The Social Science Research Institute

ANNUAL REPORT 2013 - 2014

PENN STATE
1855

The Social Science Research Institute

Letter From the Director

Welcome to the Social Science Research Institute.
Since its inception in 2001, Penn State's Social Science Research Institute (SSRI) has promoted innovation and excellence in interdisciplinary research within the social and behavioral sciences. *The Institute's mission is to foster novel, interdisciplinary collaborations by investigators who aim to address critical human and social problems at the local, national, and international levels, and to translate and disseminate this knowledge into measurable outcomes for human behavior, health, and development. The SSRI advances its mission by bringing together researchers from a range of disciplines around emerging areas of study and by providing consultation, financial support, and shared infrastructure development and services to social and behavioral scientists at Penn State.* The SSRI is one of five, cross-university research institutes supported by the Office of the Vice President for Research and also receives generous financial support from the colleges of Agricultural Sciences, Education, Health and Human Development, and the Liberal Arts.

Research in the social and behavioral sciences is broad and complex, ranging from studies of large scale social forces, including socio-economic, political, and socio-cultural processes and influences, to dynamics in smaller group settings such as families, school classrooms, and work organizations. It also encompasses research on behavior, ranging from overt actions to underlying psychological processes including cognitive, affective, and motivational functioning. And, there is special emphasis on interactions across multiple levels of analysis, from the macro- and micro-contextual, to the behavioral, and to the underlying physiological processes that together shape human health and development (The National Institutes of Health Office of Behavioral and Social Science Research, ND). As such, social science research extends from the genome to the globe, and its impacts range from evidence-based social policies that target vulnerable populations, to education programs aimed at learning and skill building, to everyday behavioral practices that promote health and prevent disease.

During the 2013-2014 year, the SSRI continued to provide consultation, financial support, and shared infrastructure and services to Penn State's social and behavioral scientists. The SSRI's 2013-2014 Annual Report presents an overview of some of this work and highlights the Institute's research units and activities, the growing number and scope of supports by the SSRI's units, and the success of the SSRI's seed

Susan McHale, Ph.D.

program in our faculty's efforts to obtain external funding for their research. A highlight of the year included the launch of the Penn State Census Bureau Research Data Center (RDC), the SSRI's newest unit (read more on page 7). We also introduce seven new SSRI co-funded faculty members who joined the Penn State faculty during the past year. With their addition, the SSRI currently co-funds 33 faculty members from five colleges and 13 departments.

The report also presents a compendium of ten articles that describe research pertaining to the SSRI's four strategic areas of emphasis: Promoting Behavior, Health, and Development of Children, Youth, and Families; Biological Bases of Behavior, Health, and Development; Social and Demographic Change; and Innovative Methods. These articles portray just a sampling of the many interdisciplinary and groundbreaking research projects led by Penn State's social and behavioral scientists.

As I hope this report communicates, the work of social and behavioral scientists remains a vibrant component of Penn State research. In the coming year, the Social Science Research Institute, through its activities and support mechanisms, will continue to promote and enhance this vital work.

Susan McHale, Ph.D.
Director

Inside This Report

OUR MISSION

The Social Science Research Institute fosters novel, interdisciplinary research in the social and behavioral sciences that addresses critical human and social problems at the local, national, and international levels. We do so by bringing together researchers from different disciplines around emerging areas of study and by providing consultation, financial support, and shared infrastructure and services to social and behavioral scientists at Penn State.

Housed within the Office of the Vice President for Research, the SSRI is one of five university-wide research institutes at Penn State.

Research on Human and Social Problems

Welcome to the SSRI

The SSRI's 11 units provide consultation, financial support, and shared infrastructure and services to social and behavioral scientists at Penn State.

Together, the units advance the Institute's mission of fostering interdisciplinary research that addresses critical human and social problems.

