

Department of Speech, Language, and Hearing Sciences University of Arizona

Academic Program Review Self-Study



Prepared by the faculty of the Department of Speech, Language, and Hearing Sciences

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TABLE OF CONTENTS

A. SELF STUDY SUMMARY	1
A. 1. ADMINISTRATIVE HOME	1
A. 2. FACULTY	1
A. 3. PROGRAMS	1
A. 4. SELF-STUDY OVERVIEW	2
B. UNIT DESCRIPTION AND GOALS	2
B.1. MISSION, ROLE, AND SCOPE	2
B.1.a. MISSION THE DEPARTMENT	2
B.1.b. ROLE AND SCOPE OF ACADEMIC DEGREE PROGRAMS	3
B.2. MAJOR GOALS AND STRATEGIC PLANS	4
B.2.a. MAJOR GOALS OF THE DEPARTMENT	4
B.2.b. STRATEGIC PLAN	4
B.3. RELATION TO UNIVERSITY MISSION AND STRATEGIC PLAN	6
C. UNIT HISTORY	7
C.1. MAJOR CHANGES SINCE LAST APR IN 2005-2006	7
C.2. SUMMARY OF RECCOMENDATIONS OF LAST APR AND RESPONSES TO THEM	9
D. OVERVIEW OF ACADEMIC QUALITY OF SPEECH, LANGUAGE, AND HEARING SCIENCES	13
D.1.a. RESOURCE INDICATORS	13
D.1.b. REPUTATIONAL INDICATORS	14
D.1.c. OUTCOME INDICATORS	15
D.2. COMPARISION TO TOP 5 PUBLIC INSTITUTIONS	15
E. FACULTY	19
E.1. RESEARCH AND SCHOLARLY CONTRIBUTIONS	22
E.2. PARTICIPATION, LEADERSHIP, AND INFLUENCE	25
E.3. TEACHING	26
E.4. FACULTY RECRUITING AND PLANNED DIRECTIONS FOR FUTURE FACULTY HIRES	28
E.5. FACULTY COMPENSATION AND COMPARISION WITH TOP 5 PUBLIC INSTITUTIONS	29
E.6. FACULTY GENDER/RACE/ETHNICITY AND EFFORTS TOWARD DIVERSITY	30
E.7. BIOGRAPHICAL SKETCHES	31
F. UNIT ADMINISTRATION	31
F.1. ORGANIZATION AND GOVERNANCE STRUCTURES	31
F.2. CLASSIFIED AND PROFESSIONAL STAFF	33
F.3. ADEQUACY OF STAFF SUPPORT	35
G. UNIT RESOURCES	36
G.1. APPRAISAL OF SUPPORT SERVICES	36
G.2. SPECIFIC RESOURCE NEEDS	39
G.3. PROJECTED CHANGES IF ADDITIONAL RESOURCES AVAILABLE	40
H. UNDERGRADUATE STUDENTS, DEGREE PROGRAMS, AND OUTCOMES	41
H.1. UNDERGRADUATE DEGREE PROGRAM	41

H.2. ENROLLMENT TRENDS _____	41
H.3. CONTRIBUTIONS TO GENERAL EDUCATION _____	42
H.4. UNDERGRADUATE PROGRAM DESCRIPTION _____	43
H.4.a.. BASIC CURRICULAR GOALS AND OPTIONS _____	43
H.4.b.. ACCREDITATION _____	44
H.4.c. COMPARISON TO PEER INSTITUTIONS _____	44
H.4.d. SUFFICIENCY OF THE UNDERGRADUATE PROGRAM _____	45
H.4.e. COURSE AVAILABILITY _____	45
H.4.f. ACTIVE LEARNING STRATEGIES _____	46
H.4.g. INSTRUCTIONAL TECHNOLOGY _____	47
H.4.h. ONLINE COURSES _____	47
H.5. UNDERGRADUATE STUDENTS _____	47
H.5.a. QUALITY OF UNDERGRADUATE STUDENTS _____	47
H.5.b. GENDER/RACE/ETHNICITY OF UNDERGRADUATE STUDENTS _____	49
H.4.c. RECRUITMENT AND RETENTION OF WELL-QUALIFIED UNDERGRADUATE STUDENTS _____	50
H.4.d. UNDERGRADUATE ADVISING _____	50
H.5.e. GRADUATE OUTCOMES AND VIEWS OF PROGRAM _____	50
H.6. UNDERGRADUATE STUDENT LEARNING OUTCOMES ASSESSEMENT _____	51
H.6.a. UNDERGRADUATE STUDENT LEARNING OUTCOMES _____	51
H.6.b. ASSESSEMENT ACTIVITIES _____	51
H.6.c. ASSESSEMENT FINDINGS _____	53
H.6.d. CHANGES MADE IN RESPONSE TO FINDINGS _____	54
I. GRADUATE STUDENTS, DEGREE PROGRAMS AND OUTCOMES _____	56
I.1. GRADUATE PROGRAM DESCRIPTION _____	56
I.1.a. MASTER OF SCIENCE DEGREE IN SPEECH, LANGUAGE, & HEARING SCIENCES _____	57
I.1.b. CLINICAL DOCTORATE OF AUDIOLOGY (AuD) _____	57
I.1.c. RESEARCH DOCTORAL PROGRAM IN SPEECH, LANGUAGE, AND HEARING SCIENCES (PhD) _____	57
I.1.d. BILINGUAL CERTIFICATE PROGRAM _____	58
I.2. GRADUATE PROGRAM CURRICULUM AND COURSES _____	58
I.2.a. ADEQUACY OF GRADUATE CURRICULUM AND COURSEWORK _____	58
I.2.b. ACTIVE LEARNING STRATEGIES _____	58
I.2.c. INSTRUCTIONAL TECHNOLOGY _____	59
I.2.d. ONLINE COURSES _____	59
I.2.e. ADEQUACY OF RESOURCES _____	60
I.2.f. INTERDISCIPLINARY EDUCATION _____	60
I.3. GRADUATE STUDENTS _____	61
I.3.a. RECRUITMENT AND QUALITY OF STUDENTS _____	61
I.3.b. ENROLLMENT TRENDS FOR SLHS DEGREE PROGRAMS _____	62
I.3.c. GENDER, RACE, AND ETHICITY OF GRADUATE STUDENTS _____	63
I.3.d. ADEQUACY OF GRADUATE STUDENT STIPENDS AND ASSISTANTSHIPS _____	65
I.3.e. THESIS/DISSERTATION SUPERVISION AND TIME TO GRADUATE _____	66
I.3.f. GRADUATE STUDENT EMPLOYMENT AFTER GRADUATION _____	70
I.3.g. SCHOLARSHIP ACTIVITIES OF GRADUATE STUDENTS _____	70
I.4. GRADUATE STUDENT LEARNING OUTCOMES ASSESSMENTS _____	72
I.4.a. EXPECTED LEARNING OUTCOMES _____	72
I.4.b. ASSESSEMENT ACTIVITIES _____	73
I.4.c. ASSESSEMENT FINDINGS _____	76

I.4.d. CHANGES MADE IN RESPONSE TO FINDINGS _____	81
J. ACADEMIC OUTREACH _____	84
K. COLLABORATION WITH OTHER UNITS _____	86
L. FACULTY PLANNING _____	87

APPENDICES

A. 2012 EXTERNAL FUNDING IN SLHS BY FUNDING TYPE _____	90
B. COMPARISON OF GRANT EXPENDITURES AND FACULTY SALARIES _____	92
C. FACULTY EMPLOYMENT HISTORY _____	93
D. SLHS CLINICAL FACULTY AND LECTURERS OVER TIME _____	94
E. SLHS STAFF EMPLOYMENT HISTORY _____	95
F. FACULTY COLLABORATIONS WITH THE UNIVERSITY _____	97
G. MASTER OF SCIENCE PROGRAM OF STUDY 2012-2013 _____	98
H. DOCTOR OF AUDIOLOGY (AUD) 2012-2013 PROGRAM OF STUDY _____	100
I. OVERVIEW OF REQUIREMENTS FOR PHD IN SPEECH, LANGUAGE, AND HEARING SCIENCES _____	102
J. SLHS COURSE NUMBERS AND TITLES _____	103
K. ASHA STANDARDS FOR SPEECH-LANGUAGE PATHOLOGY _____	104
L. ASHA STANDARDS FOR AUDIOLOGY _____	107
M. MATRIX SHOWING COURSEWORK MEETING KNOWLEDGE AND SKILLS IN AUDIOLOGY _____	116
N. PHD STUDENT OUTCOMES FOR THOSE GRADUATING 2005-06 – 2011-12 _____	118
O. PHD STUDENT OUTCOMES FOR THOSE CURRENTLY OR RECENTLY MATRICULATING _____	119
P. COMMUNITY AND PROFESSIONAL EDUCATIONAL OUTREACH _____	120
Q. FACULTY BIOSKETCHES _____	125

TABLES

D.1. SPEECH, LANGUAGE & HEARING SCIENCES RESEARCH GRANT REVENUE _____	15
D.2. TOP-RANKED PROGRAMS IN SPEECH-LANGUAGE PATHOLOGY & AUDIOLOGY _____	16
D.3. MASTER'S DEGREE IN SPEECH-LANGUAGE PATHOLOGY (MS) 2012 ADMISSIONS DATA _____	17
D.4. CLINICAL DOCTORATE IN AUDIOLOGY (AuD) 2012 ADMISSIONS DATA _____	17
D.5. RESEARCH DOCTORAL DEGREE (DOCTOR OF PHILOSOPHY) 2012 ADMISSIONS DATA _____	18
D.7. FACULTY DISTRIBUTION ACROSS RANK/TITLE AT TOP-RANKED SLHS PROGRAMS _____	18
E.1. CURRENT SPEECH, LANGUAGE, AND HEARING SCIENCES TENURE-TRACK FACULTY _____	19
E.2. SLHS SENIOR LECTURERS AND RESEARCH SCIENTIST _____	20
E.3. SLHS CLINICAL FACULTY IN AUDIOLOGY _____	20
E.4. SLHS CLINICAL FACULTY IN SPEECH-LANGUAGE PATHOLOGY _____	21
E.5. SLHS TENURE-TRACK FACULTY PRODUCTIVITY INDICATORS (2006-2012) _____	23
E.6. SUMMARY OF 2012 GRANT FUNDING IN SLHS (TOTAL GRANT PORTFOLIO) _____	24
E.7. FEDERAL RESEARCH GRANT FUNDING REPORTED IN 2012 _____	24
E.8. COMPARISON OF ANNUAL GRANT EXPENDITURES TO OTHER UA CoS DEPARTMENTS _____	24
E.9. AVERAGE TEACHER AND COURSE EVALUATIONS FOR SLHS AND CoS _____	27
E.10. SUMMARY OF TENURE-TRACK FACULTY GAINS, LOSSES, AND PROMOTIONS _____	28
E.11. COMPARISON OF FACULTY SALARIES WITH OTHER TOP-RANKED PROGRAMS _____	29
E.12. AVERAGE ACADEMIC SALARIES BY RANK: SLHS, PSYCHOLOGY, & NEUROSCIENCE _____	30
E.13. GENDER, RACE/ETHNICITY OF SLHS FACULTY _____	30
F.1. CLASSIFIED STAFF 2012 _____	34
F.2. WINGS ON WORDS CHILD LANGUAGE CENTER PERSONNEL 2012 _____	34
F.3. RESEARCH PROFESSIONALS AND STAFF 2012 _____	34

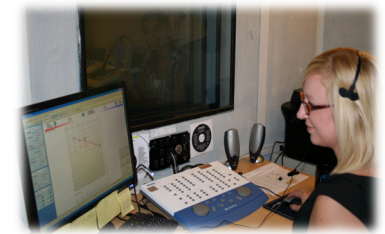
F.4. RACE AND ETHNICITY OF CLASSIFIED STAFF AND PROFESSIONAL/APPOINTED PERSONNEL	35
F.5. SLHS STAFF FTE, 2005-2012	36
G.1. RESOURCES FOR GRADUATE TEACHING ASSISTANTS AND RESEARCH ASSISTANTS	40
H.1. STUDENT ENROLLMENT IN SLHS OVER TIME	41
H.2. SLHS UNDERGRADUATE COURSES TAUGHT AND NUMBERS OF STUDENTS ENROLLED	41
H.3. GENERAL EDUCATION CLASSES OFFERED BY SLHS	42
H.4. GENERAL EDUCATION CLASSES TAUGHT BY SLHS (2011-2012): ENROLLMENT & EVALUATION	42
H.5. SLHS UNDERGRADUATE COURSEWORK	44
H.6. UNITS REQUIRED FOR MAJORS IN SLHS	45
H.7. SAT/ACT SCORES 2005-2012	47
H.8. SLHS MAJORS IN THE HONORS PROGRAM IN RELATION TO CoS & UA UNDERGRADUATES	48
H.9. TIME TO COMPLETE UNDERGRADUATE DEGREE 2005-2012	48
H.10. SLHS UNDERGRADUATE MAJORS BY GENDER	49
H.11. RACE/ETHNICITY DISTRIBUTION FOR SLHS UNDERGRADUATE STUDENTS	49
H.12. AVERAGE RESPONSES TO EXIT INTERVIEW QUESTIONS	51
H.13. SLHS UNDERGRADUATE COURSES AND OUTCOME ASSESSMENTS	52
I.1. SLHS GRADUATE PROGRAM APPLICATIONS AND ADMISSIONS	62
I.2. GRADUATE STUDENT ENROLLMENT BY PROGRAM	63
I.3. GENDER OF GRADUATE STUDENTS: SLHS, CoS, UA, and NATIONAL COMPARISON	63
I.4. RACE/ETHNICITY OF MS-SLP STUDENTS	64
I.5. RACE/ETHNICITY OF AuD STUDENTS	64
I.6. RACE/ETHNICITY OF PhD STUDENTS	65
I.7. NUMBER AND FUNDING OF GRADUATE TEACHING ASSISTANTS & RESEARCH ASSISTANTS	66
I.8. GRADUATE TEACHING ASSISTANT AND RESEARCH ASSISTANT/ASSOCIATE SALARIES	66
I.9. THESIS/DISSERTATION SUPERVISION	66
I.10. COMPLETION INFORMATION FOR MS-SLP STUDENTS	66
I.10. COMPLETION INFORMATION FOR DOCTOR OF AUDIOLOGY STUDENTS	67
I.12. COMPLETION INFORMATION FOR PhD STUDENTS	67
I.13. GRADUATE DEGREES AWARDED BY YEAR	67
I.14. GRADUATE PROGRAMS OFFERING PhD IN SLHS: DEGREES GRANTED	68
I.15. SLHS GRADUATE STUDENT EXIT INTERVIEW RESPONSES	69
I.16. EMPLOYMENT SETTINGS OF MS-SLP GRADUATES	70
I.17. EMPLOYMENT SETTINGS OF AuD GRADUATES	70
I.18. EMPLOYMENT SETTINGS OF PhD GRADUATES (2006-2012)	71
I.19. NATIONAL CERTIFICATION EXAM RESULTS IN SPEECH-LANGUAGE PATHOLOGY	77
I.20. OUTCOME ON FORMATIVE & SUMMATIVE ASSESSMENTS OF KNOWLEDGE IN AuD	79
I.21. NATIONAL CERTIFICATION EXAM RESULTS IN AUDIOLOGY	81
J.1. CONTINUING EDUCATION CREDITS PROVIDED BY SLHS OUTREACH EVENTS	85

FIGURES

E.1. SLHS INSTRUCTOR RATINGS OVER TIME	27
F.1. ORGANIZATION CHART FOR SPEECH, LANGUAGE, AND HEARING SCIENCES	33
H.1. ASSESSMENT FINDINGS FOR UNDERGRADUATE LEARNING OUTCOMES	53
H.2. CHANGES IN WRITING SCORES	54
I.1. OUTCOMES FROM COMPREHENSIVE EXAM FOR MS-SLP STUDENTS (2007-12)	77
I.2. SUMMARY OF FORMATIVE ASSESSMENT OF STUDENTS IN TRAINING IN SLP	78
I.3. OUTCOMES FROM FIRST YEAR EXAM FOR AuD STUDENTS (2007-2012)	79
I.4. SUMMARY OF FORMATIVE ASSESSMENT OF STUDENTS IN TRAINING IN AUDIOLOGY	80

Facts about the UA Department of Speech, Language, and Hearing Sciences

1. Speech, Language, and Hearing Sciences is part of the **School of Mind, Brain and Behavior** in the College of Science.
2. Our clinical programs achieve top rankings by *US News and World Report*.
 - **Speech-Language Pathology** is ranked **#5 in the US**.
 - **Audiology** is ranked **#12 in the US**.
3. Our department includes 30 research, teaching, and clinical faculty, and 20 research professionals and support staff.
4. We have 350 undergraduate students and 100 graduate students, and confer approximately 100 Bachelor of Science, 25 Master of Science, 8 Doctor of Audiology, and 2 Doctor of Philosophy degrees each year.
5. 100% of our graduate students in Speech-Language Pathology and Audiology achieve employment within three months of graduation.
6. Our on-campus **Speech, Language, and Hearing Clinics** provide service to over 3,000 Tucsonans every year; another 2,000 individuals are served at off-campus sites each year.
7. Our researchers address the basic and applied science questions in our field, supported by a research portfolio of over **\$14 million** from the National Institutes of Health, the National Science Foundation, and other sources.
8. Our research faculty are national and international leaders, with a history of **13 Fellows of the American Speech-Language-Hearing Association**, **1 Fellow of the Acoustical Society of America**, and 9 Emeritus Faculty receiving the highest **Honors of the American Speech-Language-Hearing Association**.
9. Twenty-three SLHS students have been named **Galileo Circle Scholars**, and two SLHS faculty are **Galileo Circle Fellows**.
10. Research faculty in UA SLHS are internationally recognized leaders in the following areas:
 - **Language Comprehension and Production** – Alt, Beeson, DeDe, Plante, Wilson
 - **The Neurobiology of Language** – Plante, Beeson, Wilson
 - **Developmental Language Disorders** – Alt, Plante
 - **Aphasia Research** – Beeson, DeDe, Wilson
 - **Auditory Cognitive Neuroscience** - Lotto
 - **Speech sound production and acoustics** – Story, Bunton, Hoit
 - **Speech sound development and disorders** – Bunton, Hoit, Maas, Fabiano-Smith
 - **Electrophysiological measures of hearing in infants** - Cone
 - **Hearing aid research** – Dai, Marrone



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Research and Teaching Faculty

Speech Science and Speech Disorders



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Funding: NIH/NIDCD
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Research area: Speech sound production –
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Kate Bunton, PhD, CCC-SLP Associate Professor
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Funding: NIH/NIDCD
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Research area: Behavioral and neurobiological aspects
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Funding: NIH/NIDCD
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Mary Alt, PhD, CCC-SLP Associate Professor
Research area: Receptive language skills in children
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Funding: NIH/NIDCD



Gayle DeDe, PhD, CCC-SLP Assistant Professor
Research area: Sentence comprehension and
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adults
Funding: NIH/NIDCD



Stephen M. Wilson, PhD Assistant Professor
Research area: Neurolinguistics and neural basis of
language
Funding: NIH/NIDCD



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Research area: Neuroanatomical and functional
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Funding: NIH/NIDCD

Hearing Science and Hearing Disorders



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Research area: Electrophysiology of infant speech
perception
Funding: NIH/NIDCD
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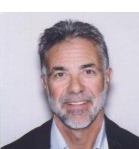
Andrew Lotto, PhD Associate Professor
Research area: Processing of complex acoustic signals
Funding: NIH/NIDCD, NSF



Huanping Dai, PhD Associate Professor
Research area: Human auditory perception of
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Clinical Faculty

Speech Language Pathology



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Associate Clinical Professor

Clinical area: Pediatric communication disorders; Augmentative and Alternative Communication Devices for children and adults



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Assistant Clinical Professor

Clinical area: Management of neurogenic communication disorders in children, adolescents and adults



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Assistant Clinical Professor

Clinical area: Early Intervention and dysphagia; children with autism, developmental delays, and phonological disorders



Kathe McGrath, MS, CCC-SLP

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Clinical area: Early Intervention and family focused therapy, Autism and Language Development



Carole Wymer, MS, CCC-SLP

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Clinical area: Children needing augmentative communication devices



Lea Cuzner, MS, CCC-SLP

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Clinical area: Preschool and school-age SLI and speech sound disorders; Early Intervention with children with hearing impairment



Barbara Kiernan, PhD

Director, Wings on Words

Clinical area: Language learning and development of children with impaired language skills



Tracy Kaplan, MS, CCC-SLP

Assistant Clinical Professor

Clinical area: Preschool language disorders, Autism spectrum disorders

Audiology



Thomas Muller, AuD, CCC-A, FAAA

Associate Clinical Professor

Clinical area: Psychosocial implications of hearing impairment in the elderly and advanced hearing instrument technology



Linda Norrix, PhD, CCC-A

Associate Clinical Professor

Clinical area: Audiological evaluations in the difficulty-to-test populations, electrophysiology and auditory processing disorders



Julie Peterson, AuD, CCC-A

Assistant Clinical Professor

Clinical area: Early Intervention, diagnosis and a team approach to providing community services for the pediatric population



Frances P. Harris, PhD, CCC-A, CCC-SLP

Assistant Clinical Professor

Clinical area: Development of programs for adults who have hearing loss

University of Arizona Clinics

Grunewald-Blitz Clinic for Communication Disorders in Children
Clinic for Adult Communication Disorders
Aphasia Clinic
Clinic for Adult Hearing
Autism Clinic Extension
Child Language Center / Wings on Words

Off Campus Clinics

Center for Hearing Impaired Children
Chapel Haven West transition program for Autism
Children's Clinic for Rehabilitative Services
St Andrews Children's Clinic, Nogales
Public Schools
Private Practice Clinics
Carondelet St Joseph's and St Mary's Hospitals
HealthSouth Rehabilitation Hospitals
Northwest Medical Center
Southern Arizona Veterans Administration Medical Center
Tucson Ear, Nose and Throat
Tucson Medical Center
University of Arizona Medical Center

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**DEPARTMENT OF SPEECH, LANGUAGE, AND HEARING SCIENCES
ACADEMIC PROGRAM REVIEW
SELF-STUDY 2012**

A. SELF STUDY SUMMARY

A.1. Administrative Home

The Department of Speech, Language, and Hearing Sciences (SLHS) is housed within the School of Mind, Brain, and Behavior (MBB) in the College of Science at the University of Arizona. The Department has been a part of the College of Science for 25 years, and was a founding member of the School of Mind, Brain, and Behavior when it was organized in Fall 2009. In addition to our Department, the School includes the Department of Psychology, the Department of Neuroscience, and the Graduate Interdisciplinary Programs in Cognitive Science and in Neuroscience. All of these units share common research interests devoted to the understanding and dissemination of knowledge about the mind, brain, and behavior.

A.2. Faculty

As of Fall 2012, the SLHS Department includes 14 tenure-track faculty members (14.0 FTE) and 11 clinical faculty (10.2 FTE). The tenure-track faculty comprises 4 Full Professors, 5 Associate Professors, and 5 Assistant Professors. A sixth Assistant Professor has been hired who will start in Fall 2013, bringing the tenure-track faculty total to 15 at that time. The clinical faculty consists of 2 Associate Clinical Professors and 9 Assistant Clinical Professors. We also have 2 full-time senior lecturers, and have employed two part-time adjunct lecturers on a temporary basis to cover course content for the faculty position that will be filled in Fall 2013. One Senior Research Scientist resides in our department, who moved over from the Neuroscience Department. We have no post-doctoral fellows at this time.

A.3. Programs

We have a single undergraduate program for the Bachelor of Science degree in Speech, Language, and Hearing Sciences. At the graduate level, we grant a Master's degree (M.S.) in Speech, Language, and Hearing Sciences, a Doctor of Audiology degree (Au.D.), and a Doctor of Philosophy degree (Ph.D.) in Speech, Language, and Hearing Sciences. The M.S. degree can have a clinical emphasis in Speech-Language Pathology, and this comprises the vast majority of students in this degree program. A non-clinical master's degree in Speech, Language, and Hearing Sciences is granted for students who desire advanced scientific training in the field, but do not have the desire or aptitude for a clinical career. The Council on Academic Accreditation (CAA), a body within the American Speech-Language-Hearing Association, regulates our clinical graduate programs in speech-language pathology and audiology. Therefore, the accrediting body stipulates the major components of the clinical and academic training programs. The undergraduate curriculum is designed so that the prerequisite knowledge and skills are gained for students who pursue graduate degrees in our field. In addition to our degree programs, we offer a recently approved Bilingual Certificate in Speech-Language Pathology that provides the option for graduate students to specialize in evidence-based methods of assessment, diagnosis, and treatment of bilingual children and adults with speech, language, and hearing impairments. We also offer a post-bachelor's training program for Speech-Language Pathology Assistants that was initiated in the Summer 2011 in response to needs within the state.

In the 2011-12 academic year, we had 340 undergraduate students and 95 graduate students enrolled. The undergraduate enrollment compares to 119 at the time of the last APR (2005-06), reflecting a 264% increase. The 95 graduate student total compares to 41 at the last APR, a 230% increase. The graduate student enrollment for 2011-12 includes 52 students seeking the Master of Science degree, 33 working toward the Doctor of Audiology degree, and 10 PhD students. The Speech-Language Pathology Assistant program runs during the summer sessions, and enrolls approximately 10 students per summer.

A.4. Self-Study Overview

In this self-study, we elaborate on the strengths and weaknesses of our program, our faculty and students, outline our mission and goals, and describe our hopes for the future. We have an outstanding group of individuals in the department, who have worked together to grow and maintain our top-ranked programs. We have accomplished a great deal in the past 7 years despite declining state and federal resources. To highlight some points detailed in this document, we note that our strengths include:

- A strong and growing undergraduate program that fully prepares students to pursue graduate education in speech-language pathology, audiology, and speech, language, and hearing sciences
- A faculty that consistently demonstrates excellent classroom teaching and are rated highly by students at the undergraduate and graduate levels
- A highly productive research environment with exceptional external funding and student engagement in research
- Top 10 national ranking of our clinical program in Speech-Language Pathology
- Areas of research and clinical excellence in child language, speech science and speech disorders, aphasia, neurobiology of language, auditory cognitive neuroscience, pediatric audiology, and audiologic rehabilitation.

Targeted areas for improvement and growth include:

- An increase in recruitment and successful completion of PhD students
- Development of a post-doctoral program
- Strengthen the national reputation/ranking of the AuD program

B. UNIT DESCRIPTION AND GOALS

B.1. Mission, Role, and Scope

B.1.a. Mission of the Department

The academic focus of the Department of Speech, Language, and Hearing Sciences is the study of human communication and its disorders. The researchers in the Department address issues that support the basic and applied science for the clinical fields of Audiology and Speech-Language Pathology. Our coursework provides core knowledge of the processes that underlie normal and disordered communication, as well as professional competencies related to clinical practice. SLHS is one of the few departments within the College of Science that has a clinical instruction mission in addition to traditional academic, research, and service commitments. To meet these programmatic needs, the Department includes both academic and clinical faculty. In addition, the Department administers speech-language and hearing clinics and a preschool program that serve the community and the clinical training needs of our students. Community outreach is a natural component of the Department mission as we conduct clinical research and student training relevant to the assessment, intervention, and prevention of communication disorders in individuals of all ages.

Overall, the mission of the Department is to contribute to the scientific study of human communication and its disorders, to educate students regarding the relevant knowledge and skills necessary for clinical and research endeavors in the field, and to provide service to the university, community, state, and beyond.

B.1.b. Role and Scope of the Academic Degree Programs

Undergraduate Degree Program: Bachelor of Science

The mission of the undergraduate program is to provide students with a strong broad-based Bachelor of Science degree that includes the general education curriculum in English composition, the biological and physical sciences, mathematics, and social and behavioral sciences. Coursework within the two-year major provides an understanding of the biological, acoustic, psychological, developmental, linguistic, and cultural foundations of human communication processes. This includes normal aspects of speech production and perception, language processing, hearing, swallowing, and the cognitive and social aspects of communication. The curriculum also provides a strong background regarding the nature of communication disorders, and the basic principles of treatment. The undergraduate degree is preparatory for graduate study in speech-language pathology, audiology, and research degrees in speech, language, and hearing sciences. However, the undergraduate major is designed to foster critical thinking, writing skills, and problem-solving abilities in a broad sense, so the education has wide application that is not limited to pre-professional training. In addition to the undergraduate major, we offer six courses that contribute to the university general education curriculum in the topic areas of natural sciences (5 courses) and individuals and societies (1 course) (see Section H).

Minor in Speech, Language, and Hearing Sciences

The Department offers a minor in Speech, Language, and Hearing Sciences. For the minor, students with majors outside of the Department take a minimum of 18 units in SLHS: 12 of the units need to be coursework selected from a specified list of undergraduate courses and the remaining 6 units can include other SLHS courses, colloquium, independent study, or directed research in the Department.

Graduate Programs: Master of Science, Doctor of Audiology, and Doctor of Philosophy

We have two clinical graduate programs, as well as a program for the research Ph.D. The clinical programs include the M.S. degree in Speech, Language, and Hearing Sciences with an emphasis in Speech-Language Pathology (MS-SLP) and the clinical doctorate in Audiology (AuD). The M.S. degree requires two years, while the AuD requires four (three in residence, and a one-year externship). Students who graduate from the clinical programs meet all of the academic and clinical requirements for certification by the American Speech-Language-Hearing Association in either Audiology or Speech-Language Pathology. The clinical degrees include training in research methods and the principles of evidence-based practice, and students have the option to complete a thesis, but it is not required. The research doctorate is a traditional PhD program that includes the completion of original dissertation research. A non-clinical Master of Science degree in Speech, Language, and Hearing Sciences (MS-SLHS) can be granted to individuals who choose not to pursue clinical training, or to complete the PhD, but complete the appropriate coursework and a thesis.

B.2. Major Goals and Strategic Plan

A formal Strategic Plan for SLHS was developed in 2006, and the plan was updated in 2009. Significant progress toward those goals has been made, and the strategic plan was revisited in 2012. The collective view of our program's future emerged from faculty discussions over the course of the past year (2011-12), and extended discussions in the Fall 2012.

