

Date: February 18, 2004

To: John Schroeter  
Faculty Senate Curriculum Committee Chair  
273 Heady Hall

From: Rick Sharp  
Graduate Coordinator  
Health & Human Performance

Re: Regents post-audit review of Ph.D. program

I have enclosed our report that constitutes the post-audit review of our Ph.D. program in Health & Human Performance which was approved by the Board of Regents in May, 1999. This document was prepared in response to the request made by Ken Kruempel in July, 2003. Department faculty and graduate students were involved in preparing the report by supplying the necessary information and reviewing drafts of the report. Final drafting was then conducted and approved by the department's Ph.D. Executive Committee and Graduate Faculty.

As you will realize upon reading this report, our Ph.D. program has grown rapidly in its first five years thanks to considerable support from faculty, departmental administration, and the College of Education. Currently, there are 11 full-time students in this program, meeting the target we had set in the 1999 Ph.D. program proposal. All Ph.D. students are supported on assistantship either by departmental funds, faculty grant funds, and/or College of Education Ph.D. Fellowships. Our students are spread evenly between the two specializations of Behavioral Basis of Physical Activity and Biological Basis of Physical Activity. All students are engaged in both research and teaching in the department as part of their assistantships, and are contributing to the department's outreach efforts. Our students publish in respected journals and present papers at most of the top national and international conferences for our field. Our first graduate was awarded the Zaffarano Prize for outstanding research by a graduate student and has published seven refereed papers from his Ph.D. research. Students are also involved in departmental governance by serving as representatives on several departmental committees, they have formed a graduate student club, and are represented in the graduate student senate.

The department of Health & Human Performance is proud of our Ph.D. program and enthusiastically supports its continuation. We have every reason to believe that our graduates will be productive and valued contributors to the field and will represent Iowa State University with distinction.

**IOWA STATE UNIVERSITY**  
OF SCIENCE AND TECHNOLOGY

College of Education

**Interoffice Communication**

February 19, 2004

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**TO:** John Schroeter  
Faculty Senate Curriculum Committee Chair  
273 Heady Hall

**FR:** Jerry R. Thomas, Chair

**RE:** Regents Post-Audit Review of the Ph.D. in Health and Human Performance

You have received the above referenced report from Dr. Rick Sharp, Graduate Coordinator in HHP. This report has been discussed with the faculty, approved by the Ph.D. Graduate Executive Committee, and by me.

I led the development of the original Ph.D. proposal that was approved by the Iowa Board of Regents in June of 1999. We have met or exceeded every goal established for that program. We have graduated two excellent students, the first who received the Zaffarano Prize for Graduate Student Research (top award at ISU). Both obtained excellent positions. We have an additional student on track to graduate in May of 2004 and another in August of 2004. Thus, from the entry of the first student in August of 1999 through 5 years of the program, 4 Ph.D.s will have graduated. These are all top students and the upcoming two graduates have already been identified as finalist for university positions. We have not lost a single student from the program except by graduation.

We currently have 12 Ph.D. students, 2 of whom are likely to graduate in 2004. We will admit 2-4 additional students for Fall 2004 depending on resources (University and grant/contract funds). External funding in HHP continues to grow as we currently have 6 funded NIH grants plus numerous other grants and contracts. This will enable us to admit and support additional Ph.D. students. However, we plan to keep our upper limit at about 16.

As you look through this report you will see ample evidence of the quality of the students we admit and the success they have attained (e.g., papers published and presented). We prepare students for college and university positions who are balanced in their approach to and understanding of the faculty roles of discovery, learning, and engagement.

Cc: Rick

## **Regents Post-Audit Review Questions**

Name of the degree: Ph.D.

Name of the major: Health and Human Performance

Administrative Unit: Department of Health and Human Performance

College: Education

Contact person(s): Rick Sharp (DOGE), Jerry Thomas (Department Chair)

### **Introduction**

**Indicate how the program has met the educational and curricular needs of students, other units in the university, the state, and nation. If appropriate, discuss how the program interacts with related programs/units within the university, other institutions, industry, government, and/or citizens of Iowa.**

The Ph.D. program in Health and Human Performance advances the Mission of the University and its plan to become the best land grant institution. First, it adds to the emphasis the University gives to both applied and basic research. The discovery of new knowledge in the various aspects of physical activity and its application to the enhancement of human movement, particularly the health benefits, is a basic tenant of the program. Second, advanced study in physical activity builds on the University's mission in the scientific and technical fields. Third, the program enhances the overall academic quality and visibility of the University. Finally, the program is clearly within the role and scope of the Strategic Plan to develop new programs that reflect the changing needs of society, especially at the graduate level.

In addition, the programs already in place at ISU contribute to the strength of the program. The close connections that have been developed between health and human performance and nutrition in the sports and exercise nutrition area benefit this Ph.D. program (nutrition has a Ph.D. program). Interdisciplinary connections to various aspects of the biological sciences (most with Ph.D. programs) enhance the biological basis of physical activity in this Ph.D. program. And the interdisciplinary opportunities with psychology and sociology (both with Ph.D.s) strengthen the behavioral basis of physical activity specialization.

## Regents Questions

**1. Is this program now available in other colleges and universities in Iowa? Where? Describe need for program.**

There is no other program in Iowa that prepares Ph.D. students in the study of physical activity from this broader, more cross-disciplinary model. The two programs at the University of Iowa use a sub-disciplinary model focused on narrow specialized preparation as previously described in the 1999 program proposal. The ISU program provides a cross-disciplinary model in line with national trends in both theory (e.g., National Science Foundation, Preparing Future Faculty) and job opportunities (Wood & Karp, 1997) for Iowa students (and others) who choose this field of study. Job opportunities available in Iowa at private colleges and community colleges clearly fall in the 62% (comprehensive/regional and liberal arts) of colleges who are seeking more broadly prepared teacher/scholars. These individuals are asked to provide leadership for planning, knowledge development, and instruction at institutions. In addition acquiring doctoral students in this program allows the Department to provide additional service to the State of Iowa. For example, we currently provide a valuable service to the State Highway Patrol with a contract for health and exercise screening. The integration of doctoral students into this service activity extends opportunities so we could offer contract services to many local law enforcement officials as well as fire departments. As a second example, the Department of Health and Human Performance operates an exercise clinic for ISU faculty/staff and Department of Transportation staff. Ph.D. students allows this outstanding program to expand to include a consulting service to Iowa employee health promotion programs that operate within business/industry or private health and fitness clubs. Another unique aspect of our doctoral program is that all doctoral students are mentored by their major professors in the area of teaching. This entails observation and laboratory teaching in upper division classes (early in Ph.D. program), teaching in the service program (first aid, CPR, personal health classes), guest lectures in upper division classes (mid-program), and progressing to independent teaching of a section of an upper division course in their sub-discipline area. In addition the students are required to have some teaching experience in a second area within Health and Human Performance. The purpose of these efforts is to produce Ph.D. graduates who are not only well-trained in research, but also are trained in teaching and student learning across at least two sub-disciplines with our field. We feel that this approach is both responsive to the documented societal needs and enhances the marketability of our Ph.D. graduates in today's academic job market.

**2. Date program was approved by Board of Regents and date program was implemented.**

Approved July, 1999

Implemented September, 1999

**3. Projected Enrollments**

**a. List actual headcount enrollments and credit hours generated by majors and nonmajors in this program for the last five years and estimate these items for the next three years.**

	<u>Year</u>	<u>Year</u>	<u>Year</u>	<u>Year</u>	<u>Crnt</u>	<u>Next</u>	<u>Sec</u>	<u>Third</u>
	<u>One</u>	<u>Two</u>	<u>Three</u>	<u>Four</u>	<u>Year</u>	<u>Year</u>	<u>Year</u>	<u>Year</u>
Undergraduate								
Majors	_____	_____	_____	_____	_____	_____	_____	_____
Nonmajors	_____	_____	_____	_____	_____	_____	_____	_____
Graduate								
Majors	<u>  1  </u>	<u>  4  </u>	<u>  7  </u>	<u>10  </u>	<u>11  </u>	<u>13  </u>	<u>13  </u>	<u>13  </u>
Nonmajors	_____	_____	_____	_____	_____	_____	_____	_____

**b. How many dropouts of this program can be identified over the last five years? What reasons were given for leaving the program?**

No dropouts

**4. What have been the employment (placement) experiences of any graduates of this program?**

**a. List the number of graduates (completions) by year.**

Gregory Brown; May, 2002  
Omar Hindawi; December, 2002

**b. What has been the success rate for graduates with respect to certification and/or licensure, if applicable?**

N/A

**c. How many undergraduate completers of the program have been accepted into graduate study programs?**

N/A

**d. What has been the success rate for obtaining jobs for graduates of the program:**

- 1) **in the field or a related field?**
- 2) **in nonrelated fields?**
- 3) **unemployed?**

Both of the graduated students have obtained positions as Assistant Professor in universities. Greg Brown is Assistant Professor in the Department of Public Health at Georgia Southern University. Omar Hindawi is Assistant Professor in the Department of Physical Education and Sport Science at Hashemite University in Jordan.

- e. **What has been the success rate for obtaining the preferred first job in the field by graduates of the program?**

Both graduates are employed in their chosen field.

5. **Has this program been unconditionally accredited? By whom? If not, why, and when is such accreditation anticipated?**

N/A

6. **Outline the current FTE staffing of the program and estimate future staffing needs for the next three years.**

There are currently 16 full time graduate faculty who can supervise Ph.D. students.

7. **Provide operating budget for proposed program or the unit that houses the program if an individual program budget is not available. (See categories below.)**
8. **Outline the increases in expenditures that resulted in the adoption of this program, as well as estimate the increases that will occur over the next three years.**

The following table shows the estimated costs we have incurred in implementing and growing our Ph.D. program. It is important to note that these costs were mainly covered by reallocation of existing funds and by increased external funds as detailed in the footnotes.

Year	<i>Actual Expense</i>				<i>Estimated Expense</i>			
	99-00	00-01	01-02	02-03	03-04	04-05	05-06	06-07
Faculty <sup>a</sup>	*							
Graduate Assistants <sup>b</sup>	10,000	40,000	77,000	120,000	122,000	130,000	135,000	140,000
General Expense <sup>c</sup>	1000	1500	2000	2500	3000	3500	4000	4500
Equipment <sup>d</sup>	3750	4500	18,000	2300	2500	2500	2800	2800
Library Resources	0	0	0	0	0	0	0	0
Space Needs <sup>e,f</sup>	0	0	0	17,100	1800	0	0	0
Computer Use	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0
<b>Total</b>	<b>14,750</b>	<b>46,000</b>	<b>97,000</b>	<b>141,900</b>	<b>129,300</b>	<b>136,000</b>	<b>141,800</b>	<b>147,300</b>

**If these expenditures were covered by reallocations, please describe the reallocations.**

Expenditures were covered by a combination of reallocation, increased grant funding, and new support from the College of Education:

<sup>a</sup> At the time of the proposal, our department had 12 graduate faculty to supervise Ph.D. students. We currently have 17 graduate faculty to supervise Ph.D. students

(16 within department, one courtesy appointment). The increase was accomplished by filling vacant lines and securing new faculty lines.

<sup>b</sup> Roughly half of the graduate assistantships were converted from assistantships for masters students to assistantships for Ph.D. students. Faculty have increased grant funding and have used this increased funding to support additional doctoral students (cost of Graduate Assistants covered by external grant funds shown in parentheses). College of Education instituted a Ph.D Fellowship program in 2002 which has supported two of our Ph.D. students each of the last two years.

<sup>c</sup> General expense is estimated from approximate costs of maintaining software licenses and office expenses for doctoral students.

<sup>d</sup> Equipment costs include mainly cost of providing desktop computers for each doctoral student.

<sup>e</sup> Space needs costs were based on a remodeling project in which one of our laboratories was remodeled so that half of the space could provide desk-space for all of our doctoral students. Additional carrels were added in 03-04.

<sup>f</sup> As a result of filling vacant faculty positions and adding additional faculty lines, the department has added considerable laboratory facilities. Our motor control laboratory was completely remodeled to add two Opti-Track systems for precisely analyzing fine motor movements, we added an exercise psychology laboratory equipped with treadmill and metabolic measurement systems for linking psychological function with physiological load, added a health promotion through physical activity laboratory, and are in the process of remodeling space to add a pediatric exercise physiology laboratory for studying the effects of exercise on health-related physiological responses to exercise in children. The addition of these labs and associated faculty have added increased opportunities for doctoral research. Costs of these remodeling projects are not shown because the costs were covered in the hiring arrangements with the new faculty.

