Research, Measurement, and Evaluation Program

Department of Educational and Psychological Studies

UNIVERSITY
OF MIAMI
SCHOOL of EDUCATION

Research, Measurement, and Evaluation Program

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"Putting Methods into Practice"

Objectives of the M.S.Ed and Ph.D. Programs

The objective of the Research, Measurement, and Evaluation Program (RME) is to train individuals to become experts in the research methodology, measurement, and applied statistics used in conducting applied research, evaluations, and assessments related to educational, psychological, and health outcomes. Graduates of the program have obtained skills concerning: (a) how to design research studies and evaluations, (b) what statistical and measurement analyses must be conducted to answer the desired research questions, and (c) how to analyze the collected data using appropriate statistical software. An emphasis of the program is on gaining experience in the application of the relevant methodologies using real-world data examples.

The RME program has three primary faculty involved in teaching the core course sequences and mentoring graduate students. Program faculty includes Dr. Soyeon Ahn, Dr. Nicholas Myers, and Dr. Cengiz Zopluoglu. These faculty members specialize in the areas of measurement, evaluation, and research methodology. Because our faculty are also engaged in research advancing the methodology in these areas, which are directly related to the courses they teach, students enjoy a classroom experience that includes in-depth coverage of material, often with applications to real-world data examples stemming from the professor's own research and consultation work.

RME Master's of Science in Education objectives

The M.S.Ed. program provides individuals with the requisite competencies to serve as a data analyst, research coordinator, and measurement advisor in a variety of professional settings such as federal, state, and county boards of education, universities and agencies conducting publicly and privately funded research projects related to education and other behavioral sciences, and public and private testing agencies.

The 30-credit program is comprised of eight core courses (24 credits), plus two elective courses (6 credits), which are selected according to students' educational and career goals and approved by their advisors. Courses are generally offered in the evenings and the program can be completed within one year of full-time study. Graduates find career opportunities as test directors in school districts, contributors to research in universities, measurement specialists or data analysts in personnel departments of corporations or government agencies, and as consultants or statistical specialists for certification examining boards, particularly in medical or allied health areas.

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RME Doctor of Philosophy OBJECTIVES

The Ph.D. in RME program provides in-depth knowledge of intermediate and advanced statistical and measurement methodologies and prepares students to make original contributions to the fields of measurement and statistics. Completion of the Ph.D. requires a minimum of 63 graduate semester credit hours, divided between a core set of required courses, a set of elective courses, and dissertation hours. Although students in the Ph.D. program are trained in a broad range of measurement and statistical methodologies, they will conduct focused research in one of two areas of specialization: (a) research methodology and statistics, and (b) measurement. Specialization in research methodology and statistics focuses on how to collect and analyze data to answer desired research questions, and how to conduct statistical analyses ranging from very simple descriptive analyses, to cutting-edge methods using sophisticated statistical models. Specialization in measurement concerns how to obtain measures of mental, psychological, and cognitive traits (e.g., ability, intelligence, depression). Because many of the traits investigated in education, psychology, and health sciences are not directly observable, the field of measurement utilizes a variety of statistical models to obtain the best possible estimates of an individual's level on the desired trait based on responses given to a set of items (e.g., a test, rating scale, or psychological inventory). These techniques are of particular importance to testing agencies assessing the ability of examinees taking high-stakes tests.

The Ph.D. program places an emphasis on gaining hands-on skills with respect to the design and analysis of quantitative research studies and conducting research that advances our knowledge and application of research methodology. Beginning as early as the second year of training, students are involved in applied field experiences and mentored apprenticeships in which they actively conduct research advancing statistical and measurement methodology under the supervision of RME faculty. Beginning in their third year of the program, students are encouraged to present original research at regional and national conferences and to publish in peer-reviewed journals.

Careers and Employment Opportunities

Both the M.S.Ed. and Ph.D. programs provide requisite training for a wide range of career opportunities. After completing the M.S.Ed. in RME program, individuals have the necessary skills to be successfully employed in positions related to data management, research coordination, and statistical analysis for private corporations, state agencies, school districts, and non-profit organizations conducting research studies and evaluations. Data-driven decision-making and accountability is central to education, health care, and other human services. There is widespread demand for individuals trained in the collection and analysis of data related to educational effectiveness, health outcomes, and human service programs. Individuals with an M.S.Ed. are well-prepared to meet this demand.

