Doctor of Philosophy, Health & Rehabilitation Science

University of Missouri-Columbia
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Executive Summary

The Ph.D. in Health and Rehabilitation Science will address a critical workforce shortage while aligning with the University of Missouri’s mission to be the land-grant and world-class research university of the State of Missouri.

There is currently a substantial nationwide shortage of doctorally prepared researchers in the “allied” health disciplines (e.g., Physical Therapy, Occupational Therapy, Speech Language Pathology, and Public Health). As discussed in the Market Analysis of this proposal, recent estimates indicate that the number of openings for research faculty in academic settings nationwide exceeds the number of program graduates by more than 300. This Ph.D. in Health and Rehabilitation Science will prepare future faculty who are critical to the success and continued accreditation of state and national programs educating health care providers in these disciplines.

Combined with this workforce shortage is the timely opportunity for researchers with interdisciplinary training and experience to advance the science behind growth in health care services within these health fields. There is a national need for leaders in research within the health disciplines. Many of these disciplines have excellent clinical foundations but few researchers advancing science and practice in those fields. Students in the Ph.D. in Health and Rehabilitation Science will advance the science of health care by learning from, and contributing to, research programs of outstanding faculty members in the University of Missouri School of Health Professions. Faculty representing the departments of Health Science, Physical Therapy, Occupational Therapy, Health Psychology, Communication Science and Disorders, and Clinical and Diagnostic Sciences will comprise the graduate faculty for this program.

Students applying for admission to the Ph.D. in Health and Rehabilitation Science may include those who have earned an advanced degree in a related field (e.g., public health) or a degree required for clinical practice in a health discipline (e.g., Doctorate of Physical Therapy). Other students will gain entry to this program after completing a bachelor’s degree in a related field (e.g., health science, psychology, exercise physiology, etc.). For all students, an interdisciplinary plan of study along with an emphasis on early and direct engagement in research activities (mentored and independent) will be hallmarks of this program.

We anticipate strong interest in this program based on the national workforce shortage along with documented interest from students currently enrolled in other programs in the MU School of Health Professions (35% of 216 students surveyed expressed interest in applying to this type of program at MU – see Student Demand section). Funded through strategic reallocations within the MU School of Health Professions, this financial model for this program is sound and sustainable. As the only Ph.D. program of its type within the UM System and across public institutions of higher education in Missouri, we anticipate that this program will become a leading program for research-focused doctoral education in the health disciplines.
1. Introduction

The new University of Missouri (MU) Ph.D. in Health and Rehabilitation Science is an interdisciplinary research-focused doctoral program that will prepare students for high impact careers in research, post-secondary education, and organizational leadership in the health disciplines (including physical therapy, occupational therapy, speech-language pathology and public health). Graduates will be highly sought after, as this rigorous, research-focused program will prepare them to meet the documented national shortage (further described below) of Ph.D.-prepared scholars to serve as faculty in health professions schools and colleges. Additionally, graduates will have a range of opportunities within industry, as they will be well qualified to work in non-governmental organizations and government agencies addressing community health problems via disease management/tracking, policy analysis, and program development, and to contribute to product development in rehabilitation/health care industries.

The MU School of Health Professions is home to 12 professional and graduate degree programs that prepare students for careers in health care disciplines including physical therapy, occupational therapy, speech-language pathology and public health. These programs have substantial positive impact within the State of Missouri, meeting critical workforce needs in the health disciplines, and are nationally renowned for excellence in their preparation of health care professionals. Our programs’ growing reputations as leaders in the foundational sciences for these disciplines reflects strategic hiring over the past 5-8 years. MU School of Health Professions faculty are leading research programs that are advancing the science of health and health care.

It is this growth in research activity and success within MU School of Health Professions that has led to the development of this plan to offer a Ph.D. in Health and Rehabilitation Science. While the national need for such a program to meet faculty shortages has existed for some time, the increase in number and productivity of our faculty over the past several years has provided us with the capacity to ensure the program will succeed. Currently, there are 24 tenured/tenure-track faculty in the MU School of Health Professions who will be available to mentor students. Appendix A includes a sampling of curricula vitae from faculty across the disciplines that will be represented in this program. This proposed doctoral program is aligned with the University of Missouri’s mission to provide all Missourians the benefits of a world-class research and land-grant university by having students who will advance the science of health care learn from, and contribute to, research programs of our outstanding faculty members.

Purpose

The Ph.D. in Health and Rehabilitation Science in the MU School of Health Professions will contribute to the University of Missouri’s goal of addressing health care needs of Missourians by increasing the reach of health-focused research occurring at the University of Missouri and contributing state wide and nationally to
the education of providers in the health disciplines. Our specific goals are three-fold: (1) to meet health care needs of Missourians by providing cutting-edge research that addresses the basic causes of disorders and develops innovative interventions to treat them; (2) to help address critical nationwide work force shortages by providing outstanding didactic and research training to the next generation of faculty in the health professions; and (3) to contribute to the University of Missouri’s complementary missions of growth in research aligned with our Association of American Universities (AAU) membership and intentional engagement in our land-grant mission of providing outstanding undergraduate learning opportunities for Missourians.

To accomplish this, the program will engage students in research within the MU School of Health Professions and prepare them to become excellent academic faculty, clinical research scientists, and health care leaders in the health disciplines. Through rigorous didactic learning opportunities and research mentoring, the Ph.D. in Health and Rehabilitation Science program will develop innovative research scientists who will have far-reaching impacts on health – promoting health and preventing disability through understanding normal and disordered functioning, effective translational applications of this knowledge, and improved health care systems within a global context.

There is a national need for leaders in research within the health disciplines, as many of these disciplines have excellent clinical foundations but relatively few researchers advancing science and practice in those fields. The MU School of Health Professions is well position to meet this need, with faculty engaged in research across a breadth of health disciplines in academic departments that have highly successful graduate/professional programs focused on training clinical health care providers. At a national and state-wide level, this Ph.D. program will educate graduates prepared to meet a workforce shortage of health professions faculty in the profession-specific departments and in the growing number of multi-disciplinary departments in the health sciences. Moreover, with a focus on interdisciplinary collaboration, this program will serve as a national model of excellence for training future researchers in health care fields.

In addition to addressing this documented workforce shortage, this program will advance the research mission at the University of Missouri. This program will increase the number of doctoral students who learn from and contribute to our expanding research portfolio, contributing to federally funded projects obtained by our faculty members and growing our capacity for research activities recognized by the AAU. In the process of developing their independent research programs, doctoral students in this Ph.D. program will: conduct studies in collaboration with their mentor(s), engage in research dissemination activities (presentations, publications), and participate in generating research ideas that build upon and expand their mentor’s line of work.
This program will also contribute to the University of Missouri’s goal of providing transformative, experiential learning activities for our undergraduate students. Graduate students in the program will expand opportunities for hands-on research experiences for undergraduate students interested in careers in health care by serving as proximal supervisors, under the broader supervision of the faculty mentor, for undergraduate student research experiences.

**Academic Component**

Interest in a Ph.D. in Health and Rehabilitation Science has existed within the MU School of Health Professions since it became an autonomous division at the University of Missouri in December 2000. As Missouri’s only state-supported school of health professions on a campus with an academic health center, the MU School of Health Professions is uniquely positioned within the state to educate not only the next generation of practitioners, but also our future faculty and researchers in the health disciplines. The MU School of Health Professions has experienced extraordinary growth in our degree programs in recent years, which has aligned with growth in our faculty and in our research engagement and success. **We have reached a critical mass of successful faculty scholars, we recognize the link between this Ph.D. program and University of Missouri AAU and land-grant foci, and we are prepared to make strategic financial investments to ensure this program will succeed. For these reasons, we have determined that now is the time to implement a Ph.D. in Health and Rehabilitation Science.**

The program curriculum is based on a mentorship-model of graduate education, wherein students are accepted to the program to work with a specific faculty mentor or mentors. Coursework will be tailored to ensure breadth and depth of didactic learning that will provide the foundation for development of an independent research program in Health and Rehabilitation Science. Direct one-on-one learning through engaging in increasingly independent research activities under the tutelage of the faculty mentor(s), culminating in the completion of a research dissertation, will be a key component of the program. A unique feature of this program will be its emphasis on interdisciplinary learning and research. Students will take courses taught by faculty from a range of academic units within the MU School of Health Professions and across the University campus (e.g., Engineering, Nursing, Psychological Sciences) and will have shared learning experiences with peers having different, but complementary, areas of scholarly interest. Moreover, a majority of faculty who will serve as mentors for this program are currently engaged in interdisciplinary research, thus providing opportunities to learn from and develop programs of research that cross disciplinary lines.

The Ph.D. in Health and Rehabilitation Science will require completion of 72 credit hours of post-baccalaureate study. This credit hour standard is consistent with expectations for award of a doctoral degree as stated by the University of Missouri Office of Graduate Studies. It is also comparable to curriculum expectations as detailed in five Ph.D. programs that have been identified as potential comparators to
our proposed program (credit hour range = 51-90; mean and median = 72). See Table 1 for additional comparison of program structures.

<table>
<thead>
<tr>
<th>University of Missouri Columbia</th>
<th>The Ohio State University</th>
<th>University of Florida</th>
<th>University of Alabama Birmingham</th>
<th>George Mason University</th>
<th>University of Kansas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Courses</td>
<td>6+11</td>
<td>9</td>
<td>23</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>Electives</td>
<td>15</td>
<td>9</td>
<td>16</td>
<td>12-18</td>
<td>30</td>
</tr>
<tr>
<td>Statistics</td>
<td>12</td>
<td>6</td>
<td>13</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Research/Thesis</td>
<td>Up to 28</td>
<td>Up to 48</td>
<td>32</td>
<td>Up to 30</td>
<td>12</td>
</tr>
<tr>
<td>Teaching</td>
<td>0</td>
<td>9</td>
<td>6</td>
<td>0</td>
<td>3 (optional)</td>
</tr>
<tr>
<td>Total</td>
<td>72</td>
<td>80</td>
<td>90</td>
<td>51</td>
<td></td>
</tr>
</tbody>
</table>

*All are Ph.D. programs in Rehabilitation Science or Health and Rehabilitation Science

The proposed doctoral program in Health and Rehabilitation Science will build upon existing strengths across the University of Missouri by drawing from coursework spanning multiple divisions. Students will collaborate with their faculty mentor(s) to create a plan of study for their doctoral degree before the end of their first semester in the program.

The core curriculum for this program that will be shared by all students focuses on (a) foundational theory and research in health and rehabilitation science [6 credit hours], and (b) statistics and research methodology [12 credit hours]. In addition, students will complete a minimum of 15 credit hours of 8000-9000 coursework that advances and is tailored to their line of research and is approved by their faculty mentor(s). The curriculum will take advantage of currently existing courses and a modest number of new courses in the MU School of Health Professions. As a primary goal of this program is to prepare students to advance interdisciplinary research in our health disciplines, students will be expected to take courses from 2 academic programs outside of their faculty mentor’s home department. Students will also complete a minimum of 11 credit hours of directed study via readings, problems or research courses, with the areas of study identified by the faculty mentor(s). Up to 28 hours of research credits may be counted towards the 72 hours minimum required to earn a Ph.D., though students may take more than 28 hours of research credits to complete their research and defend their dissertation. See Table 2 for a listing of course requirements, and Appendix B for sample curricula.
### Table 2: Health and Rehabilitation Science Course Requirements

<table>
<thead>
<tr>
<th>Required Core Courses</th>
<th>HTH_PR 8440 and HTH_PR 8442: Health and Rehabilitation Science I and II (3 cr each, new courses)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health and Rehabilitation Science (6 cr)</td>
<td></td>
</tr>
<tr>
<td>Research Methodology &amp; Statistics (12 cr)</td>
<td>STAT 7510: Applied Statistical Models I (3 cr)</td>
</tr>
<tr>
<td></td>
<td>STAT 8220: Applied Statistical Models II (3 cr)</td>
</tr>
<tr>
<td></td>
<td>Choose from Electives (see options in Appendix C)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Other Course Requirements</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Research area courses (15 cr)</td>
<td>To include courses from within SHP and across campus, approved by faculty mentor(s) (see Appendix C for partial listing of possible courses)</td>
</tr>
<tr>
<td>Research area directed study (11 cr)</td>
<td>HTH_PR 7001/8001: Topics in Health and Rehabilitation Science (1-99 cr)</td>
</tr>
<tr>
<td></td>
<td>HTH_PR 7085/8085: Problems in Health and Rehabilitation Science (1-99 cr)</td>
</tr>
<tr>
<td></td>
<td>HTH_PR 8960: Directed Reading in Health and Rehabilitation Science (1-3 cr)</td>
</tr>
<tr>
<td>Thesis/Dissertation courses (up to 28 cr)</td>
<td>HTH_PR 8090: Research in Health and Rehabilitation Science (1-99 cr)</td>
</tr>
<tr>
<td></td>
<td>HTH_PR 9090: Research in Health and Rehabilitation Science – Dissertation (1-99 cr)</td>
</tr>
</tbody>
</table>

Students may enter the program with a bachelor’s degree or with a graduate degree from a related professional discipline (e.g., Master in Public Health, Master in Occupational Therapy, Occupational Therapy Doctorate, Doctorate of Physical Therapy [DPT]). Additionally, we are developing a curriculum plan that would enable students to concurrently complete requirements for a clinical degree (e.g., DPT). Up to 30 credit hours from professional/graduate training may count towards requirements for the Ph.D., pending review and approval from the Program Director and the student’s faculty mentor(s). Students who begin the program with a graduate degree that did not include a research thesis (e.g., master’s thesis or equivalent) will complete a preliminary research project prior to advancing to the comprehensive exam requirement. Students who enter the program with a bachelor’s degree and no graduate training will complete a research project within the first two years of the program. All students must successfully complete a comprehensive examination at the end of required coursework that will include written and oral sections. Students will write a dissertation proposal that must be reviewed and approved by the student’s doctoral committee and must successfully complete a doctoral dissertation focused on original research. As part of the research training, all students are expected to submit at least one research article (may be co-authored) to a peer-reviewed journal prior to defense of the doctoral dissertation.

As an interdisciplinary program comprised of faculty from across departments in the MU School of Health Professions, the Ph.D. in Health and Rehabilitation Science will report directly to the Dean’s office in the MU School of Health Professions. Associate Dean Stephanie Reid-Arndt and Dean Kristofer Hagglund will have primary responsibility for the success of the program. There are also plans to
identify a Program Director, who will be a tenured faculty member with a successful research career in one of the health disciplines and with expertise in mentoring students and faculty engaged in research.

2. Fit with University Mission and Other Academic Programs

2.A. Alignment with Mission and Goals

“The mission of the University of Missouri System, as a land-grant university and Missouri’s only public research and doctoral-level institution, is to discover, disseminate, preserve, and apply knowledge. The university promotes learning by its students and lifelong learning by Missouri’s citizens, fosters innovation to support economic development, and advances the health, cultural, and social interests of the people of Missouri, the nation, and the world.”

Alignment with Mission as Missouri’s Land-Grant University. The Ph.D. in Health and Rehabilitation Science will substantially increase access to top-quality higher education for health professionals across the state of Missouri. This program will attract national and international students, and will serve as a destination for Missouri practitioners in the health fields who wish to earn a Ph.D. to transition to a research-focused career. These research-trained professionals will then be qualified to serve as leaders in the state’s academic institutions, as well as in government and industry positions that require the expertise of doctorally trained individuals in health disciplines. These leaders are likely to spark innovations in health care, health promotion and health service delivery, resulting in a direct health benefit for Missouri citizens and potential health care cost-savings. Research innovations may be patented and new discoveries may result in business opportunities, making an important contribution to economic development in the region and the state.

Alignment with Mission as Missouri’s Public Research and Doctoral-Level Institution. The University of Missouri has clearly identified as a priority engagement in activities that will enhance our standing in the Association of American Universities. The Ph.D. in Health and Rehabilitation Science will specifically contribute to progress in this area by (1) advancing high-impact interdisciplinary research consistent with University of Missouri priorities, and (2) recruiting and retaining doctoral students in high-growth disciplines.

The University of Missouri increased its promotion and support of interdisciplinary research with the launch of the Mizzou Advantage initiative in 2010. One of the priority areas for research investment is One Health/One Medicine, which focuses

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on the collaborations across health disciplines to “accelerate discoveries that prevent illness, heal the sick and serve humanity.”

The Ph.D. in Health and Rehabilitation Science will contribute to growth in high-impact interdisciplinary research within the MU School of Health Professions and across the MU campus. Faculty within the MU School of Health Professions have already developed high impact interdisciplinary collaborations with many academic/research units across the MU campus, including Thompson Center for Autism and Neurodevelopmental Disorders, School of Medicine, College of Engineering, College of Education, College of Arts and Science, Sinclair School of Nursing, and College of Human Environmental Sciences. As of February 2018, we have more than 45 grants involving interdisciplinary research either under review or funded by the MU School of Health Professions faculty in the departments participating in the proposed Ph.D. in Health and Rehabilitation Science. Some examples of faculty research activities include:

- Dr. Maria Dietrich in the Department of Communication Science and Disorders has engaged in collaborative research with Engineering and School of Medicine faculty that resulted in NIH-funded research designed to improve the early detection of voice disorders.
- Dr. Rachel Proffitt in the Department of Occupational Therapy, whose research focuses on virtual reality technologies for stroke rehabilitation and patient care, has an NIH KL2 Career Development Award for collaborative work with Engineering and a MU-PCOR grant with collaborators in the Schools of Nursing and Medicine.
- Dr. Cheak-Zamora in the Department of Health Sciences has led large scale DOD research projects related to autism spectrum disorders with collaborators in the Thompson Center and School of Medicine.

Furthermore, doctoral students will enhance the research productivity of MU School of Health Professions faculty, leading to greater success in securing federal research funds. In the past year alone, without doctoral students in their labs, our faculty members were awarded 33 extramural grants, for a total funding of $2.28M in FY2017. A doctoral program is critical for continued advances in research productivity and funding success, strengthening research laboratory teams and promoting growth in scholarly publications and extramural grant submissions.

Finally, by contributing to the research success of the University of Missouri, and supporting its standing in the Association of American Universities, this program will attract other high quality research faculty and students, and additional federal research funds to the University. Students from the Ph.D. program will further the research initiative of numerous MU School of Health Professions faculty and their collaborators, and strengthen the research climate on campus. Moreover, MU will become a more attractive destination for high-caliber faculty candidates if there is

an active Ph.D. program providing them with opportunities to accept graduate students and supported by an infrastructure promoting interdisciplinary research in the health sciences. Graduates from this program may strengthen the pipeline of post-doctoral fellows prepared to contribute to research at MU in high-impact areas. Additionally, as graduates of the Ph.D. in Health and Rehabilitation Science assume faculty positions in other Universities, our reputation will rise and we will experience growth in interest in our Ph.D. program and in stature of our School and University.

Alignment with Mission of MU School of Health Professions. Development of this program is specifically included in the MU School of Health Professions’ Strategic Action Plan for AY2018, as one of several priority strategies intended to increase research productivity. The presence of doctoral students in the School will directly enhance the research productivity of our faculty -- the mentorship model of training scientists ensures that the students learn substantive content and research skills from their faculty mentor(s) while taking an active role in contributing to the faculty members’ research labs. Among other activities, doctoral students can: facilitate research experiences for undergraduates in their mentor’s research lab, conduct studies in collaboration with their mentor, engage in research dissemination activities (presentations, publications), and participate in generating research ideas that build upon and expand their mentor’s line of work. Their participation in research will facilitate completion of projects, thus increasing the speed with which new discoveries can be reported and adopted for health care delivery.

Exemplary peer institutions already have similar programs to support their research endeavors. For example, all but two of the other universities in the Southeastern Conference have doctoral programs in one or more of the disciplines represented in the MU School of Health Professions. Multi-disciplinary Ph.D. programs in Rehabilitation Science are offered by two of these peers (University of Florida and University of Kentucky); the MU School of Health Professions intends to emulate these top programs, both of which demonstrate high levels of research productivity made possible, in part, by their doctoral programs.