B.2a. Major Goals of the Department

The Department is directed toward achieving and maintaining excellence in research, teaching, and service as expressed in the following goals:

Research

- To house an integrated collection of research laboratories that achieve excellence in basic and translational research in communication sciences and disorders
 - To advance foundational understanding of speech, language, and hearing
 - To provide empirical evidence to guide the best clinical practices in audiology and speech-language pathology

Teaching

- To promote academic excellence in the classroom and in independent learning opportunities
 - To promote critical thinking, writing skills, and problem-solving abilities
 - To provide high quality education in speech, language, and hearing sciences
 - To educate a diverse cohort of undergraduate students that will be prepared to contribute to society as educated citizens, and to pursue advanced degrees in audiology, speech-language pathology, speech, language, and hearing sciences, or related fields
- To complement classroom learning with exceptional clinical and research experiences in order to
 - Train highly qualified audiologists and speech-language pathologists who are well-grounded in principles of evidence-based practice
 - Prepare the next generation of scientists who establish productive research careers that further advance knowledge in our professions

Outreach and Social Impact

- To fulfill the University's land grant mission by serving as a national resource for professionals and the public regarding in human communication and communication disorders
 - To provide high quality continuing education for professionals
 - To educate the public regarding the science and clinical aspects of human communication and its disorders
 - To inform public policy relative to communication disorders
 - To advance the quality and accessibility of clinical services in local, national, and international contexts

B.2.b. Strategic Plan

The following strategic priorities were set in 2012 for the next 5 years:

Strategic Priority 1: Promote and Retain Strong Faculty and Programs

- Retain current faculty with adequate resources to promote/maintain success
 - Continue to enhance research laboratories to maximize productivity and student engagement
 - Keep teaching load at levels that allow adequate time for active research
 - Better align and maintain salaries with local and national comparison programs
- Some growth in faculty over next 5 years
 - Add 2 or 3 faculty to extend the breadth of research and to share teaching responsibilities. This might include a combination of one or two tenure-track faculty members and a lecturer. We would target individuals with research in areas that complement or extend our current areas of emphasis, such as autism, bilingualism, hearing/hearing disorders, speech/speech disorders. A lecturer would likely be targeted who could cover some of the heavy teaching needs in speech science.
- Strengthen the national profile of the Audiology program
 - Continue efforts to promote the AuD program and increase national awareness of specific strengths at the UA (e.g., the model program in audiologic rehabilitation)
 - In the faculty expansion effort noted above, seek a strong mid-career or senior faculty member in audiology.
- Modest growth in clinical faculty to complement current cohort
 - Develop bilingual speech-language clinical experience in-house
 - Maintain and strengthen ties between clinical research and clinical training

Strategic Priority 2: Undergraduate Student Recruitment for Science Careers

- Increase exposure of SLHS major to students likely to have aspirations for research careers
 - Targeted recruitment among those students declaring interest in science including those in the Honor's college
- Maintain and enhance student involvement in research
 - Increase centralized support for student research from the Department and university in order to maximize student involvement in a meaningful way, yet protecting faculty time

Strategic Priority 3: Attracting and Supporting Graduate Students in Clinical Graduate Programs

- Increase the number of graduate stipends so that we yield more of the outstanding students that we admit.
 - Increase allocation of resources to support graduate students
 - Update clinical facilities in order to maximize student training experience

Strategic Priority 4: Attracting and Supporting PhD Students and Post-Doctoral Fellows

- Increase the number of high quality applicants for the PhD program
- Increase the number of doctoral students completing the program
- Develop seed funding for post-doctoral candidates
 - Facilitate external funding for post-doctoral fellows

Strategic Priority 5: Enhancing Diversity in SLHS Department

- Maintain and enhance diversity within student body
 - Implement bilingual/bicultural program, including undergraduate/graduate introductory course
 - Remain active in local and national programs that engage under-represented students at undergraduate and graduate levels
- Increase faculty diversity
 - Implement broad recruitment plan for next faculty hire(s) with open criteria for content and rank

Strategic Priority 6: Maintaining Strong Outreach Activities

- Maintain strong community relations
 - Maintain strong continuing education programs for professionals
 - Continue clinical and education outreach to lay community
 - Develop stronger advisory board for the Department
 - Update and maintain an effective website
- Increase connections with alumni
 - Increase social media connecting to the Department
 - Continue alumnus activities (social, professional, educational)

B.3 Relation to University Mission and Strategic Plan

Our strategic plan, and the goals stated above, demonstrate our commitment to directly align ourselves with the University of Arizona Five-Year [Strategic Plan](#), 2012-2016. This document states, “As a public research university serving the diverse citizens of Arizona and beyond, the mission of the University of Arizona is to provide a comprehensive, high-quality education that engages our students in discovery through research and broad-based scholarship. We aim to empower our graduates to be leaders in solving complex societal problems. Whether in teaching, research, outreach or student engagement, access and quality are the defining attributes of the University of Arizona's mission.” The University strategic plan is guided by commitment to three major priorities: academic excellence, access and success, and quality of life and societal impact.

The SLHS Department contributes to this mission of the University in a variety of ways. The three priorities of the University of Arizona encompass educational activities, research and scholarship, and outreach. Our Department fully shares these goals and makes substantial contributions to the achievement of each:

Priority A. Academic Excellence: The University of Arizona must be a center for excellence in education and research.

The Department of Speech, Language, and Hearing Sciences is clearly a unit that maintains excellence in research and education. As detailed in the sections that follow, SLHS faculty are valued for their strong, dynamic classroom teaching. Each faculty member teaches directly in his or her areas of expertise, and it is clear that we have a group of gifted teachers who genuinely enjoy the classroom and direct student teaching and mentoring. Students experience a high level of engagement with our faculty – in the classroom, in research labs, and in clinical settings. The research contributions of the University of Arizona SLHS faculty are recognized worldwide across a range of subspecialties, and this recognition contributes to our high national rankings, our external funding success, our strong graduate applicants, and successful faculty recruitment.

Priority B. Access and Success: *An education at The University of Arizona must be accessible to all who are academically qualified, and it must prepare students for a productive future. The University must engage, retain, and graduate its students in the greatest numbers possible.*

The SLHS Department has a long history of preparing undergraduates and graduate students for clinical and research careers in speech, language, and hearing. In the past seven years, we have further developed our contributions to the general education of University of Arizona students by adding courses of broad appeal, such as those that help them better understand human communication and its disorders, or introduce them to “The World of Sound” in which we live, or to understand how the brain supports communication. Many of these students go on to pursue SLHS as their major, but for those who do not, their knowledge of human communication is greatly enhanced.

The educational environment within the Department fosters student success, and many of our faculty are directly engaged in mentoring programs intended to facilitate academic success and to ensure student retention. The very nature of area our research is directed toward understanding the neural/biological mechanisms that support cognition, perception, and motor control for successful communication, as well as maximizing function when there is impairment or disorder. Thus, as a group, we are sensitive to individual needs and strategies to enhance success – in the university setting, and in life in general.

Priority C. Quality of Life and Societal Impact: *In keeping with its historic land grant mission, The University of Arizona serves as an engine of development and a source of inspiration that enriches individual lives and advances the collective well being of our society. Across every discipline, and on a daily basis, the University works to improve the human condition for the people of Arizona.*

A fundamental focus of the Department of Speech, Language, and Hearing Sciences is to address the needs of individuals with communication disorders. Our research, teaching, and service activities naturally reflect the desire to enhance individual lives by improving the ability to communicate. Basic and applied research provide foundational knowledge that is applied clinically, and we often have the privilege of seeing the direct effects of our efforts in our on-campus speech, language, and hearing clinics. We also have a significant investment in our students, and we are committed to advancing the knowledge of people in Arizona, the nation, and beyond. The impact of their educational experience is often evident over the course of each semester, but we often have the privilege to observe the long-term contributions of our graduates over many years affirming the of the societal impact of our program.

C. UNIT HISTORY

C.1. Major Changes Since Last APR in 2005-06

C.1.a. School of Mind, Brain, and Behavior Established

In 2009, the School of Mind, Brain, and Behavior (MBB) was established within the College of Science as part of a university-wide transformation plan, and the Department of Speech, Language, and Hearing Sciences was one of the founding members. The objective of the reorganization was to improve the productivity and increase efficiencies, while building on established strengths. SLHS Department Head, Elena Plante, was active in the development of the School, and current head, Pagie Beeson, serves on the Executive Committee for MBB. The school is described as follows:

The School of Mind, Brain, and Behavior represents a multidisciplinary group of departments and programs dedicated to the teaching and discovery of principles and mechanisms underlying minds, brains, and behaviors. The School was formed to foster interdisciplinary dialog and collaboration among students and faculty and to create new educational and research opportunities unconstrained by traditional disciplinary boundaries. The School houses the Department of Neuroscience, the Department of Psychology, and the Department of Speech, Language and Hearing Sciences, as well as the Graduate Interdisciplinary Programs in Neuroscience, the Program in Cognitive Science, and the Undergraduate Program in Neuroscience and Cognitive Science. Topics range from the identification of basic cellular, molecular, genetic and developmental mechanisms to the understanding of higher-level neural and cognitive processes associated with individual and social behaviors, to the translation of empirical findings into treatments for neurological and psychiatric disorders. Core units in the School also collaborate with other units in the Colleges of Letters, Arts and Science, the College of Agriculture and Life Sciences, and the College of Medicine.

Since the MBB school was formed, we have worked together to establish an undergraduate degree in Neuroscience/Cognitive Science (NSCS) that draws from coursework offered by each unit as well as some courses taught cooperatively. The new degree does not benefit the SLHS Department directly, but we are certainly supportive of the endeavor and appreciate that it provides an excellent undergraduate option for the appropriate students; some of those students may ultimately pursue research degrees in speech, language, and hearing sciences. The MBB executive committee has also worked to develop and engage the interest and commitment of an external advisory board, with the goal of developing additional connections with the community, and a fundraising mechanism. Finally, the school has facilitated additional interdisciplinary interactions. To date, the benefits of the school are modest, but the groundwork is being laid for future added value.

C.1.b. Department Prefix Changed

For historical and recording-keeping purposes, it is important to note that the Department abbreviation changed from **SP_H** to **SLHS** in the fall 2012. This change in the abbreviation more appropriately fits the Department name, which had been changed many years earlier from Speech and Hearing Sciences to Speech, Language, and Hearing Sciences. The change may affect retrospective searches of archival data in that both prefixes must be used to pull all information associated the Department.

C.1.b. Faculty Growth

We are fortunate to have increased the number of state-funded lines for tenure-track faculty since the last APR from 10 to 15. We currently have 14 of the tenure-track positions filled, and the 15th is an Assistant Professor in Speech Science, who will begin in Fall 2013. The growth in the number of faculty has provided increased breadth in the teaching expertise and research focus across speech, language, and hearing.

C.1.c. Administrative Structure

Department Head and Associate Department Head. The last APR was conducted when Dr. Elena Plante was interim Department Head as Dr. Kathryn Bayles had just ended her term as head. Dr. Plante was subsequently appointed as head, and served the Department in that role for a total of 5 years, until the end of May 2011. Dr. Pagie Beeson began her term as head in June 2011. At that time, the faculty agreed upon the addition of an Associate Department Head, a recommendation that was approved by the Dean. Dr. Brad Story was appointed Associate Department Head, and as such, also serves as the Chair of the Department Advisory Committee.

Change in Clinic Administration. Another administrative change occurred in January 2009, after the Director of the Speech, Language, and Hearing Clinics (DeFeo) retired due to health reasons. At that time, the Department Head (Plante) chose to discontinue the Clinic Director position. The organizational structure of the Department changed so that the clinical faculty report directly to the Department Head, rather than reporting to a clinic director. This model continues, but in Fall 2012 the faculty voted to institute two Clinic Coordinators appointed by the Department Head to oversee the respective clinical activities in Speech-Language Pathology (Faux) and Audiology (Muller). As noted in the organizational chart (**FIGURE F.1**), the Clinic Coordinators and all clinical faculty report directly to the Department Head.

Staff. Many of the SLHS staff have been employed in the Department for many years, a testament to the highly collegial environment. Some changes were made over the past 7 years reflecting staff development/advancement. In Spring 2011, our Department Administrative Associate (Pam Adams) retired after 25 years of exceptional service. Our Department Administrative Secretary (Denise Minopoli) was promoted to Administrative Assistant and took over coordination of student programs and administrative support for the faculty. In order to better meet the department needs, a business manager position was created in Summer 2011. This allowed a clearer division of responsibilities, with the Business Manager and Department Accountant responsible for all budget and financial issues relating to state accounts, grant budgets, and auxiliary accounts associated with clinical revenue and gifts. This addition has been particularly important as the university shifts toward a responsibility centered management (RCM) model, which increases departmental management of revenue and costs.

IT Support. A change occurred in the provision of IT support in 2009, when the School of Mind, Brain, and Behavior was formed. At that time, we moved to a centralized IT support system through MBB. On the down side, our technical support reduced from 2 IT personnel to 1 in order to accommodate a budget cut in state funds, but the positive aspect of the current service model is the access to a cadre of IT personnel with varied expertise, in addition to our building IT person.

C.2. Summary of Recommendations of Last APR and Responses to Them

Summary from Last APR 2006

Quoting from the final APR report in 2006:

The Department of Speech, Language, and Hearing Sciences at The University of Arizona has been publicly ranked 6th among 300+ graduate training programs in the nation in speech-language pathology and 8th in audiology. Fundamentally, this Department enjoys an outstanding faculty that is disadvantaged in its UA position and seriously vulnerable to losing its nationally ranked status unless the circumstances of the departmental operation are attended to immediately. The Department reflects academic excellence across scholarship, education of students, and service to its institution, community, and State. Many of its members are clearly leaders in their individual disciplines at national and even international levels. Few programs offer the scope and opportunities afforded students of this department, yet its faculty do not enjoy the same institutional standards afforded other departments within the UA system and compares unfavorably to even the minimum standards of similar academic programs nationwide.

*In the prior 15 years, this Department has been responsible for significantly shaping the field of speech, language, and hearing sciences, and is poised to continue this role into the next decade. However, to do so **it will need permanent and effective leadership with a clear vision of their future, and the ability/skills to lead the Department through a process of strategic planning that anticipates and aligns resources methodically, who creates methods to continuously monitor and***

redesign the plan to match emerging influences, and to implement/actualize such a plan to meet that vision, aligning resources for its success. Additionally and importantly, the sustainability of the exceptional national standing of this program is critically linked to the will of The University of Arizona to allocate the resources necessary for this Department to maintain its position of excellence.

The 2006 APR report made the following recommendations:

1. Increase space and improve physical conditions in the building
2. Increase number of faculty and faculty salaries
 - a. Address excessive teaching load
3. Improve infrastructure
 - a. Equipment (e.g., some faculty have had to purchase their own office computer to support teaching and administrative duties)
 - b. IT support
4. Replace interim Dept Head with committed Dept Head
5. Strengthen strategic plan
6. Clarify revenue streams that undermine incentive (e.g., funds created as the result of extramural research grants are used to support clinical faculty salaries rather than research infrastructure; clinical salaries are not tied to goals for clinical revenue generation. The result is there is little incentive to create revenue as neither directly reaps the benefit).
7. Clinical faculty salaries are significantly lower (>10%) than salaries for comparable speech-language pathologists and audiologists in the community (including Arizona State University), resulting in difficult recruitment and retention.
8. Improved alignment of clinical and didactic programming
9. Improve relations with medical school (disadvantaged by loss of otolaryngology (ENT) program)

Changes made in response to recommendations:

1. Space and physical conditions in the building
 - a. Goals were recently met to increase research space within the building by the Provost's allocation of 1,500 square feet to our department that was previously held by another college. The Department partnered with UA Central Administration to fund renovation of the space, which is in the final stages of completion. Two large research laboratory spaces were added: one includes three sound booths for audiologic and electrophysiological research and 8 workstations; the other new lab provides a large collaborative work area for neuroimaging data analysis (24 chairs). Two new research offices were added, as well as a small conference room (10 chairs) that is used for research meetings and TA office hours.
 - b. Additional renovation was implemented throughout the building to improve the usability of space using funds from both the Department and central administration. Several faculty and staff offices and five laboratory spaces were reconfigured for better use. The resulting increase in the number of work areas available for students to engage in research was approximately 32 chairs. Two additional sound booths were added in research labs.
 - c. Goals were also met to improve teaching environments by increasing computer stations in teaching labs, adding projection systems in teaching labs and seminar rooms, and updating desks and tables for better teaching configurations.
 - d. We were fortunate to engage UA facilities management to implement a major building refresh that started in Summer 2012. This included some roof and wall repair, painting of all

public areas (halls, classroom, bathrooms, stairwells), new baseboards, and resealing varnish on doors. This work is still in progress, and will likely be completed in February or March 2013.

- e. During the fall 2012, the individual offices for all clinical faculty were redesigned with custom office furniture and storage, and were painted and carpeted. Two faculty offices were also updated, painted, and carpeted.
 - f. Current goals include upgrades to clinical environments with several plans under consideration, depending on availability of resources. We anticipate that we will begin the much-needed facelift to clinical teaching/service delivery areas in late spring or early summer 2013.
2. Increase number of faculty and faculty salaries
 - a. The number of tenure-track faculty has increased from 10 to 15 since the last APR and this has allowed us to reduce teaching load to a more reasonable level, but some well-funded faculty are still carrying a greater teaching load than is ideal.
 - b. Some progress was made to improve salaries in that the most recent hires were given competitive salaries, however, little was done to raise the salaries of existing faculty, and very little money has been available for annual salary increases or merit raises. A proposal was presented to the Dean of the College of Science by the current Department Head prior to the start of the current fiscal year (2012-13) to increase salaries for about half of the tenure-track faculty. The proposed raises were simply to address salary inequities within the current faculty, and did not attempt to match peer institutions or comparison departments, which will be examined in this report. A commitment was made to increase the targeted salaries as requested for tenure-track faculty starting 2013-2014, and department funds were allocated to cover the 2012-2013 salary increases for the current year so that raises could be granted in July 2012. In other words, department funds were used on a one-year basis to adjust some tenure-track salaries, with the dean's commitment to maintain the increases starting July 2013.
 3. Improve infrastructure (e.g., for equipment and IT support)
 - a. Within the past several years, the increase in the department revenue stream from grants and contracts, coupled with more successful business management of the clinics, has provided increased funds for general material needs. Within the past year, nearly all of the clinical faculty and support staff had their computers refreshed, and faculty and staff understand that the Department has the available funds to meet such basic needs.
 - b. Our IT support is now provided through a centralized unit in the school of Mind, Brain, and Behavior. Overall, this is an improved infrastructure offering a wider range of expertise. The adequacy of IT support depends on the personnel assigned to our department, and this has varied over time as personnel have changed. There is room for improvement in this area.
 4. Replace interim Dept Head with committed Dept Head
 - a. The Interim Department Head (Plante) became Department Head soon after the last APR.
 - b. Leadership was strong and at the end of her 5-year commitment, the transition to a new Department Head (Beeson) went smoothly in May 2011.
 5. Strengthen strategic plan
 - a. As reviewed in this document, the Department developed a strategic plan that was successful in advancing the size and strength of the research faculty.

- b. The current strategic plan aims to maintain the positive changes and advance the Department in targeted areas.
- 6. Clarify revenue streams that undermine incentive to generate income
 - a. Over the course of 7 years, the department's financial operations were overhauled, leading to a more financially stable and self-sustaining clinical program. As a result, clinical operations are no longer dependent upon research-related revenue. This has allowed for the accumulation of indirect cost revenue from extramural funding that can be invested in research needs. The clinic has also benefitted from the generation of revenue that has been used to better support operations, to update equipment, supplies, and will be used to make needed improvements in the physical clinic environment in the coming year.
 - b. Hiring a Business Manager in Fall 2011 greatly improved the efficiency and transparency in the management of department funds and allows the Department Head to identify, monitor, evaluate, and reinvest revenue back into the Department. This has allowed allocation of modest support for travel during the past year, which had not been done for more than 7 years.
- 7. Clinical faculty salaries are significantly lower (>10%) than salaries for comparable speech-language pathologists and audiologists in the community (including Arizona State University), resulting in difficult recruitment and retention.
 - a. Some progress was made in this area in that the lowest salaries were raised to more appropriate levels. Unfortunately, current salaries are still below those in the community and peer institution within the state. The model for funding clinical faculty salaries was changed in 2006, increasing state funding of clinical salaries to 50% with the expectation that clinical revenues would cover the remaining 50%.
 - b. In June 2012, an effort was made to address the low salaries of clinical faculty with the greatest longevity. A proposal was put to our dean to share the cost of salary increases for about half of the clinical faculty. The commitment to support clinical faculty salaries increases was not made, so department funds were committed to allocate 50% of the amount of the proposed raises. This effort helped to begin to alleviate the most notable salary inequities as of July 1, 2012, and continued efforts are warranted to address this issue.
- 8. Improved alignment of clinical and didactic programming
 - a. It is always a challenge to align the content taught in classes with the clinical teaching, so we have taken a number of actions to continue to promote interaction and consistency between teaching and clinical faculty.
 - b. The electronic course management system at the University of Arizona called D2L allows guest members for courses, so clinical faculty are guests on any and all relevant courses. This allows clinical faculty to follow the course material and readings as desired for classes that relate to their clinical area, to see the syllabus so that they can attend relevant classes on occasion.
 - c. At the graduate level, the first clinical experience is associated with a class that addresses broad clinical issues and includes lectures from clinical and tenure-track faculty. The D2L website for these courses is shared across the relevant clinical and tenure-track faculty.
 - d. Another interesting means of improving clinical alignment has emerged as in the context of clinical research conducted by tenure-track faculty (e.g., child language, adult aphasia). Some graduate students participate in supervised clinical training in the context of treatment research, offering a natural bridge between clinic and research activities. Informal

communication and formal presentations occur that allow for a dynamic flow of information between clinical and research faculty, and thus naturally improves the alignment between clinic and teaching.

9. Improve relations with medical school (disadvantaged by loss of ENT program)
 - a. This is another area of marked improvement. The otolaryngology (ENT) division of the Department of Surgery was re-established in 2010 at the University of Arizona Medical Center (UAMC), and an audiology program was re-opened in 2012. Our faculty played a major consultative role in helping to equip the clinic and hire the first audiologist. We now have graduate students who work as medical scribes with ENT faculty (2 each year).
 - b. In 2008, our clinical faculty (Faux) joined the ALS evaluation team at the University Medical Center South Campus (UAMC-South). Students receive training in this multi-disciplinary evaluation team conducted once a month.
 - c. In 2010, we established a contract to provide in-patient pediatric dysphagia services in the neonatal ward at UAMC. Our clinical faculty (Casteix) provides the services and supervises graduate students in that context.
 - d. In 2011, our Department facilitated the re-establishment of outpatient speech-language pathology services at the University of Arizona Medical Center (UAMC), albeit on a small scale (up to 12 hours per week). Services are provided through a contract with our Department and the Rehabilitation Department at UAMC. To date this involves services for individuals with voice disorders, dysphagia, laryngectomy, and aphasia. We have excellent relations with the Departments of ENT, Neurology, and Rehabilitation. Our incoming faculty member in voice, Samlan, already has clinical collaborations with faculty in the ENT Department, with plans for research collaboration when she begins Fall 2013.

D. OVERVIEW OF ACADEMIC QUALITY OF THE DEPARTMENT OF SPEECH, LANGUAGE, AND HEARING SCIENCES

D. 1.a. Resource Indicators

Our Department is remarkably strong and includes leading researchers in each of our focused areas of speech, language, and hearing. The faculty is relatively small (14 tenure-track positions), but highly productive group of researchers and exceptionally strong teaching skills. We highlight here indicators of quality that are reviewed in greater detail in later sections and the faculty biosketches (**Appendix Q**):

- Faculty prestige and honors
 - The University of Arizona SLHS Department emerged as a national leader in the fields of speech-language pathology and audiology in the 1970's and has retained the distinction since that time.
 - The graduate program in Speech-Language Pathology has been ranked as 5th in the nation for the past seven years by *U.S. News and World Report*.
 - The graduate program in Audiology has been ranked from 8th to 12th in the nation by *U.S. News and World Report*.
 - All four of the senior faculty members have been named Fellows of the American Speech-Language-Hearing Association (Beeson, Cone, Hoit, and Plante), and Associate Professor, Brad Story, is Fellow of the Acoustical Society of America.
 - Two faculty are College of Science Galileo Circle Fellows (Plante, Story)
 - Nearly 80% of our research faculty have federally funded research, and 93% have funding of some sort (industry awards; University awards).

- The grant portfolio in 2012 totaled \$14 million (direct and indirect costs for all active grants), with annual grant expenditures exceeding \$3 million dollars (**TABLE D.1. & APPENDIX A**).
- Five of our senior/mid-career faculty were selected to serve as standing members on study sections for grant peer-review for the National Institutes of Health.
- High quality teaching is the standard in our department with the average overall teacher effectiveness rating from students at 4.4 out of 5 over the past seven years.
- Faculty productivity is consistent with an average of 2 – 3 high quality, peer-reviewed journal articles each year.
- Our faculty author two widely used textbooks in our profession (Plante & Beeson; Hoit).
- Teaching and mentoring awards are common for our faculty.
- Student interest and quality
 - Our undergraduate enrollment has grown dramatically over the past 7 years from about 150 students in 2005-06 to 350 students in 2011-12.
 - Graduate applications to the M.S. program in Speech-Language Pathology exceed the number of available admissions slots by ten-fold (250 applications for 25 positions), and well-qualified students remained on the waiting list.
 - The doctoral program in audiology that replaced the clinical MS degree in Audiology in 2004 has grown from 19 to 33 students.
 - Our graduate students in Speech-Language Pathology and Audiology consistently pass the national certification examination (PRAXIS exam) with scores that are well above the national average (see **TABLE I.19. and TABLE I.21.**).
 - Graduate student employment in desired positions after program completion is reported at 100%.
 - Six pre-doctoral students have successfully competed for NIH pre-doctoral research fellowships (NIH/NRSA F31 awards) that launched their externally funded research careers, and two received post-doctoral fellowships (NIH/NRSA F32 awards)
- Service and Outreach
 - Our faculty maintains high levels of professional service in our field, including journal editor and associate editor roles, editorial board membership, along with consistent active ad hoc reviewing for high quality journals.
 - Nearly all faculty are active ad-hoc reviewers for granting agencies including NIH, Veteran’s administration, American Speech-Language-Hearing Foundation, and other funding sources.
 - Our faculty provide leadership and service to national committees to promote research training and to establish evidence-based practice guidelines.
 - Outreach to the local community is an exceptional strength of this department. In addition to service delivery to individuals with communication disorders in our speech, language, and hearing clinics, we consistently provide education to the professional and lay community in the form of workshops and lectures.
 - Between 6 to 10 major educational events were presented each of the past 7 years, engaging an average of 280 participants per year earning at least 70 CEU units, and totaling 2250 participants earning 555 CEUs. Many of the events were provided at no cost to the participants.

D1.b. Reputational Indicators and Comparison with other Top Programs

U.S. News and World Report first began rating graduate programs in communication disorders in 1998. Our programs have received top rankings every year since the ratings began. Specifically, our Speech-Language Pathology graduate program was initially ranked 5th in the nation. We retained that rank until 2001, when we were ranked 6th, and then moved back to 5th again in 2009 where we have remained. In

2012, our Speech-Language Pathology graduate program was 5th out of 237 programs in the U.S.; this rank was retained in the recent 2013 publication.

The audiology graduate program was first ranked as 6th in the nation, moving to 8th in 2005, 9th in 2009. In 2012, the audiology program was ranked 9th out of 68 programs. The newest ranking for 2013 placed the audiology program at 12th. Clearly these are excellent ratings and we benefit from the strong national reputation when we recruit graduate students, as well as when we recruit new faculty members.

The true differences in top-ranked programs are probably minimal, an impression that is confirmed when reviewing the array of strong programs in the top 15. We do pay attention, however, to the decline in the perceived strength of the Audiology program over the past 7 years, and this motivates some of our plans for improvement.

D.1.c. Outcome indicators

One of the best indicators of faculty productivity is consistent success obtaining external research funding. **TABLE D.1.** contains grant expenditures over the past 7 years, showing that annual grant revenue increased more than three-fold during this period, from one million to over three million dollars. The revenue per faculty FTE more than doubled over this time.

Other evidence of faculty scholarly productivity, awards and honors, research contributions, teaching performance, and service to state and nation are included in Section E. Student outcome indicators are summarized below and included in Section H for undergraduates and Section I for graduate students.

TABLE D.1. Speech, Language, and Hearing Sciences Research Grant Revenue by Year

	Fiscal Year						
	FY 06	FY 07	FY 08	FY 09	FY 10	FY 11	FY 12
Research Grant Expenditures	1,057,390	1,122,307	1,574,219	1,827,185	2,001,317	2,371,817	3,224,714
Faculty FTE	10	13	13	11	12	15	14
Revenue/FTE	\$105,739	\$86,331	\$121,094	\$166,108	\$166,776	\$158,121	\$230,337

D.2. Comparison to Top 5 Public Institutions

For purposes of comparison, we selected the top-ranked public institutions that are strong in both Speech-Language Pathology and Audiology (See **TABLE D.2**). To collect sources of information regarding strength and productivity, we consulted the American Speech-Language-Hearing Association EdFind website (www.asha.org/edfind/) which provides information on degree programs in both speech-language pathology and audiology. This site provides reported information about the students admitted to the programs, and thus is an indirect index of the reputational strength (See **TABLE D.3**).

We also searched other on-line sources hoping to find central repositories for other indicators of faculty productivity, including the Council of Academic Programs in Communication Disorders and Sciences www.capcsd.org and the National Research Council (NRC) database on graduate programs. The latter (NRC) does not consistently solicit information from speech-language pathology and audiology programs.

Top programs are identified separately for Speech-Language Pathology and for Audiology, although some programs are strong in both fields. The 2013 *U.S. News and World Report* rankings listed below, with the comparison schools indicated:

TABLE D.2. Top-Ranked Programs in Speech-Language Pathology and Audiology

Speech-Language Pathology		Audiology	
Rank	Program	Rank	Program
1.	University of Iowa*	1.	Vanderbilt University – private
2.	University of Wisconsin – Madison	2.	University of Iowa*
3.	University of Washington*	3.	University of North Carolina*
3.	Vanderbilt University – private	3.	University of Texas – Dallas
5.	University of Arizona	3.	University of Washington*
5.	Northwestern University – private	3.	Washington University in St. Louis - private
5.	Purdue University - private	:	
8.	University of Kansas*	:	
9.	University of Pittsburgh	12.	University of Arizona

* public institutions selected for comparison

TABLES D.3-5 provide information regarding admissions to top graduate programs for Speech-Language Pathology (SLP), Audiology (AuD), and PhD programs. These data provide an index of the high level of interest in our graduate program, as well as the selectivity of our admissions. The target size of our master’s SLP program is 50, which is a bit smaller than others in our comparison group, and the credentials of our cohort were stronger than most. For example, the average GRE verbal reasoning score of our admitted students was higher than the comparison programs (at the 89%ile). Our AuD program is also smaller than comparison programs, and the credentials of our admitted students are comparable to other programs. With regard to the number of PhD students, our program appears to be in the mid-range relative to other top programs.

TABLE D.3. Master’s Degree in Speech-Language Pathology (SLP) 2012 Admissions Data

	University of Iowa	Univ. of Wisconsin-Madison	University of Washington	University of Kansas	Univ. North Carolina	University of Arizona
Applications Received	184	277	341	151	341	248
Admissions offers	45	26	62	61	44	55
Offers w/ Funding	6	2	38	9	12	12
Newly Enrolled	24	26	42	30	27	25
Total Enrollment	54	56	84	62	64	49
Degrees Granted	30	24	42	31	24	21
Characteristics of Admitted Students						
Mean GPA		3.72	3.86	3.73*	3.60	3.83
GRE Verbal Reasoning	not posted	152.5 59%ile	157 76%ile	153 62%ile	155.5 70.5%ile	161.0 89%ile
GRE Quantitative Reasoning	not posted	147 40%ile	150 53%ile	150 50%ile	152 61%ile	153.5 66%ile
GRE Analytical Writing	—	4.5 72%ile	4.5 72%ile	4.0 48%ile	4.0-4.5 48-72%ile	4.0-5.0 48-87%ile

Data from the American Speech-Language-Hearing Association EdFind website reflecting self-reported data from 2012.

TABLE D.4. Clinical Doctorate in Audiology (AuD) 2012 Admissions Data

	University of Iowa	Univ. of Wisconsin-Madison	University of Washington	University of Kansas	Univ. North Carolina	University of Arizona
Applications Received	51	49	89	43	95	61
Admissions offers	18	30	37	32	14	33
Offers w/ Funding	3	5	3	—	8	7
Newly Enrolled	8	14	12	7	8	11
Total Enrollment	25	40	51	30	33	31
Degrees Granted	5	10	8	9	8	4
Characteristics of Admitted Students						
Mean GPA	not posted	not posted	3.69	3.73*	3.60	3.59
GRE Verbal Reasoning	not posted	not posted	154 64%ile	153 62%ile	155 69%ile	155.5 70.5%ile
GRE Quantitative Reasoning	not posted	not posted	160 86%ile	150 50%ile	153 65%ile	151.5 58.5%ile
GRE Analytical Writing	—	not posted	4.0 48%ile	4.0 48%ile	4.0-4.5 48-72%ile	4.0-4.5 48-72%ile

TABLE D.5. Research Doctoral Degree (Doctor of Philosophy) PhD 2012 Admissions Data

	University of Iowa	Univ. of Wisconsin-Madison	University of Washington	University of Kansas	Univ. North Carolina	University of Arizona
Applications Received	15	12	10	13	5	10
Admissions offers	3	1	0	6	2	4
Offers w/ Funding	3	n/a	n/a	3	1	4
Newly Enrolled	3	1	1	7	1	3
Total Enrollment	23	23	1	17	11	13
Degrees Granted	5	0	0	2	3	1

A review of the top programs in our field was also conducted to examine the size and composition of the faculty. **TABLE D.6** shows these data for the University of Arizona and ten other top-ranked programs. The numbers were tabulated from posted information on respective program websites (with some information clarified directly with other Department Heads). Every effort was made to distinguish tenure-track lines from clinical or research scientist lines, so that non-tenure track Assistant/Associate Professors were not included with tenure-track faculty totals. Clinical faculty totals included those with Clinical Professor and Clinical Instructor titles, as well as non-tenure-track Assistant/Associate Professors with primarily clinical responsibilities.