Individuals completing the Ph.D. in RME have the skills needed to assume faculty positions in quantitative methodology, to serve as consultants in large-scale research projects and evaluations, and to act as data analysts or research scientists in research or state agencies, private corporations, school districts, and non-profit organizations. Students focusing on measurement are particularly well-suited to work in the development and analysis of large-scale testing programs administered by testing companies (e.g., ETS and ACT) and state educational accountability agencies.

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M.S.Ed. Program Description and Course Sequences

The M.S.Ed. program in RME is designed to train students in research methodology, relevant statistical and measurement analyses, and statistical software required for the data management and statistical analyses relevant to research and evaluations conducted in educational, psychological, health, and human service environments. To accomplish this goal, students complete a set of core courses that provide training in the relevant methodologies and statistical software. These core courses cover analytic methods related to descriptive and inferential statistics, regression models, analysis of variance (ANOVA) models, measurement theory, evaluation methods, qualitative methodology, and data management. The core courses focus on application of methods to real-world problems and data analysis so that the experiences obtained in the classroom directly translate into the practical skills needed for work in research and evaluation settings. The majority of courses related to statistics, measurement, and data management are taught in fully-equipped computer labs where students actively conduct the desired analyses using relevant statistical software. Students are thus provided continuous opportunities to gain the necessary skills for applied data analysis.

Students entering the M.S.Ed. program are expected to have an understanding of simple algebra, but are not required to have any specific background in math or statistics. The applied nature of the statistics coursework ensures that necessary mathematical operations are limited to simple algebra. No specific expertise in higher mathematical content areas (such as calculus) is required. As a result, students entering the program come from a wide range of disciplines. Many students enrolled in the program have had undergraduate degrees in fields such as education, psychology, sociology, and health sciences.

The program consists of 30 credits, which are typically completed as ten 3-credit courses. Some, but not all, of the courses are offered in the evening. Given the sequencing of the program, it is often possible for students to complete the program within a 12-months of full-time study. However, many students complete the program over two or more years of part-time study. The availability of courses during the evening makes it possible to complete the program while maintaining employment during the day. We currently offer no financial support for students enrolled in the M.S.Ed. program.

The curriculum of the M.S.Ed. in RME is structured around three components: (A) a core set of 24 credits (8 courses of 3 credits each) of required coursework covering the fundamentals of research design, measurement, and statistical analysis; (B) 6 credits of elective course-work; and (C) a comprehensive exam occurring upon the completion of the 24 credits of required coursework. The specific details of the curriculum are given below.

(A) Core set of 24 credits (8 courses)

EPS 700 (Introduction to Statistics)
EPS 701 (Research Methods)
EPS 704 (Computer applications in educational & behavioral sciences research)
EPS 702 (General Linear Modeling)
EPS 706 (Categorical Data Analysis)
EPS 703 (Applied Multivariate Statistics)
EPS 705 (Measurement and psychometric theory)
EPS 708 (Introduction to Structural Equation Modeling)

(B) Electives of 6 credits (2 courses)

Students work with advisors to select from a large number of graduate courses relevant to the students' interests and professional goals. Appropriate courses may be related to advanced statistical modeling or other content areas.

(C) Comprehensive Exam

Each student must successfully pass a comprehensive exam that covers the content of the core 24 credits. This exam assesses the student's competency in these core areas of research methodology and use of statistical software, and is based on content that is aligned with the material covered in the core 24 credits.

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Ph.D. Program Description and Course Sequences

The Ph.D. program in RME is designed to provide students with expertise in one or more specialized areas of measurement or statistical modeling and in-depth training in research methodology, measurement, and applied statistical modeling. The program aims to provide students with the necessary mentoring and experiences to produce original research that advances methodology used in statistics and measurement. Students are encouraged to present research in regional and national conferences, and to publish their work in peer-reviewed journals. In this respect, students are being prepared to assume influential positions in the field of research methodology, such as faculty positions at research-intensive universities and research scientist positions in research and testing organizations.

All students entering the Ph.D. program are intended to be full-time students. Although financial support is not guaranteed, the program makes strong effort to provide all students with opportunities for financial support. A Masters degree is not required for admission, though some students may have completed a relevant Masters degree prior to entering the program. Qualified students with appropriate exposure to applied mathematics, statistics, or research methodology may enter the Ph.D. program with only an undergraduate degree. Although extensive experience with statistics is not required for admission, students must have successfully completed an introductory statistics (or equivalent) course to be considered for admission.