2.B. Duplication and Collaboration within Campus and Across System

The Ph.D. in Health and Rehabilitation Science will be the only program of its kind in the University of Missouri System. Despite a clear need for doctoral trained researchers/faculty in the health disciplines, there are few options for receiving this training in Missouri. Within the University of Missouri Columbia campus, the MU School of Health Professions Department of Communication Science and Disorders, in collaboration with the College of Arts and Sciences Department of Communication, provides students the option of earning a Ph.D. in Communication with training in Communication Science and Disorders. None of the 12 other public four-year universities in Missouri offers a Ph.D. in Health and Rehabilitation Science or in any field related to other health disciplines represented in our school (e.g., Occupational Therapy, Physical Therapy, Public Health).
We envision numerous opportunities for collaboration within the University of Missouri community, many of which will be based on opportunities for shared coursework and on existing and future research collaborations between MU School of Health Professions faculty and faculty from other academic units. Regarding shared coursework, several programs across the MU campus currently offer graduate courses that are likely to be of interest to students in this Ph.D. program (e.g., Nursing, Psychological Sciences, Exercise Physiology, Social Work, and the Master in Public Health program). Collaborative research activities across academic units, consistent with University of Missouri priorities, will be further facilitated by doctoral students engaged in interdisciplinary research.

3. Business-Related Criteria and Justification

3.A. Market Analysis

3.A.1. Need for Program
Across the lifespan, the ability to achieve one’s full potential in school, work, and leisure depends on good health. Perhaps no field of study is as complex, multifaceted, and interdisciplinary as health, which includes physical, cognitive, genetic, social and behavioral variables. It is vital to understand how these factors interact across disciplines to design effective societal responses to debilitating conditions. To address complex problems in health care, innovative, multidisciplinary research is needed that focuses on: addressing population health challenges, understanding factors contributing to health and well-being, developing strategies to prevent and treat health-related disorders, and improving health care services in acute care and community settings. Advancing this effort, this Ph.D. program in Health and Rehabilitation Science will produce scientists experienced in a multi-disciplinary approach to examining and addressing complex issues in the health sciences.

The Ph.D. in Health and Rehabilitation Science will offer the training needed to develop high caliber researchers prepared to advance the science across our multiple disciplines. Expertise in clinical training for the delivery of patient-care services is well established in the disciplines represented in the MU School of Health Professions (e.g., Physical Therapy, Occupational Therapy, Speech-Language Pathology), and these health care fields are on the cusp of significant growth in their scientific knowledge base. However, because of the manner in which these fields evolved, with professional education programs that emphasized preparation for clinical practice, there remains a significant shortage of scientists with the training and expertise to advance research in the health disciplines. These health professions fields need scientists trained in methodologically- and theoretically-rigorous Ph.D. programs such as ours to continue to develop a foundation of scientific knowledge that emphasizes the translation of basic science findings to clinical practice in health care. We cannot solve the complex problems facing health care today without research into the causes and treatments of health-related disorders. The gaps in our
knowledge are costly both in terms of the investment of resources and patients’ quality of life. The MU School of Health Professions is poised to become a leader in addressing these issues due to the breadth of our programs and our partners in other academic units at the University of Missouri. The Ph.D. in Health and Rehabilitation Science brings us closer to achieving this goal.

Closely related to the need for growth in capacity for scientific research in these health professions fields, **there is a chronic nationwide shortage of persons to fill open faculty positions in health disciplines that the Ph.D. in Health and Rehabilitation Science will help address.** First, there is an increasing number of mixed and multi-disciplinary departments and degree programs in the health sciences that need well-trained health science researchers to fill open faculty positions. Additionally, there are longstanding shortages of appropriate candidates in several of MU School of Health Professions’ specific health disciplines that have been exacerbated for some programs by changes in accreditation. For example, in the area of Physical Therapy education, the accrediting body (the Commission on Accreditation in Physical Therapy Education) has implemented a new standard requiring that 50% of faculty in programs offering the Doctorate in Physical Therapy (DPT) hold an academic (research) doctorate. This is a change from prior standards, which mandated faculty have doctoral training but allowed for either a professional doctorate (DPT) or a research doctorate. Similar standards are currently being implemented by the accrediting organization for Occupational Therapy.

The dearth of existing Ph.D. programs has resulted in significant challenges to these disciplines and others in filling faculty positions in academic settings. Per a report from the American Physical Therapy Association³, in FY2015 there were 308 open faculty positions in existing Physical Therapy programs. Moreover, current faculty in the discipline are aging (a majority are in the 50-60 year-old range) and trends reveal an increasing number of Physical Therapy programs (31 new programs under development nationally) along with increasing student enrollment (38% in the last 10 years). This combination of factors will exacerbate an existing shortage of faculty that is already severe. In the fields of Occupational Therapy and Communication Sciences and Disorders (Speech-Language Pathology), similar shortages of faculty candidates with doctorates are observed. For Occupational Therapy, the most recent annual report (2014-2015)⁴ reveals that there were 110 unfilled full-time faculty positions across Master-degree and Doctoral-degree programs, which represents approximately 13% of all full-time faculty positions in Occupational Therapy programs nationwide. In the field of Communication Sciences and Disorders, the most recent data available (academic year 2014-2015)⁵

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demonstrated a substantial discrepancy between the number of open positions – 299 – and the number of research doctorates awarded – 156.

**Despite this clear need for doctorally trained researchers/faculty in these disciplines, there are few options for receiving this training in Missouri, thus we are failing to attract/retain scientists whose research will advance the health of Missourians and whose teaching will ensure a well-prepared health care workforce.** As noted above, the MU School of Health Professions Department of Communication Science and Disorders provides students the option of earning a Ph.D. in Communication with training in Communication Science and Disorders in collaboration with the MU Department of Communication. None of the 12 other public four-year universities in Missouri offers a Ph.D. in Health and Rehabilitation Science or in any field related to other health disciplines represented in our School (e.g., Occupational Therapy, Physical Therapy, Public Health). Of the 24 independent four-year colleges/universities in Missouri, St. Louis University offers a Ph.D. in Public Health, while Washington University is the sole institution offering research-focused doctoral training across multiple health professions (Movement Science, Public Health, and Rehabilitation and Participation Science). Washington University also offers a degree in Audiology rather than speech-language pathology, which will be the research area offered in this proposed Ph.D. program. Of note, St. Louis University reported receiving 80-100 applications for 8-12 openings in the Ph.D. in Public Health program in each of the past three years. Washington University reported receiving 10-15 applications for 2 openings in each of the last 3 years.

Nearby states have some programs that are similar to what the MU School of Health Professions is proposing. For example, the University of Kansas offers a Ph.D. in Rehabilitation Science with a strong emphasis in movement science (closely aligned with the physical therapy discipline). This program consistently receives more qualified applications than available positions (they estimated receiving 6-12 applications for 3-7 positions during each of the past 3 years). The University of Kansas also has a free-standing Ph.D. in Communicative Disorders for which the number of applicants exceeds capacity. Other Ph.D. programs with similar areas of study in the vicinity of Missouri include: Health and Human Physiology and Communication Sciences and Disorders at the University of Iowa, Speech and Hearing Science at University of Illinois – Urbana-Champaign, and Communication Science and Disorders at University of Texas-Austin. **Importantly, however, none of these programs offer the multi-disciplinary framework that is exemplified in this proposed Ph.D. program and none have the strengths in multi- and inter-disciplinary education and research that exist at the MU campus.** As detailed in Table 3, the number of students interested in obtaining a research-focused education at these and other comparator institutions consistently exceeds the programs’ capacities.

<table>
<thead>
<tr>
<th>Table 3: Comparator Institutions - PhD Programs Admissions Data</th>
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OPEN – AS&RED – 2-16 September 20-21, 2018
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<tr>
<th>University of Florida</th>
<th>Discipline</th>
<th># Applicants</th>
<th># Enrolled</th>
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<tbody>
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<td></td>
<td>Speech-Language Pathology*</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>University of Iowa</td>
<td>Speech and Hearing Science**</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>University of Illinois</td>
<td>Speech-Language Pathology**</td>
<td>14</td>
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</tr>
<tr>
<td>University of Kansas</td>
<td>Rehabilitation Science*</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Speech-Language Pathology**</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>University of Kentucky</td>
<td>Rehabilitation Science*</td>
<td>16.3</td>
<td>7.7</td>
</tr>
<tr>
<td>St. Louis University</td>
<td>Public Health*</td>
<td>90</td>
<td>10</td>
</tr>
<tr>
<td>University of Texas-Austin</td>
<td>Speech-Language Pathology**</td>
<td>37</td>
<td>3</td>
</tr>
<tr>
<td>Washington University</td>
<td>Movement Science*</td>
<td>12.5</td>
<td>2</td>
</tr>
</tbody>
</table>

* 3-year averages (AY2013-2015); ** 1-year data (AY2015)

3.A.2. Student Demand for Program

To assess local student demand for the program, surveys were distributed electronically to current University of Missouri students affiliated with four professional programs – Master of Health Science in Speech-Language Pathology (in the Department of Communication Science and Disorders), Master of Occupational Therapy, Doctorate of Physical Therapy and Master of Public Health. Our survey yielded 216 respondents, who replied to the following questions: (1) Please rate your level of interest in a career as a faculty member in your discipline in the future, and (2) If a research-focused Ph.D. program in your area of study was available at the University of Missouri, please rate your interest in applying to be a student in that program within the next 5-10 years. Respondents were given five (5) response options ranging from No Interest to Substantial Interest.

As demonstrated in Table 4 below, 42% of current students (n=91) indicated they have moderate to substantial interest in becoming a faculty member in their discipline, and 35% (n=77) stated they would have moderate to substantial interest in applying to a research-focused Ph.D. program such as the Ph.D. in Health and Rehabilitation Science.
**Table 4: MU School of Health Professions Student Interest in Ph.D. Program***

<table>
<thead>
<tr>
<th>Degree Program</th>
<th>Number of Respondents</th>
<th>Interested in PhD/Career as Faculty</th>
<th>Interested in Applying to MU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor of Health Sciences and Other Students</td>
<td>25</td>
<td>48%</td>
<td>40%</td>
</tr>
<tr>
<td>Master of Health Science: Speech-Language Pathology</td>
<td>27</td>
<td>30%</td>
<td>29%</td>
</tr>
<tr>
<td>Master of Public Health</td>
<td>56</td>
<td>53%</td>
<td>59%</td>
</tr>
<tr>
<td>Master of Occupational Therapy</td>
<td>25</td>
<td>24%</td>
<td>28%</td>
</tr>
<tr>
<td>Doctorate of Physical Therapy</td>
<td>83</td>
<td>41%</td>
<td>22%</td>
</tr>
<tr>
<td>Total</td>
<td>216</td>
<td>42%</td>
<td>35%</td>
</tr>
</tbody>
</table>

* Survey completed Spring 2016

Based on these indications of local student interest, the substantial market shortage, the lack of similar programs nationally, and the number of MU School of Health Professions faculty having active research programs and an interest in mentoring doctoral students, we anticipate enrolling 4-7 new students in this program annually. During the first few years, we will gradually increase enrollment based on availability of faculty mentors and graduate research/teaching assistantships. The goal is program completion within four years. Table 5a below provides student enrollment projections based on these assumptions. Because this is a graduate program in a new content area, all students enrolling in the program are expected to be new to the University of Missouri or retained rather than leaving campus.

**Table 5a. Student Enrollment Projections*** (anticipated total number of students enrolled in program during the fall semester of given year).

<table>
<thead>
<tr>
<th>Year</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Full-Time</td>
<td>3</td>
<td>7</td>
<td>16</td>
<td>22</td>
<td>26</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Part-Time</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>3</td>
<td>7</td>
<td>16</td>
<td>22</td>
<td>26</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* All students will be new to campus.

**Table 5b. Projected Number of Degrees Awarded**

<table>
<thead>
<tr>
<th>Year</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td># of Degrees Awarded</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>4</td>
<td>6</td>
<td>6</td>
<td>7</td>
<td>7</td>
<td>8</td>
</tr>
</tbody>
</table>

### 3.B. Financial Projections

The Ph.D. in Health and Rehabilitation Science has been developed to capitalize on existing resources within the MU School of Health Professions and across the MU campus. As a result of growth in the number of research faculty within the MU School of Health Professions over the past several years, there are sufficient existing faculty to provide the mentorship and guided research experience that will be the hallmark of this program. The sole faculty wage and benefit cost will be 0.5 FTE of
one faculty member to serve as Program Director. Staffing wage and benefit costs will be limited to 0.5 FTE of an office support staff to assist the Program Director.

The most substantial cost associated with the program will be graduate assistantships. While faculty members will be expected to provide grant-funded graduate research assistantships to the extent possible, the program intends to offer graduate teaching assistantships for approximately 20 students annually. At the present time, departments in the MU School of Health Professions currently offer 20-25 0.50-FTE graduate teaching assistantships to students in other graduate programs. When the Ph.D. in Health and Rehabilitation Science is implemented, the assistantships will instead be made available to fund these doctoral students. Faculty from these programs have agreed to this plan to hire Ph.D. students in these graduate teaching assistant positions and report they have no concerns about adverse effects in their ability to recruit and retain students. Closer analysis of recent graduate teaching assistantship recipients revealed that in AY2017, considered a typical year, 25 students were hired from 10 different programs within the MU School of Health Professions and across the MU campus. More than 1/3 of these students came from the Doctorate of Physical Therapy program, which in AY2018 implemented changes that rendered its future students ineligible for graduate assistantships. With this change, and because assistantships are spread across many programs and not heavily supporting one, diverting these assistantships to the proposed Ph.D. program is expected to have minimal impact on any single program.

In addition to this strategic reallocation of assistantships to support the Ph.D. in Health and Rehabilitation Science program students, the MU School of Health Professions intends to redirect resources to cover all other program costs, including salary and benefit expenses for the two positions noted above. As a result, no additional general operating funds will be sought from University of Missouri. We believe this strategic reinvestment of funds is essential and will support our success in contributing the University of Missouri’s key missions of research and education.

Regarding sources of revenue, consistent with research doctorates across the MU campus, the returns generated for the MU School of Health Professions and the University of Missouri by this program will result less from tuition and supplemental fees and more from the anticipated increased research and grant productivity by participating faculty. Given expectations that all students will have assistantships with tuition waivers, tuition revenue will be negligible. Once the program is fully enrolled, the annual SHP supplemental fee generation will be approximately $25,000. Greater gains are expected in terms of increased grant productivity by MU School of Health Professions faculty, particularly from federal agencies (e.g., NIH), with associated indirect cost returns to the University of Missouri. See Appendix D for an accounting of anticipated program expenditures and revenues.
3.B.1. Additional Resources Needed

Because this program is designed to capitalize on existing resources within the MU School of Health Professions (faculty mentors) and across the MU campus (coursework), there are minimal additional resources needed to operate this program. The primary program expenses will include personnel: (1) Program Director – allocation of 50% FTE from among existing faculty, and (2) Staff – allocation of 50% FTE from an existing staff position. Modest operating costs will be funded from supplemental fees generated by this program along with a redirection of resources by the Dean from within the MU School of Health Professions as needed.

3.B.2. Revenue

Revenue from this program will be derived from supplemental fee income, as students in the program will be offered graduate research or teaching assistantships. All revenue will be reinvested into the program to cover program costs.

3.B.3 Financial and Academic Viability

The Ph.D. in Health and Rehabilitation Science will capitalize on existing financial resources to grow research activities within the MU School of Health Professions. There are minimal costs associated with the program, and these will be funded via strategic reallocation of existing resources within the School. As a result, there is no minimum enrollment required for financial viability. Regarding academic viability, we expect that our anticipated enrollment of 5 new students per year will enable us to have an academically rich environment for participating students.

<table>
<thead>
<tr>
<th>Viability</th>
<th>Minimum Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial</td>
<td>n/a</td>
</tr>
<tr>
<td>Academic</td>
<td>20</td>
</tr>
</tbody>
</table>

Table 5. Enrollment at the End of Year 5 for the Program to Be Financially and Academically Viable
Table 6. Financial Projections for Proposed Program for Years 1 Through 5.

<table>
<thead>
<tr>
<th></th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Expenses per year</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>A. One-time</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>New/Renovated Space</em></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><em>Equipment</em></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><em>Library</em></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><em>Consultants</em></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><em>Other</em></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total one-time</strong></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>B. Recurring</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Faculty</em></td>
<td>75,000</td>
<td>76,250</td>
<td>77,521</td>
<td>78,813</td>
<td>80,127</td>
</tr>
<tr>
<td><em>Staff</em></td>
<td>20,800</td>
<td>21,147</td>
<td>21,500</td>
<td>21,858</td>
<td>22,222</td>
</tr>
<tr>
<td><em>Benefits</em></td>
<td>33,884</td>
<td>34,449</td>
<td>35,298</td>
<td>36,168</td>
<td>37,061</td>
</tr>
<tr>
<td><em>Equipment</em></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><em>Library</em></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><em>Other</em></td>
<td>8,600</td>
<td>9,350</td>
<td>14,100</td>
<td>19,850</td>
<td>21,000</td>
</tr>
<tr>
<td><strong>Total recurring</strong></td>
<td>138,284</td>
<td>141,196</td>
<td>144,419</td>
<td>147,689</td>
<td>150,410</td>
</tr>
<tr>
<td><strong>Total expenses</strong></td>
<td>138,284</td>
<td>141,196</td>
<td>144,419</td>
<td>147,689</td>
<td>150,410</td>
</tr>
<tr>
<td>(A+B)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>2. Revenue per year</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Tuition/Fees</em></td>
<td>4,853</td>
<td>8,618</td>
<td>14,366</td>
<td>23,465</td>
<td>25,752</td>
</tr>
<tr>
<td><em>Institutional Resources</em></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><em>State Aid -- CBHE</em></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><em>State Aid -- Other</em></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total revenue</strong></td>
<td>4,853</td>
<td>8,618</td>
<td>14,366</td>
<td>23,465</td>
<td>25,752</td>
</tr>
<tr>
<td><strong>3. Net revenue (loss) per year</strong></td>
<td>(133,431)</td>
<td>(132,578)</td>
<td>(130,053)</td>
<td>(124,224)</td>
<td>(124,658)</td>
</tr>
<tr>
<td><strong>4. Cumulative revenue (loss)</strong></td>
<td>(133,431)</td>
<td>(266,009)</td>
<td>(400,062)</td>
<td>(533,286)</td>
<td>(667,944)</td>
</tr>
</tbody>
</table>
3.C. Business and Marketing Plan: Recruiting and Retaining Students

Marketing Plan. Responsibility for marketing and student recruitment for the Ph.D. in Health and Rehabilitation Science will be shared by the Program Director and the participating program faculty. Several strategies have been identified to market this program and attract new graduate students to the MU School of Health Professions. Marketing efforts will be greatest in the first several years of the program, as we seek to grow the program and develop a national reputation. We are projecting modest costs for this marketing plan. Materials can be developed and disseminated by existing resources within the MU School of Health Professions (e.g., our Communications Office as well as current faculty and staff), and much of the in-person marketing of the program will occur as faculty present at national conferences and share information about the program with colleagues and potential students. We are confident that this combination of strategies, in conjunction with documented need and interest in the program, will enable us to select high quality students from a sizeable applicant pool annually.

Target Audiences

- Our surveys of current students in the MPH program suggests that a substantial portion of those students (59%) will likely be interested in applying for admission to a research-focused Ph.D. program after earning their MPH degree, so we will actively recruit from this pool of students. Several faculty in the MU School of Health Professions Department of Health Sciences have research expertise in public health and are prepared to accept and mentor graduate students in their research labs.
- We intend to publicize the program to current students and to professionals in the health care disciplines represented in the MU School of Health Professions (e.g., Physical Therapy, Occupational Therapy, Communication Sciences [Speech-Language Pathology]). Several faculty have already been approached by students who are entering our professional programs and have expressed an interest in earning a research doctorate. Additionally, our faculty maintain close connections with their respective professional organizations and so will utilize those national professional networks to communicate broadly about this program.

Specific Strategies

- Written and electronic communications about the Ph.D. in Health and Rehabilitation Science will include: a degree-specific website, press releases distributed to a variety of media outlets, posted announcements around the University of Missouri campus, and advertisements at regional and national professional organizations.
- MU School of Health Professions faculty are consistently disseminating research findings via presentations at national/international conferences and publishing in peer-reviewed journals. By attending professional meetings, and presenting research activities, our faculty will draw students
from the Midwest and across the country to the Ph.D. in Health and Rehabilitation Science program to have the opportunity to be mentored by established as well as up-and-coming scientists in their fields.