**If the expenditures reported above represent an increase for expenses estimated at the time the new program was proposed, please explain.**

\* At the time of the proposal, our department had 12 graduate faculty to supervise Ph.D. students. We currently have 17 graduate faculty to supervise Ph.D. students (16 within department, one courtesy appointment). The increase was accomplished by filling vacant lines and securing new faculty lines.

## **9. Supporting Materials**

**The responses to the various subsections of this portion of the questionnaire are intended to provide documentation concerning the quality of the program undergoing review. For graduate programs, documentation related to both the quality and quantity of research associated with the program should be included.**

- a. **A copy of the final version of the proposal for the program as approved for submission to the Board of Regents (from five years ago).**

Attached – Appendix A

- b. **Materials from current students and graduates that document the student learning outcomes, the quality of the program, interest in the program, and need for the program.**

Attached – Appendix B

- c. **Materials from employers or potential employers of program graduates documenting their support for this program.**

Attached – Appendix C

- d. **Materials from other units within ISU and from other institutions documenting their support for this program.**

Attached – Appendix D

- e. **Information concerning revenue generated (grants, gifts, etc.) in connection with this program.**

Attached – Appendix E

May 2003



**Appendix A**

**1999 Program Proposal Approved By Board of Regents**

**1999 Board of Regents Program Review Questions**

**1999 Board of Regents Response**

## Program Proposal—Ph.D. Iowa State University

### A. Background Information

1. *Name of the proposed curriculum:* Health and Human Performance
2. *Name of the degree:* Ph.D. in Health and Human Performance
3. *Name of the department involved:* Health and Human Performance
4. *Need for the proposed program*

### Introduction

National trends suggest that preparation of Ph.D.s in many disciplines may be too narrowly conceived. For example, the National Science Foundation (June 5-6, 1995, preface) when discussing Ph.D. preparation called for greater consideration of the “changing needs of the universities, companies, and research organizations that -will employ them.” The participants in this NSF meeting endorsed “a broadening of the training and educational experience” (p. 3) of graduate students. The same idea was behind the Pew Charitable Trusts funding of the “Preparing Future Faculty” program (1994-96) that was organized through the Council of Graduate Schools and the Association of American Colleges and Universities. PFF has tried to sensitize faculty and graduate students in research universities to the need to better prepare future faculty for the job market. The underlying rationale is that often doctoral students are prepared for life in research universities, while most of the job opportunities are in regional/comprehensive universities, liberal arts colleges, and community colleges. The balance of faculty responsibilities among scholarship, teaching, and service differs considerably by type of institution. Most college and universities advertise positions for faculty who are broadly prepared to understand their field and higher education as well as bring a specialized area of scholarship to their work.

The general consensus is that Ph.D. programs in most fields have become increasingly specialized in the preparation of students (Atwell, 1996). This has resulted in new Ph.D.s for college and university positions (as well as industry and business) who are not prepared to: 1) do research in field and laboratory settings that lack expensive equipment, 2) teach beyond their narrow specialized area, and 3) serve the university, academic/professional groups, or the local community in appropriate ways. Although there have also been calls for increasing depth in scientific investigations, particularly in the biological areas where molecular and cellular work offers new insights (Latta, 1997), even scientists in these areas have called for an integrated approach among physiology, nutrition, and the behavioral sciences (Latta, 1997, p.1).

### Trends within Health and Human Performance Graduate Education

Clearly this trend toward narrowness of specialization is present in the interdisciplinary field of health and human performance (other related labels include kinesiology, exercise and sport science, or physical education). During the past 35 years the field has moved from a general teaching field of physical education to the development of respected sub-disciplines such as exercise physiology, biomechanics, motor behavior, exercise and sport psychology, pedagogy, and several others (Swanson & Massengale, 1997). More recent analyses of the 50-60 currently functioning doctoral programs in this area in the U.S. supports the observation that this field has steadily moved toward use of a sub-disciplinary model for

specialized preparation (Brandy & King, 1987; Spirduso & Lovett, 1987; Thomas, 1987) in both scholarship and teaching responsibilities for new doctorates. This has led to a narrowness of focus in the type of specialization (e.g., exercise physiology, motor behavior) as well as at the level of analysis (e.g., molecular and cellular, neurological). Now there is need for a broadening of preparation to better interconnect sub-disciplinary knowledge as well as to integrate specialized knowledge within the total field of study.

While the sub-disciplines have typically maintained their interdisciplinary connections (e.g., exercise physiology to physiology, sport psychology to psychology), they have not developed the cross-disciplinary connections (e.g., exercise physiology to biomechanics) that would broaden the impact of knowledge and research in logical ways. For example, the benefits of regular exercise (a topic in exercise physiology) is clearly related to the efficiency and effectiveness of the movement pattern used in the exercise (a topic in biomechanics); or understanding motor skill acquisition (a topic in motor behavior) is closely tied to pedagogical approaches in teaching motor skills (physical education instruction). As a result the field blends pure scientific knowledge with application. This requires Ph.D.s who are broader in their focus for both teaching and research as well as in their understanding of faculty roles at varying types of institutions (Becker, 1991; Thomas, 1991, 1997). In this proposal we develop cross-disciplinary efforts for preparing Ph.D. students around two logical themes: 1) the biological basis of physical activity, and 2) the behavioral basis of physical activity (see items 6, 7, and 8 of this proposal for more detail).

#### Centrality of Health and Well-Being to Iowa State University

The field of health and human performance makes essential contributions to knowledge and practice in the relation of exercise and movement to health and well-being. Extensive summaries of research on the influence of exercise and movement on biological (Bouchard, Shephard & Stephens, 1994) and behavioral (Singer, Murphey, & Tennant, 1993) well-being are available. Research on this relationship crosses socioeconomic, ethnic/racial, age, and gender distinctions. Preparing scholar/teachers with Ph.D.s who understand and contribute to the broad implications and benefits of exercise and movement is an important part of a land-grant institution that seeks to positively influence the health and well-being of citizens of Iowa and our nation.

#### Contributions to National and State Needs

Analysis of the job market in the field of health and human performance also reflects the need for doctorates who are more broadly prepared. For example, Wood and Karp (1997) in evaluating 4 years of job advertisement data (1992-95) from the *Chronicle of Higher Education* reported that of the jobs advertised only 18% were at Research I and II universities while 15% were for Doctoral I and II universities, 50% were at Comprehensive/regional universities/colleges, and 12% were at Liberal Arts colleges. Thus, 77% of the jobs were at institutions where a high degree of specialization for a new faculty member is probably not optimal. In addition, few job advertisements were for very specialized doctorates. Instead the positions were often described as requiring knowledge and teaching skill in two or more areas of specialization (e.g., exercise physiology and biomechanics, motor behavior and pedagogy). It is also clear that extensive research equipment and laboratories to evaluate molecular and cellular responses to exercise or the neuro-physiological control of movement are likely to be available only at major research universities where the fewest jobs are located.

There is no program in Iowa that prepares Ph.D. students in the study of physical activity from this broader, more cross-disciplinary model. The two programs at the University of Iowa use a sub-disciplinary model focused on narrow specialized preparation as previously described. The proposed program provides a cross-disciplinary model more in line with national trends in both theory (e.g., National Science Foundation, Preparing Future Faculty) and job opportunities (Wood & Karp, 1997) for Iowa students (and others) who choose this field of study. Job opportunities available in Iowa at private colleges and community colleges clearly fall in the 62% (comprehensive/regional and liberal arts) of colleges who are seeking more broadly prepared teacher/scholars. These individuals are asked to provide leadership for planning, knowledge development, and instruction at institutions. In addition acquiring doctoral students in this program will allow the Department to provide additional service to the State of Iowa. For example, we currently provide a valuable service to the State Highway Patrol with a contract for health and exercise screening. The integration of doctoral students into this service activity extends opportunities so we could offer contract services to many local law enforcement officials as well as fire departments. As a second example, the Department of Health and Human Performance operates an exercise clinic for ISU faculty/staff and Department of Transportation staff. Ph.D. students will allow this outstanding program to expand to include a consulting service to Iowa employee health promotion programs that operate within business/industry or private health and fitness clubs. Opportunities are also available for Ph.D.s prepared in this model outside of college/university settings. Business and industry use scholars with expertise in physical activity in research, development, and clinical settings. Examples include large companies in the sporting equipment/supply industry such as Nike and Wilson. Sport nutritional companies (Experimental Applied Sciences, Gatorade) employ researchers from the study of physical activity who look at nutritional products and their influence on exercise performance. Health-related groups (hospitals, HMOs, health clinics) hire Ph.D.s to do research and assist in clinical practice. Sport teams hire Ph.D.s to advise in sport management and work with athletes.

#### How the Program Strengthens Iowa State University

This proposal for a Ph.D. in Health and Human Performance advances the Mission of the University and its plan to become the best land grant institution. First, it adds to the emphasis the University gives to both applied and basic research. The discovery of new knowledge in the various aspects of physical activity and its application to the enhancement of human movement, particularly the health benefits, is a basic tenant of the program. Second, advanced study in physical activity builds on the University's mission in the scientific and technical fields. Third, the program will enhance the overall academic quality and visibility of the University. Finally, the proposal is clearly within the role and scope of the Strategic Plan to develop new programs that reflect the changing needs of society, especially at the graduate level.

In addition, the programs already in place at ISU contribute to the strength of the proposed program. The other three departments in the College of Education offer Ph.D. programs that support for the current proposal. The close connections that have been developed between health and human performance and nutrition in the sports nutrition area benefit the proposed program (nutrition has a Ph.D. program). Interdisciplinary connections to various aspects of the biological sciences (most with Ph.D. programs) enhance the biological basis of physical activity in the proposed program. And the interdisciplinary opportunities with psychology and sociology (both with Ph.D.s) strengthen the behavioral basis of physical activity in the proposal.

Two other points are also of note. Of ISU's ten peer institutions, six (Illinois, Michigan State, Minnesota, Ohio State, Texas A&M, and Wisconsin) offer a Ph.D. in the field of physical activity with a seventh (Purdue) where the Department participates regularly in a general Graduate School Ph.D. program. Within the College of Education at ISU all three of the other departments have Ph.D. programs. The approval of a Ph.D. program would make the Department of HHP a stronger academic citizen in the University, our peer group, and nationally.

The Department of Health and Human Performance proposes to develop a new Ph.D. program that is responsive to the previously described needs. These two broadly conceived areas—the biological and behavioral basis of physical activity—allow for the development of specialized knowledge and skills in research. At the same time the program covers the more general area from rather basic to applied types of knowledge, research, and teaching as well as applications to at least one special population of humans (e.g., disabled, disease, children, elderly, athletes). In addition, special attention is given to understanding faculty roles in varying type of institutions (and business/industry) with some emphasis on the type of institution in which the Ph.D. student has the greatest interest.

#### References

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- Spiriduso, W. W., & Lovett, D.J. (1987). Current status of graduate education in physical education: Program demography. *Quest*, 39, 129-141.
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- Thomas, J.R. (1987). Are we already in pieces, or just falling apart? *Quest*, 39, 114-121.
- Thomas, J.R. (1997). Vision and leadership for selecting and mentoring new faculty in higher education. *Journal of Physical Education, Recreation, and Dance*, 68(5),41-46.
- Thomas, J.R. (1991). Who is preparing Ph.D.s and for whom? *NAPEHE: The Chronicle of Physical Education in Higher Education*, 3(1), 5-11.
- Woods, M.L., & Karp, G.G. (1997). Are you ready for today's higher education positions? *Journal of Physical Education, Recreation, and Dance*, 68(7), 46-50.

#### 5. Objectives of the proposed program

The proposed Ph.D. program will develop a well-rounded scholar within the study of physical activity who understands the scope of the field as well as the general and specialized knowledge within either the

biological or behavioral basis (subsequently each called an area) of physical activity. This scholar will be prepared to enter positions at the college and university level as well as business/industry and health care settings. In particular, the more broad cross-disciplinary preparation meets the needs of the current and projected job market (previously identified) where most positions are for individuals prepared in the proposed model. Following are specific objectives:

- a. To analyze and synthesize either the biological or behavioral basis of physical activity;
- b. To develop a specialized research focus within one of the areas;
- c. To analyze, categorize, and evaluate knowledge and procedures within one of the areas;
- d. To synthesize knowledge across one area's subdisciplines;
- e. To integrate the role of the selected area within the overall field;
- f. To develop excellence in teaching across one of the areas;
- g. To demonstrate research techniques across one of the areas at the analysis and synthesis level;
- h. To gain experience in service activities (e.g., professional/academic groups, community programs, departmental);
- i. To differentiate and evaluate the balance of faculty responsibilities at varying types of institutions;
- j. To comprehend and distinguish the value and impact of ethical principles in teaching and research.