The Ph.D. program consists of 63 credits, with an expected timeline to completion of approximately four years of full-time study. The first year of study focuses on in-class coursework covering the requisite methodological approaches. In the second year, students begin developing expertise in one or more areas related to applied statistics and measurement and contribute to research in that area under the mentorship of RME faculty. The third and fourth years of the program are expected to be devoted to individual research in an area of concentration related to applied statistics and measurement.

The curriculum of the Ph.D. in RME is structured around six components: (A) a core set of 33 credits (11 courses of 3 credits each) of required coursework covering the fundamentals of research design, measurement, and statistical analysis; (B) 6 credits of a research apprenticeship, in which students conduct mentored research under the supervision of RME faculty members; (C) field experience in educational research, in which students play active roles in the design and analysis of an applied research or evaluation projects; (D) the doctoral qualifying exam; (E) the doctoral dissertation; and (F) a set of elective courses. Specific details of the curriculum are below.

(A) Core courses (33 credits are required)

EPS 700 Introduction to Statistics
EPS 704 Computer Applications
EPS 710 Meta-Analytic Methods
EPS 705 Measurement and Psychometric Theory
EPS 707 Item Response Theory
EPS 701 Introduction to Research Methods
EPS 702General Linear Model
EPS 703 Applied Multivariate Statistics
EPS 708 An Introduction to Structural Equation Modeling
EPS 709 An Introduction to Multilevel Modeling
EPS 711 Special Topics in RME: Advanced SEM

(B) Research Apprenticeship (6 credits are required)

For a minimum of 6 research apprenticeship credits, students work under the mentorship of RME faculty members (or approved faculty members outside of RME) on original studies pertinent to research, measurement, and evaluation. It is expected that the work completed during the apprenticeship culminates in a manuscript that is suitable for publication in an academic journal. The 6 credits of apprenticeship are documented as two 3-credit blocks of EPS 799 (Advanced Individual Study); and the research apprenticeship must be completed prior to the commencement of dissertation hours (EPS 830).

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Ph.D. Program Description and Course Sequences (continued)

(C) Field Experience in Educational Research (6 credits are required)

Students must complete a minimum of 6 credits in field experience related to educational research. The field experience involves providing methodological assistance to a research or evaluation project at the University of Miami or other approved organization (e.g., the evaluation division of Miami-Date County Public Schools). The nature of the field experience must be approved by the student's advisor prior to commencing the credit hours. The field experience credits are currently documented as EPS 712.

(D) Doctoral Qualifying Exam

Students must successfully pass the doctoral qualifying exam prior to the commencement of the doctoral dissertation.

(E) Dissertation Hours (12 credits are required)

EPS 830 Pre-Candidacy Dissertation Research (6 credits)

EPS 840 Post-Candidacy Dissertation Research (6 credits)

(F) Electives (6 credits)

Any combination of the courses below* may be taken for a minimum of 6 credit hours.

EPS 799 (Advanced Individual Study) and EPS 712 (Field Experience in Educational Research) can be repeated over and above the credits fulfilling a student's apprenticeship (6 credits) and field experience (6 credits) requirements

EPS 704 Computer Applications in Educational and Behavioral Sciences Research
EPS 799 Advanced Individual Study
EPS 710 Meta-Analysis Methods
EPS 712 Field Experience in Educational Research
EPS 714 Qualitative Methods I
EPS 715 Qualitative Research Methods II
EPS 703 Applied Multivariate Statistics

MTH 624 Introduction to Probability Theory (Department of Mathematics)
MTH 542 Statistical Analysis (Department of Mathematics)
MTH 625 Introduction to Mathematical Statistics (Department of Mathematics)
MTH 725 Multivariate Analysis (Department of Mathematics)

MAS 602 Multivariate Statistics (School of Business)
MAS 635 Design of Experiments (School of Business)

*Additional courses may be substituted upon approval from a student's advisor. These options include a variety of graduate courses in the fields of computer science, psychology, education, and other areas of interest.