TABLE D.6. Faculty distribution across rank/title at top-ranked programs in Speech-Language Pathology (SLP) and Audiology (AuD) with rank indicated

Institution Rank SLP; AuD	Prof.	Asso. Prof.	Asst. Prof.	Total TT Faculty	Clinical Faculty	Lecturer	Research Scientist	Adjunct Faculty	Other	Sum
U of Arizona SLP-5; AuD-12	4	5	5	14	11	2	.5		0.5	28
U of Iowa SLP-1; AuD-2	12	5	4	21	11			2		34
U of Wisconsin SLP-; AuD-21	9	4	2	15	12				1	28
U of Wash SLP-3; AuD-3	6	2	7	15	13	6	2			36
Vanderbilt SLP-3; AuD-1	11	8	12	31	3		4	1		39
Northwestern SLP-5; AuD- 8	7	8	4	19	16		1			36
Purdue U SLP-5; AuD-12	9	7	2	18	13					31
U of Kansas SLP-8; AuD-10	6	5	4	15	12					27
U Pittsburg SLP-8; AuD-8	3	4	2	9	11	1		1		22
UNC SLP-11; AuD-3	8	4	0	12	9					21
UT Dallas SLP-11; AuD-3	12	2	3	17	14		0			31
2012 Average	8.0	5.3	4.5	17.8	10.7	4.0	1.6	1.3	0.8	30.3

Our tenure-track faculty is small by comparison with other top programs, with 14 tenure-track faculty and only 4 full professors compared to an average of 17.8 tenure-track faculty with 8 full professors. Our clinical faculty cohort appears consistent with most programs (11 compared to an average of 10.7). The estimated number of faculty in other roles (e.g., lecturer, adjunct, research scientist) may be somewhat unreliable due to inconsistency in how such personnel are represented, but was included to estimate overall faculty size. Our total of 28 faculty members was slightly below the 30.3 average.

E. FACULTY

Our current faculty are listed below with rank, primary area of research, and teaching shown. Several faculty were Lecturers or Research Scientists in the Department before becoming tenure-track (TT).

TABLE E.1. Current Speech, Language, and Hearing Sciences Department Tenure-Track Faculty

Tenure-Track Faculty	Hire Date	FTE	Rank	General Area	Teaching SLHS Course Number & Name
Alt, Mary Ph.D., CCC-SLP	8/4/03 Lecturer 8/10/06 TT	1.00	Associate Professor	Child Language Development & Disorders	495a/595a Current Problems in SLHS 441/541 Language Acquisition 555 Dev Language Disorders
Beeson, Pélagie M. Ph.D., CCC-SLP	8/10/91 Res Sci 8/6/01 TT	1.00	Professor/ Dept Head	Adult Language & Disorders	207 Survey Human Comm & Disorders 544 Adult Language Disorders I
Bunton, Kate Ph.D., CCC-SLP	7/31/06 Lecturer 1/20/10 TT	1.00	Associate Professor	Speech Science & Disorders	471/571 Speech Sound Disorders 477 Communication Disorders I 572 Speech Disorders I 574 Speech Disorders II
Cone, Barbara Ph.D., CCC-Aud	4/1/01	1.00	Professor	Auditory Development	477 Communication Disorders I 582 Hearing & Balance Disorders 588C Eval of Auditory Processing 596G Cochlear Implants
Dai, Haunping Ph.D.	8/13/07	1.00	Associate Professor	Hearing Science	380 Hearing Science 562B Psychophysical Acoustics 581A Hearing Aids
DeDe, Gayle Ph.D., CCC-SLP	12/31/07	1.00	Assistant Professor	Adult Language & Disorders	362 Neurobiology of Communication 543 Adult Language Disorders II
Fabiano-Smith, Leah Ph.D., CCC-SLP	8/16/10	1.00	Assistant Professor	Phonology & Bilingual Issues	435/535 Bilingual/Multicultural Issues 473 Communication Disorders II
Hoit, Jeannette D. Ph.D., CCC-SLP	8/12/96	1.00	Professor	Speech Science & Disorders	501 Professional Issues in SLHS 567 Preclinical Speech Science 575 Neuromotor Speech Disorders 649 Survival Skills & Ethics
Lotto, Andrew Ph.D.	7/3/06	1.00	Associate Professor	Auditory Cog Neuroscience	263 World of Music: Speech, Music & MP3s 270 Scientific Thinking in SLHS
Maas, Edwin Ph.D.	1/4/10	1.00	Assistant Professor	Speech Production	367 Phonetics 500 Intro to Research Methods SLHS
Marrone, Nicole Ph.D., CCC-Aud	1/3/11	1.00	Assistant Professor	Hearing Science, Disorders, & Rehab	380 Hearing Science 454/554 Audiologic Rehab: Lifespan 581B Auditory Prosthetics II
Plante, Elena Ph.D., CCC-SLP	8/10/92 Res. Sci. 8/9/99 TT	1.00	Professor	Language Science & Disorders	512 Evaluation Process in SLP 552 School Age Language Disorders 696a Topics in SLHS
Story, Brad Ph.D.	8/7/00	1.00	Associate Professor/ Assoc Head	Speech Science	261 Anatomy & Physio of Spch Mech 565 Acoustics in SH Sciences 568 Speech Perception 567 Preclinical Speech Science
Wilson, Stephen Ph.D.	8/16/10	1.00	Assistant Professor	Lang Science & Disorders	340 Language Science 430/530 Cog Neuroscience of Lang

TABLE E.2. SLHS Senior Lecturers and Research Scientist

Tenure-Track Faculty	Hire Date	FTE	Rank	General Area	Teaching SLHS Course Number & Name
Dean, James AuD, CCC-AUD	1999- 2001 Rehired 8/17/09	1.00	Senior Lecturer	Audiology; pediatric audiology.	255 Hearing, Health, and Society 267 Acoustics in SH Sciences 586 Pediatric Audiology 559/659 Clinical Studies-Aud
Velenovsky, David PhD, CCC-AUD	2/11/08	1.00	Senior Lecturer	Audiology; Tinnitus; Electrophysiology; Vestibular function.	483r/583r Principles of Audiology 588a/I Physiol Eval Aud System 588b Assessmt & Rehab of Balance 589r Advanced Audiologic Eval 596m Tinnitus 795a Clinical Issues in Audiology
Christensen, Thomas PhD	1/1/99 Neurosci 08/01/12 SLHS	0.50	Senior Research Scientist	Neural substrates of language, memory, cognition.	no teaching

TABLE E.3. SLHS Clinical Faculty in Audiology

Clinical Faculty Audiology	Hire Date	FTE	Rank	Clinical Specialty	Teaching
Harris, Frances P. PhD, CCC-Aud	8/9/1999	1.0	Clinical Assistant Professor (AUD)	Adult audiology; audiologic rehabilitation.	589R Adv. Aud. Assessment 562a Anat and Physio of Auditory & Vestibular Systems 596I Business Aspects of Aud 921 Audiology Externship
Muller, Thomas AuD, CCC-Aud	1/1/1999	1.0	Clinical Associate Professor (AUD)	Adult audiology; amplification; cochlear implants; hearing conserv.	496a Adv. Clin Observation & Writing 559/659 Clinical Studies-Aud 587 Lab in Aud Prosthetics 597J Practice Management 795a Clinical Issues in Aud
Norrix, Linda PhD, CCC-Aud	4/29/2002	1.0	Clinical Assistant Professor (AUD)	Pediatric aud; electrophys assessmt; auditory processing dis.	795a Clinical Issues in Audiology
Peterson, Julie AuD, CCC-Aud	1/1/2010	0.90	Clinical Instructor (AUD)	Pediatric aud; amplification & assistive tech.	496a Advanced Clinical Observation, Analysis, and Writing

TABLE E.4. SLHS Clinical Faculty in Speech-Language Pathology

SLP Main Campus	Hire Date	FTE	Rank	Clinical Specialty	Teaching
Casteix, Jennifer MS, CCC-SLP	3/13/2006	1.0	Clinical Assistant Professor (SLP)	Pediatric comm. disorders; neurodev. disorders	511 Tool School 558/658 Clinical Studies-SLP
Faux Muller, Cass MS, CCC-SLP	1/4/1999	1.0	Clinical Associate Professor (SLP)	Pediatric communication disorders; neurogenic comm. disorders	511 Tool School 558/658 Clinical Studies-SLP
Hawley, Janet MS, CCC-SLP	9/24/2001	1.0	Clinical Assistant Professor (SLP)	Adult comm. disorders; aphasia; accent reduction; fluency	496a Adv. Clinical Observation & Writing 511 Tool School 558/658 Clinical Studies-SLP
McGrath, Kathe MS, CCC-SLP	5/25/2009	0.80	Clinical Assistant Professor (SLP)	Pediatric comm. disorders; neurodev dis.	511 Tool School 558/658 Clinical Studies-SLP
Wymer, Carole MS, CCC-SLP	7/1/2008	1.0	Clinical Assistant Professor (SLP)	Pediatric comm. disorders; specific language imp; AAC. Child disfluency	511 Tool School 558/658 Clinical Studies-SLP
SLP Faculty Wings on Words Preschool					
Cuzner, Lea MS, CCC-SLP	4/1/2001	0.75	Clinical Assistant Professor (SLP)	Pediatric comm. disorders; bilingual; early intervention; cochlear implant.	511 Tool School 558/658 Clinical Studies-SLP
Kaplan, Tracy MS, CCC-SLP	1/4/2010	0.75	Clinical Assistant Professor (SLP)	Pediatric comm. disorders; early intervention; ped. dysphagia.	511 Tool School 558/658 Clinical Studies-SLP
Kiernan, Barbara PhD	7/1/1999	0.5	Director, Child Language Center	Pediatric comm disorders; specific lang impairment.	399/499 Independent Studies

E.1. Research and Scholarly Contributions

E.1.a. Overview of Research and Scholarly Contributions

We have an exceptionally strong faculty that is highly productive in research and scholarly contributions to the field. As a group, our faculty address broad-ranging and diverse areas of speech, language, and hearing and associated disorders, and there is dynamic overlap in a number of areas. In reviewing the collective research within the Department, the boundaries that define speech, language, and hearing naturally blur as evidenced by collaborations across research labs. Here, we briefly highlight the work of our tenure-track faculty and the areas of expertise for which the University of Arizona Speech, Language, and Hearing Sciences Department (SLHS) is best known.

The study of language development and language disorders has always been a strength of the University of Arizona SLHS. **Professor Elena Plante** is a world leader in the study of the neurobiology of language and its relation to developmental language disorders. Her work has informed understanding of the neural basis of specific language impairment, as well as examining treatment paradigms for children with specific language impairment. Her work is complemented by that of **Associate Professor Mary Alt**, who conducts research regarding early language learning, with a particular emphasis on the development of conceptual knowledge that supports language development in young children.

Assistant Professor Leah Fabiano-Smith focuses on the development of sound systems in young children, and she is an emerging leader in the study of bilingual speech and language development.

Assistant Professor Edwin Maas, who has a background in neurolinguistics, focuses his research on the phonological and planning aspects of speech production, and examines motor learning in the context of children with developmental apraxia of speech.

In the area of adult language, **Professor Pélégie Beeson** is a major contributor to the study of written language and the acquired impairments of reading and spelling after brain damage. Her work in the development of evidence-based practice in aphasia rehabilitation is internationally recognized.

Assistant Professor Gayle DeDe conducts research that focuses on the comprehension of spoken and written language at the sentence level. Her theoretical perspective is informed by the study of language impairments in adults, specifically those with aphasia due to stroke, using novel online methodology.

Assistant Professor Stephen Wilson, whose background is in linguistics and cognitive neuroscience, is an emerging leader in neuroimaging and its application to the study of the cognitive processes and neural substrates of language. His expertise in the study of progressive aphasia is complemented by his current research on language recovery in acute stroke using multimodal imaging techniques.

The University of Arizona has a long tradition of leadership in speech science that has continued to increase the depth and breadth of research regarding the speech mechanism. **Professor Jeannette Hoit** has long been a leader in the area of speech physiology. Her current work includes studies of speech production from a developmental perspective, as well as examining the consequence of impairments of respiration and motor control on speech. **Associate Professor Brad Story**, who came to the field from engineering, receives international recognition for his computational model of the mechanics, physiology, and acoustics of human sound production. His innovative work provides a means to model not only normal speech production, but disorders as well. **Associate Professor Kate Bunton** conducts research regarding speech development and speech disorders provides foundational knowledge as well as informs clinical treatment programs to improve speech intelligibility. Story, Hoit, and Bunton also examine the acoustic representation of speech, a point of overlap with the work of **Associate Professor Andrew Lotto**, an international expert in the area of auditory cognitive neuroscience. Dr. Lotto is a key contributor to the literature on speech perception with a focus on integrating research across hearing, speech production, linguistics, cognitive science, and neuroscience.

In the auditory domain, **Professor Barbara Cone** has led the field in the use of electrophysiological measures, otoacoustic emissions tests, and behavioral methods to understand the auditory perceptual abilities of infants and children. Her work has contributed to the development of testing methods that can be used clinically. At the other end of the lifespan, **Assistant Professor Nicole Marrone** examines amplification for hearing impaired adults and issues related to hearing in noise. The clinical application of her work relates to maximizing listening skills in hearing aid users. **Associate Professor Huanping Dai**, an engineer by training, develops computational models that can predict listener performance in auditory perceptual tasks. This work has great potential for eventual application to individualized processing strategies for hearing aids.

In sum, the UA SLHS Department is a national center of excellence in several areas: the neurobiology of language and neurogenic communication disorders, speech science and speech disorders, auditory cognitive neuroscience, pediatric auditory electrophysiology, and audiologic rehabilitation. Emerging areas of strength include bilingual aspects in speech/language development, and treatment approaches for apraxia of speech.

E.1.b. Summary of Publications and Grant Funding

TABLE E.5. includes a summary of publications and professional presentations that provide an index of productivity. (A detailed list of the many significant scholarly and research contributions is included in the individual biosketches in **APPENDIX Q**). It is evident that publication and presentation rates have been uniformly high over the past 7 years. Most of the work reported here was supported by federally funded grants, so the peer-review of our work reflects both the publication process as well as rigorous grant reviews.

TABLE E.5. SLHS Tenure-Track Faculty Productivity Indicators (FY) 2006-2012

Activity	FY 05/06	FY 06/07	FY 07/08	FY 08/09	FY 09/10	FY 10/11	FY 11/12	7 yr. Avg
Peer-Reviewed Articles	38	28	34	29	33	32	31	32.1
Chapters	4	4	9	5	2	4	3	4.4
Books (authored or edited)	0	0	3	0	1	1	4	1.3
Articles/FTE	3.8	2.2	2.6	2.6	2.8	2.1	2.2	2.6
Articles+Chapters+Books/FTE	4.2	2.5	3.5	3.1	3.0	2.5	2.7	3.1
Conference Presentations	42	24	45	56	53	57	62	48.4
Invited Talks/Workshops	17	17	31	27	37	24	25	25.4
Presentations+Talks+Workshops/FTE	6	3	6	8	8	5	6	5.9
SLHS Tenure- Track Faculty FTE	10	13	13	11	12	15	14	12.6

Most of our senior and mid-career faculty have developed strong lines of continuously funded research. **TABLE E.6.** shows the overall grant portfolio of the SLHS Department for 2012. This reflects the sum of direct and indirect costs associated with all active grants, and totals over \$14 million dollars. A detailed list of the grant awards, principal investigators, and funding sources is included in **APPENDIX A**.

TABLE E.7. provides a comparison of federal research grants funds reported by the top programs in Speech-Language Pathology and Audiology on the Higher Education Survey (HES). Funding for the University of Arizona is so much higher than the other programs that it calls into question whether some programs reported only direct costs, whereas we reported full award totals. Our direct cost grant funding was \$6.4 million at the time of the survey, which still proves to be exceptionally strong.

We also examined our level of funding relative to two comparison departments in the College of Science, Psychology and Neuroscience. **TABLE E.8.** shows the annual expenditures from grant funds for the 2011-12 fiscal year for the three departments, as reported by the UA College of Science. The SLHS expenditures from grants of \$3.2 million dollars was greater than the total for the Department of Psychology, which has a tenure-track faculty twice the size of SLHS (28 vs. 14). The SLHS grant expenditures were also greater than the Department of Neuroscience, which has 8 faculty members. **TABLE E.8** also shows that the grant expenditures per faculty FTE in SLHS are twice that of the Department of Psychology, and 30% greater than the Department of Neuroscience.

TABLE E.6. Summary of 2012 Grant funding in SLHS (total grant portfolio)

	Research Grants NIH and NSF	Career Development Awards NIH	NIH Training Grants	State/ University/ Industry	Total External Grant Portfolio
	4 NIH R01s 4 NIH R01 subcontracts 2 DHHS R01 subcontracts 2 NSF Research grants 1 Dept of Ed grant 1 R03	1 NIH K01 1 NIH K23 1 NIH K24	1 NIH T-32 1 NIH T-35 sub	1 State of AZ 2 UA grants 1 Industry	
Total Award Amount	\$10,664,810	\$2,250,465	\$952,630	401,297	\$14,269,202

See detailed grant list in Appendix A. Sub = subcontract.

TABLE E.7. Federal Research Grant Funding reported for 2012*

	University of Iowa	Univ. of Wisconsin- Madison	University of Washington	University of Kansas	Univ. North Carolina	University of Arizona
Number of Grants	17	not listed	25	19	none listed	14
Total dollar amount	\$5,596,708	\$4,000,000	\$2,400,000	\$3,035,500	none listed	\$9,632,579

*data from EdFind <http://www.asha.org/edfind/> U of Wisconsin total obtained directly from dept.

TABLE E.8. Comparison of Annual Grant Expenditures to other UA College of Science Units (2011-12)*

Department	UA SLHS	UA Psychology	UA Neuroscience
Grant Award Revenue	\$3,224,714	\$3,192,081	\$1,340,983
Research Faculty FTE	14	28	8
Revenue/Faculty FTE	\$230,337	\$114,248	\$167,623

*data provided by UA College of Science

E.2. Participation, Leadership, and Influence

The SLHS faculty are actively involved our professional organizations, and many of our faculty play prominent leadership roles in the field as a whole, as well as significant contributions on local, national, and international fronts. The biosketches in **APPENDIX Q** provide information about individual faculty, which are highlighted here:

Grant Review Panels

All of the senior faculty have served, or are currently serving, as regular members on the National Institutes of Health Scientific review panels in our fields.

- NIH Biobehavioral and Behavioral Processes (BBBBP-7) Study Section – Hoit 1999-2002, 2002-03
- NIH Language and Communication (LCOM) Study Section – Beeson 2006-2011
- NIH Language and Communication (LCOM) Study Section – Plante 2012 - current
- NIH Motor Function, Speech, and Rehabilitation Study Section – Story 2012-current
- NIH Cognition & Perception (CP) Study Section (Associate Chair) – Lotto 2011-current

Our funded faculty routinely serve as grant reviewers for the NIH Communication Disorders Review Committee, NIH Special Emphasis Panels, R03 and NRSA Fellowship Grants, NIH Challenge Grants, and other Ad Hoc reviews. Junior faculty also provide reviews for the American Speech-Language Foundation grants, VA grants, and associations such as Childhood Apraxia of Speech Association of North America.

National Committee Service

- Chair, ASHA Special Interest Division Chair, Neurologic Communication Disorders and Sciences: Beeson, 1996-98
- ASHA SIG 6 Hearing Science and Research, Steering Committee: Cone, 2005-2012
- Founder/Organizer of annual meeting of the Auditory Cognitive Neuroscience Society: Lotto
- ASHA Research and Scientific Affairs Committee: Plante
- Lessons for Success Program Committee for ASHA (Grant Training) - Plante
- ASHA Publications Board: Hoit, 2005-2007
- NIH National Program for Teaching Survival Skills and Ethics: Hoit
- Chair, Evidence-Based Practice Committee in Aphasia for Academy of Neurologic Communication Disorders and Sciences: Beeson
- Technical Committee for Musical Acoustics, Acoustical Society of America: Story, 2008-current
- Speech Communication Technical Committee, Acoustical Society of America: Bunton, 2008-present
- Speech Communication Technical Committee, Acoustical Society of America: Lotto
- Psychological and Physiological Technical Committee, Acoustical Society of America: Marrone, 2010-13

Editorial positions on professional journals and monograph series

- Editor, *American Journal of Speech-Language, Pathology*, Hoit, 2005-07
- Associate Editor, *American Journal of Speech-Language, Pathology*, Hoit, 2001-04
- Associate Editor, *Seminars in Speech and Language*, Hoit, 2010
- Associate Editor, *Journal of the Acoustical Society of America*, Story, 2005-09, 2001-current
- Editorial Board for *Cognition and Frontiers in Auditory Cognitive Neuroscience*, Lotto, current
- Editorial Board, *Journal of Communication Disorders*, Plante

- Associate Editor, *Journal of Speech, Language, and Hearing Research*, Cone, 2004-2008, Bunton, 2011-current
- Associate Editor: *Language, Speech, and Hearing Services in Schools* (Alt)
- Guest Associate Editors for *Language, Speech, and Hearing Services in the Schools* (Alt), *Journal of Speech, Language, and Hearing Research* (Bunton), *Aphasiology* (Beeson).

National Awards

- Fellows, American Speech-Language-Hearing Association: Beeson, Hoit, Plante, Cone
- Fellow, Acoustical Society of America: Story

University of Arizona Awards

- College of Science, Galileo Circle Fellows: Plante 2003, Story 2008
- College of Science, Distinguished Career Teaching Award: Beeson, 2012
- Outstanding Mentor of Graduate Students Award from the Graduate & Professional Student Association, University of Arizona: Beeson 2009, Lotto (Honorable Mention)
- 5-Star faculty award finalist Honor's College: Alt, 2010

Mentors

- Mentor, ASHA Mentoring for Academic Research Careers (MARC): Hoit, 2008
- Undergraduate Biology Research Program Mentors: Alt, Beeson, Maas, Fabiano-Smith, Plante
- Biomedical Research Abroad: Vistas Open (BRAVO) – Fabiano-Smith, Plante
- Summer Research Institute Mentor: Maas
- Undergrad Health Disparities Summer Research Program: Maas
- Arizona Assurance Scholar's Program: Alt, Beeson
- Minority Access to Research Careers: Alt, Beeson, Plante
- ASEMS: Arizona Science Engineering & Math Scholars: Maas

UA Committee Service

- UA Graduate Council: Cone, 2002-2007
- UA Student Grievance Committee: Hoit, 2011-present
- UA Responsible Conduct in Research Committee: Hoit, 2010-current
- UA ADVANCE: Hoit, 2007, Beeson, 2010
- Minority Access to Research Careers (MARC) Board: Plante, current
- Mind, Brain, and Behavior Executive Committee: Plante, 2010; Beeson, 2011-current
- Mind, Brain, and Behavior Research Committee: Lotto
- Mind, Brain, and Behavior IT Committee: Wilson
- UA Seed Grants Review: Hoit, Beeson

Community Leadership

- Board of Directors, Pima Council on Aging: Beeson. 2006-10
- AZ chapter of American Parkinson Disease Association Board of Directors: Bunton, 2003-09

E.3. Teaching

Classroom teaching in our Department is primarily done by our 14 tenure-track faculty, along with two senior lecturers. Clinical faculty have primary responsibility for teaching clinical practicum courses, but they also contribute in the classroom. Currently, the default teaching load in our Department for tenure-track faculty who are active in research and graduate training is 3 courses per year. This load is adjusted depending on the stage in rank and research productivity. Teaching load is typically reduced for new junior faculty, and for faculty who have more than one large externally funded grant, such as being principal investigator or co-investigator on more than one R01 grant. Faculty who are not actively engaged in productive research would be assigned a teaching load of 4 courses. Teaching load also adjusts to accommodate department needs due to sabbaticals or when a line is waiting to be filled.

Faculty members contribute to both undergraduate and graduate level teaching, typically teaching at least one class at each level. On average (over the past 7 years), faculty members have taught 2.7 courses per year. The Department Head negotiates the specific teaching load and assignments with each faculty member, but in general, faculty members volunteer to teach classes that are closest to their areas of interest. As expected, courses that cover broad content areas, such as Research Methods or Scientific Thinking, are more likely to shift to different instructors over time. Faculty are welcome to propose new courses or to reconfigure existing courses, with guidance and approval from the curriculum committee and the Department Head. New course proposals are brought to the faculty for approval prior to the university review process. Tenure-track faculty also teach graduate seminars that are designed to meet the educational needs of doctoral students, such as a focus on seminal readings in speech, language, or hearing, or other specific topics of interest (e.g., item-response theory in SLHS).

The quality of teaching in SLHS is exceptionally high. As shown in **TABLE E.9.**, the average TCE rating for the effectiveness of our faculty instructors across the past 7 years is 4.4. out of 5 for both undergraduate and graduate level classes. This compares to average ratings for the College of Science of 4.11 and 4.38 for undergraduate and graduate levels, respectively, which are also very good ratings.

TABLE E.9. Average Teacher and Course Evaluations for Undergraduate and Graduate Courses for SLHS and College of Science. Five-year average (2007-2012) with standard deviations.

	Undergraduate Students		Graduate Students	
	SLHS	Col of Science	SLHS	Col of Science
% students responding	73.2%	71.9%	89.4%	84.6%
Instructor teaching effectiveness	4.41 (.41) n=161	4.11 (.58) n=4081	4.41 (.51) n=192	4.36 (.49) n=796
Overall course rating	3.99 (.50) n=161	3.68 (.63) n=4081	3.96 (.63) n=192	4.01 (.56) n=796
Course difficulty level	3.49 (.46) n=121	3.74 (.53) n=3500	3.29 (.60) n=173	3.41 (.65) n=767

Scores on 5-point scale, with 5 the best. SLHS n = 160 class sections. College of Science n = 4091 class sections. Data provided by TCE office.

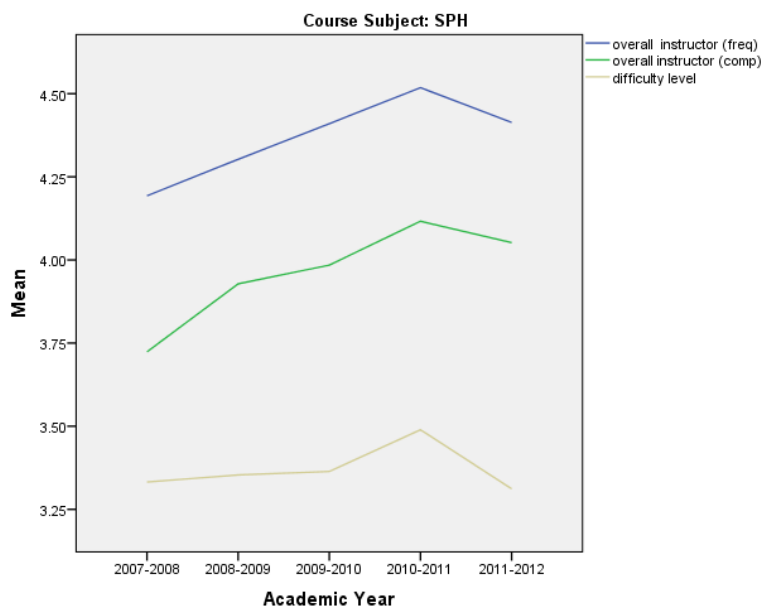


FIGURE E.1., SLHS Instructor Ratings over Time. These ratings, provided by the TCE office, shows that instructor ratings have improved in SLHS over the past 5 years, while course difficulty remained relatively constant. This upward slope is good to see during a time when we added 5 new junior faculty, and when class size was getting larger. It is consistent with the informal perception that the teaching standards are high within SLHS, and that even in class sizes of 100 – 150, teaching effectiveness is very good.

E. 4. Faculty Recruiting and Planned Directions for Future Faculty Hires

TABLE E.10 provides a summary of the chronology of faculty who were hired, retired, resigned, and reviewed for promotion and tenure. As shown, the tenure-track faculty grew from 10 to 15 over the five years from 2006-2011, and will be at 15 in the Fall 2013. A more detailed faculty history is included in **APPENDIX C**. As indicated in **TABLE E.10**, a total of nine new faculty were added since the last APR, and the tenth (Samlan) will start in Fall 2013. Two of our senior faculty retired (Glattke and Hixon), and we lost two faculty who did not make tenure. Two other faculty members (Hogan and Barkmeier-Kraemer) chose to move to other institutions during that time; Hogan moved to be closer to family (University of Nebraska) and Barkmeier-Kraemer took a more clinically oriented research position at UC Davis Department of Otolaryngology. Samlan will fill the vice-Barkmeier-Kraemer position when she begins in Fall 2013, and this spring Barkmeier-Kraemer will teach our dysphagia class via Skype in collaboration with Dr. Jeannette Hoit.

TABLE E.10. Summary of Tenure-Track Faculty Gains, Losses, and Promotions.
(see individual detail in Appendix C).

	FY 05/06	FY 06/07	FY 07/08	FY 08/09	FY 09/10	FY 10/11	FY 11/12	FY 12/13
Hire		Asst Prof MA start_8/06 Asst Prof AL start_8/06	Assoc Prof HD start_8/07 Asst Prof GD start_1/08		Assoc Prof KB start_1/10 Asst Prof EM start_1/10	Asst Prof SW start_8/10 Asst Prof LFS start_8/10 Asst Prof NM start_1/11		Asst Prof RS to start_8/13
Resign		Assoc Prof PF leave_6/07	Asst Prof TH leave_5/08	Asst Prof JL leave_5/09			Assoc Prof JBK leave_7/11	
Retire	Prof KB ret 6/06		Prof TG ret 1/08 Prof TH ret 6/08					
Promote Tenure			Tenured PB 5/08	Assoc Prof T+ AL 5/09 Prof BC 5/09	Prof PB 5/10		Assoc Prof T+ MA 5/12	
Tenure Not Granted	Assoc Prof PF 5/06							
Total FTE	10	13	13	11	12	15	14	14

T+ = tenure granted

A full cohort of 15 faculty will provide better coverage for all of our courses, as well as breadth in research areas. It does not, however, offer much cushion for sabbatical coverage or for planned or unplanned attrition. There also remain several areas where we would like research activity to develop. With the addition of Dr. Fabiano-Smith to our faculty in 2010, we have been able to expand course offering in bilingual issues and added a bilingual certificate program for our graduate students. The faculty have interest in expanding our focus on bilingual/bilingual issues to complement Fabiano-Smith's work in speech sound development (phonology). There is also consensus that the university and the state would benefit from the development of a research program addressing communication disorders relative to autism spectrum disorders. Tucson has a number of strong educational and clinical programs addressing autism, and the paucity of research and focus on the development of evidence-based

intervention programs is notable. As indicated in our strategic plan, we also envision modest growth in each of the areas of speech, language, and hearing sciences and disorders. A review of other strong programs in our field confirms that we are essentially the smallest top-ranked program in the country with regard to tenure-track faculty. An increase of 2 to 3 faculty members over the next 5 years is warranted if we want to maintain/expand our leadership role. The specific research/teaching focus of new hires is best determined relative to the strength of available candidates. In addition to bilingual issues and autism, other potential areas include augmentative/alternative communication, hearing science/disorders (including cochlear implants), stuttering and other speech disorders.

E.5. Faculty Compensation and Comparison with Relevant Peer Institutions

TABLE E.11. shows the average and range of salaries for our faculty by rank in Fall 2012, in comparison to the salaries of the top 5 public institutions in the country. Our average salaries are lower than our peer institutions across the all ranks, but are dramatically lower than other institutions for the full Professor rank (from \$14,000 - \$26,000 below). This discrepancy likely reflects that our full professors have all been on faculty for more than ten years with very little salary adjustment over those years. In contrast, our newer hires have been junior faculty members, and we were able to hire some of them at more competitive salary levels. The need for salary increases is certainly warranted relative to our peers, but also when SLHS salaries are compared to similar units within the College of Science (Psychology and Neuroscience; see **TABLE E.12**). It is important to note that our productivity is strong relative to these units as indicated by the graphic depiction of grant revenue expended provided by the College of Science (**APPENDIX B**).