#### 6. *General description of the program*

The focus of the proposed Ph.D. program is on the study of human physical activity although in some instances animal models may provide insight into the biological and behavioral bases of human physical activity. Human physical activity is broadly defined to include exercise, sport, and movements associated with daily life (e.g., reaching and grasping, driving a car, gardening, jobs). Students admitted to the program will have selected one of the two areas (biological or behavioral basis of physical activity) in which to focus their work. The *biological basis of physical activity* includes the development of cross-disciplinary expertise in exercise physiology, physical fitness, biomechanics, and applications to health promotion associated with exercise. The *behavioral basis of physical activity* includes the development of cross-disciplinary expertise in sport and exercise psychology, -motor behavior, socio-cultural, pedagogical/curricular, and management. Both areas are broadly conceived and include the integration of interdisciplinary and cross-disciplinary knowledge. However, crossover between the two specializations is to be expected in some instances as topics like special populations and motor expertise have biological and behavioral components. Of course the organization of specializations into biology and behavior is somewhat artificial; considerable overlap will (and should) occur. The selection of the names is a reasonable way to organize the program and reflects the emphasis of the preparation.

In the process of completing the Ph.D. in one of these two areas, students will:

- a. take appropriate course work (within and external to the department) to integrate cross-disciplinary expertise in the area, develop a specialized research focus (students will begin this research focus early in the program with required research credits), analyze and synthesize knowledge across one of the areas, learn and evaluate the use of appropriate quantitative, qualitative, and methodological skills for research (e.g., statistics, experimental design, computer skills);
- b. synthesize research techniques with a rotation through the laboratories/field settings within the

- area;
- c. develop expertise in and analyze laboratory/field techniques within the specialization;
- d. develop and evaluate knowledge and skills for teaching across the content of the area;
- e. participate in service activities appropriate to the area;
- f. analyze and evaluate ethical standards for teaching and research;
- g. demonstrate excellence in scholarly research by means of authoring a Ph.D. dissertation.

All university requirements for the Ph.D. (as listed in the *Bulletin*) will be met. These include: 1) appointment of a program of study committee, 2) the program of study, 3) credits required, 4) transfer credits allowed, 5) residency, 6) majors, 7) minors, 8) foreign language (none required), 9) time limits, 10) preliminary examination and 11) dissertation. A minimum of 72 semester hours of credit after the bachelor's degree must be completed in the Ph.D. program. Typical programs of study will more likely have between 80 and 90 semester hours of credit beyond the bachelor's degree to accommodate the needed cross- and inter-disciplinary knowledge base as well as the laboratory and clinical experiences.

Governance of the Ph.D. Program in HHP will be by the Ph.D. Executive Committee (EC) and a Program Director who reports to the Department DEO. The Director of the EC will be appointed by the Department DEO while the other four members will consist of two elected graduate faculty (one each from the biological and behavioral areas), one graduate faculty member appointed by the DEO, and one graduate faculty member appointed by the DEO from a related field outside of HHP. The Director will be appointed for a five-year term with the other members serving four years terms (set up so they are staggered). The EC will make decisions about admission and annual evaluation of Ph.D. students, recommendations to the Graduate School of Ph.D. mentors, approval of programs of study and doctoral committees, recommendations for financial support for: Ph.D. students, and serve as the review committee for any ethical issues involving Ph.D. students or faculty. The Director of the Ph.D. Program will be responsible for calling regular meetings of the EC, interfacing with the Graduate School reporting to the DEO and Graduate Faculty in HHP, keeping records for the Ph.D. Program, and advertising/recruiting/retention for the Ph.D. Program.

#### *7. Comparison of the proposed program with:*

- a. standards, if any, established by accrediting associations: none
- b. similar programs at other universities

There are no similar programs of which we are aware that emphasize the cross-disciplinary aspects of knowledge and skill to the degree proposed here. The Exercise Science Ph.D. Program at Arizona State University has some focus on cross-disciplinary knowledge but still maintains a very high degree of specialization in that most of the course work, laboratory activities, and research experiences are developed around the area of specialization. This proposal was developed because of a perceived need for a unique program to respond to a changing national/international environment. All of the top ranked programs in the study of physical activity (e.g., Arizona State University, Pennsylvania State University, University of Illinois, University of Texas) have multiple specializations where the preparation is in the narrow specialization. The University of Iowa also follows this model. Their materials about Ph.D. programs are exclusively focused on the development of the specialized area (e.g., exercise physiology or biomechanics or sport psychology, for example) and its connections to closely related knowledge. Its two related departments (Exercise Science; Sport Health, Leisure, and Physical Studies) show specialized preparation at the Ph.D. level in eight areas: administration of physical education and athletics, anatomy, athletic training, biomechanics, exercise physiology, motor control, sociology of sport, and psychology of sport. Also, a few programs are very general in orientation (practically no specialization), but these programs often lack a clear research focus. None of the existing doctoral programs develop a

conceptually broad area using cross- and inter-disciplinary preparation with specialized work within one of the sub-disciplines of that area.

8. *Program requirements, including*

(a) prerequisites for prospective students;

If the student's undergraduate/graduate degree is not in health and human performance, a sequence of courses representing the core of the study of physical activity must be completed (exercise physiology, biomechanics, sport/exercise psychology, motor behavior, socio-cultural and pedagogy)

(b) language requirements; **none**

(c) courses and seminars currently available for credit toward the program;

Master's level courses may be used in establishing coverage for the area

Biological Basis—Ex Sp 505, 510, 515, 516, 550, 551, 558

Behavioral Basis—Ex Sp 520,521,522,523,530,540,541,542,545,560,561,595

Ex Sp 500, 590, 591, 615, and 699 may be used as appropriate

(d) proposed new courses or modifications of existing courses

Biological Basis—New doctoral level courses (one each) in exercise physiology, and biomechanics

Behavioral Basis—New doctoral level courses (one each) in sport and exercise psychology, motor control/learning, motor development, pedagogy (both master's and doctoral level)

Across both areas-Three new doctoral level seminars, one on research, one on ethical issues in the study of physical activity, and one on faculty roles in higher education

(e) thesis and non-thesis options in master's program

If no thesis was done in the student's master's program, a research project that is equivalent must be completed before the qualifying exam. If the student enters without a master's degree, one must be completed (including a thesis) before the qualifying exam.

(f) implications for related areas within the university

Since the program will be small (we anticipate about 12-15 Ph.D. students maximum spread over 4-6 years of work), the implications for other academic units are not substantial. However, we anticipate Ph.D. students taking course work in departments that emphasize biology (e.g., chemistry and biochemistry, biomedical engineering, human nutrition, statistics, and zoology), as well as behavior (curriculum and instruction, human development and family studies, neuroscience, professional studies in education, psychology, and statistics).

(g) admission standards for graduate program

\* undergraduate degree from an accredited institution with at least a 3.0 GP A during the junior/senior years



- \* master's degree from an accredited institution with at least a 3.3 GPA (master's degree may be waived if the potential student has done an honor's thesis or published a research paper in a refereed journal as primary author; if the student is admitted without a master's degree, one will be earned along the way to the Ph.D. with a thesis required)
- \* acceptable GRE scores for verbal, quantitative, and analytical parts
- \* completed Graduate School Application and fee
- \* completed Departmental Application including designation of a potential Ph.D. mentor
- \* letter of intent (describes interest in field and background)
- \* letters (3) of recommendation

9. *General description of the resources currently available and future resources needs, in terms of:*

- (a) faculty members, including vitae and publications relating to the program;

Biological Basis of Physical Activity

*HHP Faculty*

Dr. Timothy Derrick, Asst. Prof.  
 Dr. Warren Franke, Assoc. Prof.  
 Dr. Doug King, Assoc. Prof.  
 Dr. Marian Kohut, Asst. Prof.  
 Dr. Scott McLean, Asst. Prof.  
 Dr. Rick Sharp, Assoc. Prof.

Behavioral Basis of Physical Activity

Dr. Dean Anderson, Professor  
 Dr. Rich Engelhom, Assoc. Prof.  
 Dr. Sharon Mathes, Professor  
 Dr. Katherine Thomas, Assoc. Prof.  
 Dr. Jerry Thomas, Professor  
 Dr. Galen Trail, Asst. Prof.

*Allied Faculty*

Dr. Donald Beitz, Professor of Animal Science/Biochemistry, Charles F. Curtis Distinguished Professor  
 Dr. Allison Flatau, Associate Professor of Aerospace Engineering and Engineering Mech.  
 Dr. Meg Gerrard, Professor of Psychology  
 Dr. Dan Hoyt, Associate Professor of Sociology  
 Dr. Murray Kaplan, Professor of Food Science & Human Nutrition  
 Dr. Patrick Patterson, Associate Professor of Industrial and Manufacturing Engineering  
 Dr. John Robyt, Professor of Biochemistry

*See Appendix A for Vitae*

The Department currently has several vacant lines. We would use these human resources to further strengthen our ability to offer the Ph.D. in ImP, In addition filling these lines will better distribute the undergraduate and master's work load as the Ph.D. is added.

- (b) effects of the new courses on the work load of the present staff;

While the addition of a Ph.D. program will certainly increase the work load of faculty, the program also strengthens the faculty ability to enhance other programs in the COE, University, and profession. The use of Ph.D. level graduate assistants will increase faculty effectiveness, particularly in the three required lab related science courses in HHP where the teaching and/or research assistants can supervise the laboratory activities of undergraduate students. Finally, the several currently vacant faculty lines will be used to better distribute the workload of the staff.

(c) research facilities;

Our current research facilities are excellent and suitable to support Ph.D. student work. Evidence for this can be found in external grant support as well as the quality of faculty publications and presentations. Next, the laboratories and general research lines followed are described.

### **Laboratory Facilities and Research Lines for Exercise Physiology**

The Exercise Physiology Laboratories are located in the Barbara E. Forker Building and consist of two exercise labs (2900 sq.ft. and 2100 sq.ft.), one biochemistry lab (700 sq.ft.), and a fitness center (7000 sq.ft.). The exercise labs contain ten Monark cycle ergometers, two Lode Excalibur electrically braked ergometers, two high speed treadmills, two computer controlled electrocardiographs, Biodex muscle strength testing apparatus, body composition (underwater weighing) tank, and two computer controlled metabolic measurement systems. The biochemistry lab is equipped with a Beckman DU-640 UV -VIS spectrophotometer, Farrand Ratio-2 fluorometer, refrigerated centrifuge, 16 cu ft ultra-low (-80 C) freezer, Cole-Parmer flame- photometer, Radiometer Blood Gas Analyzer, YSI Blood Glucose and Lactate Analyzer, Tissue Lyophilizer, Nanopure reagent water system, stainless steel fume hood, Packard Cobra II gamma counter, 6 ft sterile hood, ELISA microplate reader, electronic microbalance, pH meters, autoclave, cryostat, and three refrigerators. The fitness center contains a 10 station Kaiser pneumatic strength training system, treadmills, cycle ergo meters, stair-climbers, and aerobic dance floor.

Research areas pursued in these laboratories include metabolic and physiological studies of exercise in humans. Current research efforts include studies to understand the control of circulation with exercise, the role of exercise in maintaining functional abilities in the elderly, metabolism of novel dietary carbohydrates during exercise and their impact on health related metabolic indices, interactions between exercise and the immune system in maintaining human health, the impact of exercise on insulin secretion and insulin sensitivity, and endocrine factors regulating muscle strength responses during resistance training. These studies involve extensive human exercise testing including endurance capacity, strength, and body composition.

Circulatory responses to exercise are defined by measurements of blood pressure, cardiac output, limb blood flow by plethysmography, and 12-lead electrocardiography. Collection of blood and muscle tissue from subjects during exercise is frequently required as is subsequent biochemical analysis of these tissues. Muscle tissue is often used for measurements of metabolites that may accumulate in muscle during exercise and to define the direct impact of exercise and/or dietary interventions on both the quality and quantity of muscle. Procedures used in these analyses include histochemistry, microscopy, and enzymatic analysis of muscle metabolites and enzyme activities. Blood samples are often used for measurement of health markers including blood lipid profile, liver function indicators, circulating hormone concentrations, blood concentrations of immune system factors, and levels of metabolites and fuels that accumulate during exercise, Procedures related to these analyses include enzymatic analyses, radioimmunoassay, flame photometry, and ELISA.