- Faculty participating in the Ph.D. program will attend national conferences organized by their professional organizations and will set up informational booths for recruiting graduate students.

**Student Retention Plan.** We have identified several specific strategies designed to ensure student retention and promote student success:

- To ensure they have adequate time to devote to their studies and research, students in this doctoral program will have guaranteed assistantships for 4 years, with the potential for an additional year of assistantship determined on a case-by-case basis.
  - A small number of assistantships (1-3), to be funded by individual departments in the School, will be offered to select, highly sought-after first year students with no associated teaching or research responsibilities.
  - Students with teaching assistantships will not be assigned as primary instructor for courses for at least their first 3 years in the program, but rather will function as grading assistants for faculty. This will not require the time-consuming work associated with teaching courses independently, but will provide students with the opportunity to interact with undergraduates and learn from observing faculty engaged in teaching.
  - The program has set a goal to have 40% of assistantships funded as research assistantships by Year 5 through mechanisms including faculty start-up funds, research grants, and fellowship programs.

- Consistent with the mentorship-model approach to doctoral education, each student will be accepted to the Ph.D. program to work with a specific faculty mentor, who will ensure that the student is receiving the education and training needed to be a successful researcher upon graduation. In addition, recognizing that student research interests can evolve over time, students will have the flexibility to transition to a different mentor if desired. The Program Director will serve as a resource for students in navigating such changes.

- We will ensure that students are making sufficient progress in their curriculum plan and research activities via an annual review by the students’ mentors and the Program Director. Results from this review will be provided to the student in a face-to-face meeting, and suggestions for improving progress will be provided as needed.

- To promote the development of collaborative supportive working relationships among graduate students, the MU School of Health Professions will provide shared space for graduate student networking and will facilitate curricular and co-curricular activities that promote community building among the students.
The graduate students will have a shared meeting space that offers easy access in a central location on the ground floor of our buildings. In addition to WiFi, it will have comfortable seating to facilitate informal conversation and will be in close proximity to a coffee kiosk in our main lobby.

The curriculum was designed with a year-long course for all students that serves the dual purpose of providing necessary content while facilitating the development of a professional cohort for the students.

We will offer regular co-curricular activities in support of the program educational goals. For example, the MU School of Health Professions Office of Research, led by the Associate Dean for Research, currently conducts research brown bag seminars for faculty and post-doctoral fellows; graduate students will be invited and expected to join these seminars. Additionally, the Associate Dean for Research will offer specific didactic sessions geared towards providing foundational knowledge in research for graduate students (e.g., grant writing, IRB processes, ethics in research). Graduate students will also have the opportunity to engage in co-curricular activities related to the School’s growing Interprofessional Education initiative; though many activities are focused on interprofessional practice, some will be relevant for graduate students with applied lines of research.

- Student networking at the national level, critical for research success and career opportunities, will be supported with the provision of funding to support travel to one conference annually for all students who are doctoral candidates. Additionally, all departments will be encouraged to provide all students, regardless of their stage in the program, with the opportunity to apply for travel funding if they are presenting at a national conference.

4. Institutional Capacity

Responsibility for the success of the Ph.D. in Health and Rehabilitation Science will be shared by the Dean and Associate Dean for Academic Affairs, the Program Director, and the individual MU School of Health Professions faculty who will serve as mentors. To mentor students, faculty must meet the established criteria for doctoral faculty, which includes expectations of an active research program and engagement in teaching. At the same time, it is anticipated that having doctoral students will support the research activities of participating faculty, minimizing net new burden for individual faculty. Because the plan of study for coursework for these students will be interdisciplinary, drawing upon existing coursework across MU, the program will be sustainable with a modest class size (5-7 new students annually). Additionally, as detailed in prior sections regarding funding, the net new cost of this program is minimal, and can be covered by strategic reallocations by the Dean of the MU School of Health Professions.
We expect this program will primarily draw interest from new students and those students who stay at the University of Missouri for post-graduate work because of this program. There is no expectation that this program will draw students away from other University of Missouri graduate programs, as there are no comparable programs within the University of Missouri System. Rather, the addition of these students to the campus, and to existing graduate-level courses from other divisions across the University of Missouri, may instead increase the quality of classroom discussions and the engagement in interdisciplinary work among faculty.

5. Program Characteristics

5.A. Program Outcomes

Students are required to complete interdisciplinary coursework that will enable them to demonstrate mastery of theoretical and research foundations in their chosen area of health and rehabilitation science. They will engage in mentored research activities culminating in an independent dissertation research project. Upon graduation, students will have demonstrated skills in developing novel research questions in their area of study and in carrying out the complete range of research activities from project design through data collection, data analysis and synthesis, and result dissemination. Program graduates will be prepared to mentor others in their chosen areas of study and to lead independent research programs in academic or industry settings. Due to the interdisciplinary nature of the program and to the mentorship model approach to developing research skills, graduates of this program will be uniquely positioned to conduct collaborative, interdisciplinary research that will advance the science and practice of health care and to meet the need for academic researchers in the health disciplines.

5.B. Structure

The Ph.D. in Health and Rehabilitation Science program draws on areas of shared expertise and interests across the health professions while also offering tailored research mentoring within research programs of faculty in the MU School of Health Professions. Faculty from departments including Health Sciences, Physical Therapy, Communication Science and Disorders, Health Psychology, Occupational Therapy, and Clinical and Diagnostic Sciences will comprise the doctoral faculty for this program. The program will be directed by one faculty member (50% FTE allocation) with an established research program and experience mentoring students in research activities.

The program requires 72 semester credit hours post-baccalaureate. Up to 30 hours may be transferred from other graduate training, pending review and approval from the Program Director and the student’s faculty mentor(s). Students
will collaborate with their faculty mentor(s) to create a plan of study for their doctoral degree before the end of their first semester in the program. Curriculum for this Ph.D. program will include foundational course work in Health and Rehabilitation Science (6 credit hours) and core courses focused on statistics and research methodology (12 credit hours). Students will complete additional graduate coursework that advances their line of research and is approved by their faculty mentor(s). Students will complete at least 15 credit hours of 8000-9000 level coursework in their research area, along with an additional 11+ mentor-directed learning credit hours in readings, problems or research courses.

All students will complete a minimum of two independent research projects, including their dissertation research. All students must successfully complete a comprehensive examination at the end of required coursework that will include written and oral sections. Students will write a dissertation proposal that must be reviewed and approved by the student’s doctoral committee and must successfully complete a doctoral dissertation focused on original research. As part of the research training, all students are expected to submit at least one research article (may be co-authored) to a peer-reviewed journal prior to defense of the doctoral dissertation. Up to 28 hours of research credits may be counted towards the 72 hours minimum required to earn a Ph.D., though students may take more than 28 hours of research credits to complete their research and defend their dissertation.

5.C. Program Design and Content

We will capitalize on existing coursework across the MU campus and create new courses in the MU School of Health Professions. The courses are as follows:

- Health and Rehabilitation Science I and II (6 credit hours)
- Applied Statistical Models I and II (6 credit hours)
- Statistics Electives (minimum 3 credit hours - see options in Appendix C)
- Primary Research Area Courses (15+ credit hours, as specified in individual plan of study, see sample area courses in Table 8)
- Research Area Directed Study (11+ credit hours in Topics, Problems, Directed Reading courses)
- Thesis/Dissertation Research courses (up to 28 credit hours)

<table>
<thead>
<tr>
<th>Research Area</th>
<th>Public Health/Epidemiology</th>
<th>NeuroRehabilitation</th>
<th>Biomechanics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Courses**</td>
<td>Introduction to Data Science &amp; Analytics (DATA_SCI 7600)</td>
<td>Statistical Methods for Research (STAT 7070)</td>
<td>Statistical Methods for Research (STAT 7070)</td>
</tr>
<tr>
<td>Research Methods in Public Health (PHLTH 7952)</td>
<td>Biostatistics and Clinical Trials (STAT 7410)</td>
<td>Statistical Software &amp; Data Analysis (STAT 7110)</td>
<td></td>
</tr>
<tr>
<td>Principles of Epidemiology (PHLTH 8420)</td>
<td>Functional Neuroscience (PSYCH 8210)</td>
<td>Human Kinesiology (PH_THR 7250)</td>
<td></td>
</tr>
</tbody>
</table>
Community Based Public Health Interventions (NURSE 8120)  
Social & Behavioral Sciences in Public Health (PSYCH 8920)

Functional Cognition (OC_THR 7750)  
Advanced Neural Systems (PSYCH 9240)

Intro to Progr. for Engineers (BIOL_ENG 2080)  
Orthopaedic Biomechanics (BIOL_EN 7370)

* Note that Research Areas are not discipline specific (e.g., the NeuroRehabilitation emphasis will include students mentored by faculty from Communication Science and Disorders, Health Psychology, Physical Therapy, and Occupational Therapy).

** All courses are 3 credit hours.
PROGRAM STRUCTURE

1. Total credits required for graduation: 72

2. Residency requirements, if any: n/a

3. General education

Total credits for general education courses: n/a

4. Major requirements

Total credits specific to degree: 72

Courses (specific course or distribution area and credit hours):

<table>
<thead>
<tr>
<th>Course</th>
<th>Hrs</th>
<th>Course</th>
<th>Hrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health &amp; Rehabilitation Science I</td>
<td>3</td>
<td>Thesis / Dissertation Research</td>
<td>28</td>
</tr>
<tr>
<td>Health &amp; Rehabilitation Science II</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Applied Statistical Models I</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Applied Statistical Models II</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Statistics Elective</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary Research Area</td>
<td>26</td>
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</tr>
</tbody>
</table>

5. Free elective credits

Total free elective credits: n/a

The sum of hours required for general education, major requirements and free electives should equal the total credits required for graduation.

6. Requirement for thesis, internship or other capstone experience:

All students will complete a minimum of two independent research projects, including their dissertation research. All students must successfully complete a comprehensive examination at the end of required coursework that will include written and oral sections. Students will write a dissertation proposal that must be reviewed and approved by the student’s doctoral committee and must successfully complete a doctoral dissertation focused on original research.

7. Any unique features such as interdepartmental cooperation:

With the goal of providing research-focused education that is interdisciplinary, students will develop a plan of study in consultation with their faculty mentor(s) and the Ph.D. Program Director that includes coursework from
departments across MU. See Appendix C for a partial listing of course options. 5.D. Program Goals and Assessment

5.D. Program Goals and Assessment

Student learning outcomes will be assessed through coursework and successful completion of mentored and independent research experiences. Evaluation by faculty committee will serve as the assessment of whether research projects are successfully completed. Desired course outcomes will include mastery of subject material and demonstration of the ability to apply knowledge gained to the formation of independent research ideas and programs of study.

We expect to have at least 20 students enrolled by year 5 of the program. As noted previously, there are significant demands for increasing the workforce of individuals with expertise in interdisciplinary research in the health professions. Openings for persons with this academic background far exceed the number of qualified graduates from existing programs. Therefore, we expect that our graduates will be highly sought after and successful in obtaining employment in their chosen career path. We anticipate that 100% of graduates will be successfully placed in either a post-doctoral fellowship or in a position in academia, health care, government or industry within a year after completing their degree.

Program outcomes will be assessed via examining student-related variables and program-related variables. Student variables will include achievement of admissions goals (including number of applicants, student diversity) and graduation outcomes (including time-to-graduation, placement of graduates in research-focused careers). Additional program-related variables will assess contributions of this program to the School's research productivity (as indexed by variables including trajectory of faculty publication and citation counts, grant submissions).

5.E. Student Preparation

Prospective students will be comprised of individuals with strong interest in research in the areas of health and rehabilitation science. Some students will have completed the terminal degree required for clinical licensure in one of the health fields represented within the MU School of Health Professions (e.g., Doctorate in Physical Therapy, Master in Occupational Therapy, Master in Communication Science for Speech-Language Pathologists) and may have experience working as a licensed professional in their field. Others will apply for admission to this graduate program directly following completion of a bachelor’s degree in a related discipline (e.g., health science, public health, psychology, exercise physiology, etc.). Students entering the Ph.D. program with a professional degree must demonstrate understanding of the emphasis on research in this program and a commitment to a research-focused career in academia, health care, industry, etc. Students entering with a bachelor’s degree must demonstrate experience engaging in research.
activities (e.g., participating in undergraduate research experiences), a familiarity with areas of research within health and rehabilitation science, and the ability to generate novel ideas regarding their specific area of research interest.

Admissions procedures will follow those specified by the MU Office of Graduate Studies (see https://gradstudies.missouri.edu/admissions/) and will include submission of a resume, statement of purpose, and 2-3 letters of support. Candidates will be asked to specify which faculty member(s) they would prefer to work with. Those passing the first level of review will be contacted by the identified faculty member(s) and/or the Program Director for a phone/online/in person interview. Students will be selected for admission based on recommendations by the program faculty and with final approval by the Program Director.

5.F. Faculty and Administration

Successful initiation of the Ph.D. in Health and Rehabilitation Science will be the responsibility of the MU School of Health Professions Associate Dean for Academic Affairs, Dr. Stephanie Reid-Arndt. Dr. Reid-Arndt will have initial responsibility for activities including program marketing, student recruitment, and new course development (primarily the first-year course – Health and Rehabilitation Science I and II [HTH_PR 8440 and HTH_PR 8442]). Along with Dean Kristofer Hagglund, she will lead the search for a Program Director (.50 FTE), who will be charged with leading the program. Responsibilities for the Program Director will include, but not be limited to: developing shared curriculum as needed, facilitating student recruitment, organizing the prospective student application review and acceptance process, collaborating with faculty mentors for developing a plan of study for each student, supporting student success, supervising the staff person affiliated with the program, and managing fiscal affairs of the program.

Instructional needs for the program will be met by faculty within the MU School of Health Professions and across the MU campus. The Program Director or her/his designee will have responsibility for the first year core course (HTH_PR 8440 and HTH_PR 8442). Individual faculty mentors from the MU School of Health Professions will develop Problems, Topics and Readings courses for individual students and/or groups of students with shared research area interests (see CVs in Appendix A). These faculty will also serve as supervisors for the Thesis/Dissertation research conducted by students. Finally, based on the plan of study developed by each student with oversight by his/her faculty mentor(s), courses offerings from across campus will be available to meet the learning objectives for each student.

5.G. Alumni and Employer Survey
We will survey graduates 1, 3 and 5 years after completion. We will seek to learn how satisfied they are with their graduate experience and how well it prepared them for the workforce. We will also gather data on employment outcomes, including employment placement type (e.g., academia, industry) and indices of graduates’ research productivity (e.g., h-index).

5.H. Program Accreditation

There is no organizational body for accrediting a Ph.D. in Health and Rehabilitation Science, so there are no plans to seek accreditation.
Appendices

Appendix A: Curriculum Vitae from Faculty Participating in Program

Appendix B: Sample Curriculum Plans

Appendix C: Sampling of Course Options

Appendix D: Program Expenditures and Revenue
Appendix A: Curriculum Vitae from faculty participating in program

Maria Dietrich, PhD, Communication Science and Disorders
Elizabeth Kelly, PhD, Communication Science and Disorders
Mili Kuruvilla-Dugdale, PhD, Communication Science and Disorders
Stacy Wagovich, PhD, Communication Science and Disorders
Nancy Cheak-Zamora, PhD, Health Sciences
Enid Schatz, PhD, Health Sciences
Michelle Teti, MPH, DrPH, Health Sciences
Rachel Proffitt, OTD, OTR/L, Occupational Therapy
Tim Wolf, OTD, PhD, OTR/L, FAOTA, Occupational Therapy
Erin Dannecker, PhD, Physical Therapy
Trent Guess, PhD, Physical Therapy
Casey Clay, PhD, Health Psychology
SungWoo Kahng, PhD, Health Psychology
Stephanie Reid-Arndt, PhD, Health Psychology
Laura Schopp, PhD, Health Psychology
Maria Dietrich, Ph.D.
MU Department of Communication Science and Disorders

**Academic Appointment**
Assistant Professor, Department of Communication Science and Disorders, School of Health Professions, University of Missouri

**Education**
- 2013  Post-doctoral Scholar, Laryngeal and Speech Dynamics
- 2009  PhD, Communication Science and Disorders
- 2003  MA, Speech-Language Pathology
- 2001  Diploma/Graduate Degree, (Major) Rehabilitation Science, (Minor) Music Therapy

**Honors and Awards**
- 2017  University of Missouri SHP Lewis & Clark Discovery – Early Career Award
- 2007  University of Missouri Top Faculty Achiever
- 2016  Dean’s Award, University of Missouri Health System Sharing Days, Columbia, MO
- 2014  Course Release Award, University of Missouri Office of Research

**Research Interests**
Voice science and voice disorders; Role of psychobiological factors in primary muscle tension dysphonia with an emphasis on psychological stress and personality; Central control of vocalization; Early detection of voice disorders in occupational voice users

**Select Publications**


**Grants**
1R15DC015335-01 Academic Research Enhancement Award  Dietrich (PI)
03/01/16-02/28/19
Classifying neck surface EMG signals for the early detection of vocal fatigue in student teachers
The goal of the project is to determine the validity and reliability of a novel sEMG pattern recognition system to detect vocal fatigue.
Co-I: Guilherme DeSouza (Electrical and Computer Engineering)
Other Significant Contributors: Matthew Page (Otolaryngology—Head and Neck Surgery), Chi-Ren Shyu (Electrical and Computer Engineering)
Role: PI

*Award after first submission.*

**Current Teaching Activities**
CSD 3210- Anatomy and Physiology of the Speech Mechanism
CSD 4220- Voice Disorders
CSD 7085- Problems in Communication Sciences and Disorders
CSD 8225- Voice Science and Voice Disorders
CSD 8230- Dysphagia
Elizabeth Spencer Kelley, PhD  
MU Department of Communication Science and Disorders

**Academic Appointment**  
Assistant Professor, Department of Communication Science and Disorders, School of Health Professions, University of Missouri

**Education**  
2009 PhD, Speech-Language Pathology  
2005, MS, Speech-Language Pathology  
2001, BS, Communication Science and Disorders

**Awards and Honors**  
2016 University of Missouri, Top Faculty Achiever  
2015 University of Missouri Office of Research, Research Facilitation Award  
2008 New Century Scholars Doctoral Scholarship, American Speech-Language-Hearing Foundation  
2008 Conference Fellow, Lessons for Success Research Conference: Developing the Emerging Scientist in Communication Sciences and Disorders, American Speech-Language Hearing Foundation

**Research Interests**  
Language and literacy development of young children; Vocabulary learning of young children; Interventions to improve oral language skills of preschool children

**Publications**  
**Peer Reviewed Papers**  
*Underline indicates that author is a student.*

doi:10.1044/2017_AJSLP-16-0074


**Grants**

**Extramural**


**Intramural**


2014, Catalyst Award, School of Health Professions, (2014-2015, $5,453), University of Missouri-Columbia. Role: Principal Investigator.