TABLE E.11. Comparison of Faculty Salaries with other Top-Ranked Programs at Public Universities

Rank		Univ of Iowa	Univ of Wisconsin-Madison	Univ of Washington	Univ of Kansas 2011	Univ of North Carolina	U of Arizona
Assistant	Mean	\$65,050	\$80,838	\$82,599	\$78,457	\$77,226	68,000 (73,200)
	Range	\$60,100 - \$72,200	\$79,173 - \$82,503	\$54,204 - \$110,004	\$67,252- \$89,662	\$47,940 - \$83,622	\$60,000 - \$73,000
Associate	Mean	\$84,500	\$80,168	\$104,067	\$114,855	\$85,635	77,401 (80,428)
	Range	\$72,200 - \$115,756	\$75,375 - \$89,640	\$91,428 - \$119,520	\$121,710- \$108,000	\$84,114 - \$88,391	\$66,500 – 88,638
Professor	Mean	\$126,665	\$114,091	\$133,689	\$201,097	\$124,185	\$98,409 (98,526)
	Range	\$102,400 - \$154,000	\$80,900 - \$212,517	\$97,080- \$195,000	\$155,716 - \$259,094	\$94,714 - \$206,010	\$83,531- \$115,000

In parentheses = SLHS adjusted average salary after the department-funded increase June 2012

TABLE E.12. Average Academic Salaries by Rank FY 2013 in Departments of SLHS, Psychology, and Neuroscience (see details in **APPENDIX B**).

Rank	Department	SLHS (n = 14)	Psychology (n =28)	Neuroscience (n = 7)
Assistant Professor		68,000 (73,200)	73,625	none at this rank
Associate Professor		77,401 (80,428)	77,131	84,058
Professor		98,409 (98,526)	117,769	117,719

In parentheses = SLHS adjusted average salary after the department-funded increase June 2012

Salary comparisons are more difficult to document for clinical faculty. The average salary for our Speech-Language Pathology faculty is \$65,821 for a full fiscal year. The average for our Audiology clinical faculty is \$71,296. National data are limited for these professionals in an academic setting, however, it is clear that the salaries are very low for professionals in either field. The median salary for a speech-language pathologist working in a medical setting in the West is \$80,000. In Audiology, median salaries range from \$70,000 to \$80,000 in medical settings and industry for those with an AuD, and for those in an academic setting with a PhD, the range is reported at \$89,756 - \$100,569. These estimates are not adjusted for experience, and our clinical faculty are well over the national average with regard to years of experience.

Sources: <http://www.asha.org/uploadedFiles/HC11-Annual-Salary-Report.pdf>

[http://www.asha.org/uploadedFiles/10AudSurveySalaries\(1\).pdf](http://www.asha.org/uploadedFiles/10AudSurveySalaries(1).pdf)

E. 6. Gender and Race/Ethnicity of Faculty

The composition of our faculty with regard to gender and race/ethnicity is shown in **TABLE E.13**. Females are well represented, and the female to male ratio for those who do the majority of the classroom teaching is relatively balanced at 9:7. Our clinical faculty ratio is disproportionately female (11:1), yet this 91.7% representation by women is actually not quite as skewed as the membership of our professional association, ASHA, with 95.5% female membership (2011 membership survey).

TABLE E.13. Gender, Race/Ethnicity of SLHS Faculty

Tenure-Track Faculty (14) Lecturers (2) Res. Scientist (1)	Gender	Ethnicity
	Females = 9	White (non Hispanic) = 15
	Males = 8	Asian = 1 Not Specified = 1
Clinical Faculty = 12	Gender	Ethnicity
	Females = 11	White (non Hispanic) = 12
	Males = 1	Asian = 0 Not Specified = 0
All Faculty Totals = 29	Gender	Ethnicity
	Females = 20 (70%)	White (non Hispanic)= 27 (93%)
	Males = 9 (30%)	Asian = 1 Not Specified = 1

As shown in **TABLE E.13.**, the racial/ethnic diversity among our faculty is limited. Clearly, we do not have the diversity that we would want in order to match that the students in our classrooms, which include 27% from under-represented groups. The overall paucity of individuals with PhDs in our fields is a fundamental problem that will always result in a relatively small candidate pool where diversity is likely to be limited. For the profession as a whole, the 2011 ASHA member survey indicated that only 7.3% of ASHA members are members of a racial minority (compared with 27.6% of the U.S. population, according to the 2010 Census). Additionally, only 4.4% of ASHA members identified their ethnicity as Hispanic or Latino, compared with 16.3% of the U.S. population (retrieved 11/30-12 from <http://www.asha.org/uploadedFiles/2011-Member-Counts.pdf>).

Our department is committed to enhancing the diversity of our faculty in keeping with the diversity of the University community and of the state of Arizona. The University of Arizona Office of the Provost has a Strategic Hiring Initiative that offers recruitment training and assistance to promote diversity in the recruitment and hiring process, and we have taken advantage of the training and resources. For one of last recruitment efforts (for Fall 2010), we placed priority on candidates with bilingual/bicultural research and the final candidates who came to campus for onsite interviews included two individuals of Latino background. We were successful in hiring an excellent researcher/educator (Fabiano-Smith), who will coordinate our bilingual certificate program, however, she herself does not represent a minority group. Given the opportunity to expand our department, we will make every effort to identify candidates who both meet the content area needs of the Department as well as increasing our diversity. As detailed below, the graduates from our department reflect a much more diverse group than is typical in our field, so we are, at least helping to increase diversity within the profession.

E.7. Biographical Sketches

Biographical sketches summarizing faculty member's research interests, honors and awards, publications, current grant funding, invited lectures, and major service and committee assignments are included in **APPENDIX Q**.

F. UNIT ADMINISTRATION

F. 1. Organization and Governance Structure

The Department of Speech, Language, and Hearing Sciences Bylaws provide the framework for policy and governance of the Department. The Department is administered by a Head, who is appointed by the Dean of the College of Science (with recommendation from faculty vote). The Department Head is responsible for implementing and administering the programs and policies of the Department and representing the faculty to higher administration. According to the Department bylaws, the Head shall use her/his own judgment and authority to carry out the policies agreed on by the Faculty. The faculty may choose to recommend an Associate Department Head to work with the Department Head. The Associate Department Head is recommended on the basis of faculty vote. It is the Department Head's responsibility to negotiate the Associate Department Head's position with the Dean of the College of Science.

FIGURE F.1. provides a depiction of the department organization indicating that all faculty and staff report to the Department Head, with the exception of the Undergraduate Advisor, who reports to the College of Science Director of Advising, and the IT Support Analyst, who reports to the MBB IT Director. The Head bears the final responsibility for directing the Department and follows the general policies agreed upon by the department faculty with the consultative assistance of an elected Advisory Committee. The Advisory Committee is made up of three voting Faculty members, elected by the voting

Faculty, serving two-year terms. The Advisory Committee represents the Faculty and advises the Department Head with regard to departmental programs, policies, and needs. The Advisory Committee is expected to assume a major role in departmental leadership in its contacts with the Head and the Faculty. The Department Head will normally be a non-voting participant at their meetings, but will not attend a committee meeting if requested by a majority of the Advisory Committee.

The Department Head appoints committee members and chairpersons, determines their term of service, and provides for replacements. The Department Head is an ex-officio member of all Department standing and ad hoc committees. Committees carry out established department tasks and are expected to meet regularly and develop their own plans and objectives as well as carry out tasks assigned to them. Standing committees are responsible for issues related to curriculum, graduate admissions and policy committees (professional and doctoral), undergraduate issues, human subjects protection, honors and awards, and colloquium. Ad hoc committees are formed and dissolved as special needs develop; for example, faculty searches, special events, academic program review, accreditation, and fundraising. As indicated by **FIGURE F.1.**, committee chairs play a central role in oversight of many aspects of the program. The Department Head works closely with the chairs of the standing committees, such as the curriculum committee, the doctoral committee, and the graduate admissions and policy committee. In addition, some department staff members work directly with committee chairs on a regular basis, such as the Administrative Assistant (Minopoli) in the coordination of student admissions, coursework, and TA/RA assignments.

The Department Head may appoint a Coordinator (or two respective Coordinators) of clinical audiology and speech-language pathology. The Coordinators work with the Department Head to facilitate the administration of clinical training and service delivery.

Faculty meetings are held each month during the academic year. These 1 to 1.5 hour meetings are complemented by longer faculty meetings (3-5 hours) that occur at the beginning and end of each semester. Full-day faculty retreats typically occur once a year to address broad issues related to strategic planning, curriculum review/revision, and the like. Committee meetings occur on weekly, monthly, or semester basis, depending on the nature and scope of work.

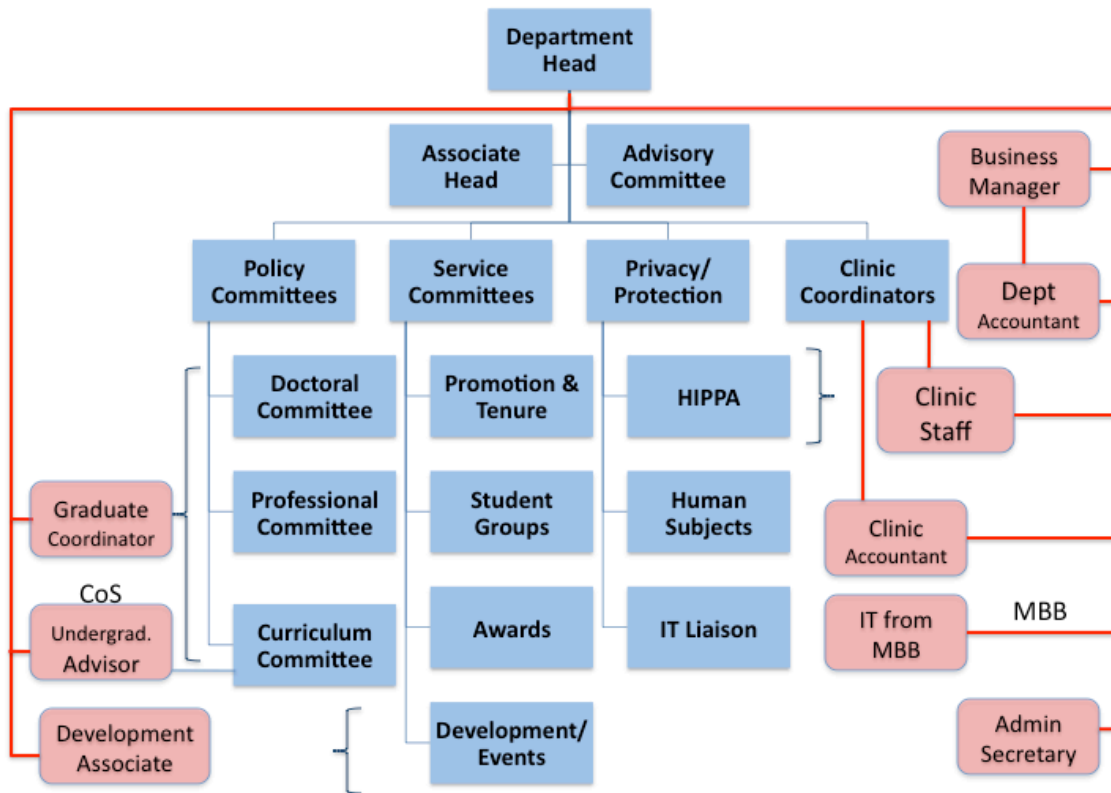
According to the bylaws, the voting faculty will vote on the following matters:

- A change (addition, subtraction, modification) to the curriculum.
- A change in the programs offered.
- A change in admissions policies.
- A proposed addition to the faculty at any rank or type (e.g., adjunct, research scientist, lecturer).
- A change in the criteria used to review performance.

Each of these issues must be brought to the department Advisory Committee. If the Advisory Committee is unanimously opposed to a proposal, it cannot be brought to the faculty for further consideration or vote.

All staff report to the Department Head, although additional layers of administrative structure are implemented; for example, the Business Manager directly oversees the department Accountant, and the Clinic Coordinators oversee the clinical staff. The current Department Head implemented optional staff meetings that occur at least three times each semester. The optional meetings include "Lunch and Learn" formats that are organized by a staff volunteer (Enneking) on topics of interest, such as, Microsoft Excel tricks, organizing electronic documents, managing email. At least once per semester, the Department Head meets with staff as a group in order to update the staff on upcoming events, explain university and department goals and strategic plans, to answer questions, and to seek input on departmental issues.

FIGURE F.1 Organization Chart for Speech, Language, and Hearing Sciences



Blue = faculty; Red = staff. Note that certain staff work with committee chairs. IT staff are supervised by the centralized IT program within the School of Mind, Brain, and Behavior (MBB). Undergraduate advisor is supervised by the College of Science Office of Student Services and Academic Advising (Robin Rarick, Director).

F.2 Classified and Professional Staff

Our current classified staff (9 FTE) includes a Business Manager, Administrative Associate, 2 Administrative Assistants, 2 Accountants, 1 Administrative Secretary, 1 Office Assistant, and 1 Computer Technician. There are 8 (6.45 FTE) support staff who work at the Wings on Words program, as well as two directors (1.5 FTE). SLHS research is supported by 7 (5.5 FTE) research professionals and 2 research staff members. Overall, state funds cover only 7.28 FTE of the 22.45 FTE for support staff, with the rest provided by grant-related funds and auxiliary accounts related to clinical service delivery. The 7-year employment history for staff is included in **APPENDIX E**. It is evident that we have a tradition of long-term service within our department. This is a reflection of the genuine friendships and collegial relations that are typical among the faculty and staff – many existing over two decades.

TABLE F.1. Classified Staff 2012 (partial state funding)

Name	Dept. Hire Date	FTE		Title	Area
Aparicio, Patricia	6/23/10	1.00	Classified Staff	Admin. Secretary	SLH Clinic
Enneking, Lacy	1978-1986 rehire_9/12/94	1.00	Classified Staff	Assoc. Accountant	SLH Clinic
Fay, Cathy	1981-87 rehire_1/7/01	1.00	Classified Staff	Admin. Associate, Development	Department
Heinecke, Shaunna	9/7/10	1.00	Classified Staff	Admin. Assistant	Clinic
Jacobs, Sherry	7/19/89	1.00	Classified Staff	Assoc. Accountant	SLH Clinic
Minopoli, Denise	5/29/07	1.00	Classified Staff	Admin. Assistant	Department
Phelan, Kevin	8/20/12	1.00	Classified Staff	Business Manager	Department
Rodriguez, David	1/25/10	1.00	Classified Staff	IT Support Analyst	School MBB
Veatch, Stephanie	3/7/11	1.00	Classified Staff	Office Specialist	Department
Wijeweera, Tharini	7/21/08	---	Classified Staff	Academic Advisor (College)	College of Sci

TABLE F.2. Wings on Words (WOW) Child Language Center Personnel (not state funded)

Name	Dept. Hire Date	FTE		Title
Chiquette, Olivia	8/13/01	0.88	Classified Staff	Instructional Aide @ WOW
Frausto, Jocabed	5/29/07	0.88	Classified Staff	Instructional Spec.Sr @ WOW
Furrier, Fran	8/22/05	0.55	Classified Staff	Instructional Spec. @ WOW
Greif, Amy	8/30/10	0.88	Classified Staff	Instructional Spec. @ WOW
Hinds, Marina	8/29/94	0.88	Classified Staff	Instructional Aide @ WOW
Kennelly, Candy	1/8/01	0.88	Classified Staff	Instructional Spec. Sr @ WOW
Kiernan,Barbara J	7/1/01	0.50	Professional	Director, Child Language Center
Pihle, Michelle	5/28/02	1.00	Classified Staff	Instructional Spec. @ WOW
Reyna, Magda	11/1/05	0.50	Classified Staff	Office Assistant @ WOW
Rost-Zakerwski, Karen	6/12/95	1.00	Professional	Director, WOW Preschool

TABLE F.3. Research Professionals and Staff (external funding)

Name	Dept. Hire Date	FTE	Classification	Title (Supervisor)
Almryde,Kyle R B	5/17/10	1.00	Classified Staff	Research/Laboratory Assistant (Plante)
Alter, Rachel	5/14/12	.75	Classified Staff	Research Technician (DeDe)
Bayley, Chelsea	6/1/12	1.00	Professional	Research SLP – Clinical Fellow (Beeson)
Iwaniuk, Jessica	7/12/12	.50	Professional	Project Manager – Research (Maas)
Patterson, Dianne	10/30/00	0.75	Professional	Research Specialist (Plante/Beeson)
Rising, Kindle	1/1/99	0.80	Professional	Research SLP (Beeson)
Figuroa, Cecilia R	7/1/12	.50	Professional	Research SLP – Clinical Fellow (Alt)
Shultz, Christine	6/15/12	1.00	Professional	Research SLP – Clinical Fellow (Beeson)
Vance, Becky	1/18/82	1.00	Professional	Laboratory Sr. Manager (Plante)

The ethnic background of the staff and appointed professionals includes 21% Hispanic, which better approximates our demographic region (29% for the state of Arizona). The inclusion of staff with bilingual Spanish/English skills is especially important in our clinical settings, and we have been successful in attracting and retaining such personnel.

TABLE F.4. Race and Ethnicity of Classified Staff and Professional/Appointed Personnel

Classified Staff = 20	Ethnicity	Gender
	White = 15	Females = 18
	Hispanic = 5	Males = 2
Professional/Appointed = 9	Ethnicity	Gender
	White = 8	Females = 9
	Hispanic = 1	Males = 0
Sum = 29	Ethnicity	Gender
	White = 23 (79%)	Females = 27 (93%)
	Hispanic = 6 (21%)	Males = 2 (7%)

F.3. Adequacy of Staff Support

Department Administrative support: Administrative support for department operations (not including our clinics) comes from five individuals: one Business Manager, an Accountant, an Administrative Associate of Development, an Administrative Assistant, and an Office Specialist. As noted in section C.1.e. regarding changes, the addition of the Business Manager in 2011 was an important improvement in the department structure.

- The Business Manager (Phelan) oversees the state budget, extramural funding from grants and contracts, gifts, and our auxiliary clinic accounts. He works with the Department Head regarding budget planning and oversight, and with each funded researcher regarding their budgets. He manages all approval and funding paperwork for faculty/staff hires.
- Department Accountant (Jacobs) works with the business manager to manage all purchasing, contract billing and receivables, grant accounts, gift accounts, and the like.
- Our Administrative Associate of Development (Fay) coordinates all outreach events, continuing education programs, alumni and donor contacts. She also oversees the maintenance and improvements/renovations of our building, along with the Department Head.
- Our Administrative Assistant (Minopoli) promoted from an office specialist position 2 years ago when our department Administrative Associate retired after 25 years of service. The department Administrative Assistant is responsible for personnel paperwork (e.g., hiring and awards for TA/RAs), provides administrative support for the undergraduate program (curriculum changes, room scheduling, grading/TCE), and also coordinates our graduate program, including the graduate admissions paperwork and record keeping. With the steady growth of enrollment and the number of graduate applications, and the increase in research-related hires, the responsibilities of this position now exceed 1.0 FTE. This is an area needing additional staff support.
- The Office Specialist (Veatch) is our front desk receptionist who also assists with travel paperwork, purchasing, keys, SLHS room schedules, and provides general office support.

TABLE F.5. shows the source of funding for staff over the past 7 years. Nearly two-thirds of our staff are supported by non-state funding resources, primarily from extramural research funding and clinical revenue.

TABLE F.5. SLHS Staff FTE, 2005 – 2011

	Fall 05	Fall 06	Fall 07	Fall 08	Fall 09	Fall 10	Fall 11
State Funds	4.55	5.09	5.29	5.04	4.11	4.96	7.28
All Funds*	16.88	19.82	19.19	19.62	19.42	23.33	19.29

*Funding from external grants and clinical revenue

Our administrative staff work very well together, and they do an excellent job supporting the department needs. As noted, it is clear that at least one additional administrative support staff is needed to support the duties of the Administrative Assistant. The feasibility of funding additional support personnel should be evaluated.

Clinical administrative support: The Speech, Language, and Hearing Clinics operate year-round and the clinical reception area is a very busy place that receives clients, schedule appointments, and processes billing forms. In addition, the clinical staff are responsible for mailing and receiving all intake forms, and the printing and mailing of clinical reports. These activities are covered by one Administrative Assistant (Heinecke) and one Administrative Secretary (Aparicio). The Accountant for the clinic (Enneking) takes care of all of the billing, collections, and accounting for the clinics. She is also responsible for establishing and maintaining relations with insurance companies, state agencies, and other contracting entities to assure proper reimbursement for services. In the past year, a graduate student assistant was employed to work at the clinic reception desk to relieve some of the overload. This was a mutually beneficial experience in that the student learned relevant business practice knowledge, and the staff benefitted from the student’s knowledge of professional issues. Overall, the clinical operations are excellent, and the staff are appreciated by clients, faculty, and students for their friendly and helpful manner. The primary problem to address with regard to clinical support is the need for additional secretarial support to manage the clinical reports. The current workload of the staff leads to excessive delay in sending out clinical reports, which impedes the effectiveness of our clinical program.

G. UNIT RESOURCES

G.1. Appraisal of Support Services

Support for teaching. The University of Arizona provides a number of centralized resources that support instruction at both the undergraduate and graduate level. The Office of Instruction and Assessment (OIA) is a campus resource that helps all faculty, instructional personnel, and researchers to integrate technology into academic activities. OIA employs about 40 full time and part time staff who offer support to the UA teaching community in course and curriculum design, online course development, program and classroom assessment and evaluation, instructional strategies and learning technologies. OIA also provides workshops, training, and ongoing support for learning management systems and web based tools, including D2L, that supplement classroom instruction, and provides for fully distance-delivered courses and programs. Most of the SLHS faculty take advantage of some aspects of the services provided through OIA, and there is a favorable appraisal of many of the resources. Greater use of these services might serve to enhance or increase the efficiency of some teaching activities.

Website support. The Office of Instruction and Assessment offers templates for faculty professional websites, and a number of SLHS faculty have made good use of this resource. Support for website development that goes beyond basic information, such as needed for department websites, is not provided without additional cost to the Department, and OIA does not appear to have adequate personnel to devote the time needed to support department website design and maintenance. SLHS initially developed our website by outside consultation and support, largely with donated time. Significant updating of the website is currently needed, and we have hired an outside design consultant (at the recommendation of the College of Science) with the cost covered by Department funds. We will have a continuing need for an appropriately trained web manager.

Statistical Consulting. The UA Research Computing Support Services office provides assistance with statistical analysis and software to researchers in any discipline. SLHS faculty and students involved in research make good use of this service, and value the central support provided at no cost. The statisticians offer consultation on experimental design, data analysis, interpretation and plotting of results, software selection, programming, design and analysis of questionnaires, and creation of online surveys. Statistical Consulting services are available to support preparation of grant proposals, thesis or dissertation research, or when writing result sections of papers, or responding to reviews. They are also available to assist in experimental design and statistical software selection. This is a highly valued service for our faculty and students, especially because there is no statistical support within the Department itself.

Computing and technology services. The University Information Technology Services provides centralized support for all faculty and students. Beyond the basic email and UA account support, they offer online and in-person workshops that are relevant for teaching and research, such as training in video-editing program/skills, data management programs (e.g., Access), and website management (e.g., Drupal). SLHS faculty and staff take advantage of these services.

The day-to-day IT support is provided to the Department through a centralized group that had origins in the Department of Psychology within the College of Social and Behavioral Sciences, so that it is referred to as the Social and Behavioral Sciences Technical Services (SBSTech). When the School of Mind, Brain, and Behavior was created and the Psychology Department moved to the College of Science, it was determined that the best solution for computing support services was to make SBSTech the provider of IT services to each unit within MBB. This group provides relatively reliable and accessible technology support for computing, multi-media, data management, and hardware for faculty, staff, and students. This is a unique service that provides access to shared resources and staff expertise that is tailored to the specific problem. SBSTech uses an online “ticket” system that provides technicians with a description of the specific issue so that appropriate expertise can be provided and updating of steps toward a solution can be documented. One technician is supported by SLHS funds, who is available full time in the SLHS Department to provide immediate response to issues involving desktop support, software installations, printer problems, and the like. An MBB network was established that was intended to provide a central automated back-up system for all data (including research labs), however, not all faculty or laboratory computers have been appropriately connected to the server.

The advantage of centralized IT system includes the access to an array of skilled IT personnel, but current limitations have been noted by faculty regarding slow response to network and server problems and the lack of proactive management of IT leading to inefficiency, loss of time, and data. Overall this support has not been fully adequate to meet departmental needs and is an area that needs improvement.

Support for research: In light of the recent building improvements that expanded and enhanced laboratory spaces, as well as some equipment purchases, the current faculty indicate that they have adequate space and resources to conduct their research. One remaining limitation is the lack of departmental support for grant preparation and administration. It is clear that principal investigators spend far too much time on the non-scientific aspects of grant preparation and maintenance, and their productivity would be enhanced by central support. The SLHS Business Manager has been helpful, but grant-specific, proactive support would provide a more efficient context for research productivity.

Support for outreach, including professional and community service

The outreach and community service activities are coordinated by SLHS Development Associate (Fay), who is funded by departmental resources. The investment in this position has proved to be excellent in the structure provided for outreach to alumni and donors, to support professional and community workshops, and to connect with university development resources. The SLHS Development Associate works closely with the College of Science Development Office that is staffed by three full-time Development Officers who provide advice and support for outreach and fundraising activities. A small amount of outreach investment funds are allocated to the Department from the College, which is typically used to cover an annual mailing to alumni. SLHS also takes advantage of outreach support offered by the University Foundation including the alumni and donor database. Overall, our support for outreach is very good because of our internal investment in a development associate who connects to the university resources. It is important to note that our faculty are self-motivated and initiate many of the community outreach activities independently, and are quick to participate in outreach events. The Development Associate provides critical support for the planning and coordination of the outreach events.

Administrative support. There are number of University resources that provide excellent support for the department administration.

- UA Office of Human Resources provides central support for faculty, staff, and department administrators. The Department Head and Business Manager rely on HR for advice and guidance on personnel issues.
- The Office of General Counsel is an important resource for SLHS. We have a working relationship with the attorneys who provide advice on contract negotiation and operational guidelines for the business conducted through our Speech, Language, and Hearing Clinics. They also provide guidance regarding privacy issues that are critical for clinical and research contexts, as well as student privacy issues. Additional support or consultation is available for any legal matter.
- The Office of the Provost offers several support services for department administrators.
 - The Associate Provost for Faculty Affairs facilitates “New Head” orientation and periodic meetings on essential topics for Department Heads and Associate Heads, including advice regarding promotion and tenure, employee relations, and diversity.
 - The Associate Vice President for Academic Resources, Planning & Management supported the SLHS efforts to obtain and renovate space within our building.
- The College of Science Assistant Dean of Business and Finance routinely provides valuable advice, guidance, and education for the Department Head and Business Manager.
- The College of Science Coordinator of Faculty Affairs provides excellent support for the promotion and tenure process.
- SLHS receives strong support from the offices and directors of Facilities Management and Parking and Transportation. Both offices demonstrate understanding and support for the unique needs of SLHS in our research and clinical service activities.

In sum, SLHS enjoys strong support from the University across a wide range of areas. The need for stronger support was identified for IT services within the Department and for website maintenance.

G.2. Specific Resource Needs

Office and laboratory space in SLHS: As reviewed in Section C.2., marked improvements have been made to the SLHS building in the past year that were jointly funded by UA central administration and SLHS funds. Our remaining needs for the building include:

- Update and reconfiguration of clinical instruction areas that comprise our speech, language, and hearing clinics. The audiology clinic, in particular, needs considerable renovation so that clinical training is conducted in a more professional setting, and space is used more effectively. Some SLHS funds have been earmarked to begin this process and efforts are being made for donor support.
- There is limited office space for additional personnel of any type in the SLHS building, however, the reconfiguration of some existing space is a reasonable solution in some cases. As noted in section C.2, we were able to improve the usability of a number of areas of the building with relatively minor renovation, so we aim to do more of the same in order to maximize the use of our available physical resources. There are no designated funds for this effort, so the source is uncertain.

Library: Our Department takes advantage of support offered through the main library, the science library, and the University Health Sciences Center Library. The primary support is provided through electronic resources, which have been adequate. We do not maintain a formal library within the Department, but faculty frequently contribute to a student library in the graduate room.

Classrooms and classroom support: Over the past seven years, the university has made a concerted effort to outfit classrooms with technical equipment including computer projectors and wireless Internet connections that facilitate classroom technology utilization, and the support has been very good. Classroom technology services (operated through the University Information Technology Services) are readily available by phone call that typically results in prompt assistance. As our undergraduate program has grown, we teach more than half of our classes outside of the SLHS building, and a particular concern has been the availability of large classrooms (accommodating over 100 students) to allow scheduling of classes so the required classes do not conflict with one another. This challenge has required consistent, proactive oversight by our Administrative Assistant and Curriculum Chair (faculty member) to work with the university room scheduling office. This is not the best use of faculty time, and we hope that an increase in classrooms on campus will ultimately reduce the effort required to appropriately schedule classes, and to allow growth of some class sizes.

Brain Imaging Facilities: Magnetic Resonance Imaging that has been conducted at the University of Arizona Medical Center. For the past 7 years, researches have primarily used a 3 Tesla magnet equipped for functional MRI studies, behavioral testing facilities, and computing workstations for image analysis, and 1.5 MRI scanner was also available. These scanners were operated with a joint use agreement between University of Arizona Medical Center and the University of Arizona, with 100% time available for research use distributed between the two magnets. During the past year, a new 3 T Siemens Skyra scanner replaced the 3T scanner, and will be used primarily for clinical purposes. A second 3T Siemens Skyra scanner will be sited in a new research imaging facility adjacent to the University of Arizona Medical Center. The Office of the Vice President for Research supported acquisition of this scanner. The SLHS Department is one of several units with multiple imaging researchers (other units include

Psychology, Radiology, Biomedical Engineering, Psychiatry) who have worked together to promote and plan for the imaging resources at the U of A. Externally funded imaging research conducted by SLHS faculty and colleagues in other departments ultimately generate revenue to offset the cost of the MRI instrumentation. It should be noted that one of our new lab spaces is designated as an imaging research laboratory that provides the space for teaching labs, presentations, and planning meetings for imaging researchers from the campus community.

Office support: The personnel resources and needs for office support were reviewed in **Section F3**. Specifically, there is the need for additional administrative support in the central office (~ 1 FTE), and secretarial support in the clinical office (~1 FTE).

Graduate Assistants: Teaching assistants are an important support for faculty, particularly when teaching large classes and classes with laboratory experiences. TABLE G.1. shows the number of funded TAs (at 0.25 FTE each) over the past seven years. It is notable that the number of TAs decreased from 16 in 2005-06 to 14 or 13 for the next several years. This was despite a steady increase in the number of student credit hours provided by SLHS (See Section H). The Department request for an increase in TAs to 17 was approved and allocated by the College of Science for FY 2011-12. As shown in **TABLE G.1.**, the number of student credit hours per TA was still nearly twice that of 7 years ago. In other words, teaching support has markedly declined over time. In contrast to this decline in available TA support, Research Associates have increased from 8 to 19 using external funds largely from grants.