Faculty also maintain collaborations with other departments to facilitate interdisciplinary research. Faculty have collaborated with the Department of Food Science and Human Nutrition in identifying nutritional interactions with exercise in determining human performance. Facilities available through this collaboration include the Human Nutrition Research Center housing a metabolic kitchen dual-energy x-ray analysis for measurements of body composition and bone health, and mass spectrometry for using

stable isotopes as metabolic tracers during exercise. Other collaborations have included departments of Biochemistry and Biophysics, Biomedical Sciences, Biomedical Engineering, and Psychology.

### **Laboratory Facilities and Research Lines for Biomechanics**

Facilities- The Biomechanics Laboratory (178N Forker) is a 1750 square foot facility renovated in 1995. The major pieces of laboratory equipment include a Peak Motus motion analysis system (Peak Performance Technologies Inc., Englewood, CO) including both video and real-time modules. Two Advanced Mechanical Technology Inc. (AMTI) force platforms are positioned centrally on an 8-m walkway in a below grade pit isolated from the building foundation. A Biopac Systems Inc. EMG system (Santa Barbara, CA) includes 8-channel capability with 4 channels of long-range (10 m) tethered equipment. Two Cybex II isokinetic dynamometers (Lumex, Inc, Ronkonkoma NY) are stationed in the laboratory for joint strength testing. An Exeter Research Impact Tester (Amherst, MA) used for materials testing is housed in the lab.

### Research Lines

*Sport Biomechanics.* This area has included projects from a variety of activities but has focused on the mechanisms underlying performance in swimming and vertical jumping. Specifically this research has focused on the effect of the use of an approach in starting/jumping on the segmental contributions to these activities. The application of this research has been the development of a new relay starting technique in competitive swimming. These projects rely on the use of the motion analysis system. Subjects are typically filmed and digitized using the motion analysis system to generate position vs. time data. From these data time-derivative data can be computed (velocity, acceleration, jerk) to provide the kinematic variables used for comparison. When possible (e.g., jumping) the force platform is used to provide kinetic data such as the impulse generated during the jumping movement or to compute joint kinetics (moments and power).

*Aging.* This research line has included the study of the relationship between exercise training, lower extremity strength characteristics, and the performance of activities of daily living (ADL). The two activities studied to date are the sit-to-stand (STS) movement and obstacle avoidance gait. Both of these activities are typically filmed to provide kinematic descriptors of the movements (position, velocity, acceleration, and jerk). The STS movement is performed with the subject in contact with the force platform to provide joint kinetic information (joint moments and power). Supplemental data collected include lower extremity strength measurements from the isokinetic dynamometers, EMG data during selected activities (e.g., STS movement and/or strength tests), and postural sway measurements using the force platform.

*Lower Extremity Function While Running.* This line of research concentrates on the potential for injury in the lower extremity while running. Several issues currently being investigated include: 1) How is shock transmitted through the body when the foot collides with the ground? 2) What effect do these shock waves have on the body? 3) What kinematic adjustments are made to reduce this shock? 4) How does the body adjust to various running surfaces? and 5) Do these adjustments cause asynchronous and potentially injurious activity between the knee and ankle joints? A battery powered portable data collection system controlled by a radio frequency transmitter has been developed for this research. The system collects data from two lightweight accelerometers attached to the leg and head as well as

electrogoniometers attached to the ankle and knee joints. These data can be collected as subjects run outside on normal running surfaces.

### Allied Research

The biomechanics lab has collaborated on numerous projects with colleagues from other disciplines and commercial companies. Within HHP our lab has provided facilities and expertise for physiology students who have used our EMG and strength testing equipment. Within the University we are very active in the Biomedical Engineering program. Our lab represents the only active biomechanics laboratory facility on ISU's campus. As such we often collaborate with BME faculty and students including Dr. Pat Patterson, the late Dr. Jeff Huston and their students. These projects have ranged from ergonomics to neural network design and have used our motion analysis systems, EMG system, force plates, accelerometers and treadmills. Outside the university we have collaborated with the University of Osteopathic Medicine and Health Science in Des Moines on gait analysis projects. The laboratory has established a working relationship with several companies: Fila USA (athletic shoes and inline skates), Hadar Inc. (athletic equipment for high schools) Frog Legs (manufacturer of polymer shock absorbers for wheelchairs), and Outdoor Technologies Group (manufacturer of golf club shafts and fishing poles). Several of these projects are partially sponsored by the Center for Advanced Technology Development.

### **Laboratory Facilities and Research Lines in Motor Behavior**

The Motor Learning Laboratory is a 1600 square foot room which houses both teaching and research functions. Research equipment included in the lab is:

- a. HP-Vectra-100mhz-computer running Lab Windows software for data collection and SPSS for statistical analysis;
- b. Mel 2.0 psychological experiment software for controlling and collecting data;
- c. Lafayette Instruments amplifiers and chart recorder for use with EMG data collection;
- d. Linear accelerometer with power supply and amplifier unit;
- e. Miscellaneous small equipment and instruments for various experimental control and data collection applications (power supplies, circuit boards, etc.).

The major research lines currently followed in the motor learning and control area are related to visual perception and muscular control aspects of catching and striking skills. Recent experiments related to the changes with learning that occur in coordination of elbow and wrist action during striking as well as the changes in timing and accuracy of the grasping response during catching. These experiments all use EMG and acceleration data as well as behavioral measures of performance accuracy.

The Motor Development Laboratory has a 150 square foot area for data collection with equipment for measuring fine hand-eye coordination in rapid timing tasks. A large and small digitizer are interfaced with computers (using Lab View software) that control and record movements coordinates as well as pressure.

Questions focus on the development across the lifespan of underlying motor control characteristics associated with various aspects of cognitive processing. Children of various ages as well as adults and the elderly are used as subjects to assess developmental differences.

In addition more clinically related programs are run with young children that related to both pedagogy and motor development. Facilities available for these projects are a small gymnasium and swimming pool as well as split-screen video technology to record movements. These programs look at the skill acquisition process as a function of practice using behavioral movement measures.

Cross-disciplinary work is done with biomechanics in the assessment of movements of children and the elderly. Interdisciplinary work is done with child development and developmental psychology.

(d) library facilities (journals, documents, etc.) In the proposed area;

*See Appendix B for Library Facilities*

(e) supplies, field work, student recruitment, etc.

Supplies for the laboratories and related areas are suitable as the research programs are well established.

Contacts and sites for field work (fitness, sport psychology, pedagogy, sport management, health promotion) are currently “in place” because these same types of sites are needed for undergraduate and master’s students. However, we anticipate having higher level activities available at these sites for Ph.D. students.

Student recruitment will include advertising in appropriate scholarly journals, newsletters, bulletins, and professional meetings. In addition we will develop a mailing list of appropriate institutions with the types of undergraduate and graduate programs for mailing brochures. We will specifically target Historically Black Institutions as well as Native American Institutions for mailings. We currently have a quality graduate brochure that we will revise upon approval of the Ph.D. program.

*10. Relationship of the proposed program to the strategic plans of the department, college, and the university.*

HHP had a program review in 1994 in which the development of a Ph.D. program was recommended similar to the one proposed here. Given the excellent undergraduate and master’s program currently in place, the sophistication and quality of the research laboratories, the excellence in scholarship, teaching, and service of the faculty, and the strong external academic units that provide support, development of a Ph.D. program is well within the capabilities of the Department. The graduate faculty are in complete agreement on the need and value of the program as proposed.

The College of Education (1996) under its Goal 1 targeted the graduate program in exercise and sport science as one to move toward national prominence. This proposal makes that move possible. In Goal 3 the COE proposed to strengthen research and scholarly productivity by faculty. This proposal supports that goal.

All of the Goals set by ISU in its Strategic Plan (1995-2000) will benefit from approval and implementation of this proposal. In particular Goal number 2--Strengthen graduate, professional, and research programs is supported by

- \*developing both basic and applied research relative to the study of physical activity;
- \*increasing quality, diversity, and numbers of graduate students;
- \*demonstrating strength in and the number of doctoral programs with national prominence especially related to science and technology;
- \*improving graduate students understanding of ethical, social, historical, environmental, and economic implications of science and technology;
- \*increasing interdisciplinary collaboration in research and graduate programs;
- \*increasing the number of faculty who are nationally and internationally recognized;
- \*increasing the quality and quantity of scholarship, research, and creative activity;
- \*enhancing programs for preparation of teaching assistants, community college teachers, and university educators;
- \* increasing the level and diversity of sources of funding for research.

Goals. 3-Strengthen outreach and extension efforts and 4.-Sustain and enhance an intellectually stimulating environment are both supported by this program particularly with regard to supporting the role of a land grant institution in providing sources of practical and applied knowledge. Finally, research on the value and benefits of physical activity support Goal 6 by enhancing human resources and the quality of life.

G.D. 3d  
ATTACHMENT

## Regents Program Review Questions—Majors

Ph.D. Degree, Major in Health and Human Performance

## 1. Need

A. How will this proposed program further the educational and curriculum needs of the students in this discipline?

A substantial demand exists for Ph.D.s in the field of health and human performance. Woods and Karp (1997) reported that the *Chronicle of Higher Education* listed 704 jobs in this field in higher education between September 1, 1992, and August 31, 1995, an average of 235 positions per year over a three year span. Not included in this analysis were the many jobs available in business and industry (e.g., exercise specialist, laboratory investigators) as well as supervisory positions in public and private schools. Estimates (King & Bandy, 1987; Spirduso & Lovett, 1987) are that 59 doctoral programs in this area produce between 175-225 doctorates per year, a number well under potential job demands. In addition programs are becoming increasingly specialized (King & Bandy, 1987; Spirduso & Lovett, 1987; Thomas, 1987, 1991) when the current and projected job market in many areas (Arwell, 1996; National Science Foundation, 1995) including health and human performance (Becker, 1991; Woods & Karp; Thomas, 1997) appears to favor more broadly prepared individuals.

The field of health and human performance makes essential contributions to knowledge and practice in the relation of exercise and movement to health and well-being. Extensive summaries of research on the influence of exercise and movement on biological (Bouchard, Shephard & Stephens, 1994) and behavioral (Singer, Murphey, & Tennant, 1993) well-being are available. Research on this relationship crosses socioeconomic, ethnic/racial, age, and gender distinctions. Preparing scholar/teachers with Ph.D.s who understand and contribute to the broad implications and benefits of exercise and movement is an important part of a land-grant institution that seeks to positively influence the health and well-being of citizens of Iowa and our nation.

The proposed program will prepare students in broader categories (biological and behavioral) of the study of physical activity so that they not only maintain a scholarly research focus, but also better meet the job market demands of most types of institutions. This preparation will result in a Ph.D. who is both an excellent scholar/teacher and understands the role of faculty citizenship in the various types of university cultures.

B. How does it further the educational and curriculum needs of other units in the college or university?

Instituting this Ph.D. in HHP will provide better balance to the College of Education as all four Departments will then have Ph.D. programs. This balance provides for better interaction among students and faculty in courses, advising, teaching, and research. In addition, some students in

G.D. 3d  
ATTACHMENT

other fields in the COE (e.g., pedagogy, learning, administration) may have direct interest in courses and research in related fields in HHP (e.g., pedagogy, motor learning, sport management).

Across the University community, a Ph.D. program in HHP will be of value to several areas including nutrition (relation of exercise and nutrition), biochemistry (relation of biochemistry in muscle and fat to more general biochemistry), engineering (relation to biomechanics), psychology (relation of motor development/control/learning to learning; relation of sport psychology to psychology). While HHP can call on these areas for support, we anticipate that many students in these areas will also seek out our courses and opportunities for research in our department.

2. A. What programs in this field of study are available in other colleges and universities in Iowa? Identification of other programs available in this field at other institutions should be made within a broad definitional framework. For example, such identification should not be limited to programs bearing the same title, the same degree designation, having the same curriculum emphasis, or purporting to meet exactly the same needs as the proposed program.

The University of Iowa has two Ph.D. programs in two Departments in the College of Liberal Arts that are related to the one proposed here. In the Department of Exercise Science, a Ph.D. is described with specializations in Anatomy, Athletic Training, Biomechanics, Exercise Physiology, and Motor Control. In the Department of Sport, Health, Leisure, and Physical Studies, a Ph.D. is described with specializations in athletic administration, cultural studies in sport and leisure, and psychology of sport.