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Ph.D. Program Description and Course Sequences (continued)

Although the progression through the courses of the Ph.D. can vary, an example of one progression for a full-time student is as follows:

YEAR 1

Fall		Spring	
EPS 700	Introduction to Statistics	EPS 702	General Linear Modeling
EPS 701	Introduction to Research Methods	EPS 703	Applied Multivariate Statistics
EPS 704	Computer Applications	Elective	

YEAR 2

Fall		Spring	
EPS 708	Introduction to Structural Equation Modeling	PSY 698	Structural Equation Models
EPS 705	Measurement and Psychometric Theory	EPS 707	Item Response Theory
EPS 710	Meta-Analysis Methods	EPS 709	Introduction to Multilevel Models

*Qualifying exam given in August prior to beginning of classes in Year 3

YEAR 3

Fall		Spring	
EPS 799	Advanced Individual Study	EPS 799	Advanced Individual Study
EPS 712	Field Experience in Educational Research	EPS 712	Field Experience in Educational Research
EPS 830	Research Apprenticeship	EPS 830	Research Apprenticeship

*Dissertation proposal successfully completed by Spring of Year 3

YEAR 4

Fall		Spring	
EPS 840	Dissertation Research	EPS 840	Dissertation Research
Elective			

University of Miami School of Education

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RME Faculty Profiles

Soyeon Ahn

Dr. Ahn received her Ph.D. in Measurement and Quantitative Methods in the Department of Counseling, Educational Psychology and Special Education at Michigan State University in 2008 and joined the EPS faculty in August 2008. Dr. Ahn's current research focuses on the application of existing data analytic techniques to resolve the complicated data issues in meta-analysis (research synthesis). Her other interests include hierarchical linear modeling (HLM), structural equation modeling (SEM), and longitudinal data analysis for educational and psychological research.

Dr. Ahn has published numerous methods papers in journals such as Journal of Educational and Behavioral Statistics (JEBS), Review of Educational Research (RER), Behavior Research Methods (BRM), Structural Equation Modeling: A Multidisciplinary Journal, and Educational and Psychological Measurement. In addition, several peer-reviewed articles on the application of meta-analytic methods in educational and behavioral science have appeared in substantive journals such as Scientific Studies of Reading, Journal of Pediatric Psychology, Journal of Counseling Psychology, and Research Quarterly for Exercise and Sport (RQES). She has served as an ad-hoc reviewer for journals including JEBS, RER, BRM, Research Synthesis Methods, Psychological Reviewer, Educational Reviewer, and RQES.

Outside of the university, Dr. Ahn has substantial experience providing statistics and measurement consultation to externally-funded projects (e.g., Promoting Science Among English Language Learners (PSELL) Efficacy and Sustainability, funded by the Institute of Education Sciences (IES), U.S. Department of Education; and Language in Mathematics (LIM) funded by the National Science Foundation) as well as grant developments. She is a member of (1) Society for Research Synthesis Methodology (Elected in 2013); (2) Campbell Collaboration (C2) Methodology Group; and (3) American Educational Research Association (Division D: Measurement and Research Methodology). She has also served on the grant review panels for several programs in the National Science Foundation since 2011.

Within the RME program, Dr. Ahn is involved in training doctoral students in research methodology and provides statistical support for educational and behavioral science research both within and outside of the University of Miami. Additionally, Dr. Ahn offers higher-level statistical courses including Meta-analytic Methods for Research Synthesis, Multivariate Statistics, and Computer Applications in Educational and Behavioral Research. Finally, she provides methodological training and statistical consultation for the Research Methodology Services component of the Dunspaugh-Dalton Community and Educational Well-Being (CEW) Research Center at the University of Miami and is an associate director of CEW.

RME FACULTY PROFILES (CONTINUED)

Nicholas Myers

Dr. Myers joined the faculty at the University of Miami in 2005 after completing a dual doctoral degree within the College of Education at Michigan State University, majoring in both Measurement and Quantitative Methods and Psychosocial Aspects of Sport and Physical Activity. Nick's dual degree was motivated, in part, by his experience as both a licensed Professional Counselor (1999-2005) and a licensed Personal Trainer (2000-2006).

Nick's research program focuses on three related areas. The first concentration is on a few quantitative methodologies (e.g., multilevel modeling and exploratory structural equation modeling) relevant to his substantive areas of interest. The second concentration is on measurement of psychosocial constructs in sport and exercise psychology (e.g., self– and collective efficacy, coaching competency, well-being). The third concentration is on self-efficacy theory in sport and exercise psychology. This program of research has received internal (e.g., Provost's Research Award) and external funding (e.g., Miami Clinical and Translational Science Institute). Nick received the early career distinguished scholar award (2013) from the North American Society for the Psychology of Sport and Physical Activity.