TABLE G.1. Resources for Graduate Teaching Assistants and Research Assistants

	FY 05/06	FY 06/07	FY 07/08	FY 08/09	FY 09/10	FY 10/11	FY 11/12	Current Year (Projected)
# of Teaching Assistants	16	14	13	14	13	14	17	17
FTE (state funds)	3.32	3.58	3.76	3.63	3.25	3.48	4.16	4.25
Expenditures	\$78,488	\$83,765	\$87,202	\$85,942	\$81,436	\$77,217	\$108,703	\$123,250
Tot Student Credit Hrs.	1,357	1,213	1,964	2,039	2,506	2,425	2,643	
Credit hrs./# of TAs	84.8	86.6	151.1	145.6	192.8	173.2	155.5	
# of Research Assistants	8	10	9	8	9	13	14	19
FTE (not state funds)	3.84	3.25	2.98	3.62	5.32	6.67	5.00	7.85
Expenditures	\$128,634	\$105,474	\$92,356	\$88,286	\$126,411	\$187,412	\$147,895	\$231,014

G. 3. Projected Changes and Quality Outcomes

To summarize, the resources needed by the Department that have implications for productivity and success include increased number of faculty, increased number of graduate teaching assistants and stipends, increased administrative support, and improved IT support services. If the resource needs could be met, we would anticipate the following enhancements to our department’s quality: (1) greater faculty research productivity and continued external funding success; (2) success in retention of our strong faculty members; and (3) growth of doctoral and post-doctoral programs.

H. UNDERGRADUATE STUDENTS, DEGREE PROGRAMS AND OUTCOMES

H.1. The Department offers one undergraduate degree program leading to a Bachelor of Science in Speech, Language, and Hearing Sciences. The program is consistent with the CIP (Classification of Instructional Programs) category for preparation for Audiology/Audiologist and Speech-Language Pathology/Pathologist as indicated by the National Center for Educational Statistics.

CIP Code 51.0201 <http://nces.ed.gov/ipeds/cipcode/cipdetail.aspx?y=55&cipid=88749>

Title: Communication Sciences and Disorders, General.

CIP Definition: A program that focuses on the application of biomedical, psychological, and physical principles to the study of the scientific bases, development, and treatment of speech, language, hearing, and cognitive communication problems caused by disease, injury, or disability. Includes instruction in language science, hearing science, speech and voice science, biology of communication, behavioral linguistics, psychology, and applications to the development of diagnostic and rehabilitative strategies and technologies.

H.2. Enrollment Trends

Enrollment trends show that SLHS has been an increasingly popular major at the University of Arizona. As shown in **TABLE H.1**, the number of student credit hours has doubled over the past 7 years and the number of undergraduate majors in SLHS has more than doubled (from 158 to 340). Similarly, the number of students completing the BS in Speech, Language, and Hearing Sciences increased from 40 to 93 per year. The increase in enrollment reflects primarily an increase in class size, doubling from an average of 36 to 74 students per class (see **TABLE H.2**). In order to accommodate the enrollment demands, the majority of our undergraduate classes were moved out of the SLHS building, which has a maximum capacity of 80 students in the largest classroom. Enrollment in independent studies and directed research also increased threefold over the past 7 years (see **TABLE H.2**.)

TABLE H.1. Student Enrollment in SLHS over Time
SPEECH, LANGUAGE & HEARING SCIENCES

	Term						
	Fall 05	Fall 06	Fall 07	Fall 08	Fall 09	Fall 10	Fall 11
Undergraduate Student Credit Hours	1,357.47	1,213.20	1,964.00	2,039.01	2,506.00	2,425.00	2,643.00
Undergraduate Students in the major (BS)	158	185	216	269	307	318	340
Undergraduate Majors completed	40	44	43	54	65	82	93

TABLE H.2. SLHS Undergraduate Courses Taught and Numbers of Students Enrolled

	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
Courses and Seminars							
Total # courses taught	18	17	18	19	19	20	19
Sum of students enrolled	639	708	1048	1199	1417	1327	1399
Average class size	36	42	58	63	75	66	74
Independent Studies or Research							
Total # courses*	7	8	14	14	15	14	16
Sum of students enrolled	118	157	191	213	274	331	392

*number of different research or independent study registration numbers

H.3. Contributions to General Education

The SLHS Department offers six courses that contribute to the university general education curriculum in the study area of natural sciences (5 courses) and individuals and societies (1 course). Two of these courses (SLHS 263, 255) were developed since the last APR.

TABLE H.3. General Education Classes offered by SLHS

Tier 2 Natural Science General Education Courses	
•	SLHS 261 Anatomy & Physiology of the Speech Mechanism (4 units) – Barkmeier-Kraemer, Story
•	SLHS 263 World of Sound: Speech, Music, and MP3s (3 units) – Lotto (new 2006)
•	SLHS 267 Acoustics for the Speech and Hearing Sciences (3 units) – Story, Dean
•	SLHS 270 Scientific Thinking in Speech and Hearing Sciences (3 units) – Fabiano-Smith, Lotto
•	SLHS 362 Neurobiology of Communication (3 units) – Plante, DeDe
Tier 2 Individuals and Societies General Education Course	
•	SLHS 255 Hearing, Health, and Society – (3 units) Dean (new 2012)

Our general education courses provide foundational knowledge for the study of speech, language, and hearing sciences, but also have broad appeal and relevance to undergraduate students regardless of their major. In developing new General Education courses, we paid careful attention to the relation between General Education goals, course objectives, and the various class activities, exercises, and assessment procedures for each course. The courses are appropriate as an introduction to the study of communication/communication disorders, but also serve as stand-alone courses for students across a wide range of disciplines.

In addition to the general education courses, SLHS 207, Survey of Human Communication and Its Disorders, has a high percentage of enrollments by non-majors and pre-majors. Many students indicate that they enrolled in the course from personal interest, or as a way to consider SLHS as a major. This course may be used by students with disabilities who participate in the SALT (Strategic Alternative Learning Techniques) center as a substitute to the University’s foreign language requirement.

TABLE H.4. General Education Courses Taught by SLHS (2011-2012) – Enrollment and Evaluation

	# Students Enrolled	Overall Instructor Effectiveness	Overall Course Rating	Amount Learned
255 Hearing, Health, & Society	26	4.8	4.3	4.1
261 Anat/Phys Speech Mechanism	141	4.4	4.0	4.3
263 World of Sound (Fall 11)	47	4.4	3.8	4.0
263 World of Sound (Sprg 12)	132	4.4	4.0	4.1
267 Acoustics (Fall 11)	76	4.4	4.1	4.3
267 Acoustics (Sprg 12)	81	4.6	4.1	4.3
270 Scientific Thinking	78	4.5	3.7	3.6
362 Neurobiology of Communication	74	4.3	3.8	4.2
Average	81.88	4.48	3.98	4.11

Many students discover the SLHS major through their enrollment in the general education courses or SLHS 207. These classes typically fill completely each semester they are offered, and SLHS 263 World of Sound has been offered during both fall and spring semesters for the past 2 years to accommodate the interest.

The general education classes receive strong positive appraisal by the students on the TCE evaluations. As shown in TABLE H.2, the overall instructor effectiveness across the various faculty members is consistently high, averaging 4.5 on a 5-point scale. The overall course ratings are about 4 on a 5-point scale, and just above 4 for the amount learned.

Course content is updated each semester that classes are taught. This reflects revisions and updates prompted by the faculty member in response to advances in the field, student feedback, self-appraisal of the course by the instructor, feedback from colleagues, and input from the Department curriculum committee. Our faculty are highly self-motivated and are constantly working to improve and update classes. Curricular issues are discussed during faculty meetings on a regular basis, so that small and significant changes are prompted by input from a range of faculty members. The Department curriculum committee plays an important role in the planning and coordinating of general education classes (and all of our classes). The chair of this committee also interacts routinely with our undergraduate advisor who provides another source of input and feedback from our students. Finally, all faculty interact with undergraduate students in a myriad of formal and informal contexts (classroom, laboratory, social events), so access to student feedback is easily provided.

H.4. Undergraduate Program Description

H.4.a. Basic Curricular Goals and Options

The SLHS undergraduate curriculum is intended to provide basic knowledge in communication sciences and disorders and it prepares students for graduate study that leads to clinical certification and licensure in either Audiology or Speech-Language Pathology, or for graduate research degrees. From a broader perspective, the Department seeks to produce graduates who are scientifically knowledgeable, who are professionally literate, and who understand the impact of science on human function and human interactions.

To complete the Bachelor of Science degree, student must meet all the general education requirements for the 120-unit degree. This includes the requirements in English composition, mathematics, biological and physical sciences, and social sciences. Students in SLHS are also required to take a statistics course. The SLHS undergraduate major requires 33 units of coursework with a minimum GPA of 2.0. The 33 units include ten required courses: seven that focus on foundational knowledge in the field, and three courses provide clinical application of the material (see **TABLE H.5.**). Students also have the opportunity to take a number of elective courses to enhance their knowledge and provide them learning opportunities outside the classroom. This includes courses listed below, as well as the individualized learning experiences in independent study, research, or senior capstone registration.

Students are required to complete a minor, either taken in a single department or as a collection of thematically related coursework distributed across several departments.

The SLHS Department participates in the Honors program in that students may enter into an "Honors contract" in any course and receive honors credit by pursuing a pre-arranged more demanding course of study. Independent research studies are also available for Honors credit, and students may commit to writing an Honor's thesis under the direction of SLHS faculty.

TABLE H.5. SLHS Undergraduate Coursework

Required Courses in the SLHS Major (number of credits)
<p><i>Foundation Knowledge in Speech, Language, and Hearing Sciences</i></p> <p>SLHS 261 Anatomy and Physiology of the Speech Mechanism (4) – Laboratory included SLHS 267 Acoustics for the Speech and Hearing Sciences (3) SLHS 340 Language Science (3) SLHS 362 Neurobiology of Communication (3) SLHS 367 Phonetics (3) SLHS 380 Hearing Science (4) – Laboratory included SLHS 441 Language Acquisition (3)</p> <p><i>Clinical Application Courses</i></p> <p>SLHS 473 Communication Disorders II (3) SLHS 477 Communication Disorders I (3) SLHS 483R Principles of Audiology (3) & 483L Audiology Laboratory (1)</p>
Optional/Elective Courses in the SLHS Major (number of credits)
<p>SLHS 207 Survey of Human Communication and Its Disorders (3) SLHS 263 The World of Sound: Speech, Music, and MP3s (3) SLHS 270 Scientific Thinking in Speech and Hearing Sciences (3) SLHS 310 Family Health and Deafness (3) SLHS 430 Cognitive Neuroscience of Language (3) SLHS 435 Bilingualism, Multiculturalism, and Nonmainstream Dialects (3) (new 2013) SLHS 454 Audiologic Rehabilitation-Lifespan (3) SLHS 471 Speech Sound Disorders (3) SLHS 496A Seminar: Advanced Clinical Observation, Analysis, & Writing (1)</p>
Individualized Learning Experiences (variable credit allowed)
<p>SLHS 199, 299, 399, 499 Independent study (also available as honors) SLHS 391, 491 Preceptorship SLHS 458 Clinical Study in Speech-Language Pathology SLHS 459 Clinical Study in Audiology SLHS 492 Directed Research SLHS 495a Current Problems in Speech, Language, and Hearing Sciences SLHS 496a Advanced Clinical Observation, Analysis, and Report Writing SLHS 498H Honors Thesis SHLS 391/491 Undergraduate Preceptorship</p>

H.4.b. Accreditation

Our undergraduate curriculum is preparatory for graduate study, and the graduate program is regulated by the Council on Academic Accreditation, a body within the American Speech-Language-Hearing Association. Our program was last accredited in 2005, and has met annual renewal requirements. We are being reviewed again for accreditation this year, with the site visit scheduled for March 2013.

H.4.c. Comparison to Peer Institutions

Our undergraduate program is similar to other nationally ranked programs that are variously titled Communication Disorders and Sciences, Speech-Language Pathology and Audiology, Speech, Language and Hearing Sciences, and the like. We reviewed program requirements in the other top programs in our field, and as indicated in **TABLE H.6.**, the undergraduate programs are quite similar in the distribution and number of credits. Both Bachelor of Science and Bachelor of Arts degrees are associated with the major, and undergraduate education typically includes preparation in composition, math, natural sciences and psychological sciences. Most, but not all, programs require an undergraduate course in statistics, as we do.

The major typically requires 32-34 semester units of coursework. The specific courses within the major vary across national programs, but the core requirements for these institutions are similar because they all aim to provide the prerequisite knowledge and skills necessary for graduate study in the field. The course requirements for the University of Arizona undergraduate degree compare to other top programs as follows:

- Similar to other programs by coverage of the following core content areas
 - Anatomy and Physiology of the Speech Mechanism, Acoustics, Phonetics, Language science, Hearing Science, Overview of Communication Disorders across the Lifespan (2 courses), and Introduction to Audiology.
- Distinct from other programs
 - Not all programs have a course that covers the Neurobiology of Communication.
 - Not all programs include laboratory components for several of the classes, as we do for Anatomy & Physiology of Speech Mechanism, Hearing Science, and Audiology.
 - We have some unique elective classes, including The World of Sound, our new class addressing bilingual/bicultural issues, and Hearing, Health, and Society.

There are no plans to make major changes in the undergraduate curriculum, however, the faculty evaluates the curriculum on a regular basis and makes appropriate changes. Recent changes are reviewed in section H.6.d.

TABLE H.6. Units Required for Majors in Speech, Language, and Hearing Sciences

	DEGREE	BIOLOG/ PHYS SCIENCE	SOCIAL/BEHAVIORAL SCIENCES	SLHS MAJOR	COURSE IN STATISTICS
U of Arizona	BS	6	9	33	required
U of Iowa	BA	7	9	32	required
U of Wisconsin	BS or BA	4	9	33	required
U of Washington	BS	6	9	33	optional
U of Kansas	BA	4	9	34	not required
U of N Carolina	minor only			15	

H.4.d. Sufficiency of the Undergraduate Program

The undergraduate program fully prepares students to proceed to graduate study at the University of Arizona or any other strong graduate programs in Speech-Language Pathology, Audiology, or a research degree in Speech, Language, and Hearing Sciences. This is evident in the observed success of UA undergraduates who matriculate through our graduate programs, and other strong programs in our field.

H.4.e. Course Availability

As noted above, many of our undergraduate courses fill to maximum enrollment. We have addressed this issue by moving to larger classrooms outside our building. In some cases, we have also added sections so that some classes are taught both fall and spring semester. In order to assure that our undergraduate majors get all of the courses that they need in a timely manner, our undergraduate advisor controls enrollment in a manner that prioritizes upperclassman.

H.4.f. Active Learning Strategies

Three of our required courses include “hands-on” laboratory experiences that complement classroom learning. These are:

- SLHS 261 Anatomy and Physiology of the Speech Mechanism includes laboratory experience with a human cadaver to study relevant anatomy. For 6 years, dissection labs were conducted at the medical center. In 2011, a plastinated cadaver was obtained, which provides an excellent teaching tool that is available in our building.
- SLHS 380 Hearing Science laboratory provides activities related to the anatomy and function of the auditory system.
- SLHS 473 Principles of Audiology laboratory activities allow students to learn how to use instrumentation to test hearing.

The Department offers many learning opportunities that permit active student engagement beyond the classroom setting. Essentially all faculty have on-going research projects and offer students the opportunity for directed research or independent studies. Other active learning strategies include observation of clinical activities in the speech, language, and hearing clinics. Observations are done in both unstructured and structured contexts, with the latter associated with the SLHS 496A Seminar: Advanced Clinical Observation, Analysis, & Writing (1 unit). A capstone experience is available for students to pursue an individualized project under faculty direction. Preceptorships are also available and are used to provide undergraduate students with indirect teaching experience allowing them to operate as non-grading teaching assistants. As noted in TABLE H.2, nearly 400 students were enrolled in various active learning courses in the 2011-12 year, more than three times the number enrolled 7 years ago.

Students at the undergraduate level also have the opportunity to participate in department colloquium, which is a forum where the faculty and graduate students present research and engage in discussion about topics within the field. Students may enroll in credit for the colloquium series, or simply attend without enrollment.

During their senior year, students are also eligible to participate in clinical experiences within one of the department clinics. Students participate in clinical observation hours as a prerequisite to clinical work, and approximately 7-10 students per semester are paired with a graduate student to participate in service planning and delivery. This experience has been on a volunteer basis in the past, but has recently been formalized to allow for academic credit for the experience using independent study registration.

The Department also supports the student group, the University of Arizona chapter of the National Speech-Language-Hearing Association, which offers many complementary learning experiences for students. For example, an educational forum is held approximately 6 times a year that is an evening educational event in which students have the opportunity to interact with local professionals as well as faculty. This student-run group has two faculty advisors who assist the students in the planning and organizing activities, many of which include faculty involvement.

H.4.g. Instructional Technology

As a group, our faculty are highly skilled in the use of technology in general, so that the application of technology for teaching is natural. All instructors use the web-based instructional site (D2L) for content delivery (e.g., lecture notes, digital video examples), course management, and some on-line assessment. In some cases, protected YouTube accounts are used to upload video materials for review outside of class. Lectures are routinely complemented by video examples, and in-class demonstrations, such as real-time acoustic analysis of speech output. On-line, real-time instructional blogging is occasionally used by some instructors. On some occasions, UA podcasts are appropriate for supplemental instruction, such as UA Neurology Grand Rounds given by our faculty or others on relevant topics.

H.4.h. Online Courses

We do not currently offer any online courses in SLHS. We recognize that this may become a priority in the future, and there are some courses that would better lend themselves to an on-line format than others. For example, some of undergraduate classes that do not require a laboratory could be formatted as online courses. We do not currently anticipate the development of on-line coursework at the graduate level because of the need for clinical education in the M.S. and AuD clinical programs. We are aware of the support offered by the Office of Instruction and Assessment, and plan to explore on-line course design in the coming years.

H.5. Undergraduate Students

H.5.a. Quality of Undergraduate Students

The data in **TABLE H.7.** below indicate the test scores for Freshman students who declare Speech, Language, and Hearing Sciences as their major are comparable to others at the University of Arizona as a whole, but are a bit below the averages for the College of Science.

TABLE H.7. SAT/ACT SCORES 2005-2012

TERM	SLHS			COLLEGE OF SCIENCE			UNIVERSITY OF ARIZONA		
	FRESHMEN STUDENTS	AVG COMP SCORES		FRESHMEN STUDENTS	AVG COMP SCORES		FRESHMEN STUDENTS	AVG COMP SCORES	
		ACT	SAT		ACT	SAT		ACT	SAT
Fall 11	32	22.4	1,026	1,336	24.6	1,129	7,300	23.9	1,105
Fall 10	35	23.5	1,051	1,205	24.6	1,137	7,025	23.8	1,098
Fall 09	21	24.2	1,028	1,164	24.6	1,150	6,966	23.6	908
Fall 08	18	21.9	1,041	982	24.5	1,135	6,709	23.5	912
Fall 07	16	21.3	1,049	978	24.4	1,175	6,569	23.5	915
Fall 06	21	22.9	1,031	894	24.8	1,192	6,009	23.5	910
Fall 05	16	23.4	1,124	820	24.9	1,198	5,974	23.5	911
<i>7-Yr Average</i>									
<i>Incoming Freshman</i>	23	23	1,050	1,054	25	1,159	6,650	24	966
<i>All Students*</i>	211	23	1,056	4,304	25	1,146	23,196	24	966

Note: Numbers are for first-time, full-time freshmen, some of whom take both exams; thus, the count exceeds the actual number of enrolled students. *Scores for the full cohort of students who declared SLHS major (not just as Freshmen).

The SLHS Department has good representation from students in the Honors College. As shown in Table H.8., about 10% of our undergraduates are Honors students. This compares to 21.6% in the College of Science and 12.9% for the university overall. It is helpful to examine these numbers and recognize that our Department may be able to attract a larger proportion of honor's students. Although we interact with the Honors College in a number of contexts, a more concerted effort could be directed to increase exposure of students to the SLHS major. We are aware that some science-oriented students do not recognize the scientific nature of the study in our Department, and therefore they overlook SLHS as major to pursue science. This is an area where we could improve our efforts, with the ultimate benefit of attracting strong, prospective doctoral students.

TABLE H.8. SLHS Majors in the Honors Program in relation to College of Science and all UA undergraduates, 2005-2011

TERM *	SPEECH, LANGUAGE & HEARING SCIENCES				COLLEGE OF SCIENCE				UNIVERSITY OF ARIZONA			
	Tot UG	Non Honor UG	Active Honor UG	% Honor UG	Tot UG	Non Honor UG	Active Honor UG	% Honor UG	Tot UG	Non Honor UG	Active Honor UG	% Honor UG
Fall 05	158	142	16	10.1%	3,018	2,278	740	24.5%	28,462	24,443	4,019	14.1%
Fall 06	185	161	24	13.0%	2,950	2,213	737	25.0%	28,442	24,569	3,873	13.6%
Fall 07	216	184	32	14.8%	3,009	2,263	746	24.8%	29,035	24,941	4,094	14.1%
Fall 08	269	239	30	11.2%	3,064	2,327	737	24.1%	29,714	26,024	3,690	12.4%
Fall 09	307	276	31	10.1%	5,340	4,366	974	18.2%	30,346	26,401	3,945	13.0%
Fall 10	318	296	22	6.9%	5,862	4,918	944	16.1%	30,638	27,341	3,297	10.8%
Fall 11	340	308	32	9.4%	6,066	4,933	1133	18.7%	30,717	26,868	3,849	12.5%
Avg				10.8%				21.6%				12.9%

The average time to complete the BS degree in SLHS has been just over 4 years. This is comparable, actually slightly less time, than programs with similar curriculum (Psychology and Linguistics). (See TABLE H.9.)

TABLE H.9. Time to Complete Undergraduate Degree 2005-12

	FISCAL YEAR (Aug/Dec/May)							
	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	FY 10-11	FY 11-12	Avg
SLHS	3.84*	4.01*	4.16	4.41	4.02	4.20	4.28	4.13
Psychology	4.53	4.27	4.44	4.22	4.48	4.30	4.31	4.36
Linguistics	4.29	4.26	4.45	4.29	4.43	4.01	4.12	4.31

*Data likely to underestimate due to transition period to new university tracking system.

H.5.b. Gender/Race/Ethnicity of Undergraduate Students

Contrary to undergraduate programs where women are not well represented, SLHS programs in the US are typically dominated by women, and our program is no different. Our 7-year average shows 92% enrollment of women, compared to the national average of 94%. This compares to a more balanced gender representation at the UA, in the College of Science and the University as a whole (see **TABLE H.10**). It is worth noting, however, that the trend is in the direction of an increase in the proportion of males over the past 7 years.

Regarding race/ethnicity, the UA SLHS Department has a larger proportion of under-represented minorities (27%) than the national average of SLHS programs (18%) and the College of Science (22%) and the University of Arizona as a whole (22%). This reflects a greater proportion of Hispanic/Latino and African American students in our Department than others (see **TABLE H.11**). There also appears to be a trend toward increased diversity on the past 7 years compared to preceding years.

Increased diversity may reflect efforts to expose a larger cohort of UA students to the discipline, which was accomplished through our large general interest/general education courses. We anticipate increased diversity in coming years as we are offering a new course in bilingual/multicultural issues in speech, language, and hearing (SLHS 435) beginning Spring 2013.

**TABLE H.10. SLHS Undergraduate Majors by Gender
2005-2012 and comparison of 7 year average to College of Science (COS), and University of Arizona**

Gender (Percent)	Academic Years by Fall Term							SLHS	Nat'l*	COS	UA
	Fall 05	Fall 06	Fall 07	Fall 08	Fall 09	Fall 10	Fall 11	7 yr Avg	2011 Avg	7 yr Avg	7 yr Avg
Female	94.0	91.5	93.8	91.6	90.1	90.9	92.8	92.1	94.2	56.1	52.6
Male	6.0	8.5	6.2	8.4	9.9	9.1	7.2	7.9	5.8	43.9	47.3

*National data from Higher Education Survey average from 213 undergraduate SLHS programs.

**TABLE H.11. RACE/ETHNICITY DISTRIBUTION FOR SLHS UNDERGRADUATE STUDENTS
2005-2012 and comparison of 7 year average to College of Science, University of Arizona, and 2011 National Averages**

Race/Ethnicity (Percent)	Fall 05	Fall 06	Fall 07	Fall 08	Fall 09	Fall 10	Fall 11	SLHS 7 yr Avg	Nat'l* 2011 Avg	CoS 7 yr Avg	UA 7 yr Avg
	American Indian/Alaska Native	4	4.2	1.5	3	2.1	1.7	1.3	2.5		2.7
Asian American	2.7	3.6	3.6	4.6	6.4	4.5	4.9	4.3		7.2	6.5
Black/African American	4.7	4.2	4.1	3.4	4.6	4.5	2.9	4.1		3.2	3.2
Hispanic/Latino	15.4	16.4	21.1	19	19.5	23.8	23.8	19.9		15.3	15.8
Native Hawaiian or Other Pacific Islander						0.7	0.3	0.5		0.5	0.6
Non-Resident Alien (includes Internat'l)			0.5	0.4	0.7	0.7	0.3	0.5		7.7	6.3
Not Specified	4	3.6	2.1	1.3	1.8	1.7	1	2.2		4.5	4.5
Under-represented groups (total)	24.1	24.8	26.7	25.4	26.2	30	28.7	26.8	17.6	21.7	22
White or Caucasian	69.1	67.9	67	68.4	64.9	62.2	65.5	66.4	81.2	59.2	61.0

*National data from Higher Education Survey average from 213 undergraduate SLHS programs (only totals available)

H.5.c. Recruitment and Retention of Well-Qualified Undergraduate Students

Student recruitment occurs in many contexts within and outside of the university. These include activities that provide exposure of our professions and our program to a broad audience, as well as activities that specifically target potential students who are likely to be particularly well qualified. Our faculty routinely participate in annual career fairs on campus, such as the UA Meet Your Major event each fall and High School Senior Day, as well as countless career day events at local high schools. We also provide research opportunities for selected high school students through local science programs. We also have participated in the MedStart summer program every year for incoming undergraduate students. Connections with prospective undergraduates also occurs through the University and College of Science events for high school students interested in the U of A. SLHS faculty routinely mentor students through the Undergraduate Biology Research Program (UBRP), and have presented in the Honor's College lunch series. We also provide guest lectures in related departments, such as Linguistics, Psychology, Education, and the School of Medicine. Our community outreach is exceptional, so that our Department has high visibility on campus and throughout the state. A natural consequence is exposure of the field of communication disorders and sciences, and our program in particular, to a wide range of prospective students; our large and growing undergraduate enrollment speaks to the success of these efforts.

H.5.d. Undergraduate Advising

In 2008, the College of Science shifted to a centralized plan for undergraduate advising. Under that model, a full-time undergraduate advisor was employed by the college who provides advice to undergraduate students in SLHS. For the first two years, the SLHS undergraduate advisor was housed within the SLHS building, where she interacted with faculty and staff on a regular basis to learn about the major. In 2010, this advisor moved to an office within the College of Science, where she continues to work. In order to keep the advisor informed, she interacts on a regular basis with the chair of the SLHS curriculum committee, as well as the Department Head. Consistent efforts are required to keep the advisor aligned with the department curriculum plans. Of interest is the fact that this advisor began taking courses within the department as a part-time non-degree seeking student, and plans to ultimately pursue graduate education in SLHS.

H.5.e. Graduation Outcomes and Views of Program

We examined the exit survey data collected by the College of Science over the past 7 years. More than 80% of the undergraduates indicated that their undergraduate experience met or exceeded their expectations. As shown in TABLE H.12, students also indicated that they agree or strongly agree that their undergraduate experience trained them in writing, quantitative skills, and problem-solving skills. Roughly 85% of students completing the survey indicated that they planned to pursue graduate school and careers in audiology, speech-language pathology, or the sciences that support the professions. We do not have data from alumni to examine long-term career choices.

TABLE H.12. Average Responses to Exit Interview Questions (3 – point scale)

	2007	2008	2009	2010	2011	2012	Avg
Did your undergraduate experience train you in your writing?	2.67	2.80	2.71	2.30	2.51	2.31	2.56
Did your undergraduate experience train you in quantitative skills?	2.48	2.48	2.56	2.15	2.29	2.19	2.36
Did your undergraduate experience train you in problem-solving skills?	2.76	2.80	2.76	2.37	2.53	2.47	2.61

1 = Disagree 2 = Agree 3 = Strongly Agree

H.6. Undergraduate Student Learning Outcomes Assessment

H.6.a. Undergraduate Student Learning Outcomes

The training mission of the SLHS undergraduate program is to provide academic and pre-clinical education to students in speech, language, and hearing sciences that is sufficient to master foundational knowledge and skills necessary for advanced learning at the graduate level. The learning outcomes relate to standards set by the American Speech-Language-Hearing Association (ASHA) that are to be fully achieved at the graduate level. By the completion of the program, undergraduate students are expected to:

1. Demonstrate understanding of basic principles of biological and physical sciences, mathematics and the social and behavioral sciences. (ASHA Standard III A)
2. Demonstrate knowledge of basic human communication and swallowing processes, including their biological, neurological, acoustic, psychological, developmental, and linguistic and cultural bases. (ASHA Standard III B)
3. Demonstrate knowledge of the nature of speech, language, hearing, and communication disorders and differences and swallowing disorders, including the etiologies, characteristics, anatomical/physiological, acoustic, psychological, developmental, and linguistic and cultural correlates. (ASHA Standards III C)
4. Demonstrate basic understanding of principles of assessment and intervention over the range of communication disorders specified in the current scope of professional practice for audiology and speech-language pathology. (ASHA Standard III D)
5. Demonstrate adequate writing skills for scientific and clinical report writing. (Standard IV B)

H.6.b. Assessment Activities

The student learning outcomes enumerated above are assessed within the associated courses in which the content and skills are taught. The expected level of understanding varies across the curriculum as prerequisite classes provide the foundation for more advanced understanding, and ultimately, an even more advanced knowledge base will be developed for students who go on to graduate school. Assessment activities include in-class and take-home exams that with a variety of question types (multiple choice, fill in the blank, short answer, and essays of various levels of detail), written papers/essays, in-class presentations, and other course-specific projects or activities. **TABLE H.13.** shows the relation of coursework to the learning outcomes.

TABLE H.13. SLHS Undergraduate Courses and Outcome Assessment associated with Learning Outcomes

Outcome	Relevant Coursework	SLHS Outcome Assessment
1. Basic knowledge in science and math	General education coursework	N/A
2. Normal human communication and swallowing	SLHS 207 , 261, 267, 340, 362, 367, 380, 430, 441, 471, 473, 477	Pre-Post Tests in SLHS 207, 471, 473, 477
3. Disorders of communication and swallowing	SLHS 207 , 261, 340, 362, 430, 441, 454, 471, 473, 477 , 483, 496A	Pre-Post Tests in SLHS 207, 471, 473, 477
4. Assessment and treatment principles	SLHS 207, 441, 454, 471, 473, 477 , 483, 496A	Pre-Post Tests in SLHS 207, 471, 473, 477
5. Effective writing skills	SLHS 270, 340, 362 , 430, 454, 471, 473, 496a	Writing samples SLHS 362

Bold indicates courses where outcomes are sampled. (Course names are listed in section H.3.a.)

The basic knowledge in science and math is achieved through general education coursework and is reinforced in courses within the major. We do not specifically assess the outcomes from general education courses, however, this knowledge will be foundational for Outcomes 2-4. In order to sample student improvement relative to targeted outcomes within the major, we examined several repeated measures within our program that provide a consistent probe of student learning over semesters. They include the following:

1. Pre-Post Tests (10-point multiple choice) in the following classes:
 - SLHS 207 Survey of Human Communication and Its Disorders
 - This introductory course is taken by pre-majors, majors, and non-majors. It provides an assessment of acquisition of new knowledge in a diverse cohort of students.
 - SLHS 473/477 – Communication Disorders I and II
 - This foundational two-course sequence for majors covers a wide range of communication disorders. These courses build upon other foundational courses in SLHS.
 - SLHS 471 Speech Sound Disorders
 - This speech disorders course requires more in-depth knowledge of communication disorders than preceding courses and should be representative of more advanced knowledge in the major.
2. Writing samples graded using a standard rubric
 - SLHS 362 Neurobiology of Communication
 - SLHS 362 is typically the first of three writing emphasis courses taken by majors in SLHS, and thus includes considerable attention to scientific writing form. Didactic instruction is provided regarding scientific writing and a strict scoring rubric is implemented.
 - This writing emphasis course provides two samples of scientific writing and allows a comparison of improvement in response to feedback and over time.