**Current Teaching Activities**

**CSD 8020**- Developmental Language Disorders

**CSD 8960**- Directed Reading in Communication Science and Disorders

**CSD 8001**- Assessment and Intervention in Early Language and Literacy

**CSD 4950**- Research Apprenticeship in Early Language and Literacy Lab
Mili Kuruvilla-Dugdale, PhD
MU Department of Communication Science and Disorders

**Academic Appointment**
Assistant Professor, Department of Communication Science and Disorders, School of Health Professions, University of Missouri

**Education**
2013  Post-doctoral Fellow Speech Physiology
2007  PhD Speech Pathology
2000  MSc Speech, Language and Hearing
1998  BSc Speech and Hearing

**Research Interests**
Biologic basis of communication disorders in neurodegenerative diseases; Impact of working memory deficits on speech production in neurodegenerative motor speech disorders

**Select Publications**


**Research Grants**

**Awarded**

<table>
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<th>Grant Title</th>
<th>Date</th>
<th>Role</th>
<th>Major Goal</th>
</tr>
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<tr>
<td>1 R15 DC016383-01 NIH-NIDCD</td>
<td>07/01/2017-07/01/2018</td>
<td>PI</td>
<td>A systematic investigation of phonetic complexity effects on articulatory motor performance in progressive dysarthria.</td>
</tr>
<tr>
<td>Role: Principal Investigator</td>
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<td></td>
<td>Major Goal: Improve the fundamental knowledge about articulatory motor performance in people with ALS, in order to develop more sensitive assessments for progressive speech loss, which may lead to the improved timing of speech therapies.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Grant Title</th>
<th>Date</th>
<th>Role</th>
<th>Major Goal</th>
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<tr>
<td>Coulter Translational Partnership Program</td>
<td>07/01/2017-07/01/2018</td>
<td>Co-PI</td>
<td>A software system for early detection and monitoring of tongue-related speech and swallowing dysfunction.</td>
</tr>
<tr>
<td>Role: Co-PI</td>
<td></td>
<td></td>
<td>Major Goal: Develop a software application for early detection and monitoring of tongue dysfunction caused by neurological disorders.</td>
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**Under Revision**

<table>
<thead>
<tr>
<th>Grant Title</th>
<th>Date</th>
<th>Role</th>
<th>Major Goal</th>
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<tr>
<td>NIH-NIDCD R21</td>
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<td>PI</td>
<td>Constructing personalized voices for progressive dysarthrias using voice conversion and text-to-speech technologies.</td>
</tr>
<tr>
<td>Role: Principal Investigator</td>
<td></td>
<td></td>
<td>Major Goal: Develop an innovative approach to build personalized voices that will meet the critical need to restore vocal identity by providing highly intelligible, natural sounding voices for people with ALS and others with communication disorders.</td>
</tr>
</tbody>
</table>

**Student-supported Research Grants**


Mentor, American Speech-Language-Hearing Association Students Preparing for Academic and Research Careers (SPARC) Award, 2016-2017, Applicant: Jacob McKinley, Co-mentor: Maria Dietrich (University of Missouri, Columbia).

**Completed Research Grants**
University of Missouri, Research Council Grant
Voice conversion for individuals with ALS
02/14/16 – 03/14/17
Role: Principal Investigator

American Speech-Language-Hearing Association Advancing Academic Research Careers Award: Mentorship in an early research career

Mizzou Advantage, UG Research Team
Early detection of dysarthria and dysphagia in ALS and Parkinson's disease
12/01/15-11/30/17
Role: Co-PI

University of Missouri, Richard Wallace Grant
09/16/15-10/16/16
Improving assessment of verbal working memory in ALS
Role: Principal Investigator

School of Health Professions Catalyst Award
06/30/14-06/30/15

Working memory deficits in ALS
Role: Principal Investigator

**Teaching Activities**
CSD 3210: Anatomy and Physiology
CSD 4950: Research Apprenticeship
CSD 8085: Neurological Bases of Speech and Language
CSD 8200: Motor Speech Disorders
CSD 8430: Introduction to AAC
Stacy A. Wagovich, PhD
MU Department of Communication Science and Disorders

Academic Appointment
Associate Professor and Chair, Department of Communication Science and Disorders, School of Health Professions, University of Missouri

Education
2001  PhD Communication Sciences and Disorders
1995  MA Speech-Language Pathology
1992  BS Ed Communication Sciences and Disorders

Select Recent Fellowships & Awards
2016  University of Missouri Undergraduate Research Mentorship Award
2015  School of Health Professions Outstanding Faculty
2014  MU Writing Intensive Teaching Excellence Award

Research Interests
The role of language and information processing in children who stutter; Word learning processes in school age children; The use of language sample analysis procedures in the assessment of language disorders

Selected Publications


**Active Grants**


**Completed Grants**


**Current Teaching Activities**

(excluding guest lectures, individual readings, and research credit courses)

CSD 4020 – Language Disorders in Children
CSD 4210 – Fluency Disorders
CSD 8020 – Developmental Language Disorders
CSD 8260 – Diagnosis in Speech-Language Pathology
Nancy C. Cheak-Zamora, Ph.D.
MU Department of Health Sciences

Academic Appointment
Associate Professor, Department of Health Sciences, School of Health Professions, University of Missouri-Columbia

Education
1999 B.A., Psychology
2002 M.A., Health Psychology
2008 Ph.D., Health Policy and Management

Research Interests
Dr. Cheak-Zamora’s research centers on the utilization of complex measurement tools to evaluate health status and health disparities in the uninsured, in the chronically ill, and within various populations with limited access to health care. Other areas of interest include HIV prevention and care, autism research and health policy.

Selected Publications


**Active Grants**

2017 University of Missouri Patient Centered Outcomes Research (PCOR) Small Project  
*Assessing and Promoting Health-Related Independence in Youth with Autism Spectrum Disorder*  
Role: PI  
Award: $5,000

2017-2018 Population, Education, and Health Care Center’s (PEHC) Small Grant  
*Disparities in Access and Utilization in Healthcare Services for Children with and without Special Healthcare Needs and their Caregivers: Does Physician Supply Play a Role?*  
Role: PI  
Award: $15,000 (5% FTE)

2017 Winn Feline Foundation  
*Shelter Cat Adoption in Families of Children with Autism: Impact on Cat Stress and Children’s Social Skills and Anxiety.*  
Role: Co-I  
Award: $25,000

*Improving Health Care Transition Planning and Health-related Independence for Youth with ASD and Their Families*  
Role: PI  
Award: $506,507 (30% FTE)

2014-2017 Autism Speaks Autism Treatment Network and Health Resources and Services Administration  
*Autism Speaks Autism Treatment Network*  
Role: Co-I (PI, Kristin Sohl)  
Award: $495,000 (5% FTE)

**Completed Grants**

2012-2013 Richard Wallace Faculty Incentive Grant
A Picture’s Worth 1000 Words: A Photovoice Exploration of the Needs of Youth with Autism Spectrum Disorder
Role: PI
Award: $4,000 (GRA support)

Current Teaching Activities
Public Health Principles and Practice
Health Promotions and Planning

Enid J. Schatz, Ph.D.
MU Department of Health Sciences

Academic Appointments
2016-present Associate Chair, Department of Health Sciences, University of Missouri
2012-present Associate Professor, Department of Health Sciences, University of Missouri

Select Recent Fellowships & Awards
2017-2018 Research Leave, University of Missouri
2017 Fulbright Fellow, June – December 2017, South Africa
2016-2017 Leadership Development Program, University of Missouri System
2015 Kristofer and Lori Hagglund Early Achievement Award (research, teaching & service award), MU School of Health Professions

Education
Ph.D. 2002 Demography/Sociology, University of Pennsylvania, Philadelphia, PA
M.A. 1999 Demography, University of Pennsylvania, Philadelphia, PA
B.A. 1995 Judaic Studies/Women’s Studies, Tufts University, Medford, MA
Post-doc 2002-04 Mellon Post-Doctoral Fellow, University of Colorado, Boulder, Resident at Wits University as the Health and Population Division Program Coordinator
Post-doc 2003-04 Wits University Research Council Post-Doctoral Fellow, University of the Witwatersrand, Johannesburg, South Africa, School of Public Health

Research Interests
Africa, Eastern; Africa, Southern; South Africa; Uganda
Aging; Gender; HIV; Public Health; Women’s Health; Rural Health; Health Care Access
Qualitative research; Mixed methods research
Public Health; Gender and Health; Research Methods; Women’s & Gender Studies

Selected Publications
Schatz E, Seeley J, Negin J & Mugisha J. 2017 (ePub ahead of print). They “don’t cure old age”: Delays to health care access among older adults in rural Uganda. Aging & Society. DOI: 10.1017/S01446866X17000502


Schatz E & Knight L. “I was referred from the other side”: Gender and HIV testing among older South Africans living with HIV. (Under Review, PLoS)

Schatz E, Seeley J, & Zalwango F. Intergenerational care for and by children: Reciprocity and impacts on children’s wellbeing in rural Uganda. (R&R, *Demographic Research*)


**Active Grants**

**Under Review**


**Active**


**Completed Grants**

*Fulbright Scholar, South Africa.* Selected by Public Affairs Section, U.S. Embassy, to the U.S. Department of State and to the J. William Fulbright Foreign Scholarship Board. Award period: 06/01/2017-12/31/2017. Award Amount: ~$46,000

*Food insecurity, ART adherence among older people living with HIV in the Western Cape, South Africa.* DST-NRF Centre of Excellence in Food Security Small Grants Program,
University of Western Cape. PI: Schatz, Knight (University of Western Cape), co-PI. Award period: 12/01/2016-11/30/2107. Award Amount: ZAR 90,000 (~$6600).

*Leaving no one behind: Identifying approaches to improving HIV treatment outcomes among older Ugandans.* UK Medical Research Council, PHNID. PI: Seeley (London School of Hygiene & Tropical Medicine); Schatz, co-i (12% effort). Award Period: 08/1/2016-12/31/2017. Award Amount: GBP149,550 (~$215,000).

**Teaching Activities**

**Undergraduate**
- Difficult Dialogues in Higher Education (team taught)
- Gender & Public Health
- Global Public Health
- Public Health-Principles & Practice
- Public Health-Principles & Practice (Honors)
- Research Methods
- Sex, Gender and Society
- Sixteen & Pregnant: Teen Pregnancy & Parenting
- Women's Empowerment
- Women, Fertility and Development
- Women's & Gender Studies Senior Capstone Seminar

**Graduate**
- Feminist Methods
- Introduction to Demography/Population Studies
- Research Project (proposal development)
- Synthesis Project (research project write-up)
- Qualitative Research Methods for Population Scientists
Michelle Teti, MPH, Dr.PH  
MU Department of Health Sciences

**Academic Appointment**
Associate Professor, Department of Health Sciences, School of Health Professions, University of Missouri

**Education**
2008  DrPH Community Health and Prevention  
2003  MPH  Community Health and Prevention  
1998  BS  Nutritional Sciences

**Select Recent Awards**
2017  Catalyst Award Honoring Those Who Speak Up and Out, University of Missouri LGBT Resource Center (Trans health research)  
2016  Best Health Materials for They are like poems in the entrance area": Using photo-story posters to improve medication adherence among people with HIV, APHA  
2015  University of Missouri Early Career Research Award  
2014  Article of the Year, “Taking pictures to take control: Photovoice as a tool to facilitate empowerment among poor and racial/ethnic minority women with HIV/AIDS, Association of Nurses in AIDS Care  
2014  Catalyst Award Honoring Those Who Speak Up and Out, University of Missouri LGBT Resource Center (LGBT curriculum development research)  
2010  Center for AIDS Prevention Studies Fellowship, HIV Prevention Research in Minority Communities, University of California, San Francisco  
2009  NIH Health Disparities Loan Repayment Program Award, NIH

**Research Interests**
HIV, social determinants of health, community based research, qualitative methods, visual methods

**Selected Publications**


**Active Grants**

**Role:** PI
**Title:** Reframing life with HIV: Resilience-based messages to promote medication adherence among young men of color living with HIV
**Source:** Patient Centered Outcomes Research
**Direct Costs:** 10K
**Time period:** 2017/11/01-2018/10/31
**Status:** A

**Role:** PI
**Title:** Developing a collaborative partnership to improve the transition to adult care and health outcomes among adolescents living with HIV in South Africa
**Source:** University of Missouri South Africa Exchange Program
**Direct Costs:** 3K
**Time period:** 2017/09/01-2018/08/31
**Status:** A

**Role:** PI
**Title:** Virtual Photo-Stories to Promote the Health of People Living with HIV
**Source:** Health Foundation of Greater Kansas City
**Direct Costs:** 35K
**Time period:** 2016/09/01-2018/08/31
**Status:** A

**Role:** Co-I (PI: Virginia Ramseyer Winter)
**Title:** Improving Body Image as a Mechanism of Depression through the Three-Dimensional Body Appreciation Mapping (3D-BAM) Intervention
**Source:** National Institute of Mental Health R21
**Direct Costs:** 403K
**Time period:** 2018/09/01-2020/08/31
**Status:** P

**Role:** Co-I (PI: Abigail Rolbiecki)
**Title:** Caregiver Speaks: A Technologically Mediated Storytelling Intervention for Family Caregivers of Individuals with Alzheimer's Disease and Other Dementias
**Source:** National Institute on Aging (R01)
Direct Costs: 2595K
Time period: 07/01/2018-06/30/2023
Status: P

Current Teaching Activities
* courses developed by M Teti
2017 Internship in Health Sciences: Community Health in South Africa
2015-Present Research Special Topics: Photovoice and Social Justice on Campus*
2015-Present Social and Behavioral Health Theory*
Rachel M. Proffitt, OTD, OTR/L  
MU Department of Occupational Therapy

Academic Appointment  
Assistant Professor, Department of Occupational Therapy, School of Health Professions,  
University of Missouri-Columbia

Education  
2013  Certificate in Clinical, Biomedical, and Translational Investigations  
2012-2014  Postdoctoral Fellowship  
2010  OTD Occupational Therapy Doctorate  
2008  Ph.D., Health Policy and Management

Research Interests  
Virtual Reality; Stroke; Traumatic Brain Injury; Occupational Therapy; Rehabilitation;  
Technology; Assistive Technology; Motor Learning; Motor Behavior; Spinal Cord Injury

Selected Publications  
Proffitt, R., Schwartz, J. K., Foreman, M., & Smith, R. O. Role of occupational therapy  
practitioners in mass market technology research and development. *American Journal of  
Occupational Therapy*. In press.

to improve occupational performance in stroke. *American Journal of Occupational  
Therapy*. In press.

Feasibility of pediatric game-based neurorehabilitation using telehealth technologies: A  
https://doi.org/10.5014/ajot.2017.024976

http://dx.doi.org/10.5014/ajot.2016.019729.

virtual reality-based reaching task in nondisabled older adults. *Journal of Motor  
Learning and Development, 3*(2), 91-109.  

exercise program using the Microsoft Kinect sensor. *International Journal of  
Telerehabilitation, 7*(2), 23-33.  
http://dx.doi.org/10.5195/ijt.2015.6177

http://dx.doi.org/10.1089/g4h.2014.0122.

Proffitt, R., & Lange, B. (2015). Considerations in the efficacy and effectiveness of VR  
interventions for stroke rehabilitation: Moving the field forward. *Physical Therapy,  
95*(3), 441-448.  

subjective experience with virtual and real environments during dynamic balance  
activities. *Journal of Aging and Physical Activity, 23*(1), 24-33.  
**Active Grants**

Small Project Award  Proffitt (PI)  09/01/17-08/31/18

*MU Center for Patient-Centered Outcomes Research*

A virtual reality program to optimize adherence to home exercise programs in persons with chronic stroke

This study seeks to determine the most effective combination of positive feedback in a game-based home exercise program and virtual coaching in improving adherence to a home exercise program for people with chronic stroke.

Project Incentive Award  Proffitt (PI)  09/01/17-08/31/18

LSVT® Global

*LSVT®BIG in Stroke: A Case Series*

This goal of this research is to investigate the use of the LSVT®BIG intervention with people with chronic stroke in a series of case studies. Funds will be used to support student training and participant honorariums.

UL1 TR000448, Sub-Award KL2TR000450  Evanoff (PI)  07/01/16-06/30/19

NIH/NCATS

*Washington University Institute of Clinical and Translational Sciences*

The goal of this KL2 award is to obtain the mentored training necessary for the investigator to become an independent scientist and expert in developing and testing virtual reality-based interventions for rehabilitation.

**Role:** MU KL2 Career Development Scholar

**Completed Grants**

Richard Wallace Faculty Incentive Grant  Proffitt (PI)  04/15/16-12/31/16

Mizzou Alumni Association

*Novel Technologies as a Rehabilitation Intervention in Stroke*

The purpose of this project was to determine the appropriate combination of newly available VR technologies and assess the feasibility and safety for use in the chronic stroke population.

**Role:** PI

**Current Teaching Activities**

OC THR 7000: Research Project

OC THR 8090: Synthesis Project

OC THR 7993: Fieldwork Level II-B

OC THR 8095: Synthesis Project – Mentor Hours

OC THR 4970/7970: Research Methods

HP 4950: Research Apprenticeship

OC THR 7005: Research Project – Mentor Hours
Timothy Wolf, OTD, PhD, OTR/L, FAOTA
MU Department of Occupational Therapy

Academic Appointments
2007-2010  Instructor, Program in Occupational Therapy, Department of Neurology, Washington University School of Medicine, St. Louis, Missouri
2010-2015  Assistant Professor, Program in Occupational Therapy, Department of Neurology, Washington University School of Medicine, St. Louis, Missouri
2015-Present  Associate Professor and Department Chair, Department of Occupational Therapy, University of Missouri-Columbia
2015-Present  Adjunct Assistant Professor, Program in Occupational Therapy, Washington University School of Medicine, St. Louis, Missouri

Education
2003  Bachelor of Science-Health Science-Pre Occupational Therapy, Truman State University, Kirksville, Missouri
2007  NIH-T32 Predoctoral Fellow-Predoctoral Interdisciplinary Clinical Research Training (PICRT) Program
2007  Master of Science-Clinical Investigation, Washington University, St. Louis, Missouri
2007  Occupational Therapy Doctorate (OTD), Washington University, St. Louis, Missouri
2016  Doctor of Philosophy (PhD), Rehabilitation and Participation Science-Neurorehabilitation emphasis, Washington University, St. Louis, Missouri

Research Interests
The goal of Dr. Wolf's lab is to generate knowledge that will guide intervention aimed at improving participation in work and community activities post-neurological injury. The majority of the current research in this laboratory is with individuals with stroke and chemotherapy-induced cognitive impairment. The two primary objectives of this research are: (1) to identify and manage cognitive, primarily executive function, deficits to improve participation after neurological injury; and (2) to investigate the efficacy of self-management education and cognitive-strategy training based interventions to improve health and participation outcomes after neurological injury.

Selected Publications
*denotes student author


**Active Grants**

**Governmental:**

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<th>Description</th>
<th>Amount</th>
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<tr>
<td>2012-2016</td>
<td>Principal Investigator, Clinical Efficacy of Self-Management Intervention Post-Mild Stroke, funded by National Institutes of Health (NIH) (NCMRR/NICHD) (1K23HD07190-01)</td>
<td>$389,107</td>
</tr>
</tbody>
</table>
2013-2015  Principal Investigator (Sub-Award), Development of a performance-based measure of executive function: the Complex Task Performance Assessment (CTPA), funded by the Boston Rehabilitation Outcomes Center, Medical Rehabilitation Infrastructure Network, National Institutes of Health (NIH) (NCMRR/NICHD) (R24-HD065688-04)  
Total Award Amount: $59,527

2016-2018  Co-Principal Investigator, Better Living after Stroke through Technology (BLAST), funded by National Institutes of Health (NIH) (NHLBI) (1RRNR016183-01) (Dershung Yang, PhD, Co-Principal Investigator) Total Award Amount: $1,612,843

Non-governmental:
2016-2017  Principal Investigator, Development of a hybrid health navigator and self-management education intervention for individuals with chronic stroke, funded by the Roger S. Williams Research Award, University of Missouri. Total Award Amount: $10,000

2016-2017  Principal Investigator, Development of a hybrid health navigator and self-management education intervention for individuals with chronic stroke, funded by the Research Council, University of Missouri. Total Award Amount: $10,000

2016-2019  Co-Principal Investigator, Interdisciplinary, Inter-institutional Stroke Research Collaborative, funded by Mizzou Advantage One Health, One Medicine: The Convergence of Human and Animal Medicine, University of Missouri (Gregory Worsowicz, MD, Co-Principal Investigator). Total Award Amount: $508,128

**Current Teaching Activities**
OcThr 7750: Functional Cognition (2 Credits)
OcThr 7005: Research Project Mentor
OcThr 7970: Research Methods
OcThr 8090: Synthesis Project
Erin Alice Dannecker, Ph.D., ATC  
MU Department of Physical Therapy

**Academic and Administrative Appointments**

2010–present  Co-Director of Scholarly Activity, Dept. of Physical Therapy, University of Missouri  
2009–present  Associate Professor, Department of Physical Therapy, University of Missouri  
2003–2009  Assistant Professor, Department of Physical Therapy, University of Missouri

**Education**

1988  B.A. in Psychology  
1996  M.S. in Athletic Training/Psychology  
2000  Ph.D. in Exercise Psychology/Gerontology and Health Psychology  
2000–2003  National Institutes of Health F32 Postdoctoral Fellowship in Pain Research

**Research Interests**

Interactions between pain and physical activity and the influence of individual factors (e.g., biological sex, body weight, expectations, emotions, etc.) on those interactions; Types of and administration methods for pain measures; Respondents’ and clinicians’ interpretations and use of pain measures

**Selected Publications**


Active Grants
MU Center for Patient-Centered Outcomes Research 1/1/2018-9/31/2018
Dannecker (PI)
The Validation and Contradiction of Patients' Pain Beliefs
The primary objectives of this application are to (1) explore occurrences of perceived validation and contradiction and the impact of validation and contradiction during a pain education video and (2) examine the relationships among validation, contradiction, pain beliefs, and emotions.