Nick's professional service is consistent with his research program. Nick served (2012-2014) as an elected Officer for the Multilevel Modeling Special Interest Group within the American Educational Research Association. Nick has served as a statistical consultant for the Research Methodology Services component of the Dunspaugh-Dalton Community and Educational Well-Being (CEW) Research Center at the University of Miami as well as for projects funded by the Florida Department of Education. Nick currently serves as the director of the Research, Measurement, and Evaluation (RME) graduate program. The RME doctoral program has consistently been rated a top 20 program nationally by Academic Analytics.

Cengiz Zopluoglu

Dr. Zopluoglu joined the EPS faculty at the University of Miami in 2013. Prior to joining the EPS faculty, he received his Ph.D. in Quantitative Methods in Education program in the Department of Educational Psychology at the University of Minnesota. He has held research positions with the Quantitative Methods in Education program and Office of Research and Consultation Services at the University of Minnesota, and had the privilege of doing psychometric research at the Minneapolis Public Schools in Minnesota and ACT, Inc. in Iowa.

Cengiz has a broad range of research interests. These interests can be summarized in three primary areas: item response theory, test score integrity, and nonlinear mixed-effects models. In item response theory, one of his research interests is dimensionality assessment of item response data. In addition, he is interested in item parameter estimation of several unidimensional and multidimensional IRT models, particularly for the Samejima's IRT model for continuous measurement outcomes. As a second area of research, Cengiz is studies the sensitivity and robustness of statistical methods proposed in the literature for detecting potential test fraud, as well as working on developing new methods (e.g. artificial neural networks) in this area. As a third area of research, Cengiz is collaborating with colleagues in order to develop software routines for estimating the parameters of nonlinear mixed-effects mixture models and to study the robustness of model parameter estimation with different estimation schemes.

In the RME program at the University of Miami, he teaches courses on educational measurement and psychometric theory and serves as a consultant for the Research Methodology Services component of the Dunspaugh-Dalton Community and Educational Well-Being (CEW) Research Center at the University of Miami.

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Frequently Asked Questions

Q: Do I need a strong math or statistics background to apply to the RME program?

A: No, extensive undergraduate coursework in math and statistics is not necessary. Naturally, individuals who enter our program with a strong math and/or statistics background tend to be familiar with many of the concepts covered in the courses, but it is not necessary.

Q: Can I apply the RME program to interests I have in another field, like psychology?

A: Yes, many students who have other substantive interests focus their doctoral research on using state-of-the-art statistical and measurement models to answer specific research questions in areas like psychology, education, and the health sciences.

Q: What are the career opportunities like for students graduating from the RME program?

A: Simply stated, the career opportunities are fantastic. Demand for individuals with graduate training in research, measurement, and evaluation outweighs the current supply. Private and public agencies, as well as universities, are constantly searching for individuals with expertise in these areas. This demand is, in part, fueled by the increase in national and state-level achievement testing mandated by the No Child Left Behind (NCLB) act, which requires individuals trained in applied statistics and measurement for the psychometric/technical development of tests (i.e., determining from a statistical point of view whether the items of a test are working properly, and how to best estimate and individual's ability based on the responses to the test items). Additional demand for experts in research methodology and measurement is generated through the increasing use of standardized psychological testing for diagnostic purposes and the high level of demand for the evaluation of educational and psychological programs implemented in school systems.

Q: What Type of Businesses and Agencies are Typical Employers?

A: This will depend, in part, on what type of career you desire. If you want to teach, conduct research, and serve as a consultant to academic grants, then colleges and universities would be the natural employer. Nearly every college or university that grants graduate degrees would have the need for one or more individuals trained in research, measurement, and evaluation. If you are interested in a career that focuses on designing and implementing large-scale evaluations of programs (such educational programs, or health-related programs), then a public or private research agency, or large-scale testing agencies, such as ETS, ACT, and The College Board, would be examples of potential employers. Finally, if you are interested in measurement issues related to large-scale testing, then public testing agencies (i.e., state testing agencies) and private testing agencies (e.g., ETS, ACT, the American Board of Medical Examiners) would be examples of potential employers.