H.6.c. Assessment Findings

Figure H.1. shows the performance on the 10-point multiple choice quizzes taken at the beginning and end of the four courses described in the previous section (SLHS 207, 471, 473, and 477). A consistent pattern of performance is demonstrated whereby the average performance on the pre-test averages about 40% and improves to 80% after the course. The information sampled by these quizzes relates specifically to the learning objectives 2 – 4 as indicated in **TABLE H.13**. The primary goal is for students to achieve the 80% or better mastery level, but it is interesting to note that it appears that the level of mastery for SLHS 471 and 473 improved over the four years that were sampled in the exact same manner.

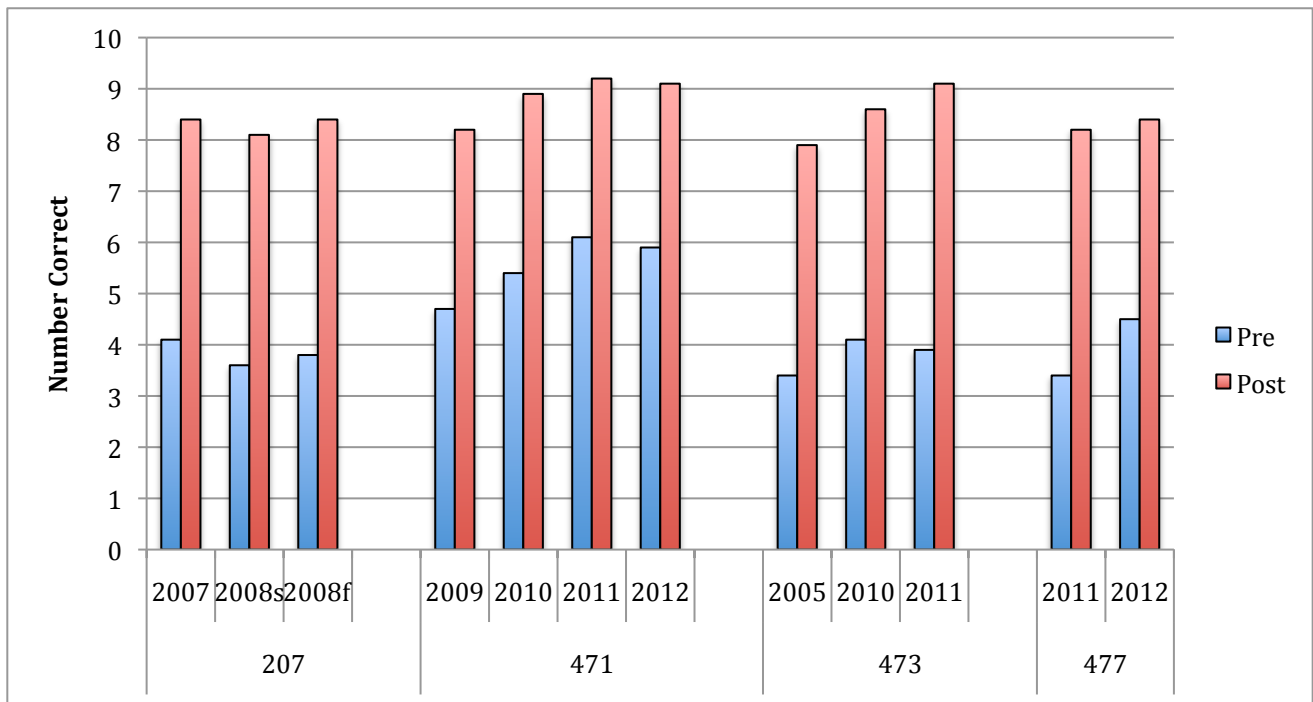


FIGURE H.1. Assessment Findings for Undergraduate Learning Outcomes. Scores on 10-point multiple-choice test taken on the first day of class (pre) and at the end of the course (post) for courses SLHS 207, 471, 473, and 477. (See course title and rationale in **TABLE H.13**).

Learning outcomes for writing skills have been sampled in a consistent manner for the past 3 years (2010-2012) in SLHS 362 (Neurobiology of Communication). In this class, students write two papers on a scientific topic related to the course content and are provided with writing guidelines and a standard scoring rubric. Students are allowed to submit a re-written paper following feedback from the first essay. As noted in **FIGURE H.2.**, the first papers are far from meeting the strict criteria for well-written papers. Students show marked improvement, both in their response to editorial input used to re-write the papers (post) and in the writing of the second paper compared to the first. Student learning in the area of writing continues in the two other writing-emphasis courses, so that they should have the tools for graduate school, or other life pursuits that involve analytical writing skills.

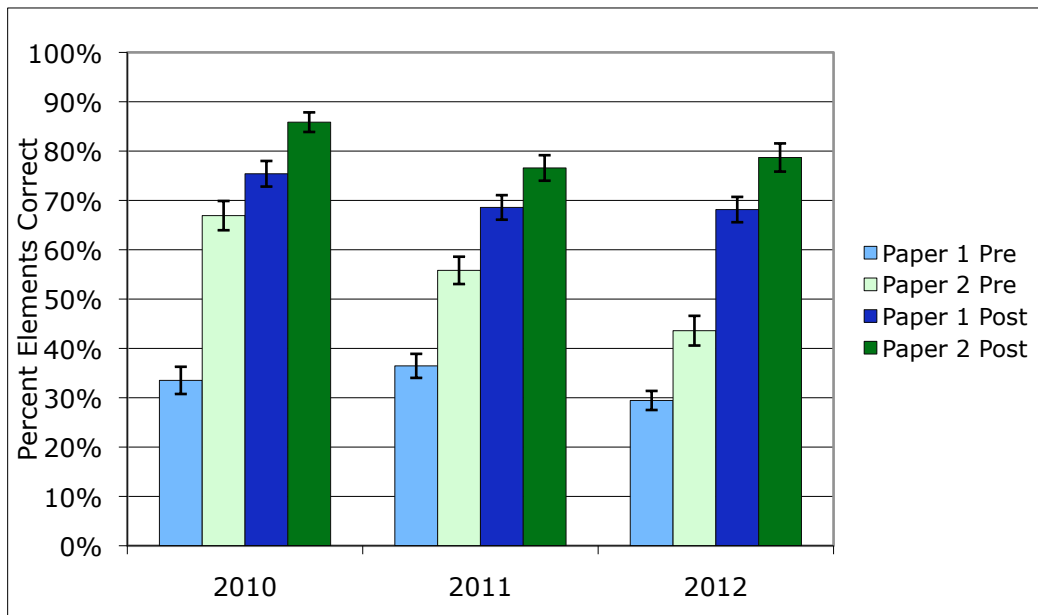


FIGURE H.2. Changes in writing scores over the course of the semester in undergraduate writing emphasis course (SLHS 362). Light bars indicate first draft by students (Pre); dark bars indicate papers re-written after feedback (Post). Average class size = 60 students. Error bars = SEM.

H.6.d. Changes Made in Response to Findings

SLHS faculty members have a strong commitment to undergraduate teaching. The emphasis on basic science and foundational knowledge is a common thread through all of the courses. All faculty utilize informal feedback from the students as well as formal teaching evaluations to improve their courses on a regular basis. Learner outcomes documented on course syllabi are updated annually and reflect changes in the course based on feedback.

With regard to objective measurement of learning outcomes in SLHS, the pre-post test scores have been confirmatory of our impression from other indicators that students clearly advance their knowledge in the targeted areas. This information combined with the strong course evaluations indicate overall success in our teaching mission. That said, we continue to review, evaluate, and modify our curriculum in order to achieve the best possible educational sequence for our students.

With regard to writing skills, the annual review of student writing performance in our three writing emphasis classes (SLHS 340, 362, 430) has led to considerable change over time in an effort to improve student outcomes. These changes include:

- increased consistency in the rubrics used to evaluate writing in the writing emphasis courses and sharing of that rubric with all faculty
- increased use of student preceptors in the writing emphasis courses in order to increase the feedback to students and allow for re-writing of papers in SLHS 362 in response to feedback. (Note that preceptors only do the initial review and feedback on papers, and all grading is done by the responsible faculty member).
- increased structure of preceptor training with supervising faculty to maximize scoring reliability.

Since the last APR review, the increase in the number of teaching faculty has allowed us to significantly rework the undergraduate curriculum in a way that we think markedly enhanced student learning. Improvements to the courses were based on informal feedback from students, formal course evaluations, as well as peer critiques and discussions.

- Three courses related to hearing (acoustics, hearing science, and audiology) were sequenced and topics reorganized to allow students to build knowledge over three consecutive semesters. This sequencing has improved student performance in the upper division course in Principles in Audiology (SLHS 483R/L). This improvement in the curriculum is due to an increase in faculty numbers allowing us to offer lower division courses both fall and spring semesters.
- Laboratory experiences for three courses (SLHS 261, 380, and 483L) have been restructured to add hands-on laboratory demonstrations designed to illuminate difficult concepts in these courses. The addition of a cadaver to the laboratory for SLHS 261 has allowed for the opportunity to see anatomical structures in situ, thereby improving students' recognition of the structures and allowing for application to clinical disorders presented in later courses. Labs in Hearing Science (SLHS 380) and Principles of Audiology (483L) have been reworked to include hands-on demonstration of auditory/acoustic phenomena. The personal experience with these phenomena improves retention and transfer of knowledge when built on during a subsequent course. The laboratory components of these courses are unique compared to peer institutions that offer few undergraduate laboratory experiences.
- We have also been able to offer SLHS 367, Clinical Phonetics, again, a course that had not been taught as a full course for several years due to insufficient faculty. The availability of this course has greatly improved our ability to prepare students for the elective course in Speech Sound Disorders (SLHS 471). Student performance in SLHS 471 has improved as a direct result of training in clinical phonetics and this has allowed the instructor to cover topics in more depth and provide a strong clinical foundation for future clinical work.
- The Department has also added a registration for teaching preceptors at the undergraduate level (SLHS 491). This registration allows us to offer additional opportunities for top students to work with their peers as a mentor and solidify their knowledge in an area.
- The Department has added a number of courses (1 lower division, 2 upper division), which improves breadth of students' knowledge in the field. These include SLHS 255 Hearing, Health, and Society (GEN ED), SLHS 435 focusing on Multicultural and Multilingual Populations, SLHS 430 Cognitive Neuroscience of Language.
- Two upper division undergraduate courses covering communication disorders (SLHS 477 and 473) were reworked by the faculty to approach communication disorders using a lifespan approach (consistent with the prevailing views of the field), avoiding duplicate presentation of material, and increasing the number of different disorders covered. The focus has also expanded to include evidence-based practice as a pillar of the field.

I. GRADUATE STUDENTS, DEGREE PROGRAMS AND OUTCOMES

I. 1. Graduate Program Description

We have three graduate degrees:

- Master of Science (MS) in Speech, Language, and Hearing Sciences
- Doctor of Audiology (AuD)
- Doctor of Philosophy (PhD) in Speech, Language, and Hearing Sciences

In addition, our Department provides the following:

- Bilingual/Bicultural certificate program (approved 1/3/13) – a new optional complement to our graduate degrees.
- Speech-Language Pathology Assistant Program, a 3-4 month post-bachelor's program.
- Combined clinical and research degree programs in speech-language pathology (MS/PhD) and audiology (AuD/PhD), whereby the student completes the degree requirements for both degrees. This program was supported by a training grant T32 awarded from the National Institute on Deafness and Other Communication Disorders.

Our programs are classified according to the National Center for Educational Statistics under the Classification of Instructional Program (CIP) codes indicated below.

M.S. and Ph.D. degrees in Speech, Language, and Hearing Sciences:

CIP Code 51.0201 <http://nces.ed.gov/ipeds/cipcode/cipdetail.aspx?y=55&cid=88749>

Title: Communication Sciences and Disorders, General.

CIP Definition: A program that focuses on the application of biomedical, psychological, and physical principles to the study of the scientific bases, development, and treatment of speech, language, hearing, and cognitive communication problems caused by disease, injury, or disability. Includes instruction in language science, hearing science, speech and voice science, biology of communication, behavioral linguistics, psychology, and applications to the development of diagnostic and rehabilitative strategies and technologies.

Doctor of Audiology:

CIP Code 51.0202 <http://nces.ed.gov/ipeds/cipcode/cipdetail.aspx?y=55&cid=88747>

Title: Audiology/Audiologist.

CIP Definition: A program that prepares individuals to diagnose and treat hearing loss and other disorders involving the ear, advise patients on means to use their remaining hearing, and select and fit hearing aids and other devices. Includes instruction in acoustics, anatomy and physiology of hearing, hearing measurement, auditory pathology, middle and inner ear analysis, rehabilitation therapies and assistive technologies, and pediatric and other special applications.

Bilingual Certificate:

CIP Code: 13.1012

Title: Bilingual, Multilingual, and Multicultural Education, Other.

CIP Definition: Any instructional program in bilingual, multilingual, and multicultural Education not listed above.

I.1.a. Master of Science Degree in Speech, Language, and Hearing Sciences

The Master of Science degree in Speech, Language, and Hearing Sciences is typically a 2-year course of study. The majority of students seeking this degree have an emphasis in clinical speech-language pathology, so it is referred to here as the MS-SLP. Through academic coursework and supervised clinical practicum experiences, students are prepared for the professional practice of speech-language pathology. Academic coursework covers speech, language, and hearing sciences and the nature and treatment of communication disorders across the lifespan (a minimum of 36 graduate credit hours); clinical practicum provides experience across an array of disorder types. The program is accredited by the Council on Academic Accreditation of the American Speech-Language-Hearing Association (ASHA) in Speech-Language Pathology. Thus, the required coursework and clinical training address all of the ASHA Standards for the necessary knowledge and skills for speech-language pathology.

The MS-SLP program is designed to be completed within 2 years for students entering with previous academic preparation (e.g., an undergraduate degree in SLHS). The 2-year program includes the summer term between years 1 and 2. We also offer a 3-year MS program for students who have undergraduate majors outside of the field. The first year of this 3-year program is designed to allow students to complete prerequisite coursework that will provide a solid foundation and ensure success in the master's program. The final 2 years of the three-year program are identical to the 2-year MS program. An overview of the course requirements are detailed in **APPENDIX G**.

The non-clinical Master of Science degree in Speech, Language, and Hearing Sciences (MS-SLHS) also includes 36 units of coursework, but does not include clinical practicum experiences, and students are not held accountable for the knowledge and skills that are clinical in nature.

I.1.b. Doctor of Audiology (AuD)

The Doctor of Audiology (AuD) program is a 4-year course of study for a professional degree with a clinical emphasis in audiology. The program is accredited by the Council on Academic Accreditation of American Speech-Language-Hearing Association (ASHA), which is distinct from the accreditation in speech-language pathology. The required coursework and clinical training address all of the ASHA Standards for the necessary knowledge and skills for audiology. Through academic coursework and supervised clinical practicum experiences, students are prepared for the professional practice of audiology. Academic coursework covers hearing sciences and the nature and treatment of hearing and balance disorders across the lifespan clinical practicum provides experience across an array of disorder types.

The University of Arizona Au.D. curriculum includes a prescribed list of 59 semester units of coursework covering all major topic areas included in the audiology scope of practice, and 16 semester units of clinical practicum enrollment. The AuD courses and typical sequence are described in **APPENDIX H**. Students must also successfully complete a mentored research project and a series of three comprehensive exams. An additional 18 units of coursework is also required, but may have been taken at the undergraduate level. These units include coursework in statistics, research methods, speech/language development, speech/language disorders and speech perception.

I.1.c. Doctor of Philosophy in Speech, Language, and Hearing Sciences (PhD)

The Doctor of Philosophy (Ph.D.) program prepares students for academic and research careers through coursework and participation in research projects. Our goal is the development of independent researchers and teachers. Graduates gain a broad base of knowledge about human communication sciences and disorders and significant in-depth preparation in their special areas of concentration within the discipline. An overview of the curriculum guidelines are included in **APPENDIX I**, which details the

required courses (about 12 units) of the 36-unit minimum. Students typically take coursework during the first 2 years, as they also gain research skills in the context of research rotations and engage in ongoing research in the lab of the primary mentor. All students complete an original dissertation research project.

I.1.d. Bilingual Certificate Program

The recently approved Bilingual Certificate in Speech-Language Pathology allows students to specialize in evidence-based methods of assessment, diagnosis, and treatment of bilingual children and adults with speech, language, and hearing impairments. Students who earn this certificate will demonstrate knowledge of how the structure of common languages spoken in the United States compares and contrasts with English, how to appropriately assess and treat all languages in the bilingual or multilingual individual, how to train and implement the use of interpreters, and cultural awareness and sensitivity in the clinical setting. Students are required to take 11 credits: (1) SLHS 435/535 Bilingualism, Multiculturalism, and Nonmainstream Dialects (3 units); (2) a bilingual clinical practicum supervised by a bilingual speech-language pathologist in one setting or an accumulated number of contact hours across clinical placements with culturally and linguistically diverse populations; (3) a phonetics course in a language other than English (outside of our Department), and (4) one elective course outside or within our Department related to bilingualism and/or multiculturalism (11 credits).

I. 2. Graduate Program Curriculum and Courses

I. 2.a Adequacy of Graduate Curriculum and Courses

The graduate coursework offered within SLHS adequately covers all of the course requirements for the degrees offered. Coursework, clinical practicum, and research opportunities are available for all three areas: speech, language, and hearing. As noted, the clinical programs meet the academic requirements for ASHA accreditation in Speech-Language Pathology, and also for Audiology. The core courses for the doctoral program are available, and special seminars are offered to meet changing interests and needs over time.

I.2.b. Active Learning Strategies

Many of the courses in our curriculum incorporate active learning experiences as an integral aspect of the learning process. For example, SLHS 512 (Evaluation Process in Speech-Language Pathology) is specifically taught using a problem-based learning format designed to train formal problem-solving methods. Other active learning approaches are noted in **APPENDIX K** where courses are listed relative to the ASHA standards that they meet. Learning in the classroom is complemented by a variety of learning contexts elaborated below.

Clinical Practicum: Students completing the MS degree in speech-language pathology and those in the AuD program complete supervised clinical practicum experiences. Clinical practicum is an integral component of these programs. Students work closely with clinical faculty on campus and professionals in the community who act as preceptors for their clinical training. Initial clinical experiences are gained with children and adults in the University of Arizona Speech, Language, and Hearing Clinics under the supervision of University clinical instructors and teaching faculty. A rotation system is then employed such that students are assigned to continue at the University Clinic or to

participate in a variety of off-campus facilities such as Tucson public schools, local hospitals and medical centers, and children's agencies.

Colloquium: A weekly colloquium series sponsored by the Department provides an excellent complementary learning experience for students. Presentations typically occur 3 times per month and are open to all. Speakers include members of the SLHS faculty, other UA departments, local resources, and visiting scholars. Student presentations are also included in the colloquium series under the direction of supervising research or clinical faculty. Attendance at the colloquia is particularly appropriate during the first year of graduate school as a means to learn more about the research and clinical activities in the department. Students are to enroll in the colloquium for academic credit a minimum of one semester during their graduate program. To do so, students register for SLHS 595a for 1 unit of credit.

Teaching Preceptorships: PhD students who plan an academic career are encouraged to gain mentored teaching experience during their doctoral program. Students have the opportunity to teach a course, or selected units within a course, to gain teaching experience. They are involved in preparing a course syllabus, learning objectives, test items, and lecture notes. Opportunities are also available for single lectures, typically given prior to the preceptorship. Students are observed and evaluated by their faculty mentor or other faculty designate, and they also have the option of peer-review by other doctoral students.

Research Experiences: In addition to the formal thesis option, students in the professional programs (SLP and AuD) have the opportunity to participate in ongoing research in faculty laboratories. For the AuD students, a research project is required as part of their training. In the case of PhD students, they are required to do a minimum of at least two research lab rotations, one outside of the primary mentor's lab. These rotations allow the students to actively engage in research projects that often lead to co-authorship on presentations and/or papers. It also provides the opportunity to observe how a given lab is organized and managed, an important aspect of preparing them for a research career.

I. 2.c. Instructional Technology

As described in **Section H.3.g.**, Instruction Technology for Undergraduate Teaching, our faculty are highly skilled in the use of technology in the classroom, laboratory, and clinical settings. All of the technologies used with undergraduate students are used with graduate students. In addition, graduate level teaching involves greater use of instrumentation and software that are relevant to teaching about communication sciences and disorders. Classroom teaching in speech-language pathology typically include a wide array of video/audio recordings of normal and disordered communication that provide learning opportunities for descriptive analysis, differential diagnosis, and to demonstrate teaching principles. Instrumentation used to analyze, evaluate, and treat speech, language, and hearing processes are included in a wide array of teaching contexts. This includes, for example, spectrographic analysis of speech output, detection/measurement of otoacoustic emissions, electrophysiological measures of hearing, and various brain imaging techniques and analysis software packages.

I. 2.d. On-Line Courses

We do not offer any on-line coursework, and do not currently anticipate the development of on-line coursework at the graduate level because of the need for clinical education to complement the M.S. and AuD clinical programs.

I. 2.e. Adequacy of Resources

Office, Lab, and Clinical Preparation Spaces for Graduate Students. The graduate students in the clinical programs have several common workspaces provided and maintained specifically for them. This includes a large “grad room” on the 4th floor that includes couches, desks, tables, computers, and bookshelves for their use. They also have individual lockers in which to store personal items during the day. Within the clinic, there is a student workroom where clinical materials are also stored. In addition, there is a secure computer room for report writing and video analysis. Supplies for the conduct of clinical practice are provided and some of the funds to cover the cost of consumables come from the clinical practicum course fees. All PhD students have office space within the Department, either within the laboratory of their mentor, or in designated office space for doctoral students. They are provided with materials and supplies to conduct research.

As described in **Section C.2.**, considerable effort has been directed toward improving the learning environment for students in our Department. This has included the addition of more space for students to participate in research, so that students who work in specific research labs have desk and computing space. Most of the computing equipment costs are covered by the appropriate research project, but the Department also helps to support the needs of research labs through start-up funds and indirect cost revenues.

Student Travel. For several years (2008-2010), support for student travel was generated by specific fund-raising activities coordinated by the Department development committee. These efforts allowed us to institute a student travel fund with a call for applications twice a year. Students receive travel awards in relatively modest amounts of \$200 - \$400, based on the merit of the application, with students presenting at conferences awarded larger amounts than those simply attending a meeting. An evaluation of the cost-benefit of the work involved in the fund-raising event prompted a shift to other sources of money to support the travel fund. Currently, we support the fund with designated or unrestricted gifts to the Department and using some of the revenue generated by continuing education conferences conducted by the Department. We have been able to provide awards to essentially all students who seek support for travel to present at meetings for the past 5 years. It is our goal to grow the travel fund so that awards can be larger and thus offer better coverage for student travel.

Photocopy. One central photocopy machine is used for the Department in the main office on the second floor, and one photocopy machine is dedicated for clinical needs on the first floor. The central photocopy machine is connected by network to all faculty offices and research labs. Student use of the photocopy machine is limited to clinical work, teaching assistant and research-related needs. There is not a photocopy machine that is available for discretionary student use. The inclusion of a machine that accepts funds from student ID cards (CatCard) would be a welcome benefit for students that could be explored. Such a machine could be placed in the graduate student workroom.

I. 2.f. Interdisciplinary Education

Our PhD students are required to complete a minor in another department. The minor consists of at least 9 units of graduate-level coursework from the minor department. Thus, all of our PhD students are engaged in coursework outside the department for at least the minor, and additional coursework is often completed to obtain tools or knowledge needed for their chosen area of research. For example, over the past year our PhD students have taken graduate-courses from the Departments of Psychology, Linguistics, Electrical and Computer Engineering, Spanish, Public Health, Biochemistry, Neuroscience, and Education.

Some of our graduate-level courses also attract PhD students from other departments, especially from Cognitive Science, Psychology, and Linguistics. As an example, our course in Speech Perception has typically drawn enrollment of about 5 students from other departments. The graduate class in adult language disorders typically has at least one student from other departments, such as, linguistics, special education, and psychology. We also offer a variety of doctoral seminars that, depending on the topic, attract outside PhD students as well. For example, Survival Skills and Ethics (SLHS 649) consistently enrolls graduate students from 10-15 other department units.

I.3. Graduate Students

I.3.a. Recruitment and Quality of Students

Student recruitment efforts are embedded in a myriad of faculty activities that provide excellent exposure for our program. This includes:

- Faculty presentations at national conventions and conferences, as well as invited talks around the country (and internationally).
- Professional service and leadership in our profession and related interdisciplinary contexts
- Strong collegial relations within the profession
- Contributions to the scientific literature and scholarly chapters and books

Additional recruitment activities include:

- Annual participation at graduate recruitment centers at large national meetings, such as the American Speech-Language-Hearing Association and the American Academy of Audiology.
- Career fairs at the University of Arizona, local high schools.
- Prospective student visitation to the Department is welcome at any time, but we also host three full days with a visitation schedule each spring for prospective graduate students to come visit.

We consistently have strong applicants to our graduate programs. The applicants for the MS-SLP program are among the strongest applicants to any of such programs in the nation, based on the Higher Education Survey data regarding GRE scores and GPA (see **TABLE I.1** below, and comparisons in **TABLES D.3-5**). The number of applications for the M.S. with an emphasis in Speech-Language Pathology has more than doubled over the past 7 years to about 250 per year (**TABLE I.1**), and there is particularly high selectivity (an average of 15% of the MS-SLP applicants are admitted). The number of applications to the AuD program has also increased to 60, nearly twice the number in 2005. Approximately 24% of applicants are admitted, and they are also of high quality. By comparison with the MS-SLP students, the Verbal GRE scores are not quite as high for the AuD students admitted to the program. The PhD students admitted to the program are relatively comparable to the MS-SLP students with regard to GRE scores. National comparison data are not compiled for PhD students, so that it is not clear how our students would compare to the national pool. It is worth noting that we find that GRE scores have good face validity in predicting graduate student performance. That is, our best students typically have among the highest GRE scores, and the poorest students often have scores on the lower end of those admitted. We also note that the top MS and AuD students are often considered good candidates for the PhD program. This observation prompted the development of the T32 grant entitled Developing Clinical Investigators in Audiology and Speech-Language Pathology.

TABLE I.1. SLHS Graduate Program Applications and Admissions

MS-SLP								7 Year-
Academic Year (fall)	f2005	f2006	f2007	f2008	f2009	f2010	f2011	Avg
# Applicants	105	119	117	140	176	239	248	163.4
#Admitted	27	17	25	24	24	24	23	23.4
% Admitted	20%	16%	21%	17%	14%	10%	9%	15.3%
# Matriculated	23	17	22	19	24	23	23	21.6
Characteristics of M.S. Class								
Verbal GRE	520	540	552	572	552.9	569.6	533	548.5
Quantitative GRE	610	634	652	605	644.5	647.5	663	636.6
Analytical Writing GRE	4.7	4.64	4.69	4.6	4.42	4.4	4.5	4.6
GPA	3.80	3.71	3.74	3.69	3.67	3.77	3.8	3.7

AuD								
Academic Year	f2005	f2006	f2007	f2008	f2009	f2010	f2011	Avg
# Applicants	39	28	37	32	44	38	61	39.9
#Admitted	8	6	10	10	8	11	12	9.3
% Admitted	21%	18%	27%	31%	18%	30%	20%	23.6%
# Matriculated	5	5	10	9	7	10	11	8.1
Characteristics of AuD Class								
Verbal GRE	466	486.6	507	535.5	492.5	505	450	491.8
Quantitative GRE	626	645	607	647.7	617.5	663	603	629.9
Analytical Writing GRE	4.7	5.3	4.5	4.17	3.94	4.2	3.77	4.4
GPA	3.69	3.86	3.8	3.55	3.57	3.67	3.55	3.7

PhD								
Academic Year	f2005	f2006	f2007	f2008	f2009	f2010	f2011	Avg
# Applicants	6	9	7	10	19	14	10	10.7
#Admitted	1	3	3	3	5	2	2	2.7
% Admitted	17%	33%	43%	30%	26%	14%	20%	26.1%
# Matriculated	1	4	2	3	5	2	2	2.7
Characteristics of PhD Students								
Verbal GRE	520	570	560	483	522	530	650	547.9
Quantitative GRE	670	698	595	607	604	535	620	618.4
Analytical Writing GRE	4	4.38	4.0	4.83	4.2	4	4.5	4.3
GPA	3.29	3.72	3.89	3.67	3.75	3.37	3.86	3.7

I.3.b. Enrollment Trends for SLHS Graduate Degree Programs

Our total graduate student enrollment has fluctuated over the past seven years between 73 and 100 students.

- We target 50 students in our MS-SLP program (roughly 25 new admissions each year) and aim to admit twice that number in order to hit the mark. This ratio works better some years than other years, and in recent years we have learned that it is wise to over-commit so as to hedge against last minute changes that occasionally occur.

- The AuD program has steadily increased as we had planned with the transition to the 4-year degree. Ten students are targeted for enrollment with each new class.
- Enrollment of PhD students is dependent upon individual matches between candidates and mentoring faculty. The number of doctoral students has declined from a high of 18 to our current cohort of 10 students (with 2 additional students in the clinical/research program who are completing clinical fellowship years).

TABLE I.2. Graduate Student Enrollment by Program

SPEECH, LANGUAGE & HEARING SCIENCES							
	Term						
	Fall 05	Fall 06	Fall 07	Fall 08	Fall 09	Fall 10	Fall 11
Masters Students (MS)	56	50	39	38	42	53	52
Clinical Doctorate (AuD)	19	16	19	26	27	32	33
Doctorate (PhD)	18	16	15	15	15	15	10*
Department Totals							
Total # Graduate Students	93	82	73	79	84	100	95*
Graduate Credit Hours	990	916	838	866	1,058	1,159	1,114
Faculty FTE	10	13	13	11	12	15	14

*Two students completing clinical fellowship years are not included in this count.

I.3.c. Gender/Race/Ethnicity of Graduate Students

As noted for our undergraduate student population, women are well represented in SLHS graduate programs. As shown in **TABLE I.3.**, all of our graduate programs have more than 70% women compared to men. We would like to achieve a better gender balance, and recognize that our efforts to do so at the undergraduate level have the best likelihood of making an impact.

TABLE I.3. Gender of Graduate Students in SLHS, College of Science, UA, and National Comparison

		Fall 05	Fall 06	Fall 07	Fall 08	Fall 09	Fall 10	Fall 11	SLHS	COS	UA	Nat'l Compare*
Academic Plan	Gender								7 yr Avg	7 yr Avg	7 yr Avg	2010 HES data
AUD	F	83.3%	62.5%	72.2%	73.1%	75.0%	78.1%	72.7%	73.8%	56.1%	52.6%	86.1%
	M	16.7%	37.5%	27.8%	26.9%	25.0%	21.9%	27.3%	26.2%	43.9%	47.3%	13.9%
MS/SLHS	F	94.3%	94.0%	94.9%	92.1%	95.1%	94.2%	92.3%	93.8%	56.1%	52.6%	95.7%
	M	5.4%	6.0%	5.1%	7.9%	4.9%	5.8%	7.7%	6.1%	43.9%	47.3%	4.3%
PHD/SLHS	F	83.3%	87.5%	85.7%	92.8%	93.3%	93.3%	80.0%	88.0%	56.1%	52.6%	76.1%
	M	16.7%	12.5%	14.2%	7.1%	6.7%	6.7%	20.0%	12.0%	43.9%	47.3%	23.9%

*National comparison data from Higher Education Survey (HES) 2010-11 Communication Sciences and Disorders program survey.