**Current Teaching Activities**
- Health Professions 3900 - Introduction to Research Process and Evidence Base.
- Physical Therapy 7510 - Evidence Based Practice
- Physical Therapy 7850 - Assessment and Neuropsychology of Pain
- Physical Therapy 7550 - Psychosocial Issues for Health Promotion
Trent Guess, PhD  
MU Department of Physical Therapy

**Academic Appointment**  
Associate Professor of Physical Therapy and Orthopaedic Surgery, University of Missouri – Columbia

**Education**  
1992  
BS Mechanical Engineering  
1994  
MS Mechanical Engineering  
2003  
PhD Mechanical Engineering

**Research Interests**  
Dr. Guess is an expert in musculoskeletal biomechanics and the founding director of the Mizzou Motion Analysis Center. His research combines experimental and computational methods in movement analysis to study mechanical loading in the joints of the lower limbs. As founding director of the Mizzou Motion Analysis Center (MAC) (http://mizzoumotioncenter.com) – which includes experimental gait measurement and computational resources – Dr. Guess oversees all researchers working in the lab. The MAC is engaged in a broad spectrum of research activities that include collaborations with physical therapists, orthopaedic surgeons, athletic trainers, electrical engineers, bioengineers, and biologists.

**Selected Publications**  
**Active Grants**

Coulter Translational Partnership Program  
Guess/Cook (PI)  
08/1/17 – 07/31/18

**Mizzou Knee Arthrometer Testing System (MKATS)**

Goal: Build, validate, and clinically evaluate a device that provides quantitative measurement of knee laxity.  
**Role:** Engineering PI

Coulter Translational Partnership Program  
Guess/Cook (PI)  
08/1/17 – 07/31/18

**BioJoint Flex**

Goal: Build, validate, and clinically evaluate a device that improves knee range of motion.  
**Role:** Engineering PI

**Completed Research**

Missouri Orthopaedic Institute Research Grant  
Guess (PI)  
08/13/15 – 05/31/17

**Joint Loading and Knee OA**

Goal: Create computational models that predict knee cartilage contact pressures during walking and stair climbing for two subjects presenting with mild knee osteoarthritis and two age matched controls.  
**Role:** Principal Investigator

Missouri Orthopaedic Institute Research Grant  
Sherman SL (PI)  
10/01/14 – 09/31/17

**Correlating Motion Analysis Systems and Clinical Testing to Establish an Appropriate Return to Sport Protocol Following ACL Reconstruction in Athletes**

Goal: Develop a comprehensive protocol for safe return to play following ACL reconstruction by assessing serial functional movements performed during the recovery process.  
**Role:** Co-Investigator

University of Missouri Research Board  
Sayers (PI)  
09/01/14 – 08/31/17

**Patient-Specific Rehabilitation in Knee Osteoarthritis**

Goal: Develop an algorithm to define patient cohorts based on a cluster analysis of a broad spectrum of knee OA patient assessments.  
**Role:** Co-Investigator

**Teaching Activities**

Masters Research in Bio 1 Engr  
Doctoral Research in Bio Engr  
Research Process – Writing Intensive  
Research Apprenticeship  
Human Kinesiology  
Doctoral Dissertation Research in Bio Engr  
Masters Thesis Research in Bio Engr  
Undergraduate Honors Research in Bio Engr
Casey James Clay, Ph.D., BCBA-D  
MU Department of Health Psychology

**Academic Positions**

2017–current  Assistant Professor, Department of Health Psychology, University of Missouri

2016–2017  Visiting Assistant Professor, Department of Health Psychology, University of Missouri

**Education**

2015–2016  Post-Doctoral Fellow, University of Missouri, Columbia, MO

2011–2015  Ph.D., Disability Disciplines, Utah State University, Logan, UT

2007–2010  MS, Applied Behavior Analysis, Northeastern University, Boston, MA

2003–2007  B.S., Psychology, Utah State University, Logan, UT

**Research Interests**

Applied Behavior Analysis; Preference Assessment; Animal Assisted Intervention for individuals with autism related disorders; Parent/caregiver training; Problem behaviors exhibited by individuals with autism and related disorders; Functional assessment/analysis

**Publications (Peer-reviewed)**


**Book Chapters**


**Internal Grants—Funded**
MU PCOR Small Project Award C.Clay(PI) August 2017-August 2018
“Virtual Reality Behavioral Skills Training for Behavioral Intervention with Individuals with Autism Spectrum Disorders”
Total Costs: $18,680.90.

**Teaching Activities**
HLTH PSYC 8100 Concepts and Principles of Behavior Analysis
SungWoo Kahng, PhD  
MU Department of Health Psychology  

**Academic Appointment**  
Associate Professor and Chair, Department of Health Psychology, University of Missouri - Columbia  

**Education**  
2006  Graduate Certificate: Leadership and Management in the Life Sciences  
1999  PhD, Psychology  
1996  MS, Psychology  
1990  BA, Psychology  

**Research Interests**  
Applied behavior analysis; Problem behaviors exhibited by individuals with autism and related disorders; Functional assessment/analysis; Function-based treatments; Parent/caregiver training  

**Selected Publications**  

**Active Grants**  
*Effectiveness of Animal-Assisted Social Skills Interventions for Children with ASD*  
Project Period: 7/1/16-12/31/17  
Sponsor: Organization for Autism Research  
Total Direct Cost: $2000  
Principal Investigator: Jorgenson  
Role: Mentor
**Parental Adherence to Measuring Treatment Outcome**

Project Period: 1/12/17 – 12/31/17
Sponsor: MU School of Health Professions; Faculty Scholarship Facilitation Fund Award
Total Direct Cost: $1100
Principal Investigator: Kahng

**Completed Grants**

**Targeting Sleep in Kids with Autism Spectrum Disorder**
Project Period: 3/1/16 – 2/28/17
Sponsor: University of Missouri Research Board
Total Direct Cost: $68,941
Principal Investigator: McCrae
Role: Co-Investigator

**A Simplified Outcome Measure for Use in Treatment Trials for Individuals with Intellectual and Developmental Disabilities**
Project Period: 7/17/15 – 1/15/16
Sponsor: MU School of Health Professions; Faculty Research Facilitation Fund Award
Total Direct Cost: $250
Principal Investigator: Kahng

**Translational Analyses of Chronic Aberrant Behavior Across the Life Span**
Project Period: 9/1/09 – 6/30/14
Sponsor: National Institutes of Health, NICHD P01HD055456
Total Direct Cost: $3,589,824
Principal Investigator: Cataldo
Role: Co-Investigator

**Behavioral Economics in MRDD and Behavior Disorders**
Project Period: 5/1/06 – 2/28/14
Sponsor: National Institutes of Health, NICHD 2R01HD049753-04
Total Direct Cost: $943,974
Principal Investigator: Deleon
Role: Co-Investigator

**Current Teaching Activities**
- Applied Behavior Analysis and Autism Research & Practice in Applied Analysis
- Advance Applied Behavior Analysis
- Methods in Applied Behavior Analysis
- Survey of Applied Behavior Analysis
Stephanie A. Reid-Arndt, Ph.D., ABPP  
MU Department of Health Psychology

**Academic and Administrative Appointments**

- **2013-present**: Associate Dean for Academic Affairs, MU School of Health Professions  
- **2011-present**: Associate Professor, MU Department of Health Psychology  
- **2011-2013**: Chair, MU Dept. of Health Psychology  
- **2005-2011**: Assistant Professor, MU Department of Health Psychology  
- **2007-2011**: Associate Chair, MU Dept. of Health Psychology  
- **2001-2009**: Director, Adult Neuropsychology, MU Dept. of Health Psychology  
- **2000-2005**: Clinical Assistant Professor, MU Department of Health Psychology

**Education**

- **1999-2000**: Post-Doctoral Fellow, Neuropsychology/Rehabilitation Psychology, MU Department of Physical Medicine & Rehabilitation  
- **1999**: Ph.D. Clinical Psychology, Specialty in Neuropsychology, University of Arizona  
- **1995**: M.A. Clinical Psychology, University of Arizona  
- **1992**: B.A., Cum Laude, Honors in Psychology, University of California San Diego

**Honors**

- Diplomate, American Board of Professional Psychology, Rehabilitation Psychology

**Research Interests**

Role of neuropsychological functioning in functional outcomes among medical populations; impact of neuropsychological changes and other psychosocial factors on functional outcomes among breast cancer survivors; role of stress in cognitive deficits among oncology patients; role of executive functioning and self-regulation in functional outcomes among individuals with traumatic brain injury (TBI)

**Selected Publications**


Editorships


Active Grants
Anesthesia Patient Safety Foundation 2015-2018

Does Optimized General Anesthesia Care Reduce Postoperative Delirium In Older Patients Undergoing Hip Fracture Repair?
The goal of this research is to examine whether an optimized general anesthesia protocol, with enhanced monitoring of patient vital signs during anesthesia, will reduce post-operative cognitive deficits among older persons.
Role: Co-Investigator (5% FTE) (PI: Quinn L. Johnson, MD, MBA)

Completed
University of Missouri Research Council 2016-2017

Usability Testing of the Kinect-based Fall Risk Evaluation and Feedback System.
The goal of this research is to evaluate the usability of a computerized fall risk evaluation system for older persons. Results are to serve as pilot data for a project examining the use of this technology for enhancing fall risk assessment and intervention follow through among older persons.
Role: Co-Investigator (PI: Lorraine Phillips, PhD, RN)

Roger S. Williams Fund, University of Missouri School of Health Professions 2014-2017

*Biopsychosocial and Interpersonal Factors Involved in Outcomes Following TBI.*

The goal of this research is to examine the roles of cognitive and behavioral factors in quality of life for persons with TBI. As PI, I have lead responsibilities for the study design; with the Co-Investigators, I share responsibility for oversight of data collection, analyses and result dissemination.
Role: Principal Investigator (5% FTE)

Susan G. Komen Foundation 2012-2013

*Psychosocial support and counseling services for breast cancer patients in distress.*

The goal of this project was to develop a psychological services treatment line for women receiving treatment for breast cancer in an academic medical setting.
Role: Co-Principal Investigator (10% FTE) (PI: Jeanette Linebaugh RN, MSN, OCN)

MO Dept. of Health & Senior Services, HRSA 2009-2013


The purpose of this project was to develop and launch a website that could be used as an educational resource for professionals (e.g., Vocational Rehabilitation counselors) working with persons with traumatic brain injury (see [http://braininjuryeducation.org](http://braininjuryeducation.org)).
Role: Principal Investigator (10-30% FTE)

University of Missouri Research Board 2007-2009

*Cancer-Related Stress and Cognitive Deficits.*

The goal of this research was to study the relationships between stress, coping styles and cognitive deficits among women who had been diagnosed with cancer but had not yet undergone chemotherapy.
Role: Principal Investigator (10% FTE)

National Institutes of Health / National Cancer Institute (R03 CA108340-01) 2004-2007

*Predicting Positive Outcomes among Cancer Survivors: Individual and Social/Environmental Factors.*

The goal of this research was to investigate the effects that cognitive changes associated with treatment for cancer may be having on quality of life and other functional outcomes. As Principal Investigator, I led study design, supervised data collection, and led data analysis and result dissemination.
Role: Principal Investigator (20-25% FTE)
Laura H. Schopp, Ph.D., ABPP
MU Department of Health Psychology

**Academic Appointments**

- **1997-2001** Assistant Clinical Professor, MU Physical Medicine & Rehabilitation
- **2000-2003** NIH/National Library of Medicine Health Informatics Research Fellow, University of Missouri
- **2001-2004** Assistant Professor, MU Department of Health Psychology
- **2004-2009** Associate Professor, MU Department of Health Psychology
- **2006-2013** Director, University of Missouri System Wellness Program
- **2009-present** Professor, MU Department of Health Psychology

**Education**

- **1986** BA Psychology and Philosophy, St. Louis, University
- **1991** MA Clinical Psychology, University of Missouri, Columbia, MO
- **1996** PhD Clinical Psychology, University of Missouri, Columbia, MO
- **1996** Internship in Clinical Psychology, Duke University Medical Center, Durham, NC
- **1997** NIH Fellowship in Rehabilitation Psychology, University of Missouri Columbia, MO
- **2003** NIH Fellowship in Medical Informatics, University of Missouri, Columbia, MO

**Research Interests**

- Brain Injury; Handicapped or Disabled (Health or Safety or Medical); Telemedicine;
- Women’s Health; Rural Health

**Selected Publications**


**Active Grants**

1 D40HP29827-01-00 Johnstone (PI) & Schopp (Co-PI) 2016-2019

*Graduate Psychology Education Program, Health Resources and Services Administration*

Purpose of this training grant is to provide primarily clinical and supplemental clinical research training to pre-doctoral interns in health psychology across varied integrated primary care settings. The grant supports five interns per year for three years.

**Completed Grants**

University of Missouri Research Council Schopp (PI) 2015-2016

*Wellness standard of care comparison group for worksite self-management*

H133N000012 Schopp (PI) 2003-2007

*Missouri model spinal cord injury system.*

The project evaluated a model of preparation and training for persons with spinal cord injury and their personal assistants to support more consumer-directed assistance services rather than traditional agency-driven services.

H133G020065 Schopp (PI) 2002-2006

*PeerLink: Empowering persons with disabilities to manage their own health information*

This project developed and evaluated a peer-to-peer early cloud-based community and personal information and resource management model to support health and independent function among persons with disabilities.

1 R01DC04340-01A2 Zhao (PI) 2000-2006

*Enhanced multimedia telehealth for hearing disabilities*
This study developed innovative tools for telehealth delivery systems to support robust video and voice recognition for lip reading, signing, and real-time captions for deaf and hard of hearing telehealth users.

**Role:** Co-Investigator

**H133N000012**

*Missouri model spinal cord injury system*

This study conducted comprehensive outcomes research on biomedical, health care, and community reintegration services for persons with spinal cord injury, from emergency management through community integration.

**Role:** Co-Principal Investigator

**H133G80033**

*NIDRR: Creating permanent behavioral health access for rural Missourians with traumatic brain injury.*

This study evaluated the effectiveness of using telehealth methods to train rural behavioral health generalists in traumatic brain injury clinical issues so that they could serve as resources for rural residents with TBI.

**Role:** Principal Investigator
## Appendix B: Sample Curriculum Plans

### MU School of Health Professions
Ph.D. in Health and Rehabilitation Science

### Sample Curriculum

#### Research Area - Public Health / Epidemiology

<table>
<thead>
<tr>
<th>Year 1 - FALL</th>
<th>Year 2 - FALL</th>
<th>Year 3 - FALL</th>
<th>Year 4 - FALL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Statistical Models I (STAT 7540)</td>
<td>Intro to Data Science &amp; Analytics (BIOL 5200)</td>
<td>Social &amp; Behavioral Sciences in Public Health (PSYCH 8010)</td>
<td>Elective</td>
</tr>
<tr>
<td>Health &amp; Rehabilitation Science I (HCM 6460)</td>
<td>Topics in Health and Rehabilitation Science (HCM 7000/7001)</td>
<td>Topics in Health and Rehabilitation Science (HCM 7000/7001)</td>
<td>Thesis/Research (HCM 8000)</td>
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#### Year 1 - SPRING
<table>
<thead>
<tr>
<th>Year 1 - SPRING</th>
<th>Year 2 - SPRING</th>
<th>Year 3 - SPRING</th>
<th>Year 4 - SPRING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Statistical Models II (STAT 8270)</td>
<td>Community Based Public Health Interventions (P/PH 8120)</td>
<td>Elective</td>
<td>Thesis/Research (HCM 8000)</td>
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<tr>
<td>Health &amp; Rehabilitation Science II (HCM 8442)</td>
<td>Problems in Health and Rehabilitation Science (HCM 7005/7006)</td>
<td>Thesis/Research (HCM 8000)</td>
<td>Thesis/Research (HCM 8000)</td>
</tr>
<tr>
<td>Principles of Epidemiology (P/PH 6020)</td>
<td>Thesis/Research (HCM 8000)</td>
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</table>

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### MU School of Health Professions
Ph.D. in Health and Rehabilitation Science

### Sample Curriculum

#### Research Area - Neurorehabilitation

<table>
<thead>
<tr>
<th>Year 1 - FALL</th>
<th>Year 2 - FALL</th>
<th>Year 3 - FALL</th>
<th>Year 4 - FALL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health &amp; Rehabilitation Science I (HCM 6440)</td>
<td>Topics in Health and Rehabilitation Science (HCM 7000/7001)</td>
<td>Topics in Health and Rehabilitation Science (HCM 7000/7001)</td>
<td>Thesis/Research (HCM 8000)</td>
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<tr>
<td>Functional Cognition (PSYCH 7750)</td>
<td>Thesis/Research (HCM 8000)</td>
<td>Reading in Health and Rehabilitation Science (HCM 8040)</td>
<td>Thesis/Research (HCM 8000)</td>
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#### Year 1 - SPRING
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<th>Year 3 - SPRING</th>
<th>Year 4 - SPRING</th>
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</thead>
<tbody>
<tr>
<td>Applied Statistical Models II (STAT 8270)</td>
<td>Geriatrics and Clinical Trials (STAT 7410)</td>
<td>Elective</td>
<td>Thesis/Research (HCM 8000)</td>
</tr>
<tr>
<td>Health &amp; Rehabilitation Science II (HCM 8442)</td>
<td>Problems in Health and Rehabilitation Science (HCM 7005/7006)</td>
<td>Thesis/Research (HCM 8000)</td>
<td>Thesis/Research (HCM 8000)</td>
</tr>
<tr>
<td>Functional Neurosciences (PSYCH 8210)</td>
<td>Thesis/Research (HCM 8000)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix C: Sampling of Course Options

Statistics/Research Methods courses
- DATA_SCI 7600: Introduction to Data Science and Analytics
- DATA_SCI 7630: Introductory Probability and Statistics for Data Analytics
- DATA_SCI 8610: Statistical and Mathematical Foundations for Data Analytics
- ESC_PS 9126: Prevention Science Research Design and Analysis
- ESC_PS 9460: Health Behavior Change Research
- ESC_PS 9710: Structural Equation Modeling
- ESC_PS 9720: Hierarchical Linear Modeling
- HDFS 9550: Meta-Analysis Research
- HMI 7432: Health Database Management and Public Health Data Systems
- HMI 8545: Methods in Public Health Informatics/Biostatistics
- NURSE 8020: Intermediate Statistical Methods for Health Researchers
- NURSE 8030: Interpreting Statistical Evidence in the Health Sciences
- NURSE 9420: Qualitative Methods
- PSYCH 8710: General Linear Models in Psychology I
- PSYCH 8720: General Linear Models in Psychology II
- PSYCH 8730 Stat Software Packages
- PSYCH 9720: Latent Variable Models in Statistical Analysis
- PSYCH 9710: Multivariate Statistics in Psychology
- PSYCH 9715: Multilevel Modeling
- PSYCH 9720: Latent Variable Models in Statistical Analysis
- PSYCH 9750: Advanced Structural Equation Modeling
- STAT 7020: Stat methods in Health Sciences
- STAT 7070: Statistical Methods for Research
- STAT 7110: Statistical Software and Data Analysis
- STAT 7410: Biostatistics and Clinical Trials
- STAT 7540: Experimental Design