- B. With what representatives of these programs have you consulted in developing this proposal? Provide a summary of the reactions of each institution consulted.

University of Iowa

The HHP Department Chair from ISU delivered a copy of the this proposal (see appendix for copy of the memo, 8/27/98) to the two individuals listed below (because there is a Ph.D. program in this area at the University of Iowa) and asked them to provide a written response. I received an email response from Dr. Jerry Maynard, Chair of the Department of Exercise Science, on December 11, 1998, and a fax response on December 18, 1998 from Dr. Bonnie Slatton, Chair of the Department of Sport, Health, Leisure, and Physical Studies. A summary of each is provided below (copies of the email and fax are in the appendix).

*Dr. Jerry Maynard, Department of Exercise Science*

Dr. Maynard indicates that the Department of Exercise Science does not object to the proposed program. He makes five points: 1) He does not share our philosophy that a broader based program is more desirable; but acknowledges that this disagreement does



G.D. 3d  
ATTACHMENT

not make him right and us wrong, simply that we disagree; 2) He suggests that the proposed program is similar to a discontinued Ph.D. at the University of Iowa that was more broadly focused; therefore, we may attract students not currently being served by programs in the State; 3) HHP at ISU is adequately equipped to support the program; laboratories are good and the addition of faculty lines enhances the overall departmental goals and mission; 4) The proposed program is sufficiently different from the UI exercise science program, probably because the programs are located in different Colleges with somewhat different missions; 5) The title for the degree is acceptable but UI would object if exercise science was used.

*Dr. Bonnie Slatten, Department of Sport, Health, Leisure, and Physical Studies*

The Department of SHLPS believes there is some overlap between the behavioral basis of physical activity in our proposed program and their specializations in sport psychology and cultural studies. However, they acknowledge that the programs differ by purpose and arrangement of some areas. They agree our program is focused on a broader basis of preparation while their program is more specialized in nature. They indicate their program is aimed at preparing scholars for positions at Research I universities and we agree. What we disagree on is their point that the type preparation offered in their program is equally effective for all types of university/college positions. That is exactly the point of the proposed program and evidence for its need can be seen in numerous ways already identified in the proposal (see page 1 of the Ph.D. Proposal document) and this BOR Questionnaire. In particular, the *Preparing Future Faculty* program funded by Pew and endorsed by the Council on Graduate Schools supports our position. SHLPS while disagreeing on the points listed, indicates that our faculty clearly merits involvement in a Ph.D. program.

University of Northern Iowa

The University of Northern Iowa does not have a similar program. However, the Department Chair of HHP mailed a copy of the proposal to Dr. Christopher R. Edginton, Director of the School of Health, Physical Education and Leisure Services at the University of Northern Iowa so they would be aware of the proposal. They have responded (see attached letter) and support the program.

- C. In what ways is this proposed program similar to those mentioned in A? In what ways is it different or does it have a different emphasis? In describing program similarities and differences, consider such factors as curriculum, prospective student groups to be served, and career or other types of goals to be emphasized.

The Ph.D. program proposed at ISU is similar to the two at the University of Iowa in that both

G.D. 3d  
ATTACHMENT

Focus on the study of physical activity. In addition similar requirements are expected for the selection and entrance of graduate students into the programs. The number of hours for completion of the degree is similar. Career goals for students from all of the programs are likely to center mostly on college and university positions with some opportunities in business/industry and school positions.

A major difference is in the broadness of the preparation of the Ph.D. While both of the University of Iowa Ph.D.s are focused on narrowly conceived specializations, the proposed program at Iowa State University is broader in its educational/research intent so that students will obtain cross-disciplinary (e.g., biomechanics and exercise physiology; pedagogy and motor behavior) and interdisciplinary (exercise physiology and physiology, sport psychology and psychology) within the two defined areas of work: Biological bases of physical activity and behavioral bases of physical activity. From a teaching perspective, the program at ISU intends to prepare the prospective Ph.D. to teach across the several cross-disciplinary areas within the defined area of work. This difference in preparation will also lead to different placement opportunities. As cited in the proposal itself and question 1 from the "Regents Program Review Questions," most of the jobs (over 82%) available in the field of the study of physical activity are for more broadly prepared individuals who can teach across more than one sub-disciplinary area. The HHP faculty at ISU believes meeting this current and projected need in the job market is important and the preparation described in the Ph.D. proposal will achieve this objective.

We are not suggesting that highly specialized Ph.D. programs are not needed; clearly opportunities exist for individuals with preparation such as that provided by the University of Iowa. However, we believe the data support substantial change in the profession and job market (as well as many other professions and job markets—see NSF report cited in the proposal) that emphasizes more broadly prepared teacher/scholars. This proposal meets that need.

- D. How does the proposed program supplement the current programs available? In some instances, this question should go beyond how the program will supplement others within the state. If the justification for the program involves special regional or national needs, a description of existing programs within the region or the nation and how the proposed program will relate to these should be provided.

Currently there are 59 doctoral programs in the study of physical activity in the U.S. They are divided into two types of Ph.D. programs (Spirduso & Lovett, 1987), those programs with a high degree of specialization (similar to the current programs at the University of Iowa) and those programs that are very general in nature (these have little impact nationally). Neither type of program is responsive to today's job market in our field (Wood & Karp, 1997) or more generally (Atwell, 1996). The proposed program is responsive to the need for scholars who have specialized preparation in support of their research, yet are teachers who can understand and promote student learning across more broadly conceived areas. Evidence suggests that currently existing Ph.D. programs in Iowa or across the U.S. are not meeting these current and projected

G.D. 3d  
ATTACHMENT

needs.

- E. Has the possibility of some kind of interinstitutional program or other cooperative effort been explored? What are the results of this study? Consider not only the possibility of a formerly established interinstitutional program, but also how special resources at other institutions might be used on a cooperative basis in implementing the proposed program solely at your institution.

Interinstitutional programs or cooperative efforts have not been explored. This situation is virtually untenable with Ph.D. students who often move families to the institution and do not have the resources to work between geographically separated institutions. While a semester of work at another institution might be possible with interested faculty and Ph.D. students as well as external sources of funding, this most often works effectively when these contacts are initiated by faculty and students rather than being mandated by joint programs.

3. Please estimate the enrollment in the program (for the next five years) as follows:

A. Undergraduate Majors—N/A

B. Graduate Majors

<u>4</u>	<u>8</u>	<u>12</u>	<u>12-15</u>	<u>12-15</u>
1999	2000	2001	2002	2003

C. On what basis were these estimates made?

We plan a small program that takes in about 3-4 new full-time Ph.D. students each year, has about a 4 year time-to-degree, thus graduating about 3-4 new Ph.D.s each year beginning in the 4<sup>th</sup> year of the program. The size and selectivity of the program will produce quality scholar/teachers who meet job demands and are marketable.

- D. What are the anticipated sources of these students? For example, persons currently enrolled in other programs within the institution; persons currently attending other institutions, in-state or out-of-state, persons not currently enrolled in institutions of higher education.

We anticipate seeking Ph.D. students from numerous sources. We expect some of our M.S. students in HHP to have an interest as will master's students from other programs on campus (e.g., nutrition, bioengineering, psychology, biological sciences). We will advertise to other institutions both in Iowa and in most other states. We specifically plan to recruit students from Historically Black, Hispanic, and Native American institutions. We will follow-up with current contacts at international institutions. We regularly receive calls about a Ph.D. program from interested students. Broadly based advertisement of the program in professional journals,

G.D. 3d  
ATTACHMENT

scholarly meetings, newsletters, graduate student services, and with a web-site all will contribute to developing an excellent and diverse pool of potential Ph.D. students from which to choose.

4. Please provide any available data or information on employment opportunities available to graduates of this program in Iowa and nationally.

A recent examination of the jobs in the study of physical activity that were advertised in the *Chronicle of Higher Education* was reported by Woods and Karp (1997). Their data indicated that during a three year period (1992-95) 704 jobs were advertised. Over 80% of these jobs were not in Research I or II institutions but in Doctoral I and II, Comprehensives, and Liberal Arts institutions. In the majority of the job descriptions, faculty were sought with broad teaching abilities across several areas as well as strong scholarly skills. The proposed Ph.D. program has been designed to specifically address this need. In addition, estimates are that the 59 doctoral programs in the U.S. are producing 175-225 graduates per year (Spiriduso & Lovett, 1987). Since we know that a substantial number of these Ph.D.s are not U.S. citizens, opportunities for a new Ph.D. program that addresses the needs of the profession and job market seem substantial.

5. Are there accreditation standards for this program? No

6. Does the proposed program meet minimal national standards for the program, e.g., Council of Graduate Schools or other such bodies? Yes

7. Please report any reaction of the Iowa Coordinating Council for Post-High School Education.  
N/A

8. Please list the Iowa institutions in which articulation agreements are being developed for the proposed program.  
N/A

9. Please estimate the probable marginal increases in the expenditure that may be necessary as a result of the adoption of this program for the next three years.

	Estimated (Incremental) Costs		
	First Year	Second Year	Third Year
A. Faculty	* see footnote		
B. Graduate Assistants	\$20,000**	\$30,000	\$40,000
C. General Expenses	\$ 1,000***	\$ 1,500	\$ 1,500
D. Equipment	\$ 0	\$ 0	\$ 0

			G.D. 3d ATTACHMENT
E. Library Resources	\$ 0	\$ 0	\$ 0
F. New Space Needs	\$ 0	\$ 0	\$ 0
G. Computer Use	\$ 0	\$ 0	\$ 0
H. Other Resources	\$ 0	\$ 0	\$ 0
Total	\$ 21,000	\$ 31,500	\$ 41,500

\*We currently have 6 faculty lines that are on budget but filled by part-time or temporary people. We plan to fill one at associate or full professor level (likely combining two positions) and 4 at assistant professor levels to enhance the Ph.D. proposal. While these strengthen the proposal, they are not listed as new resources.

\*\*We are requesting \$20,000 the first year with an incremental increase of \$10,000 in year two and three so that after 3 years the total is \$40,000 (see letter in appendix providing this support)

\*\*\*These are incremental increases

10. Describe the nature and justification for the additional resource needs.

Most of the funds are associated with increased needs for graduate assistantships. In addition to the funds requested over a three year period (essentially funding for 4 graduate assistants), the Department will add to this by reducing the number of M.S. students supported (from about 20 to about 15) and transferring these funds to support Ph.D. graduate assistantships. However, we have requested and had approved funds (see item 11 and letter in appendix) for two new graduate assistantships the first year and one additional graduate assistantship for the second and third years. The increase in General Expenses is associated with supplies for teaching as a result of the program.

11. How is it anticipated that the additional resource needs will be provided? (For programs planning to use external grants, what would be the effect of the grant termination?)

The letter in the appendix indicates that these additional resources have been agreed to by the Dean of the College of Education and Dean of the Graduate School. The Department will provide the additional resources for supplies. Also, we do expect to obtain resources beyond these from grant and contract activities, the program will not be dependent on these funds, just enhanced by them.



G.D. 3d

MEMORANDUM

**To:** Board of Regents

**From:** Board Office

**Subject:** Proposal for a Ph.D. in Health and Human Performance in the College of Education at Iowa State University

**Date:** June 7, 1999

**Recommended Action:** Approve the Iowa State University proposal to establish a Ph.D. in Health and Human Performance (HHP) in the College of Education effective immediately.

Executive Summary:

Iowa State University is requesting approval of a Ph.D. in Health and Human Performance in the College of Education.

This proposal has been reviewed by the Board Office and the Interinstitutional Committee on Educational Coordination (ICEC) and both are recommending approval.

The proposed Ph.D. will have two tracks - Biological Basis of Physical Activity and Behavioral Basis of Physical Activity. The tracks are focused on cross-disciplinary and interdisciplinary knowledge about physical activity. Included in the Biological Basis is the development of cross-disciplinary knowledge and skills from exercise physiology, biomechanics, physical fitness, and health promotion as well as interdisciplinary work from biochemistry, nutrition, bioengineering, vet physiology, and biology. For the Behavioral Basis cross-disciplinary knowledge and skills are from motor behavior, physical education pedagogy, sport psychology, sport sociology, and sport management as well as interdisciplinary work from psychology, neuroscience, education, and sociology. Both tracks have appropriate statistical and methodology work. The premise underlying these two tracks is to develop a broadly based Ph.D. across a track with specialized research expertise in one of the topics listed within the track.