TABLE I.4. Race/Ethnicity of Master of Science Students

Race/Ethnicity (Percent)	Fall							SLHS	Nat'l*	CoS	UA
	05	06	07	08	09	10	11	7 yr Avg	2011	7 yr Avg	7 yr Avg
MS - SLP											
American Indian/Alaska Native	0%	0%	0%	1.9%	2.4%	0%	0%	2.2%		2.7%	2.5%
Asian American	1.8%	0%	2.6%	3.8%	12.2%	7.7%	3.8%	5.3%		7.2%	6.5%
Black/African American	0%	0%	0%	0%	0%	1.9%	3.8%	2.9%		3.2%	3.2%
Hispanic/Latino	3.6%	1.5%	5.1%	7.7%	7.3%	5.8%	7.7%	5.5%		15.3%	15.7%
Native Hawaiian or Other Pacific Islander	0%	0%	0%	0%	0%	1.9%	0%	1.9%		0.5%	0.6%
Non-Resident Alien (includes Internat'l)	1.8%	2.0%	0%	0.3%	0.5%	0.3%	0.2%	1.9%		7.7%	6.3%
Not Specified	1.8%	5.8%	15.4%	13.1%	4.9%	1.9%	3.8%	6.7%		4.5%	4.5%
Under-represented groups (total)	3.6%	1.5%	5.1%	9.6%	9.7%	9.6%	11.5%	7.2%	13.6%	21.7%	22.1%
White or Caucasian	90.9%	90.2%	76.9%	68.4%	73.2%	80.8%	80.8%	80.2%	84.0%	59.2%	61.0%

*National data from ASHA membership data <http://www.asha.org/uploadedFiles/2011-Member-Counts.pdf>

TABLE I.5. Race/Ethnicity of Doctor of Audiology (AuD) Students

Race/Ethnicity (Percent)	Fall							SLHS	Nat'l*	CoS	UA
	05	06	07	08	09	10	11	7 yr Avg	2011	7 yr Avg	7 yr Avg
AuD											
American Indian/Alaska Native	0%	0%	3.8%	3.8%	3.5%	3.1%	0%	3.6%		2.7%	2.5%
Asian American	16.6%	25.0%	27.7%	15.3%	10.7%	6.2%	6.0%	15.3%		7.2%	6.5%
Black/African American	0%	0%	0%	0%	0%	0%	6.0%	6.0%		3.2%	3.2%
Hispanic/Latino	11.0%	12.5%	16.6%	15.3%	14.2%	9.3%	15.1%	13.4%		15.3%	15.7%
Native Hawaiian or Other Pacific Islander	0%	0%	0%	0%	0%	0%	0%	0.0%		0.5%	0.6%
Non-Resident Alien (includes Internat'l)	0%	0%	0%	3.8%	7.1%	3.1%	3.0%	4.3%		7.7%	6.3%
Not Specified	0%	6.3%	22.2%	15.3%	21.4%	6.2%	3.0%	12.4%		4.5%	4.5%
Under-represented groups (total)	11.0%	12.5%	20.4%	19.1%	17.7%	12.4%	21.1%	16.3%	10.3	21.7%	22.1%
White or Caucasian	72.0%	53.6%	27.7%	46.1%	42.8%	71.0%	60.6%	53.8%	86.2%	59.2%	61.0%

*National data from ASHA membership data <http://www.asha.org/uploadedFiles/2011-Member-Counts.pdf>

Regarding race/ethnicity of our graduate students, the AuD and PhD student cohorts are relatively diverse, matching the proportions at the University, and are somewhat more diverse than the national averages in other graduate programs in the US (See **TABLES I.5-6**). The students in our MS program are less diverse, however. We anticipate that our newly approved Bilingual Certificate program is an excellent means to attract greater diversity, and is relevant for all three graduate degrees. In addition,

Fabiano-Smith leads our Department (and our national organization) in proactive efforts to identify and address recruitment and retention strategies of Latino doctoral students, as well as the broader issue of addressing barriers and facilitators of academic success of graduate students from a range of under-represented groups.

TABLE I.6. Race/Ethnicity of PhD Students

Race/Ethnicity (Percent)	SLHS							Nat'l*	CoS	UA	
	Fall 05	Fall 06	Fall 07	Fall 08	Fall 09	Fall 10	Fall 11	7 yr Avg	7 yr Avg	7 yr Avg	
SLHS-PHD											
American Indian/Alaska Native	0%	0%	0%	0%	0%	0%	0%	0%		2.7%	2.5%
Asian American	0%	5.6%	0%	0%	0%	0%	0%	5.6%		7.2%	6.5%
Black/African American	0%	0%	0%	0%	0%	0%	9.0%	0%		3.2%	3.2%
Hispanic/Latino	0%	0%	7.1%	14.3%	13.3%	20.0%	18.2%	14.9%		15.3%	15.7%
Native Hawaiian or Other Pacific Islander	0%	0%	0%	0%	0%	0%	0%	0%		0.5%	0.6%
Non-Resident Alien (includes Internat'l)	33.3%	18.7%	21.4%	21.4%	13.3%	6.7%	9.0%	17.8%		7.7%	6.3%
Not Specified	0%	18.7%	14.3%	14.3%	13.3%	6.7%	0%	13.5%		4.5%	4.5%
Under-represented groups (total)	0%	0%	7.1%	14.3%	13.3%	20.0%	27.2%	11.7%	11.5%	21.7%	22.1%
White or Caucasian	61.1%	62.5%	57.1%	50.0%	60.0%	66.7%	63.6%	60.1%	67.0%	59.2%	61.0%

*National data from ASHA membership data <http://www.asha.org/uploadedFiles/2011-Member-Counts.pdf>

I.3.d. Adequacy of Graduate Stipends and Assistantships

Our Graduate Teaching Assistants are supported by funds allocated through the College of Science, whereas Graduate Research Assistants and Associates are funded by grant and Department monies. The current salary schedule for these student positions is indicated in **TABLE I.8**. Benefits (tuition and insurance) are also attached to the awards. The salaries for TAs have been low, and so we were pleased that they were raised by \$850 for the 2012-13 academic year. As shown in **TABLE I.7.**, we only have funds to support 17 TAs each year. This covers about 23% of the graduate students in the M.S./AuD programs.

TABLE I.7. shows that the number of TAs funded for SLHS has not grown in a manner consistent with the increased enrollment undergraduate and graduate enrollment. This means that although our undergraduate classes have dramatically increased in size, the TA support has not increased. It also means that a smaller proportion of the MS and AuD students are funded by this mechanism.

We are fortunate that funds for Graduate Research Assistants and Associates has increased over the past 7 years as a result of success in external funding for the research and our training grant.

TABLE I.7. Number and Funding of Graduate Teaching Assistants and Graduate Research Assistants

	FY 05/06	FY 06/07	FY 07/08	FY 08/09	FY 09/10	FY 10/11	FY 11/12	Current Year (Projected)
# of Teaching Assistants	16	14	13	14	13	14	17	17
FTE (state funds)	3.32	3.58	3.76	3.63	3.25	3.48	4.16	4.25
Expenditures	\$78,488	\$83,765	\$87,202	\$85,942	\$81,436	\$77,217	\$108,703	\$123,250
# of Research Assistants/Assoc	8	10	9	8	9	13	14	19
FTE (not state funds)	3.84	3.25	2.98	3.62	5.32	6.67	5.00	7.85
Expenditures	\$128,634	\$105,474	\$92,356	\$88,286	\$126,411	\$187,412	\$147,895	\$231,014

TABLE I.8. Graduate Teaching Assistant and Research Assistant/Associate Salary Schedule 2011-2012

Title	25%	50%	Annual salary	Appointment
Teaching Assistant	\$7,250	\$14,500	\$29,000	Academic
Grad Res Assistant	\$7,500	\$15,000	\$30,000	Academic
Grad Res Associate	\$10,000	\$20,000	\$40,000	Fiscal

I.3.e. Thesis/Dissertation Supervision and Time to Graduate

The MS-SLP and AuD students have a thesis option that is not required. All AuD students complete a mentored research project, but a formal thesis is not required. In recent years, two to three graduate students have chosen to complete a thesis each year. Typically a given faculty member has only one (or sometimes two) graduate students working on a MS thesis.

TABLE I.9. Thesis/Dissertation Supervision

Activity	FY 05/06	FY 06/07	FY 07/08	FY 08/09	FY 09/10	FY 10/11	FY 11/12
Masters Theses Completed	0	2	2	3	3	3	2
Dissertations Completed	3	3	2	2	2	2	1

Time to Graduate and Completion Rates. As shown in **TABLE I.10**, our Master of Science degree students typically complete their degree in a 2-year time frame, unless they enter the degree program without a background in SLHS. In the latter case, a prerequisite year is required to complete the degree, so 3 years is the expected completion time. A number of those students manage to complete the degree more quickly, finishing after two-and-one-half years (see **TABLE I.10**). The completion rate is high at 91%.

TABLE I.10. Completion Information for MS-SLHS Students

SLP 2005-2012	# Students Entered	Complete in 2 yr	Complete in 2.5 yr.*	Complete in 3.0 yr.*	Overall completion rate	Did not compete
SLHS	155	108	13	20	141/155 = 91%	14/155 = 9%

*Longer completion time appropriate for 3-year students who do not have pre-requisite undergraduate coursework in SLHS. No comparison group is available for this degree with the College of Science.

The Doctor of Audiology program began in the 2004 academic year with a cohort of students who had previously been seeking the Master's degree in our program with an emphasis in Audiology. It should be noted that no new students were admitted in the fall 2004 as coursework was being redesigned; therefore, there was no cohort graduating in 2008 (**TABLE I.11**). The students in the Doctor of Audiology program consistently complete the program in the required 4 years. This includes three years of coursework and one externship year. As shown in **TABLE I.11**, the completion rate for the AuD degree was 69% of the students, with five additional students choosing to complete the M.S., rather than the AuD. This completion rate is lower than desired. This appears to reflect both the relatively long time commitment for the degree (4 years), which causes some students to change their plans, but also the loss of some students who could not meet the academic and clinical rigors of the program. Adjustments to the program are under consideration, including making the research requirement optional and reducing coursework requirements outside of the department, and the faculty are committed to maintaining strong admissions criteria.

TABLE I.11. Completion Information for Doctor of Audiology Students

AuD	# Students Entered	Complete AuD in 4 yr	Changed to MS degree	Completed AuD or MS by 2012	Did not compete
2002-2008	42	29/42 (69%)	5/42 (12%)	34/42 (81%)	8/42 = 19%

In the SLHS Ph.D. program, 15 students completed the degree in the past 7 years, and the median time to completion was 5.5 years. As shown in **TABLE I.12**, this is comparable to the time taken for a Ph.D. in Linguistics, and shorter than time for a PhD in Psychology by one year. To determine completion rates for the graduate programs, we examined the outcomes for students who began the program during the Academic Years of 2001-2007. As shown in **TABLE I.12**, 60% of the students entering the PhD program completed the degree, which was comparable to Psychology and Linguistics Departments. The students who did not complete the PhD typically made the decision not to pursue the degree after their first year in the program. Only one student discontinued the PhD after passing the comprehensive examination.

TABLE I.12. Completion Information for PhD Students

PhD AY 2001-2007	Entered Program	Complete PhD in 6 yrs	Complete PhD in 8 yrs	Median Time to Degree
SLHS*	25	13/25 = 52%	15/25 = 60%	5.5 yrs. (n=15)
Psychology	91	25/91 = 27.5%	50/91 = 54.9%	6.5 yrs. (n=92)
Linguistics	46	26/46 = 56.5%	31/46 = 67.4%	5.5 yrs. (n=46)

* and SP_H (previous department code). Pulled from Dec, May, August graduations.

TABLE I.13. Graduate Degrees Awarded by Year (AY 2006-2012) and Arizona Board of Regents (ABOR) Threshold for Productive Programs

	FY 05/06	FY 06/07	FY 07/08	FY 08/09	FY 09/10	FY 10/11	FY 11/12	SLHS 7-Year Total	SLHS 3-Year Total	ABOR 3-Year Threshold
MS	27	27	16	19	13	26	21	149	60	9
AUD	5	4	0*	5	5	6	4	29	15	6
PHD	3	3	2	2	2	2	1	15	5	6

*no cohort entering in 2004 (would have graduated in 2008) because it was a transition and planning year for the AuD program.

TABLE I.14. US Graduate Programs offering PhD in Speech, Language, and Hearing Sciences: Number of degrees granted per year for 2008-2011* (2011-12 data not yet available)

Academic Year	Number of PhD Programs	Number of Programs Reporting	Number of PhD degrees granted	Average # PhDs graduated per year	UA SLHS Number of PhDs per Year
2007-2008	42	22	29	1.32	3
2008-2009	45	31	46	1.48	2
2009-2010	41	37	68	1.84	2
2010-2011	38	37	51	1.38	2
Average PhD's awarded per year				1.505	2.25

*National data retrieved from <http://www.asha.org/Academic/HES/Archived-HES-Data-Reports/>

The Arizona Board of Regents threshold for productivity of degree programs is indexed by the sum of the degrees granted in three consecutive years. As indicated in **TABLE I.13.**, the number of SLHS degrees is well above the threshold for the MS degrees (60 compared to 9 required). The requirement for doctoral programs is 6 degrees granted per 3-year intervals. The Doctor of Audiology program meets this threshold with 15 degrees granted in the past 3 years, however, the SLHS PhD program had only 5 degrees awarded in the past 3 years (although a sixth degree was granted in December 2012).

To put our graduation numbers for the PhD in context, it is important to recognize that there has been national concern regarding the shortage of PhDs in our profession and the low number of doctoral students in Speech, Language, and Hearing Sciences for the past 10 years. A review of the archived Higher Education Survey results from graduate programs indicated that about 40 programs offer a PhD in Speech, Language, and Hearing Sciences (see **TABLE I.14.**) Over the four years of available data (Academic years 2008-2011), these programs graduated an average of 1.5 students with a PhD each year. During that interval, the UA SLHS program graduated an average of 2.25 PhDs. Thus, our productivity is above the national average, but that does not lessen our commitment to improve the growth and stability of our PhD program. Our faculty feel a strong responsibility to train future scientists and academic professionals in our field, and certainly our program at the University of Arizona plays an important role in the national efforts to lessen the shortage of PhDs. It is important to note that all faculty members who train PhD students also play a significant role in our other degree programs. In other words, the resources that support doctoral training are intertwined with those that support all of our degree programs.

One approach to increasing the number of PhD students is our training grant funded by the National Institute on Deafness and Other Communication Disorders. This T-32 grant entitled *Developing Clinical Investigators in Audiology and Speech-Language Pathology* (2008-13) was designed to increase the number of students who transition from clinical degrees to research degrees, thus funding students who commit to complete the MS to PhD or the AuD to PhD. Students from this cohort will graduate in the coming years. Additional recruitment efforts are in place to achieve our goal of increasing the number of strong candidates who come the University of Arizona and successfully complete the degree. This includes a) providing Department support for doctoral student funding when faculty mentors do not have adequate external funds, b) increased networking with professional colleagues to recruit high quality students, and c) enhancing the research environment for doctoral students.

Exit Survey. The College of Science offers an exit survey for graduate students to complete. Responses were available and evaluated for graduates from 2007, 2009, and 2011. Graduates uniformly indicated that the graduate program had met most or all of their expectations with regard to coursework (95%) and with regard to research (100%). The survey also provides an opportunity for students to indicate particularly inspirational faculty. Eight different faculty members were identified will frequent comments regarding exceptionally strong mentorship provided by those individuals.

The SLHS Department has conducted a written exit survey as a means to obtain student feedback regarding their confidence in their academic and clinical preparation. The results from four years are presented in **TABLE I.15**. Essentially all of our graduate students find immediate employment upon graduation, and some of the PhD students go on for Post Doctoral degrees.

TABLE I.15. SLHS Graduate student exit interview responses
Rating scale: 1 = Inadequate ... 5 = Fully prepared.

<i>Question</i>	2007	2008	2009	2012	<i>Mean</i>
How do you rate your level of preparation in each of the following areas:					
• To understand the anatomy and physiology of speech, language, and hearing mechanisms and their disorders.	4.63	4.67	4.67	4.67	4.65
• To perform diagnostic procedures and instrumental measure with children.	3.88	4.33	3.67	4.17	4.04
• To perform diagnostic procedures and instrumental measure with adults	3.88	3.67	4.33	3.67	3.83
• To plan and implement treatment procedures with children.	4.00	4.33	3.67	4.17	4.09
• To plan and implement treatment procedures with adults.	3.75	4.00	4.00	3.50	3.78
• To provide informational counseling regarding speech, language, and hearing disorders.	3.63	4.00	4.00	3.83	3.83
• To critically evaluate professional literature.	4.63	4.67	5.00	4.50	4.65
• To understand, appreciate, and access the resources of professional organizations (i.e. ASHA and AAA)	4.00	4.50	4.67	3.50	4.09
I was completely satisfied with the education that I received in my major area of study.	4.00	4.60	4.00	4.33	4.23
I was completely satisfied with the education that I received in my minor area of study.	3.33	3.80	3.00	3.80	3.53
My on-campus clinical practica were high quality learning experiences.	4.25	4.17	4.00	4.67	4.30
My off-campus clinical practica were high quality learning experiences.	4.38	4.67	5.00	4.50	4.57
I felt free to communicate problems or concerns to the faculty or staff.	4.38	4.17	2.67	4.67	4.17
I was offered adequate academic advising.	4.13	4.00	4.00	4.17	4.09
<i>Average by Year</i>	<i>4.06</i>	<i>4.25</i>	<i>4.05</i>	<i>4.15</i>	<i>4.14</i>

I.3.f. Graduate Student Employment after Graduation

Clinical Program Graduates. All of our graduate students gained employment after completing the program. For the MS-SLP students, the primary settings were in health care (including acute or rehabilitation hospitals, skilled nursing facilities) or schools (see **TABLE I.16**). In recent years, several of our graduates have worked in university settings as research speech-language pathologists. The AuD students work primarily in private practice or in medical settings (**TABLE I.17**).

TABLE I.16. Employment Settings of MS-SLP Graduates

	2011	2012
School setting (K-12)	29.2%	42.9%
College/university	8.3%	9.5%
Healthcare setting (including private practice)	62.5%	47.6%
	100.0%	100.0%

TABLE I.17. Employment Settings of AuD Graduates

	2011	2012
School setting (K-12)	33.3%	0%
College/University	0%	0%
Hospitals	16.7%	100%
Private Practice	50%	0%
	100%	100%

Ph.D. Graduates (2006-2012). Ten of 15 PhD students completed post-doctoral fellowships immediately after completing their degrees from the University of Arizona. Two of those were funded by NIH/NRSA post-doctoral fellowships. Four graduates went directly to tenure-track faculty positions, and five of those who completed post-docs are now in faculty positions in university settings as indicated in **TABLE I.18**. Two of the graduates are still in their post-doc fellowships.

I.3.g. Scholarship Activities of Graduate Students

PhD students are active in the research laboratories of their mentors, as well as other faculty members. On the average, PhD students present at least one professional presentation per year at national conferences, and author/co-author between 1 and 4 papers in peer-reviewed journals during their program. In addition, there are many opportunities for students to give presentations within the Department, on campus, or in the community. All of the PhD students give at least two colloquium presentations during their course of study. About half of all other graduate students give a colloquium at some time during their program. At least 4 poster session opportunities occur for graduate students every year including: SLHS homecoming, UA Student Showcase (Oct.), Graduate Interdisciplinary Programs reception (Dec.), annual Auditory Cognitive Neuroscience Meeting (Jan.), Cognitive Science poster session (May), and other special events sponsored by SLHS and the School of Mind, Brain, and Behavior.

Many graduate students in the clinical programs also conduct mentored research that they present at national conferences (roughly 25% of the students), and AuD and MS-SLP students co-author publications (roughly 10% of all students).

TABLE I.18. Employment Settings of Ph.D. Graduates (2006-2012)

Post-Doctoral Fellowships

Post-doctoral Fellow, University of Texas at Austin
Post-doctoral Fellow (NRSA F32), Arizona State University F32- Speech-Language Pathologist, Phoenix
Post-doctoral Research Fellow, The National Institutes of Health, Laryngeal and Speech Section
Post-doctoral Fellow, Mayo Clinic Rochester
Post-doctoral Fellow, Brandeis University
Post-doctoral Fellow, University of Washington
Post-doctoral Fellow, Department of Speech, Language, and Hearing Sciences, University of Arizona
Post-doctoral Fellow (NRSA F32), Memory and Aging Center, University of California at San Francisco
Post-doctoral Researcher, Duke University-Singapore
Post-doctoral Scholar, Department of Head and Neck Surgery, David Geffen School of Medicine, University of California, Los Angeles

Research Positions

Research Associate, University of Seoul, Seoul, Korea
Research Audiologist*, Oregon Health Science University and the National Center for Research in Auditory Rehabilitation (NCRAR) at the Portland VA Hospital

Faculty Positions

Assistant Professor*, Dept of Communication Sciences and Disorder, Dept. of Surgery, University of Wisconsin at Madison
Assistant Professor*, Syracuse University, Department of Communication Sciences and Disorders
Associate Clinical Professor*, Northern Arizona University
Assistant Professor, University of Connecticut
Assistant Professor*, University of Alberta
Assistant Professor, Vanderbilt University
Assistant Professor*, San Francisco State University
Assistant Professor, St. Ambrose University, Audiology and Speech-Language Pathology Program
Assistant Professor, Towson University, Department of Audiology, Speech-Language Pathology and Deaf Studies

Clinical Positions

Speech-Language Pathologist*, Tucson, Arizona
Speech-Language Pathologist*, Phoenix, Arizona

*after Post-doctoral Fellowship

I.4. Graduate Student Learning Outcomes Assessment

I.4.a. Expected Student Learning Outcomes

The learning outcomes are distinct for the three graduate programs: MS, AuD, and PhD.

I.4.a.i. Expected Student Learning Outcomes for MS in Speech-Language Pathology

The training mission of the Department of Speech, Language, and Hearing Sciences at the University of Arizona is to provide academic and clinical training to students in speech-language pathology sufficient to achieve the following knowledge outcomes and skills:

- Demonstrate the ability to comprehend basic principles of biological and physical sciences, mathematics and the social and behavioral sciences. (ASHA Standard III A)
- Demonstrate the ability to analyze, synthesize and evaluate biological, acoustic, psychological, developmental, linguistic and cultural correlates of basic human communication processes and disorders including: speech, receptive and expressive language in oral, written, and manual modalities, hearing, swallowing, cognitive aspects of communication, and social aspects of communication. (ASHA Standards III B & C)
- Demonstrate the ability to analyze and evaluate information about prevention, assessment, and intervention over the range of communication disorders specified in the current ASHA Scope of Practice for audiology and speech-language pathology. (ASHA Standard III D)
- Demonstrate the ability to analyze and synthesize relevant information regarding professional ethics and to interpret the principles of the ASHA Code of Ethics as they apply to the professional practice of audiology and speech-language pathology. (ASHA Standard III E)
- Demonstrate the ability to comprehend the common principles of research and research design, both basic and applied, used in human communication sciences and disorders and to know sources of research information and how to access them. (ASHA Standard III F)
- Demonstrate an understanding of issues currently having an impact on audiology or speech-language pathology as a profession. (ASHA Standard III G)
- Demonstrate the ability to demonstrate speech and language skills necessary for effective interaction with clients/patients and their relevant others, for writing grammatical and substantive scientific and technical reports, diagnostic and treatment reports, treatment plans, and professional correspondence. (ASHA Standard IV B)
- Demonstrate the application of appropriate knowledge and skills in the clinical setting as evidenced by on-going formative assessment (Standard V-B)

The complete list of knowledge and skills and the associated coursework is included in **APPENDIX L**.

I.4.a.ii. Expected Student Learning Outcomes for Doctor of Audiology

The AuD program prepares students for clinical practice in Audiology. The expected learning outcomes are highly specified with regard to the knowledge and skill expectations for audiology, and our coursework and clinical practica are designed to address all of the expected learning outcomes. The fully elaborated list from the ASHA standards and the associated coursework is included in **APPENDIX L**.

Students are expected to acquire knowledge and skills in the following six areas:

- Demonstrate understanding of the foundations of clinical practice in audiology (Standard IV-A)

- Demonstrate knowledge of prevention and identification of disorders of hearing and balance (Standard IV-B)
- Demonstrate knowledge of assessment principles and procedures for hearing and balance disorders (Standard IV-C)
- Demonstrate knowledge of principles and methods of intervention (treatment) of hearing disorders, balance disorders, and other auditory dysfunction (Standard IV-D)
- Demonstrate understanding of principles of advocacy and consultation regarding hearing and balance disorders (Standard IV-E)
- Demonstrate knowledge of research methods and administrative skills necessary for clinical practice (Standard IV-F)
- Demonstrate the application of appropriate knowledge and skills in the clinical setting as evidenced by on-going formative assessment (Standard V-A)

I.4.a.iii. Expected Student Learning Outcomes for PhD Students

Doctoral education is highly individualized, however, there are fundamental research competencies that all doctoral students are expected to achieve through laboratory experiences and coursework. These skills are detailed in the doctoral student handbook:

- Procedural competencies:
 - Knowledge of research instrumentation and hardware relevant to area of study.
 - Knowledge of general use software programs relevant to research and teaching (e.g., Excel, Adobe, Powerpoint), and lab specific software (e.g., Matlab, SPM, EPrime, Direct RT).
 - The ability to search the literature, including searching electronic databases and being able to pursue a theme through the literature.
 - Knowledge and application of statistics and other mathematical models for understanding data.
 - How to keep lab records.
 - In some cases, knowledge of specific techniques (e.g., ERP, dissection), that are necessary or beneficial for a specific area of research.
- Writing competencies
 - The ability to abstract and summarize information.
 - The ability to write in the style of publications in the field.
 - The ability to present information in poster format.
 - The ability to write and manage human subjects-related documents.
- Scientific competencies
 - The ability to discuss research projects in terms of the scientific method and aspects of validity.
 - The ability to design a research project that measures/manipulates a target effect and controls extraneous effects.
 - The ability to manage the day-to-day aspects of completing a research project from conceptualization through data collection and manuscript production.

I.4.b. Assessment Activities

The assessment activities for graduate students are described in the respective student handbook for the SLP, AuD, and PhD programs. Indirect assessment occurs in a wide range of the contexts for the

graduate students. The clinical graduate students in SLP and AuD receive feedback from clinical supervisors on a regular basis as their skills are shaped. The full faculty reviews student progress twice each year in a designated faculty meeting, but also with in the context of separate SLP and AuD faculty meetings, as needed. The intention is to assure adequate progress is being made by students and to address any specific needs as they become apparent. All students have a primary academic advisor who provides feedback to the student, particularly if there are specific concerns about satisfactory progress in the program. Similarly, the PhD students are reviewed each year to assure adequate progress, but any concerns or needs are addressed as they arise by the doctoral committee, the faculty mentors, or other faculty involved in doctoral student training. The more direct assessment activities are highlighted below for each degree program.

I.4.b.i. Outcome Assessments for the MS-SLP Graduate Students

First Year Examination: An examination over the first year's coursework and clinical experiences is given to all first year Master's students following the first academic year (typically, in May after the final exam period and before the beginning of summer clinic). Performance on the exam is used for departmental purposes only; it may be used to guide the second year of graduate study and to help to assure successful completion of the graduate program. The purpose of the first year examination is to confirm that students are making adequate progress with regard to mastery of content and clinical principles, and to confirm adequate writing skills necessary for successful performance in the profession.

- **Exam format and content:** Students write essay answers to several (e.g., 5-7) questions in a 3-hour time period. The exam is scheduled in a computer lab, but students may request a hand-written option. The questions will cover material from the first year coursework, so students are expected to select questions consistent with their plan of study. In other words, students should select questions that are relevant to the coursework completed by the end of the first year of study.
- **Scoring:** The scoring rubric for the exam includes High Pass (HP), Pass (P), Needs Remediation (NR), Fail (F). Passing performance is a rating of High Pass or Pass on 80% of the questions answered.
- **Consequences:** Any answers scored as "Needs Remediation" will prompt recommendations from faculty members for remedial work related to each question. The timeline for completing remediation is detailed in the letter given to the students. The faculty review the performance of any student who Fails one or more questions OR who receive Needs Remediation on two or more questions, and recommendations for additional remediation will be made by their program committee and the Department Head. Failure to make satisfactory academic progress (for example, as evidenced by poor performance on the first year exam and failure to successfully complete remedial work) will result in review of student status and recommendations for remediation, which could include oral examination and/or discontinuation in the program.

Comprehensive Examination: A written comprehensive examination is required of all non-thesis master's students. The exam is scheduled in the last semester during which students take coursework required for graduation (typically, March). Any student with a grade point average below 3.0 will not be permitted to take this examination. The comprehensive examination for students has two parts: oral and written. If a student completes the written portion of the examination in a satisfactory manner, the oral portion is waived. (The examination for the thesis student is an oral format.)

- The written portion of the Master's comprehensive examination is scheduled for a 3-hour time period. To pass this examination, students must receive a rating of Pass on 80% of the questions. Answers are evaluated in terms of the information content; the organization; quality and clarity of writing, and references cited.
- Scoring: Scoring rubric for the exam includes High Pass (HP), Pass (P), Low Pass (LP), Fail (F).
- Consequences: An oral examination is given when the written portion is failed. The exam is comprehensive and is administered by the student's program committee. The oral examination is scheduled for a 2-hour period of time, but the examining committee may conclude the examination after 1 hour if the candidate has shown satisfactory knowledge of the field of study. In no event should the examination exceed 3 hours. At least two-thirds of the examining committee must vote PASS for the student to pass this examination. If a student passes the oral portion, he or she will be considered to have passed the comprehensive examination, which is reported to the Dean of the Graduate College on the "Completion of Degree Requirements" form. If the student fails the oral portion, he or she may retake the written examination after a lapse of at least four months. If the second written examination is failed, a second oral may be given and a member of the Committee on Graduate Study will be appointed by the Dean of the Graduate College to oversee it. The results of the second oral examination are final. At least two-thirds of the voting committee members must vote in favor of PASS if the student is to pass the second examination.

Clinical Competency: The mastery of clinical knowledge and skills is tracked using a form developed by the University of Arizona clinical faculty, referred to as the Formative Assessment of Students in Training (FAST). This extensive tracking system of clinical skill development includes the proficiency ratings on a scale from 1 to 5 in the targeted areas, over the course of each semester of clinical training. An example of the summary sheet form is provided in **FIGURE I.2.**

I.4.b.ii. Outcome Assessments for the AuD Graduate Students

One of the strengths of our program is our systematic method of formative and summative student assessment. Each Au.D. student undergoes three evaluations:

1st Year Exam (Summer after 1st Year): This exam includes both written and practical elements covering the concepts in the early coursework. It is a formative exam, intended to identify students who are struggling and areas in which they need more support. Students who low-pass or fail questions work directly with the relevant professor to improve and demonstrate their knowledge in that area.

3rd Year Exam (Fall of 3rd Year): Before students are allowed to pursue a 4th year externship, they must successfully complete this clinically oriented exam to demonstrate that they are ready to work with more independence. This exam involves formal practical assessment with real patients in the areas of audiologic assessment (adults and children) and hearing aid fitting. Then the student completes a case-based oral exam that assesses their knowledge of evidence-based practice in all areas of study. (Note that since the last APR report we have substituted the oral exam for the previously written exam as we feel that in this format we are able to probe more deeply and assess a broader scope of topics.)

4th Year Exam (Final semester): This summative exam is given in an oral format and begins with a description and defense of their research project. It then includes a discussion of their externship experience, and ends with probing questions of both theoretical and clinical natures.

Clinical Competency: In a manner similar to speech-language pathology, the mastery of clinical knowledge and skills is tracked using the Formative Assessment of Students in Training in Audiology (FAST-A). This extensive tracking system of clinical skill development includes the proficiency ratings on a scale from 1 to 5 in the targeted areas over the course of each semester of clinical training. An example of the summary sheet form is provided in **FIGURE I.3**.