Content-based courses
- BIOL_EN 7370: Orthopaedic Biomechanics
- C_S_D 7430: Neurophysiology for Speech, Language, and Hearing
- C_S_D 7810: Psycholinguistics
- C_S_D 7820: Speech Perception
- C_S_D 7830: Individual Differences in Language Processing
- C_S_D 7840: Language and Development in Infancy
- C_S_D 8020: Developmental Language Disorders
- C_S_D 8030: Acquired Language Disorders
- C_S_D 8150: Advanced Speech Science
- C_S_D 8200: Motor Speech Disorders
- C_S_D 8210: Disorders of Fluency
- C_S_D 8220: Disorders of Voice
- C_S_D 8230: Dysphagia
- C_S_D 8240: Orofacial Anomalies
- C_S_D 8320: Speech Sound Disorders
- ESC_PS 8510: Medical and Psychological Aspects of Disability
- HDFS 8420: Cognitive Development
- HDFS 8770: Poverty
- NURSE 8120: Community-Based Public Health Interventions
- NEUROSCI 8440: Integrative Neuroscience I
- NEUROSCI 8442: Integrative Neuroscience II
- PSYCH 7520: Behavior Genetics
- PSYCH 8210: Functional Neuroscience
- PSYCH 9230: Seminar on FMRI
- PSYCH 9240: Advanced Neural Systems
- NEP 5580: Advanced Exercise Physiology
- NEP 8860: Exercise Endocrinology
- NEP 8870: Exercise Metabolism
- NUTR_S 8340: Nutrition in Human Health
- NUTR_S 8085: Problems in Nutritional Sciences
- NUTR_S 8850: Advanced Exercise Physiology
- MPP_8416: Skills in Biomedical Research
- P_HLTH 7150: Principles of Public Health
- P_HLTH 7160: Interdisciplinary perspectives in Global Public Health
- P_HLTH 7952 Research methods in public health
- P_HLTH 8420: Principles of Epidemiology
- P_HLTH 8150: Human Health & Environment
- P_HLTH 8920: Social & Behavioral Sciences in Public Health
- P_HLTH 7750: Physical Function and Older Adults
- P_HLTH 7751: Psychosocial Function and Older Adults
- P_HLTH 7800: Public Health Promotion Campaign Successes & Failures]
- P_HLTH 8250: Equity and Disparities in Health
- P_HLTH 8251 Immigrant Health
- P_HLTH 8260 Emergency Preparedness
- P_HLTH 8620 Emerging zoonosis pathogens
- P_HLTH 8300 Health Care in US
- P_HLTH 8920: Social and Behavioral Sciences in Public Health
- P_HLTH 8953 Developing and Evaluating Global Public Health Programs
- OC_THR 7650: Principles of Intervention
- OC_THR 7750: Functional Cognition
- OC_THR 7770: Community-Based Practice
- PH_THR 7240: Applied Neurophysiology for Allied Health Students
- PH_THR 7250: Human Kinesiology
- PH_THR 7420: Foundations of Therapeutic Exercise
- PH_THR 7270: Clinical Pathophysiology
- PH_THR 7790: Pharmacology in Rehabilitation
## Appendix D: Program Expenditures and Revenue

**School of Health Professions (CHLPR)**  
Ph.D. in Health and Rehabilitation Science  
Course/Curriculum Planning  

**TOTAL NEW Credit Hours Generated:** 72  
**NEW HOURS LISTED & TAUGHT BY SHP:** 48

<table>
<thead>
<tr>
<th>PROGRAM - YEAR ONE (1)</th>
<th>PROGRAM - YEAR THREE (3)</th>
<th></th>
<th>PROGRAM - YEAR TWO (2)</th>
<th>PROGRAM - YEAR FOUR (4)</th>
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<tr>
<td>Semester</td>
<td>Course #</td>
<td>Course Description</td>
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<td>Course #</td>
<td>Course Description</td>
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<td>Health &amp; Rehabilitation Science I</td>
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<tr>
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<td>Applied Statistical Models I</td>
<td>3</td>
<td>Fall</td>
<td>HTH_PR 9090</td>
<td>Research in HRS (dissertation)</td>
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<td>Research in Health &amp; Rehab. Science</td>
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<tr>
<td>Spring</td>
<td>HTH_PR 8442</td>
<td>Health &amp; Rehabilitation Science II</td>
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<td>Spring</td>
<td>HTH_PR 9090</td>
<td>Research in HRS (dissertation)</td>
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<td>Spring</td>
<td>STAT 8220</td>
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<td>tbd</td>
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</table>

**SHP Credit Hours**  

**Total Credits per student** 72
### Ph.D. in Health and Rehabilitation Science

#### Students and Credit Hours by Fiscal Year and by Student's Program Year

**Updated to add student travel (networking)**

<table>
<thead>
<tr>
<th>Student Year in Program</th>
<th>Fiscal Year</th>
<th>Yr 1 (FY20)</th>
<th>Yr 2 (FY21)</th>
<th>Yr 3 (FY22)</th>
<th>Yr 4 (FY23)</th>
<th>Yr 5 (FY24)</th>
<th>Yr 6 (FY25)</th>
<th>Yr 7 (FY26)</th>
<th>Yr 8 (FY27)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ay18/19</td>
<td>Ay20/21</td>
<td>Ay21/22</td>
<td>Ay22/23</td>
<td>Ay23/24</td>
<td>Ay24/25</td>
<td>Ay25/26</td>
<td>Ay26/27</td>
<td>Ay27/28</td>
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<tr>
<td>Fully Enrolled</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Residents</td>
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<td>8</td>
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</tr>
<tr>
<td>Non-Residents</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
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<td>2</td>
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</tr>
<tr>
<td><strong>Total</strong></td>
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</tr>
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</table>

**Credit Hours, by Program Year**

<table>
<thead>
<tr>
<th>Student's Year in Program</th>
<th>Fiscal Year</th>
<th>Yr 1 (FY20)</th>
<th>Yr 2 (FY21)</th>
<th>Yr 3 (FY22)</th>
<th>Yr 4 (FY23)</th>
<th>Yr 5 (FY24)</th>
<th>Yr 6 (FY25)</th>
<th>Yr 7 (FY26)</th>
<th>Yr 8 (FY27)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ay18/19</td>
<td>Ay20/21</td>
<td>Ay21/22</td>
<td>Ay22/23</td>
<td>Ay23/24</td>
<td>Ay24/25</td>
<td>Ay25/26</td>
<td>Ay26/27</td>
<td>Ay27/28</td>
</tr>
<tr>
<td>Fully Enrolled</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Residents</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Non-Residents</td>
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<td>2</td>
<td>2</td>
<td>2</td>
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<td>2</td>
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<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>6</td>
<td>6</td>
<td>6</td>
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<td>6</td>
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</table>

#### Student's Year in Program

<table>
<thead>
<tr>
<th>Year</th>
<th>Fiscal Year</th>
<th>Yr 1 (FY20)</th>
<th>Yr 2 (FY21)</th>
<th>Yr 3 (FY22)</th>
<th>Yr 4 (FY23)</th>
<th>Yr 5 (FY24)</th>
<th>Yr 6 (FY25)</th>
<th>Yr 7 (FY26)</th>
<th>Yr 8 (FY27)</th>
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</thead>
<tbody>
<tr>
<td>Yr 1</td>
<td>Ay18/19</td>
<td>3</td>
<td>54</td>
<td>3</td>
<td>54</td>
<td>3</td>
<td>54</td>
<td>3</td>
<td>54</td>
</tr>
<tr>
<td>Yr 2</td>
<td>Ay20/21</td>
<td>1</td>
<td>18</td>
<td>2</td>
<td>36</td>
<td>2</td>
<td>36</td>
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<td>18</td>
<td>2</td>
<td>36</td>
<td>2</td>
<td>36</td>
<td>2</td>
<td>36</td>
</tr>
<tr>
<td>Yr 4</td>
<td>Ay22/23</td>
<td>1</td>
<td>18</td>
<td>2</td>
<td>36</td>
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<td>36</td>
<td>2</td>
<td>36</td>
</tr>
<tr>
<td>Yr 5</td>
<td>Ay23/24</td>
<td>1</td>
<td>18</td>
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<td>2</td>
<td>36</td>
<td>2</td>
<td>36</td>
</tr>
<tr>
<td>Yr 6</td>
<td>Ay24/25</td>
<td>1</td>
<td>18</td>
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<td>2</td>
<td>36</td>
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<td>36</td>
</tr>
<tr>
<td>Yr 7</td>
<td>Ay25/26</td>
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<td>18</td>
<td>2</td>
<td>36</td>
<td>2</td>
<td>36</td>
<td>2</td>
<td>36</td>
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</tbody>
</table>

#### Incoming Class Size (Progr Y1 students)

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Resident</th>
<th>Non-Resident</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Year</td>
<td>18</td>
<td>6</td>
</tr>
</tbody>
</table>

#### Degrees Awarded (by Academic Yr)

<table>
<thead>
<tr>
<th>Year</th>
<th>Resident</th>
<th>Non-Resident</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>18</td>
<td>12</td>
</tr>
<tr>
<td>Year 2</td>
<td>18</td>
<td>12</td>
</tr>
<tr>
<td>Year 3</td>
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<td>12</td>
</tr>
<tr>
<td>Year 4</td>
<td>18</td>
<td>12</td>
</tr>
</tbody>
</table>

#### Program Totals (Students / Credit Hours)

<table>
<thead>
<tr>
<th>Year</th>
<th>Resident</th>
<th>Non-Resident</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>6</td>
<td>12</td>
</tr>
</tbody>
</table>

#### MU Hrs Taught

- **SHP Hrs Taught**
- **Non-SHP Hrs Taught**

#### Program Totals

<table>
<thead>
<tr>
<th>Year</th>
<th>Resident</th>
<th>Non-Resident</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>18</td>
<td>36</td>
</tr>
</tbody>
</table>

#### Total Credit Hours Generated

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Hrs Taught</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>72</td>
</tr>
</tbody>
</table>

### Notes

- No enrollment expected until FY20, beginning in Fall 2019 (AY19/20)
- A significant number of non-resident students (about 33%) will enter the program each year, however nearly all will convert to MO residency by their 2nd year.
- Enrollment is expected to stabilize at 6 new students per year (but actual enrollment may fluctuate slightly each year).
- Calculations display on-time completion (4 years) for all students, although completion may be delayed (5 years) for about 10% of students.
- There will be very little/no attrition per class between enrollment years.
### Revenues

<table>
<thead>
<tr>
<th>Tuition</th>
<th>FY20</th>
<th>FY21</th>
<th>FY22</th>
<th>FY23</th>
<th>FY24</th>
<th>FY25</th>
</tr>
</thead>
<tbody>
<tr>
<td>In State UGrad CrHrs generated</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Out State UGrad CrHrs generated</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RES Grad CrHrs (SHP generated)</td>
<td>36</td>
<td>13,352</td>
<td>60</td>
<td>22,590</td>
<td>114</td>
<td>43,559</td>
</tr>
<tr>
<td>Non-RES Grad CrHrs (SHP generated)</td>
<td>12</td>
<td>12,187</td>
<td>24</td>
<td>24,739</td>
<td>24</td>
<td>24,739</td>
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<tr>
<td>School of Health Professions Total</td>
<td>48</td>
<td>25,540</td>
<td>84</td>
<td>47,329</td>
<td>138</td>
<td>68,671</td>
</tr>
<tr>
<td>Educational Fee Discounting</td>
<td>(25,540)</td>
<td>(47,329)</td>
<td>(68,671)</td>
<td>(102,272)</td>
<td>(110,887)</td>
<td>(112,550)</td>
</tr>
<tr>
<td>Total Fees (Net Income)</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
</tbody>
</table>

**The graduate tuition rates are estimated at about 3% over FY18 (for FY20) and are increased by 1.5% per year thereafter.**

**Students are expected to receive a full tuition waiver for each year in the program.**

### Supplemental Fees

<table>
<thead>
<tr>
<th>Year</th>
<th>FY20</th>
<th>FY21</th>
<th>FY22</th>
<th>FY23</th>
<th>FY24</th>
<th>FY25</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP Supplemental Course Fees</td>
<td>48</td>
<td>4,853</td>
<td>84</td>
<td>8,618</td>
<td>138</td>
<td>14,366</td>
</tr>
<tr>
<td>SHP Dean’s Fee Sharing</td>
<td>n/a</td>
<td>14,366</td>
<td>222</td>
<td>23,465</td>
<td>240</td>
<td>25,752</td>
</tr>
<tr>
<td>Total Supplemental Fees (Total)</td>
<td>$4,853</td>
<td>$8,618</td>
<td>$14,366</td>
<td>$23,465</td>
<td>$25,752</td>
<td>$26,136</td>
</tr>
</tbody>
</table>

**The SHP supplemental fee rate is estimated at about 3% over FY18 (for FY20) and increases by 1.5% per year thereafter.**

**Supplemental Fees are not automatically waived with tuition remission.**

### Other Support

<table>
<thead>
<tr>
<th>Year</th>
<th>FY20</th>
<th>FY21</th>
<th>FY22</th>
<th>FY23</th>
<th>FY24</th>
<th>FY25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other Support:</td>
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<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
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</table>

**Fully Enrolled**

**Total Program Resources:**

<table>
<thead>
<tr>
<th>Year</th>
<th>FY20</th>
<th>FY21</th>
<th>FY22</th>
<th>FY23</th>
<th>FY24</th>
<th>FY25</th>
</tr>
</thead>
<tbody>
<tr>
<td>$4,853</td>
<td>$8,618</td>
<td>$14,366</td>
<td>$23,465</td>
<td>$25,752</td>
<td>$26,136</td>
<td>$26,136</td>
</tr>
</tbody>
</table>
### UM - New Program Proposals Financial Projections -- Expenditures

**School of Health Professions (CHLPR) -- Updated to add student travel (networking) -- Fully Enrolled**

**Ph.D. in Health and Rehabilitation Science**

<table>
<thead>
<tr>
<th>FY20</th>
<th>FY21</th>
<th>FY22</th>
<th>FY23</th>
<th>FY24</th>
<th>FY25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yr 1</td>
<td>Yr 2</td>
<td>Yr 3</td>
<td>Yr 4</td>
<td>Yr 5</td>
<td>Yr 6</td>
</tr>
</tbody>
</table>

#### One time Expenditures

| Total One Time Charges | none anticipated | 0 | 0 | 0 | 0 | 0 |

#### Recurring Expenditures

##### Benefit Eligible Personnel Costs

**Faculty Positions**

| 1 Director (50% FTE, 12 mos); Appoint eff. 7-1-2018 | 75,000 | 76,250 | 77,521 | 78,813 | 80,127 | 81,463 |

**Support Staff Positions**

| 1 Support Staff (50% FTE); Hire/Appoint eff. 7-1-2018 | 20,800 | 21,147 | 21,500 | 21,858 | 22,222 | 22,592 |

**Payroll**

| 95,800 | 97,397 | 99,021 | 100,671 | 102,349 | 104,055 |

**Benefits**

| Faculty/Staff Benefits (Benefit eligible) | 33,884 | 34,449 | 35,298 | 36,168 | 37,061 | 37,975 |

| Faculty/Staff Benefits (Benefit non-eligible) | 0 | 0 | 0 | 0 | 0 | 0 |

**Benefits**

| 33,884 | 34,449 | 35,298 | 36,168 | 37,061 | 37,975 |

##### Stipends - Research Assistants (Grad Students)

- Hiring PhD students at $20,000 stipend (9 mo)
- Assumes all PhD students receive a full-tuition waiver and a 9-month stipend of $20,000
- Masters students may also be supported by research grants (savings are not reflected above)

**Stipends**

| 0 | 0 | 0 | 0 | 0 | 0 |

##### Recurring Equipment Purchases -- Equipment that will be replaced annually, or on cycle

**Capital Equipment**

| None planned | 0 | 0 | 0 | 0 | 0 | 0 |

**Non Capital Equipment**

| Minor Building/Classroom renovation | 0 | 0 | 0 | 0 | 0 | 0 |

| Computer upgrade/replacements | 0 | 0 | 0 | 0 | 0 | 0 |

**Total NonCapital Equipment**

| 0 | 0 | 0 | 0 | 0 | 0 |

**Library**

| Additional Databases Licenses | 0 | 0 | 0 | 0 | 0 | 0 |

| Additional Publications | 0 | 0 | 0 | 0 | 0 | 0 |

| Additional Other (please list) | 0 | 0 | 0 | 0 | 0 | 0 |

**Total Library Charges**

| 0 | 0 | 0 | 0 | 0 | 0 |

##### Operating Space Costs

- Employee Supplies (office,phone,copier, etc.) @ $3,500 / 1.0 FTE
- Employee Travel/Training at $5,000 per 1.0 FTE - faculty only
- Other, if any

**Operating Costs**

| 6,000 | 6,000 | 6,000 | 6,000 | 6,000 | 6,000 |

**Other costs please list - Direct Student Support**

- Resources/Materials (SPSS, etc.) @ $150 per Student
- Student Travel (networking) @ $1,000 ea during Y3 & Y4
- Marketing/Travel for Student Recruiting, TTL per Year
- Other (list, if any)

**Student Support**

| 2,600 | 3,350 | 8,100 | 13,850 | 18,000 | 15,000 |

**Total Recurring Costs**

| 138,284 | 141,196 | 148,419 | 156,689 | 160,410 | 163,030 |

**Total New Program Costs**

| 138,284 | 141,196 | 148,419 | 156,689 | 160,410 | 163,030 |

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**Page 4**

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**Page 5**

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### SHP GENERATED REVENUES AND EXPENSES

(excludes tuitions to other MU schools)

<table>
<thead>
<tr>
<th>Form FP: Net Revenues</th>
<th>Fiscal Year --&gt;</th>
<th>FY20</th>
<th>FY21</th>
<th>FY22</th>
<th>FY23</th>
<th>FY24</th>
<th>FY25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program Year --&gt;</td>
<td></td>
<td>Yr 1</td>
<td>Yr 2</td>
<td>Yr 3</td>
<td>Yr 4</td>
<td>Yr 5</td>
<td>Yr 6</td>
</tr>
<tr>
<td># Students/Year --&gt;</td>
<td></td>
<td>4</td>
<td>9</td>
<td>14</td>
<td>19</td>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>

### EXPENSE

A. 1X Expense

- Total One-Time Costs
  - $0

B. Recurring/Annual Costs:

- Salaries (benefit-eligible Faculty & Staff)
  - $95,800
- Benefits (on Faculty & Staff salaries only)
  - $33,884

- Total Salary/Benefits
  - $129,684

C. Stipends:

- Redirect existing positions/funds
  - $0

D. CHLPR Central Costs

- None assessed

E. Other Costs

- $8,600

- EXPENSE TOTALS
  - $138,284

### SUMMARY

- Program Year
  - Yr 1
  - Yr 2
  - Yr 3
  - Yr 4
  - Yr 5
  - Yr 6

### CAMPUS REVENUE

- Tuition Generated (net of educational discounting)
  - $0

- Less portion returned to support program, see below
  - $0

- CAMPUS REVENUE SHARE RETAINED
  - $0

### PROGRAM RESOURCES

- SHP Fees Generated by Program Enrollment
  - $4,853

- Support from SHP Dean (to be identified)

- Program Support / Resources
  - $4,853

### EXPENSE

- One Time Expense
  - $0

- Positions (Faculty, Staff)
  - $129,684

- Supplies / Other Expense
  - $8,600

- Program Expense / Uses
  - $138,284

- PROGRAM NET (Annual)
  - ($133,431)

- PROGRAM TOTAL (Cumulative)
  - ($133,431)
June 29, 2018

Dr. Steven W. Graham
Senior Associate Vice President for Academic Affairs
University of Missouri System
309 University Hall
Columbia, Missouri 65211

Dear Dr. Graham,

Thank you for inviting my assessment of the proposed Ph.D. program in Health and Rehabilitation Science that is under consideration at the University of Missouri-Columbia. Overall, my impression was that this program would be an outstanding addition to the offerings at the University. There is a well-defined need for highly-skilled workers in this broadly-defined field and the state of Missouri is vulnerable to experiencing brain drain without a program to retain and attract top talent in this field. The program complements the land-grant mission of the University and will contribute to the University’s strategic goal of “accelera[ting] discoveries that prevent illness, heal the sick, and serve humanity.” The university has many of the necessary elements in place already with respect to research-active faculty with relevant expertise. Indeed, the faculty appear to be quite productive without the resource of doctoral trainees in their labs. Adding the ability to train Ph.D. candidates will likely elevate the research productivity of faculty affiliated with the program, become an attractor for strong research faculty, and contribute to the University’s goals for elevating its standing.