The Department currently appears to have a strong faculty qualified to offer the Ph.D. and five faculty positions (currently filled with temporary appointments) will be hired over the next 2-3 years. In addition a number of faculty in other academic units do interdisciplinary work with faculty and students in HHP. These faculty have agreed to participate in the program. Laboratories, clinical settings, internships, and teaching facilities to support the program are considered to be of

Post-It™ brand fax transmittal memo 7671		# of pages	10
To	Jerry Thomas	From	Sage Mikulak
Co.		Co.	
Dept.	HHP	Phone #	4-9550
Fax #	4-8747	Fax #	4-8844

high quality. Assistantships will be available for Ph.D. students from existing departmental and grant resources.

Highlights:

- Iowa State University is requesting approval of a Ph.D. in Health and Human Performance in the College of Education.
- The University lists the need for this program as follows:
  - 1). National trends in preparing Ph.D.s suggest that programs are becoming very specialized so that new doctorates are not effectively prepared to function in the jobs found in higher education, business and industry (National Science Foundation, June 5-6, 1995). Often Ph.D.s are prepared for life in research universities, while most of the jobs are in other types of institutions. This same effect is found in Ph.D. programs in HHP. The HHP proposal seeks to combine the benefits of a broadly conceived area of preparation with a more specialized research emphasis.
  - 2). A survey of jobs in HHP from the *Chronicle of Higher Education* (1992-95) reported that of 704 jobs evaluated, only 15% were at Research I and II institutions with the remaining jobs being in Doctoral, Regional, and Liberal Arts colleges/universities. When the job descriptions were evaluated, nearly all the positions were seeking broadly prepared faculty, who could teach in more than on specialized area. The HHP proposal will directly address this problem.
  - 3). The average number of jobs in HHP each year in higher education (based on the Chronicle data) is about 235 (excluding opportunities in public education, business, industry, and research). Estimates are that only between 175-225 new Ph.D.s are produced each year (a significant number of whom are international) by the 59 Ph.D. programs in the U.S. The HHP proposal will add about 3-5 new Ph.D.s per year to that total when the program is fully implemented. In addition, the Ph.D.s from this program should be more effectively prepared to respond to current and future market conditions.
  - 4). Of the 10 institutions considered peers for Iowa State University, seven have doctoral programs in HHP (Illinois, Michigan State, Minnesota, Ohio State, Purdue, Texas A&M, and Wisconsin). Within the College of Education at ISU, only HHP does not have a doctoral program. Approval of this program will allow HHP to become a more active and visible citizen with the University and professional communities.
- The proposed program meets the Board's criteria for new program approval.

- Attached are the University's responses to the Board of Regents questions for new program approval.
- The Interinstitutional Committee on Educational Coordination and the Board Office have reviewed the proposal and are recommending approval.

  
Robert J. Barak

Approved:

  
Frank J. Stork

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**Appendix B – Materials from Current & Former Students**

**Student Awards**

**Refereed Publications By Students**

**Research Presentations By Students**

**Letters of Support from Students**

## Student Awards

- 2003 **Neil Johannsen** has received the Gatorade Sports Science Institute student research grant award. Graduate-level research projects in the general areas of exercise physiology, energy metabolism or sports nutrition are eligible for funding on a competitive basis through the Institute.
- 2002 **Greg Brown** received The Zaffarano Prize for Graduate Student Research. This award is given annually by the ISU Vice Provost for Research and Advanced Studies to recognize superior performance in publishable research by a graduate student at ISU.
- 2002 **Greg Brown** received the ISU Research Excellence Award. The purpose of these awards is to recognize graduate students for outstanding research accomplishments as documented in resulting theses and dissertations. These students are also expected to be academically superior and able to not only do research, but develop a well-written product.

## Papers in Peer-Reviewed Journals and Books (Ph.D. student names in **bold**)

### 2004

**Lowry KA**, Smiley-Oyen AL & Gallagher JD. Differences in walking balance in persons with and without Alzheimers disease. In Review.

Thomas, J.R., Gallagher, J.D., & **Lowery, K**. Sport expertise: A meta-analysis. *Journal of Sport and Exercise Psychology*. In review.

**Hernandez JP**, Franke WD. Age- and fitness-related differences in limb venous compliance do not affect orthostatic tolerance. *Journal of Applied Physiology*. In review.

**Hernandez JP**, Karandikar A, Franke WD. Effects of age and fitness on tolerance to lower body negative pressure. *Journal of Gerontology Biological Sciences and Medical Sciences*. In review.

Franke WD, Lee K, Buchanan DB, **Hernandez JP**. Blacks and whites differ in responses, but not tolerance, to orthostatic stress. *Clinical Autonomic Research*. In press.

Welk, G.J., and **Schaben, J.A**. Psychosocial correlates of physical activity in children: A study of relationships when children have similar opportunities to be active. *Measurement in Exercise Science and Physical Education*. In press.

Welk, G.J., Babkes, M., and **Schaben, J.A**. Parental Influence in Youth Sports. In: R. Malina and M Coelho-Silva (Eds). *Biosocial Approach of Youth Sports*. In Press.

Derrick, T.R. and **Thomas, J.M**. Time-Series Analysis: The cross-correlation

function. In: *Innovative Analyses of Human Movement*, Stergiou, N. (ed). Human Kinetics Publishers, Champaign, Illinois, 189-205, 2004.

### 2003

Franke WD, Mills KK, Lee K, **Hernandez JP**. Training mode does not affect orthostatic tolerance in chronically exercising subjects. *European Journal of Applied Physiology*. 89:263-270, 2003.

**Hernandez JP**, Nelson-Whalen NL, Franke WD, McLean SP. Effects of age on maximal and submaximal expressions of the bilateral deficit. *Journal of Gerontology Biological Sciences and Medical Sciences*. 58:M536-541, 2003.

**Johannsen N**, Binkley T, Englert V, Neiderauer G, and Specker BL. Bone response to jumping is site-specific in children: A randomized trial. *Bone* 33:533-539, 2003.

Kohut ML, Thompson JR, Campbell J, **Brown GA**, Vukovich MD, Jackson DA, King DS. Ingestion of a dietary supplement containing dehydroepiandrosterone (DHEA) and androstenedione has minimal effect on immune function in middle-aged men. *Journal of the American College of Nutrition*. 22(5): 363-371, 2003.

Specker BL, **Johannsen N**, Binkley T, and Finn K. Total body bone mineral content and tibial cortical bone measures in preschool children. *Journal of Bone Mineral Research*. 12:2298-2305, 2003.

**Thomas, J.M.** and Derrick, T.R. The effects of step uncertainty on impact peaks, shock attenuation, and knee/subtalar synchrony while running on a treadmill. *Journal of Applied Biomechanics*. 19:60-70, 2003.

### 2002

Finn K, **Johannsen N**, and Specker B. Factors associated with physical activity in preschool children. *Journal of Pediatrics*. 140(1):81-85, 2002.

**Brown GA**, Martini ER, Roberts BS, Vukovich MD, King DS. Acute hormonal response to sublingual androstenediol intake in young men. *Journal of Applied Physiology*. 92(1): 142-146, 2002.

### 2001

**Brown GA**, Vukovich MD, Martini ER, Kohut ML, Franke WD, Jackson DA, King DS. Effects of androstenedione-herbal supplementation on serum sex hormone concentrations in 30- to 59-year-old men. *International Journal of Vitamin Nutrition Research*. 71(5): 293-301, 2001.

**Brown GA**, Vukovich MD, Martini ER, Kohut ML, Franke WD, Jackson DA, King DS. Endocrine and lipid responses to chronic androstenediol-herbal supplementation in 30 to 58 year old men. *Journal of the American College of Nutrition*. 20(5): 520-528, 2001.

## 2000

**Brown GA**, Vukovich MD, Martini ER, Kohut ML, Franke WD, Jackson DA, King DS. Endocrine responses to chronic androstenedione intake in 30- to 56-year-old men. *Journal of Clinical Endocrinology and Metabolism*. 85(11): 4074-4080, 2000.

**Brown GA**, Vukovich MD, Reifenrath TA, Uhl NL, Parsons KA, Sharp RL, King DS. Effects of anabolic precursors on serum testosterone concentrations and adaptations to resistance training in young men. *International Journal of Sport Nutrition and Exercise Metabolism*. 10(3): 340-359, 2000.

## 1999

**Brown GA**, Vukovich MD, Sharp RL, Reifenrath TA, Parsons KA, King DS. Effect of oral DHEA on serum testosterone and adaptations to resistance training in young men. *Journal of Applied Physiology*. 87(6): 2274-2283, 1999.

King DS, Sharp RL, Vukovich MD, **Brown GA**, Reifenrath TA, Uhl NL, Parsons KA. Effect of oral androstenedione on serum testosterone and adaptations to resistance training in young men: a randomized controlled trial. *Journal of the American Medical Association*. 281(21): 2020-2028, 1999.

### Research Presentations/Abstracts of Current Students

## 2004

**Johannsen, N.** & R.L. Sharp. Effect of pre-exercise ingestion of modified cornstarch on metabolism during endurance exercise. Submitted to American College of Sports Medicine, Indianapolis, IN. June, 2004.

**Lee, D.** & K.L. Armstrong. An examination of the self-motives, the social-motives, and the team-motives as factors that influence the consumption of televised sports. Submitted to the North American Society of Sport Management. Atlanta, GA. June, 2004.

**Lee, D.** & K.L. Armstrong. Gender influence on the consumption of televised sports. Submitted to the North American Society of Sport Management. Atlanta, GA. June, 2004.

**Thomas, J.M.**, T.R. Derrick, and J.C. Gillette. The effect of knee angle at contact on impacts while running off a raised platform. Submitted to American College of Sports Medicine. Indianapolis, IN. June, 2004.

Derrick, T.R., T.J. Tauber and **J.M. Thomas**. Frequency distribution of leg impacts during daily activity and exercise. Submitted to American College of Sports Medicine. Indianapolis, IN. June, 2004.

**Wickel, E.** Adolescent aerobic fitness and adult cardiovascular disease risk factors: the Aerobic Center Longitudinal Study. Submitted to American College of Sports Medicine. Indianapolis, IN. June, 2004.

**Wickel, E.** Relationship between adolescent fatness and adult cardiovascular disease risk factors: the Aerobics Center Longitudinal Study. Submitted to American College of Sports Medicine. Indianapolis, IN. June, 2004.

**Wickel, E.** The effect of floor slope on maximal acceptable weight of lift. Submitted to Rocky Mountain Biomechanical Symposium. Fort Collins, CO. July, 2004.

**Ihmels, M.** The reliability and convergent validity of field tests of body composition in children. Submitted to American College of Sports Medicine, Indianapolis, IN. June, 2004.

**Schaben, J.A., R. Joens-Matre, L.D. Hensley, & G.J. Welk.** The predictive utility of the children's physical activity correlates (CPAC) scale across multiple grade levels. Submitted to American College of Sports Medicine. Indianapolis, IN. June, 2004

**J.P. Hernandez, A. Karandikar, K.E. Allbee, W.D. Franke.** Effects of age and fitness on tolerance to lower body negative pressure. Submitted to American College of Sports Medicine. Indianapolis, IN. June, 2004.

**J.P. Hernandez, W.D. Franke.** Effects of a 6-month endurance training program on limb venous compliance and orthostatic tolerance in an older population. Southern Gerontological Society. Atlanta, GA. 2004.

**Lind, E., R.R. Joens-Matre, & P. Ekkekakis.** Small changes, big differences: Affective responses during exercise of self-selected and imposed intensity. North American Society for the Psychology of Sport and Physical Activity. Vancouver, British Columbia, Canada. 2004.

**Joens-Matre, R.R., E. Lind & P. Ekkekakis.** BMI, social physique anxiety, and affective responses to physical activity in sedentary, middle-aged women. Submitted to American College of Sports Medicine. Indianapolis, IN. June, 2004.

**Lind, E., R.R. Joens-Matre, & P. Ekkekakis.** From art to science: Predicting self-selected exercise intensity from self-reported individual differences in intensity preference. Submitted to American College of Sports Medicine. Indianapolis, IN. June, 2004.

## 2003

Franke, W.D., D.B. Buchanan, K. Lee, **J.P. Hernandez.** Blacks do not have improved LBNP tolerance compared to whites. American College of Sports Medicine. San Francisco, CA. 2003.

**Hernandez, J.P., W.D. Franke.** Effects of age and fitness level on calf venous compliance and orthostatic tolerance. American College of Sports Medicine. San Francisco, CA. 2003.

Smiley-Oyen, A.L. & **K.A. Lowry.** Changes in rapid aiming with practice in people with Parkinson's disease. North American Society for the Psychology of Sport and Physical Activity, Savannah, GA. 2003.