I.4.b.iii. Outcome Assessments for the PhD Students

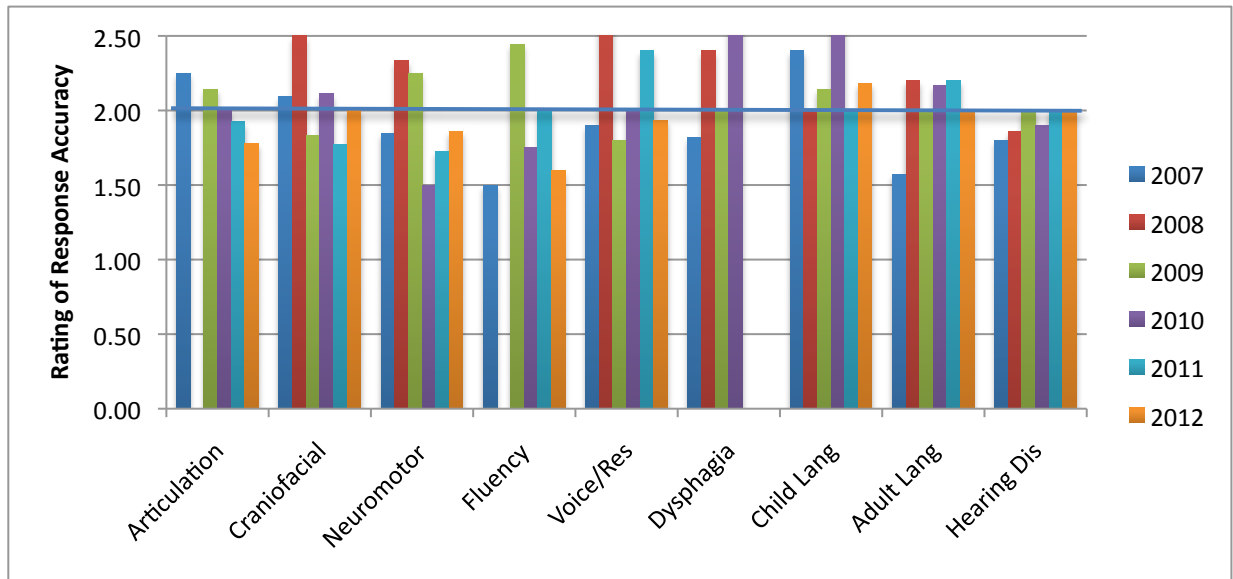
Because of the highly interdisciplinary nature of our field, each PhD student develops a program of study that is designed to achieve their own research training goals as well as provide them with broad knowledge of the field outside the specific research area. Development of each program of study along with learning outcomes is carried out under the direction of a primary advisor and a program committee. Formal assessment consists of a **qualifying exam** that is typically taken in the first semester of study, a **comprehensive exam** that is taken after all coursework in the program of study has been completed, a **prospectus meeting** in which the dissertation plans are discussed and approved by a dissertation committee, and the **final dissertation defense** which includes evaluation of both the written work and oral presentation. In addition, a progress report must be submitted annually by each PhD student. This documents all coursework taken, and grades received, during an academic year, as well as conference presentations, publications, and work in progress. This report along with an annual faculty review of each PhD student allows for ongoing assessment of academic progress and early indication of any problems that need to be addressed.

I.4.c. Assessment Findings

I.4.c.i. Assessment Findings for the MS-SLP Graduate Students

The results of the First Year examinations are evaluated on an individual basis so that competencies are confirmed and individual remediation activities are determined when necessary. The faculty meet to review the outcomes of the examination and to confirm proper follow-up and satisfactory remediation as needed. The results from the written comprehensive examination taken during the last semester of the MS-SLP program provide confirmation that knowledge levels meet expectations. **Figure I.1** provides a summary of average competency ratings across a range of content areas in the MS-SLP program that were consistently sampled. A score of 2 (Pass) is the target, with any scores greater than 2 indicating exceptional/honors level performance. The results indicate that the average response accuracy typically reaches the criterion level. It should be noted that grading for this exam is quite rigorous. This is evident when examining the results of the national competency examination (PRAXIS) that is taken by our students as they seek national certification (see **TABLE 1.16**). This summative examination samples the same knowledge and skill set that comprise the learning objectives in our program. PRAXIS scores range from 250-990, with a passing score 600 or greater. All of our graduates pass the exam and their average scores are well above the national mean (734 vs. 667). Again, these scores confirm that the standards in our department are particularly high.

FIGURE I.1. Outcomes from Comprehensive Exam for MS-SLP students from 2007-2012



Key: 0 = Fail; 1 = Low Pass, needs remediation; 2 = Pass; 3 = High Pass or Honors.

TABLE I.19. National Certification Examination Results in Speech-Language Pathology (PRAXIS)

	# taking exam	Percent Passed	UA Average Score	National Mean (SD)	n
FY 05/06	19	100%	753	655 (70)	4596
FY 06/07	26	100%	705	657 (74)	4841
FY 07/08	14	100%	727	666 (69)	5821
FY 08/09	21	100%	727	669 (68)	6050
FY 09/10	14	100%	748	668 (67)	6266
FY 10/11	22	100%	733	671 (67)	6612
FY 11/12	20	100%	744	680*	
Grand Mean			733.9	666.6	

*only median available to date. PRAXIS scores range from 250-990, with a passing score 600 or greater.

The outcomes from ongoing evaluation of the clinical skill development is recorded for each student in the Formative Assessment of Students in Training. The example outcomes for an individual student are shown in **FIGURE I.2**. The scores on the FAST represent the summary of evaluation across all of the knowledge and skills listed in the ASHA Standards for Speech-Language Pathology (see **APPENDIX K**). A progression of skill mastery is expected over the course of training, so that a score of 3 out of 5 during the first semester, for example, is perfectly acceptable. The goal is to move toward mastery (5) over the course of training.

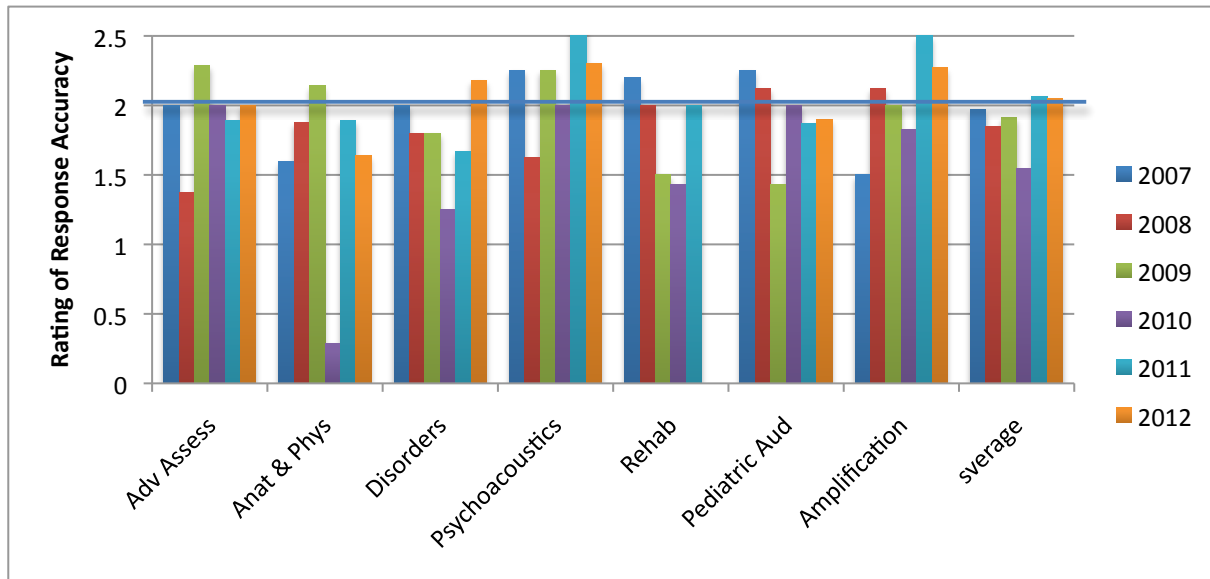
FIGURE I.2. Example Summary of Formative Assessment of Students in Training in Speech-Language Pathology (APPENDIX K lists the ASHA Standards associated with the specific knowledge and skills).

F.A.S.T.		Formative Assessment of Students in Training						
Student:								
Supervisor:								
Proficiency Rating Scale								
1-----2-----3-----*-----4-----5								
Emerging -----> Acceptable -----> Near Mastery								
OUTCOMES	Pre-training	SEMESTER IN TRAINING						Mean
		Sem 1	Sem 2	Sem 3	Sem 4	Sem 5	Sem 6	
PREVENTION ACTIVITIES	1.5		4.5				3.5	4
SCREENING PROCEDURES	1.08		4.3			5	4	4.43
EVALUATION: Planning & Implementation	1.09			4.5	4	4.5	4.5	4.38
TREATMENT: Planning & Implementation	1		3.5	4.25	4	5	4.5	4.25
FUNCTIONAL OUTCOME MEASUREMENT	1		3.5	4.5	4	4.5	4.75	4.25
REPORTING (Oral and Written)	1		3.5	3.75	4	4.25	4.5	4.00
Personal Qualities & Verbal Interaction	3		4	5	4	5	4.5	4.5
PROFESSIONAL DEMEANOR	3		4	5	4	5	4.75	4.55

I.4.c.ii. Assessment Findings for the AuD Graduate Students

The outcome measures for the AuD program are similar to those reviewed for the SLP program. The first year exam outcomes are shown in Figure I.17 because those data were sampled in the most consistent manner over the past seven years. Most of the content areas were mastered as indicated by the scores reaching 2.0. For students who did not provide passing answers, specific remediation plans were followed. Additional information regarding the outcomes from the direct assessments of AuD students is displayed in **TABLE I.17**. This information is further complemented by **FIGURE I.3**, which is an example of the extensive evaluation of clinical skill development across the semesters of student training. Note that a progression of skill mastery is expected over the course of training.

FIGURE I.3. Outcomes from First Year Exam for AuD students from 2007-2012



Key: 0 = Fail; 1 = Low Pass, needs remediation; 2 = Pass; 3 = High Pass or Honors.

TABLE I.20. Outcome on Formative and Summative Assessments of Knowledge in AuD Students

	<i>Class of:</i>	2010	2011	2012	2013	2014	2015
1st Year Exam	Passed all Questions	2 of 5	2 of 10	2 of 8	0 of 7	3 of 11	7 of 11
	Passed with Remediation on 1 or more Q	3 of 5	6 of 10	5 of 8	7 of 7	6 of 11	4 of 11
	Withdrew or counseled out prior to exam		2 of 10	1 of 8		2 of 11	
3rd Year Exam	Passed all Questions	4 of 5	8 of 8	3 of 7	7 of 7	7 of 9	
	Passed with Remediation on 1 or more Q	1 of 5		2 of 7		2 of 9	
	Withdrew or counseled out prior to exam			2 of 7	1 of 7		
4th Year Exam	Passed all Questions	5 of 5	7 of 8	5 of 5			
	Passed with Remediation on 1 or more Q						
	Withdrew or counseled out prior to exam		1 of 8				

FIGURE I.4 Example of Summary of Formative Assessment of Students in Training in Audiology
(See APPENDIX L for description of the ASHA Standards for Audiology).

Student	Class of 2013											
Rate Proficiency												
1-----2-----3-----4-----5												
Emerging -----> Near Mastery												
Standard	Mean	SEMESTERS IN TRAINING										
		Sem 1	Sem 2	Sem 3	Sem 4	Sem 5	Sem 6	Sem 7	Sem 8	Sem 9	Sem 10	Sem 11
Identification												
KNOWLEDGE & SKILLS IN:												
B1	3.88	3.5			4	4						4
B2	5.00					5						
B3	3.63	4			3	3						4.5
B4	3.33	3			3							4
B5	2.00					2						
B6	2.00					2						
C. Assessment												
STUDENT MUST HAVE KNOWLEDGE OF:												
C1	4.25							4.5	4			
KNOWLEDGE & SKILLS IN:												
C2	3.46	3.5		3	3	3.5	3		4			4.25
C3	3.33	3.5	2	3	3.5	3.5	3		4			4.167
C4	3.80	3.5	3	3	3	4.5	4		4.5			4.875
C5	3.50		3	3	3.5	3.75	3		4			4.25
C6	3.00	3				3						
C7	3.35	3.5	3	3	3	4	2		4			4.333
C8	3.75	3						3.5	4			4.5
C9	3.57	3			3	3.5			4			4.333
C10	3.57	3.5	3	3	3.5	3.5			4			4.5
C11	3.88	3.5			3	4						5
D. Intervention (Treatment)												
KNOWLEDGE & SKILLS IN:												
D1	3.39	3	3.25	3	3	3			4			4.5
D2												
D2a	3.05	3	2	3	3		2		4			4.375
D2b	3.75							4				3.5
D2c	3.50	3	3	3	3	3	3	5	4			4.5
D2d	3.79		3.5			3	3	5	4			4.25
D3	3.00					3						
D4	2.00						2					
D5	3.45	4			3	2			4			4.25
D6	4.00							4				
D7	3.61	3	3.5		3			4	4			4.167
E. Advocacy/Consultation												
KNOWLEDGE & SKILLS IN:												
E1	3.80	3.5	2.5					4	4			5
E2	3.25		2.5					4				
E3	4.00	3.5			3.5			4				5
F. Education/Research/Administratio												
KNOWLEDGE & SKILLS IN:												
F1	3.28	3	3	2		3		4				4.667
F2	3.28	3	3			3	2	4				4.667
F3	3.56					2		4				4.667
F4	3.88				3			4	4			4.5
F5	4.25							4				4.5
F6	3.63		3		3			4				4.5

Finally, we receive the scores from the ASHA national certification examination for our students in the AuD program. This examination provides a summative evaluation of learning by our students. As shown in **TABLE I.21** our students all pass the exam, and their average score is higher than the national mean (667 vs. 643). As in the case of the MS-SLP program, it appears that our students are held to high standard relative to other programs in the country.

TABLE I.21. National Certification Examination Results in Audiology (PRAXIS)

	# taking exam	Percent Passed	UA Average Score	National Mean (SD)	n
FY 05/06	2	100%	645	631 (39)	400
FY 06/07	3	100%	660	635 (37)	389
FY 07/08	2	100%	625	635 (37)	431
FY 08/09	5	100%	674	641 (34)	469
FY 09/10	7	100%	673	642 (43)	532
FY 10/11	0	**	**	638 (32)	514
FY 11/12	6	100%	723	680*	
Grand Mean			666.7	643.1	

*only median available to date **No AuD students taking exam that year.
PRAXIS scores range from 250-990, with a passing score 600 or greater.

I.4.c.iii. Assessment Findings for PhD Students

In order to move through the doctoral program successfully, PhD students must reach each of the milestones: qualifying examination, comprehensive written and oral examination, dissertation prospectus and completion, and dissertation defense. In order to successfully accomplish each of these steps, they must master the procedural, writing, and scientific competencies identified in **Section I.4.a.iii**. The progression of doctoral students who graduated during this interval from 2006-2012, and those who are currently in the program are included in **APPENDIX N and O**. A review of the student accomplishment of milestones indicates that nearly all students successfully master the competencies to progress through the program in a timely fashion (average time to completion was 5.5 years). Two students withdrew from the program during their first year, and one student failed the comprehensive examination, ultimately choosing to complete a non-clinical MS degree in SLHS. In our more recent cohort, some students who chose the MS/PhD program, ultimately changed their plans regarding the PhD. The issue in these cases was not one of competency, but rather a change in educational plans.

I.4.d. Changes Made in Response to Findings

Changes in MS-SLP Program Since Last APR Report

Since the last APR report, our MS curriculum has been reworked such that all students within a given class follow the same plan of study. This is a change from the last APR report when we offered two “tracks.” Under this approach we had some students focus on adult topics their first year and some students focus on pediatrics, the courses were then reversed in their second year of study. This created challenges for the student academically, clinically, and also had a negative effect on the collegiality of the students. From an academic standpoint the fixed sequence of courses has allowed instructors to build on knowledge gained in previous semesters and allowed instructors to expand topics covered with an emphasis on translation of science to clinical practice for each area of study. The opportunity to take an elective course in their final semester of study has also allowed students to further their knowledge

in an area of interest. The standard sequence has also allowed for improvement sequencing of clinical placement, better student preparedness, and upon graduation students are competent across the breadth of the field. For the students, enrollment by their cohort in the same courses each semester has allowed them to develop strong relationships within their cohort and has facilitated students working together to prepare for things such as comprehensive examinations.

The coursework taken for the MS program conforms to the requirements for clinical certification through the American Speech-Language-Hearing Association (ASHA) and covers the breadth of the field of Speech Language Pathology. Students take a minimum of 4 graduate courses in the area of language disorders, 1 course in clinical speech science and 3 courses in speech disorders. In addition, they take 1 course in evaluation practices, 1 course in swallowing, 1 course in auditory rehabilitation, 1 course in professional issues and 1 course in research methods. Learner outcomes for these courses are predetermined by clinical certification standards. Students also complete 400 clinical practicum hours as part of their graduate program in order to be eligible for certification upon graduation. The sequence of the clinical practicum is linked to the sequence of courses.

Since the last APR, two significant changes in the MS program of study have been made. These include (1) addition of a clinical speech science course and (2) reorganization of the speech disorders courses to meet current standards. The development and implementation of the clinical speech science course was based on the faculty's perceived needs of the students and student performance in disorder courses suggesting they need a stronger foundation in physiology of the speech mechanism, instrumental measures of speech production, speech acoustics, and speech perception prior to enrolling in courses related to speech disorders. The development of this course allowed for more in depth study of speech disorders and their evaluation and treatment. The speech disorders courses were reorganized into a sequence of two courses that covers disorder topics such as voice, stuttering, and craniofacial anomalies. Prior to this reorganization, students only took courses in 2 of 3 disorder areas. Inclusion of all three disorders is a part of the 2014 ASHA certification standards and has been proactively implemented in our curriculum. Additional changes include:

- One addition to the curriculum has been the development of a clinic preparedness course (SLHS 510 Tool School) taken by students during their first semester to prepare them for the rigors of clinic, including treatment planning and design, reinforcement techniques, data management, and report writing. This course is taught by the clinical faculty, however, a number of tenure track faculty lecture on their area of expertise within the semester.
- The addition of new faculty since the last APR, has also allowed for development of several new graduate level courses in speech and language science that students in the MS program can take as an elective their final semester in the program. These courses include SLHS 530 Cognitive Neuroscience of Language, and SLHS 435 Bilingualism, Multiculturalism, and Nonmainstream Dialects. The Cognitive Neuroscience of Language class is also taken by some advanced undergraduate students and students in the Cognitive Science Graduate Interdisciplinary Program. The class in bilingual issues is the core course in our new bilingual certificate program.
- One challenge in the MS program is the sequencing of a graduate course in research methods. Currently this course is taken during students' final semester in the program, so that earlier semesters can focus on specific communication disorders and clinical procedures that are pre-requisite to clinical practicum. The research methods class emphasizes issues that are likely to impact professional practice, such as single-subject design, levels of evidence, and treatment effect sizes, so the placement at the end of the program has some merit. However, students would benefit from aspects of this course earlier in their program as it would inform their review of the literature, and students wishing to complete a thesis would benefit from guidance in research design. Discussions are underway among the faculty and curriculum committee to

rework this course to allow material to be offered earlier in the program, perhaps in a different format and taught by a number of different faculty members, in hopes of engaging more students in research activities within the Department. This has always been a challenge given the focus on clinical training in the MS program, but is something the faculty is dedicated to improve.

Changes in AuD Program Since Last APR Report

The coursework taken for the Au.D. program conforms to the requirements for clinical certification through the American Speech-Language-Hearing Association (ASHA) and covers the breadth of the field of Audiology. The academic requirements have been updated since the last APR report and will continue to do so largely because of changes in field and profession and based on student feedback.

The significant programmatic changes in the last seven years are as follows:

- **Expansion of the Coursework in Hearing Aids and Cochlear Implants:** In 2006 these topic areas were covered by two courses, each with a lab, for a total of 8 units. Given the substantial technological advances in these areas, and thus increased content, these areas are now covered by a total of 12 units: Amplification I, Amplification II, and Cochlear Implants, each with an associated lab.
- **Expansion of the Pediatric Audiology Course:** This course was expanded from 3 to 4 units largely to accommodate additional content on pediatric auditory rehabilitation.
- **Expansion of Coursework in Auditory Processing Disorder Assessment:** This is a growing area of clinical practice, and one in which our students have struggled on in comprehensive exams. As such, we have re-envisioned our advanced electrophysiology course as “Evaluation of Auditory Perception, Processing and Cognition” and expanded it from 2 units to 3 to accommodate increased content in this area.
- **Creation of a Course on Tinnitus Evaluation and Treatment:** Previously this content was covered in our course on Disorders of Hearing and Balance. Technological advances and the increasing involvement of audiologist in tinnitus treatment, however, necessitated the expansion of this area to a full unit of its own.
- **Elimination of the Requirement of Coursework in Instrumentation and Rehabilitation:** Student feedback led us to believe that both of these courses were unnecessary; Instrumentation because the content was redundant to information already being provided in other courses and Rehabilitation because the course, also taken by undergraduates and SLP students, was too remedial for the audiology students. Instead, more advanced content on rehabilitation has been added to the expanded coursework in amplification and pediatric audiology.
- **Elimination of the Requirement of Coursework in Speech/Language Evaluation:** Audiology student feedback regarding this course was overwhelmingly negative as it was felt that the content was far too specific to Speech and Language and related to specific procedures they would not likely ever use. In response to this, we eliminated the requirement and added instead content on Speech and Language screening into the Clinical Readiness course.
- **Elimination of the Requirement of a Minor:** Previously we required 9 units in a minor area of study. This however became impractical in part because of prerequisite requirements for graduate coursework in other areas. Also, it was noted that curriculum already requires coursework outside of audiology (6 units in Speech/Language pathology and 6 units in Neuroscience and Genetics/Pharmacology). As such, we elected to eliminate the requirement of a minor.

Changes to the PhD Program Since Last APR Report

The qualifying exam was modified since the last APR so that it provides not only a means for faculty to assess writing skills and ability to integrate information, but also to allow the student an opportunity to seek early advice and direction on their program of study, career direction, and laboratory experiences. The exam has proved to be particularly valuable for both faculty and students in our highly interdisciplinary field in order to determine the types of knowledge and skills that are needed for a student to succeed. In some cases, the qualifying exam has served to inform a student that a doctoral program may not be appropriate career path.

Over the past seven years, our Department has consistently guided eligible PhD students to pursue external funding for dissertation research via the NIH/NRSA pre-doctoral fellowship grants (F31). Faculty mentor the grant writing process, both in the context of a grant-writing class and individual mentoring. Since the last APR, six doctoral students in our Department have been awarded F31 grants.

I.5. Post-Doctoral Fellows

Our program had a post-doctoral funding mechanism during the 1990s when we were home to the NIH/NIDCD-funded National Center for Neurogenic Communication Disorders. Since that funding mechanism ended in 2001, we have not had a post-doctoral fellowship program per se or a central means to support post-docs. Individual grant funding for post-docs has always remained an option, but there has only been one SLHS post-doctoral fellow during past 7 years, who was funded by a faculty grant (Beeson).

As a faculty, we are committed to developing a Post-Doctoral program. We recognize two limiting factors: 1) the small number of potential post-doctoral candidates in our field, 2) funding uncertainties that make it difficult to advertise post-doctoral positions. To address this issue, we have recently agreed to allocate a portion of grant related revenue (ICR and salary savings) to fund one post-doctoral candidate each year. The goal would be to provide initial funding for post-docs who then work with the appropriate faculty mentor to seek external post-doctoral funding (e.g., NIH/NRSA Post-doctoral fellowship, F32; or a mentored K award). Additional funding options would come from individual faculty grants, of course, but the assurance of at least one department-funded post-doc position will relieve issues related to the mismatch of grant awards and post-doc availability.

J. ACADEMIC OUTREACH

Outreach and service to the community is a natural aspect of our Department, and one that has continued to grow in the past several years in particular. Our on-campus speech, language, and hearing clinics provide high quality evaluation and management of communication disorders across the lifespan, but we do much more than that. Our contributions include a) model clinical service delivery programs, b). continuing education for professionals, c). community lectures and health education for the lay public, and d). advocacy for individuals with communication disorders. The activities and outcomes are highlighted below.

Specialty Clinical Programs: Our Department offers specialty programs for individuals with communication disorders that have become local, state, and national models of service delivery. Like all of our clinics, these programs benefit the participants and provide training for our students, but several programs are worthy of specific notice because they also served as national models of service delivery.

- Aphasia Groups – for more than two decades, the University of Arizona has been recognized as a leader in group treatment for individuals with aphasia. The weekly groups provide a functional context for individuals with acquired communication impairment to develop and practice conversational skills. The program has been featured in book chapters, educational videos, and the popular press. Professionals from other institutions visited our program prior to developing their own programs. The program was also the inspiration for other group programs throughout Tucson and Arizona, so that the impact extends far beyond our current groups.
- Living with Hearing Loss Groups – Another innovative program for the community is our Living with Hearing Loss program. The program conducts three to six week training sessions with individuals with hearing loss and their communication partners to train them in strategies to maximize communication success. Information about this program has been shared at numerous national conferences and recognized by the American-Speech-Language-Hearing Association as a model program.
- The Wings on Words preschool is a program located near to campus where children with specific language impairment receive education in an environment that is specifically designed to promote language development. Many of our MS-SLP students receive clinical training in this unique environment as part of their clinical rotations.

Continuing Education for Professionals: SLHS faculty are committed to advancing our own education and to promoting continuing education within the professional community. To do so, we sponsor professional lectures and full-day workshops on a variety of topics. Some events are taught by our faculty, others by other local professionals, and by national and international experts as well. All of the professionals in the community who serve as clinical preceptors for our graduate students are provided at least one complementary workshop per year. A summary of the number of events is listed below, and a more complete history is included in **APPENDIX P**.

TABLE J.1. ASHA Continuing Education Credits provided by SLHS Outreach Events for Professionals

Academic Year	05/06	06/07	07/08	08/09	09/10	10/11	11/12	Totals
Public Outreach								
Public Lectures (in dept)	6	1	1	2	4	8	10	32
Community Talks	7	6	8	6	7	8	8	50
Professional Events								
Educational Forums	3	8	3	4	3	1	3	25
Workshops/Conferences	3	3	2	3	3	4	6	24
# Participants	301	401	252	187	233	198	418	2,257
Total CEUs	79	70	103	39	60	58	90	555

Community Outreach: Our Department interfaces with the community on a daily basis, but also maintain an active schedule of outreach activities. Table J.1. gives summary numbers, but a glance at **APPENDIX Q** shows the range and consistency of our contact with the community in the form of lectures, health fairs, and special programs. We highlight three programs below:

- **Tucson Hope Fest**
 - The Tucson Hopefest is a large-scale health and services fair for low income and homeless Tucsonans. Each year our clinical faculty and students provide hearing and speech screenings and referrals for approximately 100 individuals ranging from newborn to elderly.

- **Pima County Hearing Aid Bank**
 - The Pima County Hearing Aid Bank is a cooperative program of the Community Outreach Program for the Deaf, Midtown Sertoma, and the University of Arizona Hearing Clinic through which low-income elderly adults can obtain reconditioned used hearing aids at very little cost, \$70 per aid. The U of A Hearing Clinic provides all clinical care from evaluation, through fitting and follow up for years. We serve approximately **70 new patients per year** and spend approximately **600 hours per year** providing these services.
- **La Clinica at St. Andrews, Nogales**
 - Once a month, our clinical faculty and students provide hearing evaluations and help with the provision of hearing aid verification through this multidisciplinary clinic for low income children given special permission to cross the border from Nogales Mexico. We have been involved in this program for more than 15 years.

Advocacy and Legislative Service: Our faculty are active in state and local issues that affect the quality of speech, language, and hearing services provided to the public. Both tenure-track and clinical faculty serve on state committees to advocate, protect, and regulate service delivery for those with communication disorders. Examples include, participation on statewide Decision Theatre: *Solutions to the Shortage of Speech-Language Pathologists in Arizona's Schools*, ethics committees, early childhood development task force, and the like.

K. COLLABORATION WITH OTHER UNITS

The Department of SLHS engages in extensive interaction with other academic units at the University of Arizona. Virtually every member of our faculty has substantial interactions with colleagues in other departments. These interactions include involvement in interdisciplinary programs, and with faculty in other department on the main campus, the college of medicine, and the college or public health. **APPENDIX F** provides a table to indicate the specific collaborations that are highlighted here:

- Five members of the faculty have joint appointments (non-FTE) appointments in other departments.
- Roughly 2/3 of the SLHS faculty belong to one or more Graduate Interdisciplinary Programs (GIDPs).
 - Many faculty participate in the Cognitive Science and Neuroscience GIDPs, both of which are now administered through the School of Mind, Brain, and Behavior.
 - Faculty collaborations are also strong with Biomedical Imaging, Second Language Acquisition and Training (SLAT).
- Interdepartmental collaborations include:
 - Main campus departments: Psychology, Linguistics, Education, Spanish/Portuguese, Chemistry, Optical Sciences
 - University Medical Center: Pediatrics, Neurology, Nursing, Radiology, Surgery (Division of Otolaryngology)
 - School of Public Health: Family & Child Health, Health Promotion, Environmental and Occupational Health
 - School of Science, Information, Technology, and Arts (SISTA)
 - Bio5 Institute
- As part of the School of Mind, Brain, and Behavior, SLHS contributed to the development of the newly designed undergraduate major in Neuroscience/Cognitive Science (NSCS), and our coursework contributes to the major.

L. FACULTY PLANNING

The SLHS faculty are enthusiastic about many aspects of our program including the upward trend in several indicators of productivity (e.g., grants awarded), and the consistently high educational outcomes of our students. The recent improvements to our building have been a welcome step forward to enhance the research and teaching environments. As we look to the future, there was good consensus on several points.

1. Our undergraduate program is strong and, overall, our students are meeting the targeted educational outcomes. We are happy with the current size of our undergraduate program, but the faculty is open to increasing student credit hour offerings by opening additional sections or semesters of courses, if additional teaching faculty were added. We also see additional opportunities for high-interest general education courses that could be added.
2. Enrollment numbers are good for the MS-SLP, and AuD programs. We would like to maintain these high quality programs at roughly same enrollment numbers, but would like to capture a higher percentage of the highly qualified applicants by improving the amount and number of graduate student funding awards. The faculty can support this effort by increasing graduate research assistants funded by grants, but this approach is currently limited to some extent by the high employee related expenses (ERE) for graduate assistants. The university can help in this effort by increased funding for graduate student TAs. As noted in the review of resources, our undergraduate student credit hours have increased dramatically over the past seven years, but the number of funded TAs has not. If a responsibility centered management approach is implemented that accounts for student credit hours, then our department should function well within such framework.
3. We want to promote the reputational strength of our AuD program. At least one additional high profile faculty member in that area would assist in that effort. Improvements to the physical appearance and functionality of our on-campus clinic may also help in that respect.
4. We want to attract a greater number of highly qualified doctoral students and to begin to grow a small cohort of post-doctoral fellows within the Department. SLHS plans to allocate some indirect cost revenue (ICR) toward the funding of at least one post-doc per year in order to support efforts for independent post-doctoral funding, such as the NIH/NRSA F32 mechanism.
5. Ideally, we should have some growth in our faculty in order to address several content areas that are currently not strongly represented by our faculty. There are a number of content areas where the reputational strength of the program could be enhanced with additional hires, particularly in the areas of speech and hearing. Additional motivation to increase the number of faculty by 2 or 3 members is to ensure teaching loads that allow faculty to accomplish their research goals. We have been amazingly productive in garnering grant revenue, but our average rate of publication is not as high as we would like or expect. This relates to the relatively heavy teaching load that some faculty have had to bear even when they are well funded.
6. Our clinical faculty are strong and the number is close to being adequate to meet the training needs. The addition of one more clinical supervisor with strong skills in bilingual/bicultural issues would support our efforts to build a more appropriate bilingual training context for our students. The salaries for our clinical faculty remain low relative to practicing clinicians in our community, which threatens retention. Despite the fact that our clinical faculty are full-time teaching faculty, state funds cover only half of their salary.
7. Finally, we want to retain our tenure-track faculty, and need to achieve and maintain appropriate salaries to do so. Our senior tenure-track faculty, in particular, are significantly underpaid relative to national peers, as well as peers within the College of Science. This issue should receive serious attention.

In sum, SLHS is a highly collegial and productive department that represents the University well in local, state, national, and international contexts. As a group, we love our work, enjoy our students and colleagues, and have great appreciation for Arizona and its residents. We conduct science, teach students, and improve the lives of individuals with communication disorders. Thus, the alignment of our program mission with the Strategic Plans for the University is natural and genuine.