Notwithstanding my general enthusiasm for the proposal, some questions arose in my review that I raise here for your consideration:

1. The proposal states that the cost of graduate assistantships will be borne by strategic reallocation of existing resources. Impacts of these reallocations on other programs appeared to be understated and there were no contingency plans to mitigate potential adverse impacts.
2. The application does not request additional resources for research but research productivity is expected to increase. It would be wise to include some projections for new space and other resource needs to support the expected growth in research activities.
3. The proposal provided little detail about how research and grant productivity will need to increase to offset the costs of the program and generate revenue. A simulation of different scenarios with varying submission volumes, success rates, and budget sizes (with the established indirect cost rate) could be informative for setting benchmarks and evaluating the program’s impact.
4. Finally, there appeared to be a small error in Tables 4a (9 new enrollments in year 3) and 4b (only 6 projected degrees awarded in year 6).

You posed four specific questions in your request for my assessment. Responses to each of those questions appear below.
The proposed curriculum appears to be rigorous and commensurate with doctoral programs in this field nationally. Students will have access to a suitably broad array of courses from a variety of departments to tailor their programs of study. It was not clear whether the program would require a certain diversity of coursework to ensure an interdisciplinary foundation for students’ training. The proposal also outlined a variety of mechanisms by which they can receive academic credit for their research work – an essential feature for research-intensive doctoral programs. The formal expectation that students submit a peer-reviewed manuscript prior to the dissertation defense was commendable; however, it was not clear if the student needed to be the first author on the paper. Overall, this curriculum strikes the right balance between structured and unstructured educational experiences and provides a strong foundation for a Ph.D. program. Graduates should be equipped for a variety of career paths in academia, industry, healthcare, and government.

In a word, yes. The health needs of Americans continue to grow and costs are escalating rapidly. Neither of these trends are showing signs of abating. In view of demographic trends and an aging population, health and rehabilitation science will take on increased importance in the years ahead. A highly-trained and skilled workforce is needed to address the growing needs of the nation in this field.

There is limited competition from other institutions in the region so the proposed program is likely to become a regional, if not national, attractor instantly. Programs at comparator institutions (Table 2) appear to reflect limited demand but high selectivity. The greatest exception is the Public Health program at St. Louis University which attracts an average of 90 applicants/year (but only admits 11%). There is clearly a strong interest in this field in Missouri and this program is well-positioned to attract and compete for top-quality doctoral students.

A diverse array of existing courses are combined with a smaller set of new courses to form the basis for the program. The coursework appears to be quite well-matched to the foci of the program. The only omissions I observed involved (a) training on the science of behavior change and intervention, and (b) letters of support from other programs whose courses were listed in this application.

The faculty attached to this proposal are well-qualified to deliver research-intensive doctoral training. Several lead federally-funded research programs and the addition of a doctoral program will only increase the faculty’s competitiveness when applying for federal grants. One question is whether there are minimum requirements for or expectations of faculty’s experience or research productivity if they seek to mentor students in this program?

The financial plan appeared to be sound; however, as noted previously, I wonder about the impact of strategically re-allocating 20 graduate assistantships away from existing programs. Simulating the returns under a variety of research growth scenarios may provide another revenue source to strengthen this financial plan.

**Question 1:** Provide an assessment of the overall curriculum for the program as the foundation for a strong PhD program. Will the curriculum produce high-quality graduates who are capable of making significant contributions in this field?

**Question 2:** Is there a sufficient “market” for doctoral students interested in this area to allow the program to be viable over time?

**Question 3:** Do the courses, faculty, and financial plan outlined in the proposal provide the necessary elements for the doctoral-level education in health and rehabilitation science?
One suggestion I might offer here involves program goals and assessment. Broader benchmarks for success may be useful for assessing the program. The employment rate of graduates is certainly appropriate but, for a new program, it may be more useful to identify some goals for admissions (e.g., number of applicants, applicant quality indicators, selectivity, yield). There are also other graduation-side outcomes that could be used to assess program success (e.g., graduation rates, time-to-completion, earnings, licensures). Student and faculty diversity is another important consideration for benchmarking program success. Finally, I would recommend monitoring a diverse range of research impacts from faculty and trainees affiliated with the program – ranging from traditional metrics (e.g., publication and citation counts) to more contemporary ones (e.g., Altmetrics, policy influence, Congressional testimonies, popular media features).

Question 4: How does this program compare with other similar programs in the country and does the program have the potential to achieve a national reputation?

The proposed program compares favorably with research-intensive doctoral programs in health and rehabilitation science nationally. There is no doubt that the proposed program would compete for strong students, and that graduates will be in demand by employers. The program's novelty may present a minor barrier for recruitment but the expected growth in research productivity should more than offset that barrier. I would expect this program to earn a strong reputation relatively quickly.

Overall, I am very enthusiastic about the potential for the proposed Ph.D. program in Health and Rehabilitation Science and believe it would be an asset for the University of Missouri-Columbia. I hope my feedback is useful as the proposal advances toward approval and implementation. Thank you for considering my input. Please feel free to contact me if you have any questions about my assessment.

Sincerely,

David E. Conroy, Ph.D.
Professor, Kinesiology and Human Development & Family Studies
Adjunct Professor, Preventive Medicine, Northwestern University Feinberg School of Medicine
July 1, 2018

Steve Graham
Senior Associate Vice President for Academic Affairs
University Missouri System
309 University Hall
Columbia, MO 65211

Re: Doctorate in Health and Rehabilitation Science

Dear Vice President Graham:

I am in writing in response to your request that I comment upon the proposal by the School of Health Professions to create a doctorate in Health and Rehabilitation Science. You asked me to comment on four aspects of the proposal. I will insert my comments below each question.

1. Provide an assessment of the overall curriculum for the program as the foundation for a strong PhD program. Will the curriculum produce high-quality graduates who are capable of making significant contributions in this field?

The curriculum consists of 72 semester credit hours including six hours in rehabilitation sciences and other core work in statistics, methodology, two research projects and a dissertation. The program allows the transfer of up to 30 graduate hours with approval. This is important as many rehabilitation professionals earn a master’s degree, prior to becoming interested in doctorate level study. The proposed program will be taught by an interdisciplinary faculty assuring a broad approach topics.

The program requirements are quite demanding and equal, or surpass, the requirements in similar programs. Clearly, the program has a strong emphasis upon producing graduates well prepared to pursue rehabilitation research. I believe this curriculum will produce highly educated graduates who can contribute to research base in the field.

2. Is there a sufficient “market” for doctoral students interested in this area to allow the program to be viable over time?

As is well described in the proposal, there has been a shortage of doctoral faculty in rehabilitation professions for more than 30 years. The relatively recent advent of the D.PT and the D.OT has provided a source of clinically prepared faculty. These programs, however, do not provide significant educational
experience in research. The proposed new doctorate at MU does address the need for educators prepared to do research in rehabilitation. The “graying” of the population in the United States and other developed countries will drive increased demand for rehabilitation professionals. Thus, it is important for public research universities to address this need. I believe the MU program be sustainable and impactful.

3. Do the courses, faculty, and financial plan outlined in the proposal provide the necessary elements for the doctoral-level education in rehabilitation science education?

I reviewed the proposed curriculum, the faculty and the financial plan. I believe the faculty, course plan and financial plan are adequate to launch the program. The program projects enrolling five students per year which is appropriate and achievable. The marketing budget is the only area of concern. I suspect the program will easily attract the first cohort based on demand that has not been addressed previously. As noted above, I believe the MU program could easily move into the top ten in the US. To achieve this goal, they will need more money for marketing. I doubt MU administration will see many other proposed programs that have the likelihood of success this program promises. Assuming the university seeks to launch programs that will attract national recognition, the administration should consider investing in the program to facilitate a quick rise in ratings. In my opinion, the return of investment for money invested in the Doctorate in Health and Rehabilitation Sciences will recoup invested dollars.

4. How does this program compare with other similar programs in the country and does the program have the potential to achieve a national reputation?

I am most familiar with the Ph.D. in Rehabilitation Science which was the first program in this area established at the University of Florida while I was dean of the College of Public Health and Health Professions. Since UF established their degree in 1999 a number of other universities has established similar programs. Among the AAU universities, the University of Washington and the University of Buffalo have programs. Examining the curriculum and faculty at competing programs, I believe the University of Missouri program will be stronger than the vast majority of existing programs that are located in departments. In my opinion, the Mizzou program could quickly ascend the listed of “best” programs in this area.

I appreciated your request to comment on this promising program. If I can provide more information, please contact me.

Sincerely,
Robert G. Frank, Ph.D.
Professor
Department of Family and Community Medicine
Department of Psychology and
Director, Center for Innovation in Health and Education
NEW DEGREE PROGRAM PROPOSAL

Ph.D. in Health and Rehabilitation Science
University of Missouri-Columbia

PRELIMINARY STATEMENTS: The proposal outlined is intended to produce an interdisciplinary research doctorate that will primarily provide workforce for institutions that are increasingly looking for or requiring research credentials for faculty being hired for roles in professional education settings. The School of Health Professions looks to assist in the preparation of a portion of this workforce by creating a Ph.D. program that focuses on the interdisciplinary research training of individuals to populate physical therapy, occupational therapy, speech-language pathology and public health faculty/researcher roles. The offering appears to align well with the University's mission as a research and land-grant university, its identity as a public research and doctoral-level institution, and with the mission of the School. The program would build from programs that have a strong reputation of excellence in professional education and service and have a growing profile in research. As the School's first doctoral program, it appears to be the next logical step in the School's progression to heightened excellence and visibility.

ADEQUACY OF CURRICULUM: The curriculum is reasonable and comparable to similar programs with a shared core curriculum of two introductory courses (Ger) in Rehabilitation Sciences and 12cr in Research Methodology & Statistics. An additional 2Ghr of coursework, (including directed readings, special topics and problems in rehabilitation) is to be designed with the research mentor (mostly drawn from existing coursework on the campus) to complement the student's research focus. Four potential tracks for these electives are shown in the proposal. The remainder of the 72 credit hours needed for degree (up to 28 hours) will be designated for research. At least one published paper and a dissertation is also required for graduation.

The mix of coursework and research requirements is appropriately balanced and is representative of what one would expect as good preparation for the Ph.D. Considering the emphasis placed in the proposal and the uniqueness of the interdisciplinary nature of the program, this reviewer would have liked to see this better reflected in the proposal. The only real shared interdisciplinary offerings, excluding statistics, that appeared to be required of all students is the initial Ger introductory coursework. From that point, it appears that students would simply move to various tracks which would allow students to be more "silohed" than one would expect from an interdisciplinary degree. The terminology of interdisciplinary "appears" to reflect in the proposal that faculty mentors and coursework could come from different parts...
of the school and university. It appears that this is an effort of four different disciplines in the school to combine forces to establish a doctoral program, but does not show particular steps that would make the program truly interdisciplinary in nature for the student or how the student would appear much different from graduates in more disciplinary based programs.

I think the proposal, which is strong, could be strengthened more by elaborating on how the curriculum will produce interdisciplinarily trained and interdisciplinary-prepared researchers as graduates.

**MARKET DEMAND:** The proposal does a very good job in addressing marketplace shortages for academic researchers in the four fields mentioned in the proposal. The demand of professional accrediting bodies for research credentials for professional program faculty will drive this demand for many years. The unspoken issue is how many of these graduates will actually be given the freedom and resources to utilize these credentials and the availability of research funding to support investigators, especially in the rehabilitation sciences. This creates a true need for the program to insure that these students receive an experience that will set them apart to be competitive down the road.

Student demand numbers are always tricky. Students entering professional schools asked about academic careers generally over respond positively to the question of interest, not understanding fully the additional time and cost commitment to academic careers, the small differentials (if any) in pay, and the lessened opportunity to professionally practice while in faculty/researcher roles. The numbers provided in the proposal are very encouraging, however, as they suggest at least that an internal base may help with initial student recruitment.

Comparisons, to peer (regional) institutions, for applicants versus students enrolled may provide more light. However, what would be helpful is to understand why those not enrolled were not. Were these actually the number of applications or the number of acceptances? For those not accepted or enrolled, what were the reasons---did they accept elsewhere? Was there insufficient faculty funding to support a larger number of students? Were the unenrolled students actually qualified and how many would have been offered a spot if additional spots were available? Also, how many of the students would have been qualified, based on language skills, to teach in the University since part of the proposed financial plan depends on supporting these students through teaching assistantships?

In spite of these areas that may need a little clarification and addressing to strengthen the proposal, I believe that the program should have demand for the first several years, and ongoing demands, for numbers at the level it is proposing.

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BIRM IN GHAM, AL 35294-1212
Courses, Finances, Faculty - In the area of coursework there are really no concerns. With the exception of the one 6hr course sequence for new students, all other courses appear to be existing. Increasing enrollments on the margins in these courses should have no adverse financial effect while providing known quality educational experiences to the prospective students.

It is very admirable to see how the School has worked extensively and gained internal agreement to use existing assets and to deploy financial revenue to try to launch this doctoral program -especially since almost all research doctorates in the health and science sectors traditionally lose money. The redeployment of graduate teaching assistantship money to Ph.D. students who will assume these teaching roles will be helpful. I would urge some caution here. While providing essential dollars, there is a likelihood that students diverted from fulltime research to teaching responsibilities will take longer time to graduation making the four-year graduation expectation possibly a little slippery. In addition, a significant number of Ph.D. candidates in these areas are often not native English speakers. Provisions need to be taken into account to provide support if these students do not come to the University with the needed language skills to function in the graduate assistant role.

To be national-competitive, most programs in these areas, even as start-ups, provide graduate stipends rather than assistantships. Most offer school-base d support through didactic experiences and expect mentors to fund those stipends once the student enters the lab. These stipends are usually in the $20-30,000/ year range plus health insurance and tuition waivers. To achieve this would mean the need for about $150-2S0K/ year for pre-lab students and a research base that would be able to provide student support of $700-900K per year. While the current resources do not appear available to start this way, there needs to be a plan over time to migrate to a plan that would allow UM to be competitive in student recruitment with the strongest programs.

The faculty shown to be involved in the proposal appear to be committed researchers and talented. Many are early-career researchers. While the proposal notes $2.2 million in funding in the past year, the concern is that very few have an independent funding record that has been sustained at financial levels that would allow them to support the costs of a graduate student. Many, themselves, are being supported by mechanisms that focus on developing undergraduates or their own early stage development. Many have support that is dependent on intramural support or as contractual work with investigators at other institutions. Most have significant gaps in funding. This is important for several reasons.

- Faculty members should ultimately, through grant funding, be able to support the students' research and provide them with external opportunities for career enrichment.
• Teaching doctoral students about how to be successful in obtaining research funding is part of the educational process and should be modeled by the mentor.
• Faculty members’ grants should be a critical part of paying the costs of graduate education and those grants can serve as vehicles for students to apply for supplemental grants that increase revenue streams while teaching the student how to successfully prepare grants that will be critical to their future.

This being the case, I would strongly advise the College and University to invest the necessary funds in the next two years to recruit two-three researchers to this program who are well-funded and have a track record of success in grant funding. They not only could help in the funding of students in the first few years of the program, but also serve to assist junior faculty who currently have the potential to grow in this arena.

On a side note, adding a doctoral program may serve to help recruit some of these types of individuals who see the preparation of researchers as a key mission in their careers. However, doctoral students, as a whole, rarely provide a cost-effective solution to increasing research funding for current faculty and are generally only productive in their last year of training, at best, making the argument that having doctoral programs will increase extramural funding somewhat questionable.

From these statements, I would conclude that to deliver the program in a manner that will be successful will need a greater resource pool than is shown in the current proposal.

PROGRAM POTENTIAL: The program has many similarities to others that have emerged over the past decade. Nevertheless, I believe the proposed Ph.D. in Health and Rehabilitation Science has an opportunity to emerge as one of the better programs nationally over time. There is a clear School commitment to this program, a history of excellence in the School's programs and the beginning emergence of a research-committed junior faculty that bodes well for the success of this program as it is launched. The program will meet a legitimate need and would be a very important addition to the national workforce network. My only concern is that the School and University carefully consider the resources needed to allow the program to be initiated on strong footing and wait to launch until those resources are in place.
Steve Graham  
Senior Associate Vice President for Academic Affairs  
University of Missouri System  
309 University Hall  
Columbia, Missouri 65211

Dear Dr. Graham,

Thank you for the opportunity to review the proposal for a PhD in Health and Rehabilitation Sciences, proposed by the School of Health Professions. I have tailored my review to address the four questions posed in your request.

1. **Provide an assessment of the overall curriculum for the program as the foundation for a strong PhD program. Will the curriculum produce high-quality graduates who are capable of making significant contributions in this field?**

The proposed curriculum is quite similar to our PhD in Health and Rehabilitation Sciences with both including 2 foundational courses in Health and Rehab Sciences, 2 statistical courses, and a cognate area (ours is 3 classes; the proposal indicates 26 credits). One major difference between the proposed program and our program is the absence of any teaching preparation in the proposed MU-SHP program. Our students are required to take 2 courses: 1) College Teaching and 2) Teaching and Curriculum in Health Sciences plus complete a teaching practicum. While it is critical for students to have a strong research base, we consider it equally important to prepare them to develop curriculum, syllabi, lectures, tests, etc, so have included this preparation as well. MU-SHP might consider adding this to their program, especially since the students are to be funded as teaching assistants.

It is somewhat surprising that a student, entering the program with a BS, can complete it with 72 credits; our current program is 63 credits beyond the MS or 80 beyond the BS, allowing for 15 credits of the MS to count toward the PhD. In addition, Ohio State allows students to only register for 3 credits post-candidacy while still being considered full-time; it is unclear whether MU-SHP has a similar system. Yet, this still results in 15-18 credits for their dissertation work, which is expected to take 1-2 years. The proposed program seems to have 28 credits of research split between several courses and participation in research activities; however, the specific credits are not included in the proposal, so it isn’t possible to see how these are distributed. Similarly, the University of Florida’s program in Rehabilitation Science requires 90 credits beyond the BS. Thus, the proposed program seems under-credited in comparison to ours and some other programs. Notably, our dual degrees (DPT/PhD and OTD/PhD) allow students to take a few of the PhD requirements while completing the entry-level programs and allows a few of the entry-level credits to count toward the PhD credits, thus shortening the time to complete both degrees by approximately 1 year (6 rather than 7 years).

In addition to our teaching core, we also have included a grant writing course and one focused on IRB approval and compliance. In addition, students take a 1 credit seminar up to candidacy, whereby they attend our grand rounds, reading papers of the presenter prior to attending, and then meet to discuss; attendance after candidacy is encouraged but not required. We also have a grant academy activity each
semester, where faculty present their upcoming grant proposals for open critique by the other faculty, which students are required to attend. We have found these activities very helpful in preparing our students for their future as scholars and specifically grant writers. Such activities might strengthen the current proposal, although there are a couple of courses included in the research requirement within the proposal that might address these things.

The proposed “potential study plans” in Table 8 outline 5 courses for each cognate area but the narrative describes 26 credits; since the credits aren’t provided for the courses in the table, it is unclear how these add to 26 credits. Or is there some expectation for additional courses outside those in the table?

2. Is there a sufficient “market” for doctoral students interested in this area to allow the program to be viable over time?

As the proposal states, there is a critical need for PhD prepared faculty in the health and rehabilitation fields as we are starting to see the baby-boomer faculty retiring and new programs developing. With changes in accreditation expectations, this need is expected to expand. While Table 3 suggests that 24-53% of current students might be interested, it is highly unlikely that so many will actually seek a PhD. Also, there are more programs that might be competitors than those listed in Table 2; for example, the University of Florida, the University of Alabama Birmingham and George Mason University have PhD programs in Rehabilitation Sciences that would seem to be regional competitors for this program.

However, there are quite a few students looking for quality programs and an increasing need for quality programs to prepare the next generation of scholars, for whom jobs are waiting. Our graduates are highly sought after for post-docs and for faculty positions; while we encourage them to complete a post-doc to enhance their preparation, several have gone straight into faculty positions because of the growing number of available spots.

The limiting factor for enrollment in most programs is their ability to financially support the students, which is typically the expectation for PhD programs to minimize the additional debt for graduates. It would appear that MU-SHP has this issue covered with support of up to 20 GA positions.

3. Do the courses, faculty, and financial plan outlined in the proposal provide the necessary elements for the doctoral-level education in music education.

I’m assuming this is meant to say health and rehabilitation sciences. As indicated in the plan, PhD education is not a money-making proposition. With small enrollments, courses are typically taught to small cohorts of students, but the program intends to use some existing courses within and outside the school to maximize resources. We have also found it advantageous to offer courses to other graduate students (e.g. our biomechanics course is quite attractive to the biomedical engineering students) to expand enrollment and revenue. However, our PhD program is largely supported, as indicated in the MU proposal, by income generated from our entry-level programs.