**Joens-Matre, R.R., E. Lind & P. Ekkekakis.** Social physique anxiety and body mass index moderate affective responses during exercise. Cooper Institute Conference: "Physical activity and mental health: A multidisciplinary approach". Dallas, TX. 2003.

**Joens-Matre, R.R., E. Lind & P. Ekkekakis.** Exercise intensity and affective responses in sedentary middle-aged women. North American Society for the Psychology of Sport and Physical Activity. Savannah, GA. 2003.

**Lind, E., R.R. Joens-Matre, & P. Ekkekakis.** Selection of exercise intensity by formerly sedentary middle-aged women: A psycho-physiological perspective. American College of Sports Medicine. San Francisco, CA. 2003.

**Hindawi, O.S.,** Thomas, K.T., Smiley-Oyen, A, Engelhorn, R., & Thomas, J.R. Developmental changes in cognitive and motor time. American Alliance for Health, Physical Education, Recreation and Dance. Philadelphia, PA, 2003.

Thomas, J.R., Gallagher, J.D., & **Lowry, K.** Sport expertise: A meta-analysis. Senior Scholar Lecture (invited). North American Society for Psychology of Sport and Physical Activity. Savannah, GA, 2003.

Welk, G.J., **J.A. Schaben.** Physical fitness and perceived competence in home school and public school children. American College of Sports Medicine. San Francisco, CA. 2003.

**Schaben, J.A.** and G.J. Welk. Psychosocial correlates of physical activity in home school and public school children. American College of Sports Medicine. San Francisco, CA. 2003.

## 2002

**Hernandez, J.,** W.D. Franke. Physical predictors of orthostatic tolerance: does size matter? American College of Sports Medicine. St. Louis, MO. 2002.

**Lowry, K.A.,** A.L. Smiley-Oyen & J.D. Gallagher. Differences in walking balance in Alzheimer's disease. North American Society for the Psychology of Sport and Physical Activity. Baltimore, MD. 2002.

**Joens-Matre, R.R., & P. Ekkekakis.** Can short walks enhance affect in older adults? North American Society for the Psychology of Sport and Physical Activity. Baltimore, MD. 2002.

**Thomas, J.M.** and T.R. Derrick. The effects of step uncertainty on impact peaks, shock attenuation, and knee/subtalar synchrony while running on a treadmill. The Fourth World Congress of Biomechanics, Calgary, Canada. 2002.

**Schaben, J.** and G.J. Welk. Predicting activity patterns when children have the same opportunity to be active. American College of Sports Medicine. St. Louis, MO. 2002.

## 2001

**Hernandez, J.P.,** N.L. Nelson, W.D. Franke, S.P. McLean. Bilateral index expressions and

iEMG activity in elderly vs young adults. American College of Sports Medicine. Baltimore, MD. 2001.

**Thomas, J.M.** and T.R. Derrick. The effects of step uncertainty on impact peaks, shock attenuation, and knee/subtalar synchrony while running on a treadmill. Midwest Graduate Students' Biomechanics Symposium. Milwaukee, Wisconsin. 2001.

## **2000**

**Johannsen, N.** Total body bone mineral content (TBBMC) and parameters of bone size of 3 and 4 year old children. Federation of the American Societies of Experimental Biology. San Diego, CA. 2000.





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Friday, January 16, 2004

To whom it may concern,

I had the privilege of being the first doctoral student admitted to and to graduate from the Department of Health and Human Performance at Iowa State University. The vision of doctoral level graduate education developed by Drs Jerry Thomas, Rick Sharp, and the rest of the faculty in the Department of Health and Human Performance at Iowa State University is an effective model for the preparation of future faculty members. My experiences as a student were superb and prepared me extremely well for a career in higher education.

The faculty within the Iowa State University Department of Health and Human Performance are very thorough in their training of doctoral students, and allow a student to have as many experiences preparatory for an academic career as possible. Students are encouraged to serve on departmental and university committees preparatory for similar service in a faculty position. A student's teaching duties are gradually progressed from occasional guest lecturer and laboratory instructor to principal instructor, so that classroom skills can be developed and honed under the guidance of experienced and respected professors. Students are also prepared to teach many classes in the field of Health and Human Performance and not just within a narrow specialization.

As a graduate student in the Department of Health and Human Performance at Iowa State University, I worked very closely with my faculty mentor Douglas S. King, Ph.D. to fully develop my teaching skills. Upon completion of my graduate education, I was confident in my teaching abilities, had developed effective classroom skills, and had a well prepared set of course notes and exam materials for many of the classes I would be teaching. Indeed, the transition from a graduate teaching assistant to an assistant professor was as seamless as one could possibly expect.

My research training was far superior to that experienced by most of my contemporaries who were enrolled in more established doctoral programs. While at Iowa State, I earned the top research award available to graduate students at Iowa State (*The Zaffarano Prize for Graduate Student Research*) and received research honors at graduation. Upon graduation in August 2002, I was author



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or coauthor on 7 peer-reviewed publications in high quality Index Medicus referenced journals. I have since authored or coauthored 3 additional manuscripts associated with data collected as a graduate student, and there are still several manuscripts waiting to be written. The faculty in the Department of Health and Human Performance at Iowa State University (most notably my mentor, Dr King) ensured that I had ample opportunities to present my research at local, national, and international conferences. Indeed, my research training was so outstanding that when I was searching for a faculty position near the completion of my graduate education, I was competitive with people who had spent several years in postdoctoral research positions.

In summary, my doctoral training in the Department of Health and Human Performance at Iowa State University was excellent and prepared me thoroughly for a tenure track faculty position. When I was searching for a tenure track position I had my choice of positions at institutions ranging from small liberal arts colleges to major research extensive universities. I whole-heartedly support, and am evidence of the success of, the vision of doctoral education as it is practiced in the Department of Health and Human Performance at Iowa State University.

If I may be of an additional assistance in this matter, please feel free to contact me by mail, telephone, or email.

Sincerely,

A handwritten signature in cursive script, appearing to read "Gy Br".

Gregory A. Brown, Ph.D.  
Assistant Professor of Exercise Physiology  
Jiann-Ping Hsu School of Public Health  
Georgia Southern University  
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gabrown@GeorgiaSouthern.edu

January 10, 2004

To Whom It May Concern:

I am currently ABD in the Ph.D. program in the Health and Human Performance Department. This program has evolved into an excellent educational experience for students interested in Kinesiology. As I have begun searching for jobs, I have realized how well this program has prepared me to merge into the professional environment. That is one of the reasons I feel this is one of the highest quality programs in the field of Kinesiology. Many programs train students in one specific area with one specific focus. This program does a great job of giving us the specific training we need in our particular area of interest as well as broadening our knowledge base to encompass an understanding of many aspects of the field of Kinesiology. The end-all goal is not just to have the knowledge but to be able to integrate and share that knowledge with others. Therefore, they really strive to give all students a chance to share their knowledge by teaching courses of their own by the time they graduate. These are both essential for many jobs (especially with the recent budget cuts) which are looking for one person to be able to teach a variety of courses and understand how these courses overlap and integrate. In addition, we are able not only to say we can teach these courses, but we HAVE taught these courses.

Our program also does a great job of facilitating research collaboration for graduate students within the department. Whether behavioral or biological basis, you will often see graduate students collaborating and helping on projects that are not in their area of interest. A good example of this is the research that is taking place with Dr. Sharp as well as with Dr. Franke. Many graduate students are involved in the data collection and are learning important skills sets that they will be able to take with them. More specifically, we all have great opportunities for research experiences with our mentor and other great projects. We are definitely surrounded by excellent faculty which allows us to see a variety of great research endeavors.

In addition to our course work and research opportunities, the program also strives to prepare us for aspects of the profession that are not covered in regular courses, such as tenure and promotion, ethics in research, history of our field, critically reading research, grant writing, teaching philosophies and much, much more. These are covered during our seminar which also provides us with exposure to research areas other than our own and to share ideas. Another experience that all Ph.D. students will encounter is serving on a departmental or university committee. It is obvious to me that this program was very well created and is striving to develop the most prepared faculty for all facets of the job.

Programs like these are relatively few and far between. There is a high demand for programs like these to prepare students to be exceptional faculty members. No matter what type of program a student is interested in working, this program can train them to be the best. I highly recommend this program for continuation. It is imperative that we keep pushing this field to its limits and it is programs like this program that prepare students that can keep this field evolving.

Sincerely,



Jodee A. Schaben

To Whom It May Concern:

I am in my third year of the PhD program in Health and Human Performance at Iowa State University. I have been at Iowa State for five years including my Master's work. The first year of my Master's program was also the first year of the PhD program with Greg Brown as the inaugural student. Through my time here and my friendship with Greg I feel that I have seen the program from its inception. While the program had a few struggles in the initial stages, these would be inherent in any beginning program. The quality of the program has improved each year and I feel that it is equivalent to the upper tier programs around the country. As the program advances I am confident that it will continue to reach a level that places it among the top programs. The faculty members are well respected and knowledgeable in their respective fields, and they are able to instruct us as graduate students and help us to reach our goals.

The interest in the program has grown in the time I have been here. We began with a single student, and have added 2-3 students each year. There are now 12 students currently in the program working towards their PhD. The need for the program I feel is a strong one, especially with the situation we have here at Iowa State. We have strong faculty as mentioned before, along with great research facilities and an accomplished department chair. I feel that not having a doctoral program with these resources would be a waste of a wonderful opportunity.

It would be my recommendation that we continue the growth of the doctoral program at Iowa State University.

Josh Thomas

A handwritten signature in cursive script that reads "Joshua M. Thomas". The signature is written in dark ink and is positioned below the typed name.

January 16, 2004

To Whom It May Concern,

I am a 3<sup>rd</sup> year doctoral student in the Department of Health and Human Performance with a concentration in the biological basis of physical activity. Before attending ISU, I was practicing physical therapist of 15 years specializing in geriatric rehabilitation. I received my post professional master's degree in Kinesiology under the mentorship of Dr. Ann Smiley-Oyen at the University of Pittsburgh. Working with Dr. Smiley-Oyen not only advanced my knowledge of the neural basis of movement, it cultivated a desire to teach and pursue a research agenda. Towards the end of my master's degree, Dr. Smiley-Oyen accepted a position here at ISU, and I made the decision to move to the Midwest to continue my doctoral studies under her mentorship.

My career goal is to work in a Doctorate of Physical Therapy program where I can teach, continue my line of research, and maintain a limited clinical practice. The specific objectives of my doctoral studies to attain this goal are to increase my knowledge regarding neuromotor control, biomechanics, research methods and statistics, and issues in gerontology; to develop and initiate a research agenda in which gait and cognition are examined in the elderly; and thirdly, to develop my ability and skills in teaching. This doctoral program is fulfilling all three objectives. Coursework is available in the areas listed above; in addition, I have worked in several research labs and have gained additional experience in the areas of neuromotor control and biomechanics. Through work in the labs and work on my dissertation, I am establishing my research agenda. In addition, I have already gained experience in the classroom by teaching motor control labs for 5 semesters, as well as teaching this entire core course for a summer session. Thus, this program has helped me to develop as a teacher and as a researcher.

Programs around the country in physical therapy are currently transitioning from a master's degree to a doctorate degree. Critical to preparing faculty for these programs is a well-balanced doctoral program. Most institutions require their physical therapy faculty to teach in two main areas, as well as to be involved in productive, often cross-disciplinary research. The doctoral program in Health and Human Performance ensures this type of broad preparation by requiring students to participate in various research rotations and fostering research collaborations, by requiring coursework that demonstrates both depth and breadth within the department, and by providing teaching opportunities in various areas.

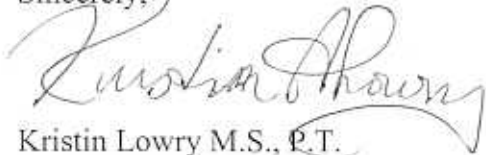
Thus, within the domain of physical therapy, there is a great need for this type of doctoral program. This program assists the physical therapy profession by helping students to develop as teachers, and by supporting research agendas that are relevant to clinical populations. In addition, the knowledge gained in human performance will directly impact treatment of patient populations.

Certainly this broad preparation is critical to not only the advancement of the physical therapy profession, but to all areas of study of human physical activity. The wide diversity of interests among the doctoral students demonstrates the need for a well-rounded program. This diversity fosters the integration of knowledge, and is motivating to me both personally and professionally.

