoctoral first employment appointments *within and outside* CSD programs are considered, the increases over the last few years (72.7% in 2012–2013, 84.9% in 2013–2014, 80.6% in 2014–2015) are impressive. However, only about half of CSD PhD graduates (60.3% in 2012–2013, 40.6% in 2013–2014, and 47% in 2014–2015) seek a faculty-researcher position in **U.S. CSD programs** as their first employment after graduation (CAPCSD & ASHA, 2014, 2015, 2016), and 22% of graduates in 2014–2015 took postdoctoral positions.

CSD programs use varied strategies to encourage graduates to seek academic positions and to encourage students to choose an academic career. A previous section "Recruitment and Admission" highlights these strategies in detail. However, all CSD

programs are encouraged to make the provision of this type of information, preparation, and encouragement to students a high priority.

- **Recommendation #16:** Given the current and projected shortage of PhD-level faculty to fill CSD positions in academic programs, the AAB recommends that programs systematically examine their own strategies for preparing and encouraging graduates to obtain and be successful in academic positions.

Enhanced CSD Education and Recognition Outside of CSD

Finally, current data on existing CSD PhD programs are important because (a) they enable university faculty and administrators to compare, evaluate, and improve their own research-doctoral programs in CSD and (b) they provide a baseline for regularly updating important information to foster continuous improvement. Such reporting and improvement are especially important in the current climate of reductions in state dollars supporting education. In addition, in the most recent assessment of research-doctoral programs conducted by the National Academy of Sciences (NAS; Ostriker, Kuh, & Voytuk, 2011), the discipline of CSD **was not** one of the 62 fields or disciplines included. It is vital that CSD faculty and programs are represented in this type of reporting and are part of the conversation on research-doctoral education because federal agencies invest considerable sums of money to support research-doctoral students as fellows, trainees, and research assistants.

In the most recent report, the criteria for a field or discipline being included were that the field or discipline, as a whole, had to (a) have granted at least 500 doctorates in the last 5 years (2001–2002 to 2005–2006); and (b) be represented in at least 25 institutions. Taken together, these criteria ensure that fields/disciplines that are examined have a significant presence in research-doctoral education and that there are enough programs nationwide to make comparison meaningful. Despite the fact that CSD programs meet the criteria (and have, for some time), our discipline historically has not been included, whereas 62 other fields/disciplines that met these criteria *were*—including such related fields as neuroscience, kinesiology, nursing, public health, psychology, sociology, and linguistics. In addition, in examining the criteria at a program level, a *program* is a unit of graduate study defined by its performance of at least three of the following four activities: (1) enrolls students in research-doctoral study, (2) designates its own faculty, (3) develops its own curriculum, and (4) recommends students for research-doctoral degrees. To be included in the latest study, a doctoral program meeting these criteria must also have produced at least five doctorates between 2001–2002 and 2005–2006. From previous *HES CSD Education Surveys*, it is clear that many CSD PhD programs would meet these criteria; therefore, CSD should have been included in the report.

- **Recommendation #17:** The AAB recommends that ASHA's Chief Staff Officer for Science and Research inquire about—and advocate for the inclusion of—CSD programs in the next NAS report that assesses the state of research-doctoral programs.

Conclusions

The results of the interviews conducted by the AAB with 73 of 76 CSD PhD coordinators or program directors yielded valuable information for PhD programs seeking to examine and refine the educational opportunities that they provide for their students. A number of innovative models and practices were highlighted across a range of PhD programs and should provide examples of how interested programs could begin to undertake enhancements or transformations in their own programs. As noted by the AAB members after the interview process, many programs are offering some components of what may be viewed as current "recommended practice" in PhD education; however, as noted by Gray (2011) in referring to CSD programs, "Most of the promising practices for increasing retention and decreasing attrition seem like common sense, but the fact is that few graduate programs have all the pieces in place" (Gray, 2011). Therefore, the AAB encourages programs to examine their own practices closely and to institute some of the innovative practices described in this report. The AAB suggests that if we can act as a collective community to improve PhD CSD education, we can increase enrollment and completion, increase the number of graduates who choose academic positions, and add to the research and scientific base in our discipline. Moreover, we also can address "low productivity" issues faced by some programs and thereby strengthen our standing in the larger PhD community.

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