As stated, the primary cost for a PhD program is graduate assistantships. That the School is able to support 20 is remarkable; it is not evident what these students will be expected to do as GAs, but teaching in the entry-level, especially undergraduate programs, is likely. It is unclear how they will be prepared to assume a teaching role, which is typically not part of their entry-level clinical education. There will need to be considerable support for first year PhD students to enter into teaching roles, but this is a surmountable problem with the use of University and local resources, I would think. While explicitly
stated in the proposal that these assistantships are currently given to students in the entry-level programs and will transition to the PhD program with “no concerns about adverse effects”, the entry-level programs may lose some students that would have been enticed by those GA positions. The proposal also states that faculty are expected to fund students on grants eventually, which may allow some of these GA positions to be returned to the entry-level programs. In addition, we include support for GAs in all of our start-up packages to help new faculty get engaged in PhD education early in their careers.

There is modest concern that few of the faculty seem to have substantial extramural funding at present to support graduate students. However, they appear to be engaged in scholarship and appropriately productive, publishing consistently, which is a foundational expectation for grant funding, and several have R21 or R15 funding, which should help them transition to larger awards. The faculty’s national and international presentations were not included in their CVs, but it is assumed that they are also presenting at professional meetings. The proposal indicates that there is an expectation that additional grant funding will be likely, given recent hires and grants in review, which will be critical for the success of the program. Also, there is an expectation that the PhD program will help grow the research program. At Ohio State, we have seen an 8-fold increase in grant funding (from about $1M to over $8M in annualized direct costs), since the implementation of our PhD program; while there are many factors that have contributed to that, including the hiring of more research-focused and funded faculty, there is no doubt that PhD students have contributed to our research growth. In part, the ability to recruit research-intensive faculty is improved when they know they can contribute to a PhD program and recruit PhD students.

4. How does this program compare with other similar programs in the country and does the program have the potential to achieve a national reputation?

National reputation for graduate programs results from the reputation of the faculty and the graduates. Right now, the MU-SHP faculty are publishing and presenting, which should be earning them some national attention. The CVs provided do not include national service, which, of course, is also part of garnering national reputation. Additional extramural grant funding should contribute to improved national awareness. It will be important for the School to also develop financial support for students to travel to professional conferences to present their research; eventually, these costs can be transitioned to grants, as faculty obtain additional extramural awards, but initially, the School will need to provide some support. Ohio State provides support for one conference post-candidacy with other travel supported through faculty start-up or grants. Recently, we have initiated support for one conference pre-candidacy as well. In addition, students should be encouraged to apply for national scholarships and awards, which will enhance the program’s reputation, when they are successful. Ultimately, programs are defined by where their students go for post-docs and their first jobs as well as the level of success that they have within these experiences.

It appears to me that the program has a good curriculum plan, the right emphasis on research development, and a mix of seasoned scholars with emerging scholars to support the program. I have provided a few suggestions that I think might strengthen the curriculum. It will also be critical for more of the faculty to acquire extramural funding because this should be part of every student’s preparation. Notably, the proposal makes it clear that this is an expectation. If you look at the prominent programs across the country in this area (U Delaware, U Pittsburgh, U Florida, USC), they are also some of the strongest research faculty in their respective professions, so growing the research agenda of the School
will be critical in achieving national recognition for the program. However, it appears that there is

administrative support for this and an interest to grow in this area. Overall, the School seems well
situated to pursue this program.

Again, thank you for the opportunity to review the program. I wish you success in its implementation and
am happy to provide clarity for any of my remarks, if needed.

Best Regards,

Deborah S. Larsen, PT, PhD, FASAHP, FAPTA
Professor and Director, School of Health and Rehabilitation Sciences
Associate Dean, College of Medicine
Associate Vice President, Health Sciences
June 29, 2018

Dear Dr. Graham:

Thank you very much for the opportunity to evaluate this proposal for a new Ph.D. program in Health and Rehabilitation Science at the University of Missouri. I tried to be thorough, yet succinct in my evaluation, however if you are in need of further detail or clarification on any point, please do not hesitate to contact me either by phone at (352) 294-1808 or by email at robert.leeman@ufl.edu.

Sincerely,

Robert F. Leeman, Ph.D.
Associate Professor
Department of Health Education and Behavior
University of Florida

Adjunct Assistant Professor
Department of Psychiatry
Yale School of Medicine
External Report on Proposed Doctoral Program in Health and Rehabilitation Science at the University of Missouri-Columbia

Robert Leeman, Ph.D., Department of Health Education & Behavior, University of Florida

I enjoyed reading this well-written proposal. I have provided responses to each of the four questions provided. In some cases my comments include questions for clarification. If you are in need of any additional information or feedback, please do not hesitate to be in contact with me.

1. **Provide an assessment of the overall curriculum for the program as the foundation for a strong PhD program. Will the curriculum produce high-quality graduates who are capable of making significant contributions in this field?**

   There are a number of strengths of the curriculum, which increase the likelihood that the program will produce high-quality graduates who are capable of making significant contributions to the field.

   The preliminary research project for students not entering the program with a research-focused master’s degree is a good idea. It is essential for graduate students to demonstrate sooner than later that they are capable of seeing a project through, from beginning, middle, to the end. Perhaps at some point, you may opt to require this step of all students regardless of the nature of any prior master’s degree.

   The plan for coursework had a number of strengths as well. The foundation in health and rehabilitation science coursework is important in laying the groundwork for the rest of the program and 6 credits is a reasonable outlay of effort. Twelve credits is a reasonable commitment for research methodology and statistics. The course offerings in this category are highly relevant to the program and offer sufficient breadth. Specifically, I also appreciated that there were introductory level statistics courses among the offerings. I would predict that a number of students in this new program, particularly in its early years, will enter with little to no training and exposure to statistics so it will be important to offer appropriate coursework for these students. Likewise, 28 credits of thesis/dissertation work is also reasonable. My main concern is the 26 credit requirement for research area courses and that only 3 can be from directed readings. Coursework is important to provide students with the foundation they need but it is also critical that students not get bogged down in their coursework and have ample time to focus on research. You might consider increasing the number of credits in this category that students can use for directed research or readings.

   I applaud the plan to require mentors and students to formulate a plan of study early in the process (i.e., by end of first semester). I also applaud the requirement that students submit to a peer reviewed journal at least once. While I think these are excellent features, I wonder if one or both, in practice, might be challenging to enforce. It will be important for the Program Director to take a strong leadership role on these issues.
One point of clarification, when it is stated that the “Doctoral dissertation (will be) focused on original research” does that include or exclude secondary data analyses?

2. **Is there a sufficient “market” for doctoral students interested in this area to allow the program to be viable over time?**

The proposal makes a strong and clear argument that there is both a national need and local interest among current students for this program. Further, a point is made early on that “Many of these disciplines have excellent clinical foundations but few researchers advancing science and practice in those fields.” Based on my experience, I am in strong agreement with this statement.

In terms of locating students who will be successful, I think there is an opportunity for programs such as this to recruit students who were solid undergraduates but do not have the grades and/or test scores to get into the most competitive graduate programs (e.g., medical school, Ph.D. programs in clinical psychology). If those recruiting for this program can educate prospective students on the need for doctoral-level faculty in these fields, that will go a long way to allaying any concerns on the part of students regarding entering this type of graduate program rather than the type of program they may have initially intended to enroll in.

I have two questions: While doctoral training always has the primary goal of mentoring the next generation of faculty, are there needs in industry that could also be served by students graduating from this program? If so, that would be an important point to make in this proposal and when recruiting students. Many universities, including my own, are beginning to adapt to the reality that many students either enter programs with or transition during their graduate studies to a goal of industry employment. Thus, doctoral programs will be well served going forward by indicating an openness to this career trajectory and perhaps even provide relevant seminars, training opportunities, etc. Anecdotally, one of my friends from graduate school is employed by a firm that conducts market research for companies producing novel medications and medical devices. I would imagine her firm would be interested in graduates from a program such as this one.

My second question has to do with the mentorship model. While strong mentor-mentee relationships are, of course, critical, will there be ample opportunity to change advisors as needed? Will firm procedures be put in place to guide this process? In my experience, this is a topic about which prospective students have concerns, justifiably.

One suggestion is that in addition to recruitment at national conferences via formal booths as proposed, the program could require any affiliated faculty receiving travel funds to make recruitment efforts such as posting flyers/brochures by their poster presentations.

3. **Do the courses, faculty, and financial plan outlined in the proposal provide the necessary elements for the doctoral-level education in Health and Rehabilitation Science?**

The interdisciplinary nature of the program with faculty from multiple departments involved is a great strength of the proposed program, in my view. Students will benefit greatly from being able to interact with faculty from multiple disciplines though it can at times be challenging to “mix” faculty and students from differing disciplines. I like the idea of Brown Bag seminars, for instance, not only for the students’ benefit but for the benefit of the faculty as well. While these
types of events are beneficial in general, they are perhaps particularly important for programs engaging faculty and students from various backgrounds.

In terms of the financial piece, it is a tremendous advantage that the requisite number of teaching assistantships is already in place, just currently offered to students in other programs. It makes all of the sense in the world to offer those assistantships internally instead. Will there be any opportunity for fellowships other than teaching assistantships and those funded by grants? In Section 3.B.2, graduate research assistantships were mentioned in passing. I was not sure if those would be exclusively grant-funded. While this requires sufficient revenue, it would be an advantage to be able to offer a small number of outstanding students a graduate research assistantship that would free them from teaching assistant responsibilities. This type of an opportunity could offer an important advantage in recruiting the brightest prospective students.

Another financial question has to do with the statement that no expenses will be required for new/renovated space. Does this mean that there is already ample office space to house these students? What about a common area for students to congregate and other important spaces such as a computer lab?

In terms of the faculty involved, the range of disciplines represented is a tremendous strength. Many of the faculty have a degree of existing grant involvement, primarily as Principal Investigator on small external or internal grants, or Co-Investigator/Subaward Principal Investigator roles on larger, external grants, which is good. Ideally, one would like to see more faculty with substantial external grant support as Principal Investigators, but as the proposal states, the institution of this doctoral program will likely help to facilitate further grant activity on the part of the faculty, though it may take at least a few years for the program to bear fruit in this respect. Doctoral students in their initial years of training typically require a great deal of supervision and guidance, which, if done well, may in some cases actually distract faculty from grant writing rather than facilitating it. Again, while the faculty have a number of strengths, they are skewed toward the junior and early- mid-career levels. Given this and the current level of grant involvement on the part of faculty, the Program Director will indeed be a key hire for multiple reasons, including advancing the program’s grant portfolio and overall level of experience.

4. **How does this program compare with other similar programs in the country and does the program have the potential to achieve a national reputation?**

Given all of these factors and the advantages the University of Missouri brings, including tremendous opportunities for collaboration, the program would appear to be well poised to be positioned favorably among other, similar programs in the country and to achieve a national reputation.
Dear Dr. Graham:

Thank you for facilitating the process of obtaining external reviews of our proposal for a Ph.D. in Health and Rehabilitation Science. We have carefully considered the suggestions and comments from each of the reviewers, and have modified our proposal to provide requested information. We are grateful for the reviewers’ feedback, for we feel it has resulted in improvements to our program proposal. Below we offer a summary of the key points raised by the reviewers along with our responses.

1) Reviewers offered a range of (sometimes conflicting) comments on number of credit hours specified in our curriculum plan. Specifically, while one stated that the proposal appears “under credited” as compared to other programs, another commented that the program requirements appear demanding as compared to similar programs.

   **Our Response:** Based on these comments, we realized that additional information was needed to specify the MU and national contexts that influenced the formation of this program’s curriculum. On pages 6-7 of the proposal, we provide information about standards of Ph.D. programs at MU along with a table (also included below) that provides closer examination of 5 comparator programs identified by reviewers. As noted in the proposal, 72 credit hours is the mean and median of curriculum expectations across these comparator programs, and the distribution of credit hours (e.g., in research area courses, statistics, and research/thesis credits) across programs is similar.

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<td>3 (optional)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>72</td>
<td>80</td>
<td>90</td>
<td>57-75</td>
<td>72</td>
</tr>
</tbody>
</table>

*All are Ph.D. programs in Rehabilitation Science or Health and Rehabilitation Science*
2) Reviewers reported generally having positive opinions about participating faculty, yet they noted that few of the faculty have sustained extramural funding to support graduate student costs (e.g., stipends or travel).

*Our Response:* We acknowledge in the proposal that many of the MU School of Health Professions faculty are in the early stages of their careers and therefore have not yet achieved consistent grant funding. Our long-term plan to address this is to increase the capacity of our faculty to offer grant-funded assistantships and funds for student travel to present at national conferences. The School’s Office of Research has multiple strategies to support the development of our faculty, including mentoring, access to a grant writer, pre-award budget development, post-award budget management, and a statistician, as well as opportunities for seed monies to support collection of pilot data for grant proposals. Additionally, we have hired two more senior faculty who will be joining the School in Fall, 2018. We believe that the growth in our research culture, along with our strategic hires, will position our faculty to provide research-based funding for graduate students in the future. In the meantime, current faculty will be encouraged to include funding for student travel and graduate research assistantships in their grant proposals, new faculty hires will be offered assistantship funding for students in their start-up packages, and faculty will be encouraged to work with students to identify and apply for fellowships to fund graduate students’ education.

Finally, as noted on page 21 of the proposal, the individual departments participating in this program will be encouraged to utilize reserves to offer a one-year assistantship to a small number (1-3) annually of the highest caliber students. Additionally, the Dean’s Office will commit to ensuring that all graduate students who have reached doctoral candidacy status will have funding for one national or international professional conference annually to present research (this additional expense has also been reflected in the budget).

3) The proposal states that cost of graduate assistantships will be borne by strategic reallocation of existing resources; reviewers asked that we further elucidate the impact of this change on other programs and the goals of the school.

*Our Response:* We were mindful of the possible effects of this strategic reallocation when this plan was created. As detailed on page 17 of the proposal, each year these assistantships have been widely distributed across many departments, and so the redirection of the assistantships will have minimal impact on any single program.

4) Reviewers were unclear what responsibilities would be shouldered by graduate students having teaching assistantships, suggesting that clarification of the impact of any teaching commitment on student outcomes (e.g., time to graduation) was needed.

*Our Response:* As noted on page 21 of the proposal, graduate teaching assistants will not be teaching courses independently but will be grading assistants for faculty. This will help avoid extra work that graduate students may take on when teaching course independently, while giving them an opportunity to interact with undergraduate students and learn from observing teaching faculty. Some students may seek opportunities to teach or co-teach a course in the latter period of their graduate training as a desirable experience prior to entering the academic job market. We also note that a recent article in Inside Higher Ed described research findings indicating that engaging graduate students in teaching activities did not adversely affect their research productivity (June 27, 2018).
5) Reviewers noted the importance of graduate stipends rather than assistantships to facilitate recruiting and to remain competitive with top programs in this research area, raising a question of whether this program would plan to move toward graduate stipends rather than assistantships.

*Our Response:* We appreciate this observation and agree that having stipends and also research (rather than teaching) assistantships will promote our ability to attract students. As noted above, participating departments will be encouraged to offer 1-year assistantships to attract the highest caliber students. Additionally, we have set a goal that by Year 5 of the program’s implementation, 40% of assistantships will be funded from research startup funds, research grants or research fellowships. To accomplish this, the Program Director will assist with identifying qualifying fellowships, faculty will be counseled to include assistantship funding in grants, and assistantships will be included in start-up packages for new faculty hires.

6) Reviewers asked for additional information regarding space and resources to support increased research productivity and common space to support meaningful interaction among Ph.D. students.

*Our Response:* As detailed on page 21, we have identified a shared meeting space for Ph.D. students only that will facilitate informal conversations and meaningful engagement. Research space for Ph.D. students will be provided by specific departments, most of which already have dedicated space for current research assistants. Additionally, as a school we are continually examining space and strategically reallocating what is available to support research activities. Availability of space is a campus-wide issue, but our School has demonstrated consistent enrollment growth along with increase in research productivity, and we have long-term plans to acquire additional space in buildings where our programs are currently housed.

7) While reviewers supported our concept of an interdisciplinary program, some noted that the proposal did not provide clear evidence of how the students would be assured interdisciplinary learning and research opportunities.

*Our Response:* With this feedback, we realized that additional information was needed to illuminate the interdisciplinary features of the program. Additional specifics are provided here and have been integrated in the proposal.

- As noted in the curriculum description, students will participate in year-long sequence in Health and Rehabilitation Science where they will learn about work across disciplines and develop relationships with their graduate student cohort.
- When developing curriculum plans, students will be encouraged to select courses taught by range of disciplines across campus and to enroll as a cohort (i.e., with other Health and Rehabilitation Science graduate students) when possible. We expect students to complete courses taught by faculty from at least 2 disciplines other than their mentor’s discipline.
- As student numbers in the program grow, faculty will develop new classes in their areas of research and will be encouraged to offer topics appropriate to other disciplines (the relatively small size of the student cohort will incentivize this, as faculty will need to attend to enrollment numbers and are unlikely to meet target enrollments with graduate students from their discipline(s) only).
• Faculty mentors are already engaged in interdisciplinary research, so as mentors they will appeal to students seeking interdisciplinary education and careers. Reflecting this, the research areas identified in Table 8 (page 24) are interdisciplinary (e.g., NeuroRehabilitation includes faculty from Occupational Therapy, Health Psychology, Physical Therapy, and Communication Science and Disorders).

In addition to these key issues, several suggestions were made about strategies that could further enhance the program. We appreciate these ideas and wish to address them briefly here.

8) Consider developing courses, modules to prepare students to teach in academic settings.

Our Response: We considered including a year-long sequence with course on pedagogy of teaching followed by a lab course wherein graduate students teach a class independently and meet regularly as a group with faculty mentor for support and feedback. However, given that the emphasis of this program is on research productivity, and in recognition of the fact that a majority of our faculty are in the early years of their careers, we determined that we first needed to set a solid foundation of a research focus. Once this is accomplished, likely within the first 5 years of the program, we intend to pursue adding a sequence of courses focused on teaching to our curriculum. In the meantime, we note that the MU Office of Graduate Studies is reexamining its role in offering mentorship to graduate assistants related to teaching and other issues. This Office will be a resource for our students from the start. Moreover, any training/mentoring we develop will happen in collaboration with the Office of Graduate Studies.

9) Consider offering graduate students support in developing research skills, including grant writing and managing IRB processes.

Our Response: We agree that this is an excellent suggestion. As described on page 21 of the proposal, the MU School of Health Professions has an Office of Research led by the Associate Dean for Research that includes a grant writer and a part-time statistician. The Office currently offers Brown Bag seminars focused on these and related topics for current faculty and post-doctoral fellows. In addition to having graduate students participate in this existing program, the Associate Dean for Research will develop other seminars to specifically address research skill development among graduate students.

10) Comment on whether there are needs in industry that could be met by graduates from this program.

Our Response: We believe there will be many opportunities for our graduates in industry; some of these have been highlighted on page 4.

11) Consider training on the science of behavior change and intervention. Also consider increasing the number of formal interdisciplinary courses.

Our Response: We agree that these are important goals as our curriculum expands. We anticipate adding courses to meet these needs within the first several years as student enrollment goals are met. This will be facilitated by the fact that the identified Research areas reflect the shared interests of interdisciplinary groups of faculty and that our faculty
have interests in the design and assessment of interventions as well as the behavioral variables as mediators of health.

12) Consider strategies to enhance the assessment of the effectiveness of the program.

Our Response: We appreciate the suggestions offered by one reviewer in particular regarding the additional metrics we could consider assessing to determine the impacts of the program. While our School already tracks student success and faculty productivity metrics on an ongoing basis (at least annually), on page 26 of the proposal we have specified those student and faculty research metrics that we will attend to as evidence of this program’s effectiveness.

Thank you again for the opportunity to consider and respond to feedback from the external reviewers of our program proposal. We hope that we have effectively addressed questions that were raised with our responses in this letter and with changes to the proposal. However, please do let me know if additional information would be helpful.

Kind regards,

Stephanie Reid-Arndt
Stephanie Reid-Arndt, Ph.D., ABPP
Associate Dean for Academic Affairs