The graduate faculty not only provide a superior curriculum, they provide a truly supportive environment for their students. They are excellent role models for how to balance research, teaching and community service. I am confident that my preparation from this program will allow me to achieve my career goals, and have recommended this program to other clinicians.

I am grateful to be here and be a part of this outstanding graduate program.

Sincerely,

A handwritten signature in cursive script that reads "Kristin Lowry". The signature is written in dark ink and is positioned above the printed name.

Kristin Lowry M.S., P.T.  
Department of Health and Human Performance



January 16, 2004

To Whom It May Concern:

I am a PhD student in the Health and Human Performance Department studying exercise physiology under the mentorship of Dr. Rick Sharp. Although I am only in my second semester, I feel I can still provide an accurate evaluation of our program because I have studied here for two years, have interacted with many of the professors in our department, and have had the opportunity to interact with many of the past and present PhD students. I commend the original founders for their patience and wisdom while researching and organizing the PhD program. I believe they were committed to establishing a program that would not only give the future professors an advantage over graduates from other universities by providing a multi-disciplinary education, but also research and teaching experience that exceeds the requirements for employment in research, clinical, and teaching institutions. The team of professors who established this program genuinely cared about the future of graduating PhD students.

The growth and expansion of the up-and-coming PhD program here at ISU is a tribute to the foresight and support of the current faculty and heads of the College of Education, Dean Walter Gmelch, and the Department of Health and Human Performance, Dr. Jerry Thomas. Since the inception of the program, the department has added multiple new faculty positions and expanded the number PhD students to 12 by adding an amazing collection of diverse students who match with the excellent new and existing faculty. This program's utilization of student and faculty diversity is excellent and will set an example to both existing and future PhD programs across the United States.

With a marked decrease in funding for university programs and a surplus of PhD students flooding the market, programs with an integrated, multi-disciplinary approach to education are in serious demand. With this said, I completely support the continuation of our program and feel it will inspire a change in existing programs and become one of the highest ranked curriculums in the nation. I am very appreciative to be a part of the Department of Health and Human Performance and hope that wherever I go after graduation, I will maintain contact with my mentors and fellow students and be an example to others of our great program.

Sincerely,



Neil Johannsen

**Appendix C – Support Letters from Employers of Former Students**

**Rick Carter (Chair, Georgia Southern University)**





JIANN-PING HSU SCHOOL OF PUBLIC HEALTH  
POST OFFICE BOX 8076  
STATESBORO, GEORGIA 30460-8076  
TELEPHONE (912) 681-0200  
E-MAIL: PH-office@georgiasouthern.edu

January 16, 2004

To Whom It May Concern:  
Iowa State University

**RE: Doctoral Program in Health and Human Performance**

The Graduate Program in *Health and Human Performance* at *Iowa State University* is relatively new and on track with fulfilling its mission and objectives. The program is well formulated and supported by an excellent faculty. There is a strong need to educate excellent scholars, researchers and clinicians in the area of Health and Human Performance. This statement is supported by the goals and objectives as articulated by such notable entities as the Surgeon Generals Healthy People 2010 and 2015 reports, the CDCs focus in chronic disease intervention, and the emerging health issues resulting from inactivity, overeating and ageing.

However, no review is complete without evaluation of the product produced. It has been my pleasure to work with the first of Iowa State's Doctoral graduates in Health and Human Performance, Dr. Greg Brown. I have found Greg to be knowledgeable, articulate, energetic, and well positioned for academia as an assistant professor. All faculty at Georgia Southern University are evaluated in three domains: teaching, research and service. Greg has performed well in each area. These accomplishments reflect the educational pathway chosen by Greg and acknowledge the program of study delivered by Iowa State University and the Department of Health and Human Performance. Greg is now positioning himself for expanded grant procurement, extending his teaching and communication skills while establishing himself as an ongoing member of the tenure track faculty.

In summary, I find that Iowa State's Department of Health and Human Performance has achieved many milestones in their short yet very productive tenure at the doctoral level. The product they produce is needed to meet the demands of society.

In closing, please feel free to contact me anytime regarding this recommendation or other areas I may be able to assist with.

Sincerely,

A handwritten signature in cursive script that reads "Rick".

Rick Carter, PhD., MBA  
Chair and Professor

**Appendix D – Support Letters from within ISU**

**Suzanne Hendrich (Associate Dean, FCS)**

**Peter Martin (Professor, Gerontology)**

IOWA STATE UNIVERSITY  
OF SCIENCE AND TECHNOLOGY

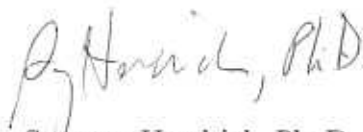
College of Family and Consumer Sciences  
Associate Dean for Undergraduate Programs  
and Educational Technology  
124 MacKay Hall  
Ames, Iowa 50011-1120  
515 294-5981  
FAX 515 294-0100  
E-mail shendric@iastate.edu

Rick L. Sharp, Ph.D.  
Professor & Graduate Coordinator  
Department of Health & Human Performance  
Iowa State University  
250 Barbara E. Forker Building  
Ames, IA 50011

Dear Rick,

I am writing in support of the Ph. D. program in Health and Human Performance. I have served as external member of the program's supervisory committee since the program's inception, and can attest to the rigor of the program's admissions policies. Only very able students have been accepted to the program, according to their GRE scores, grades and letters of recommendation, students comparable in qualifications to students accepted into other well-regarded graduate majors at ISU (e.g., nutritional sciences). The program enrollment seems adequate for the number of faculty participating, with 2 Ph. D. graduating so far; reasonable progress in 5 years. I can also attest to the level of dedication and interest of graduate faculty in participating in this major. There is considerable competition among faculty members for the students who are accepted. The faculty members of this program are doing a good job of finding external grant support for assistantships, and are showing a good linkage between their scholarly activities and the success and productivity of graduate students in this program.

Sincerely,



Suzanne Hendrich, Ph. D.  
Professor, Food Science and Human Nutrition  
Associate Dean

IOWA STATE UNIVERSITY  
OF SCIENCE AND TECHNOLOGY

Gerontology Program  
1096 LeBaron  
Ames, Iowa 50011-1120  
515 294-5186  
FAX 515 294-1765  
E-mail: pxmartin@iastate.edu

February 10, 2004

Rick L. Sharp, Ph.D.  
Professor & Graduate Coordinator  
Department of Health & Human Performance  
Iowa State University  
250 Barbara E. Forker Building  
Ames, IA 50011

Coordinator:  
Peter Martin

Advisory Committee:  
Lee Alekel  
Karen Bermann  
Christine Cook  
Mary Lynn Damhorst  
Warren Franke  
Nancy Meredith  
Dan Russell  
Ann Smiley-Oyen

Dear Dr. Sharp:

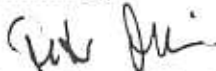
It is a pleasure to write a letter in support of the Ph.D. program in the Department of Health and Human Performance. The program is very strong indeed and deserves to continue and expand.

As the director of the Gerontology Program and as a faculty member at Iowa State University I have had the opportunity to work with different faculty members and graduate students from Health and Human Performance. I have been impressed with the progress the program has made and with the high quality of doctoral students and their work. Faculty members in the department skillfully mentor an ambitious and enthusiastic group of graduate students who develop first-rate dissertations. Student professional presentations are of very high quality, and I have no doubt that most doctoral students will enter academic careers in Health and Human Performance. Several student/faculty publications have been published in top gerontology journals.

Faculty and graduate students have also played an important role in the Gerontology Program. As part of a larger interdepartmental team, important grant proposals were developed, and students regularly participate in our seminar and colloquium series.

All these activities are clear evidence that the doctoral program in Health and Human Performance has had a significant impact in a short amount of time. I have no doubt that the program will build on this very firm foundation and will become a leading program of its kind. I support this program wholeheartedly and without any reservation.

Sincerely,



Peter Martin, Ph.D.  
Director

**Appendix E – Revenue Generated in Connection with Ph.D. Program**

**Research Grants and Gifts**

## Grants

- 1999 Iowa Dept. of Education. "Team Nutrition Demonstration". PI: K. Thomas. \$163,972.
- 1999 Experimental and Applied Sciences. "Androstenedione". PI: D. King and R. Sharp. \$122,000.
- 1999 Cerestar USA. "Glycemic Responses to Ingestion of Acid/Alcohol Modified Starches". PI: R. Sharp. \$34,113.
- 1999 Iowa Dept. of Public Safety. "Cardiovascular Disease Risk in Law Enforcement Personnel". PI: W. Franke. \$72,000/yr.
- 2000 Cerestar USA. "Metabolic Responses to Ingestion of Acid/Alcohol Modified and Thin-Boiled Starch During Prolonged Exercise." PI: R. Sharp. \$69,625.
- 2000 United States Department of Agriculture (Center for Designing Foods to Improve Human Nutrition). "Optimizing the Food Guide Pyramid to Enhance Fat Oxidation." PI: Doug Lewis (FSHN) and R. Sharp. \$38,928.
- 2000 Iowa Dept. of Public Safety. "Cardiovascular Disease Risk in Law Enforcement Personnel". PI: W. Franke. \$72,000/yr.
- 2001 National Institutes of Health. "Cerebellar Dysfunction And Reach To Grasp Movements". PI: J. Bloedel and A. Smiley-Oyen. \$79,200.
- 2001 Nyvatex Corporation. "Effect of Non-Linear Electric Fields on Immune Cell Number and Function". PI: M. Kohut. \$66,136.
- 2001 United States Department of Agriculture (Center for Designing Foods to Improve Human Nutrition). "Postprandial Digestion, Glycemic Response, Utilization, and In-Vivo Fatty Acid Synthesis from Acid-Alcohol Modified High-Amylose Corn Starch. PI: M. Kaplan (FSHN) and R. Sharp. \$30,296. Collaborator: Murray Kaplan (Food Science & Human Nutrition).
- 2001 Iowa Dept. of Public Safety. "Cardiovascular Disease Risk in Law Enforcement Personnel". PI: W. Franke. \$72,000/yr.
- 2002 The Cooper Institute. "A School Based Pedometer Challenge". PI: G. Welk. \$33,247.
- 2002 National Institutes of Health. "Motor Learning and Transfer in Parkinson Disease and Cerebellar Dysfunction". PI: J. Bloedel and A. Smiley-Oyen. \$73,000.
- 2002 Grain Processing Corporation and Center for Advanced Technology Development. "Metabolic Responses to Ingestion of Acid/Alcohol Modified Starches." PI: R. Sharp. \$72,569.

- 2002 National Institute of Health. "Exercise and Influenza Immunity: A Psychoneuroendocrine Model". PI: M. Kohut. \$323,325.
- 2002 National Institute of Health. "Center for Research on Botanical Dietary Supplements". PI: D. Birt (FSHN) and M. Kohut. \$108,050.
- 2002 Iowa Department of Education and USDA. "Team Nutrition Training Grant III". PI: K. Thomas. \$42,872.
- 2002 Iowa Dept. of Public Safety. "Cardiovascular Disease Risk in Law Enforcement Personnel". PI: W. Franke. \$72,000/yr.
- 2003 National Institute of Health. "Evaluation of Occupational Carrying Tasks for Farm Youth". PI: T. Derrick and J. Gillette. \$255,500.
- 2003 National Institutes of Health. "Affect and Physical Activity in Sedentary Adults". PI: P. Ekkekakis. \$73,000.
- 2003 Iowa Dept. of Public Safety. "Cardiovascular Disease Risk in Law Enforcement Personnel". PI: W. Franke. \$72,000/yr.
- 2004 Campbell Soup Company. "Rehydration and Subsequent Exercise Tolerance". PI: R. Sharp and D. King. \$99,100.
- 2004 Iowa Dept. of Public Safety. "Cardiovascular Disease Risk in Law Enforcement Personnel". PI: W. Franke. \$72,000/yr.
- 2004 Iowa Department of Education and USDA. "Team Nutrition Training Grant". PI: K. Thomas. \$ 20,890/yr

Gifts

- 2000 Sharon Mathes Scholarship to support female graduate student in Behavioral Basis of Physical Activity. Expendable: \$2,000/yr.
- 2000 Betty Keenan Graduate Student Support to fund travel expenses of graduate students presenting research at professional meetings. Expendable: \$1500/yr.
- 2001 Barbara E. Forker Scholarship to fund tuition and or travel expenses for graduate students. Expendable: \$1200/yr.
- 2002 Dyslin Family Scholarship to fund tuition expense for graduate student. Expendable: \$1200/yr.