The
Social Science
Research
Institute

Children, Youth, and Families Consortium

Clearinghouse for Military Family Readiness

Network on Child Protection and Well-Being

Census Research Data Center

Survey Research Center

Population Research Institute

Social, Life, and Engineering Sciences Imaging Center

Geographic Information Analysis Core

Quantitative Developmental Systems Methodology

Administrative Core

Information Technology Core

SSRI Centers & Institutes

Children, Youth, and Families Consortium
www.cyfc.psu.edu

Director: Susan McHale, Ph.D.
Associate Director: Keith Aronson, Ph.D.
Associate Director: Douglas Teti, Ph.D.
Assistant Director: Margaret Gray, M.P.A.

The CYFC promotes and supports research, education, and engagement that address the complexities of human development, behavior, and health in diverse populations of youth and families. The CYFC supports projects ranging from the analyses of infant socio-emotional development and brain function in cognitive aging to studies of health, education, and resource disparities among children, youth, and families in the United States and in developing countries around the world.

Clearinghouse for Military Family Readiness
www.militaryfamilies.psu.edu

Director: Daniel Perkins, Ph.D.
**Associate Director: Keith Aronson, Ph.D.**

The Clearinghouse focuses on issues pertaining to children, youth, and families via interdisciplinary applied research as well as evaluation, implementation, and dissemination science that promote the health and well-being of military service members and their families. The Clearinghouse analyzes the evidence base for prevention and intervention programs for military personnel and their families and provides live technical assistance to professionals. Posts on its website include training videos, research papers, and blogs that are timely and relevant to its professionals and families.

Geographic Information Analysis Core
www.ssri.psu.edu/services/geographic-information-analysis-core

Academic Director: Leif Jensen, Ph.D.

The GIA Core promotes and enhances social science at Penn State by providing services to facilitate the use of geospatial data and the incorporation of spatial perspectives in research in the social and behavioral sciences. Its services feature traditional Geographic Information Systems (GIS) applications including geocoding, mapping/cartography, web-based mapping, and geospatial data acquisition, archiving, and management. The unit supports the collection of intensive longitudinal geospatial data and the building of contextual and ecological databases. It also provides expertise in spatial statistics, advanced spatial analysis methods, exploratory spatial data analysis, and customized GIS/spatial analysis programming.
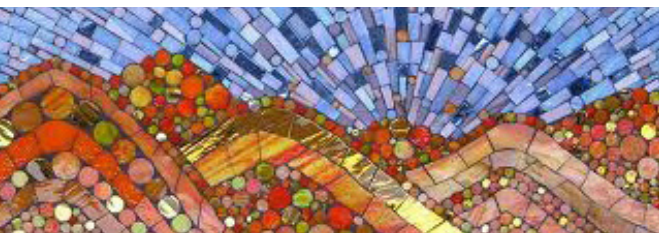
Network on Child Protection and Well-Being
www.protectchildren.psu.edu

Director of Policy and Administration: Margaret Gray, M.P.A.
Director of Research and Education: Jennie Noll, Ph.D.

The Network focuses on children, youth, and their families in work aimed at building a sustainable network of researchers and practitioners who produce new knowledge, foster the design and evaluation of novel approaches to the prevention, detection, and treatment of child abuse and neglect, create interdisciplinary education opportunities and experiences for Penn State students, and put the products of these efforts to work in communities throughout Pennsylvania and beyond. The Network also serves as the University's coordinating entity for the dissemination of communications, public awareness, student engagement, and services pertaining to child protection and well-being information and initiatives.

Population Research Institute
www.pop.psu.edu

Director: Jennifer Van Hook, Ph.D.
Associate Director: Marianne Hillemeier, Ph.D

The PRI aims to advance the scientific understanding of human population dynamics by providing research supports to its 79 faculty affiliates and associates. Priority research areas include immigration, inequality and population health, communities and neighborhoods, and adolescence/young adulthood. The PRI houses Penn State's dual-title degree in Demography, which has been supported by a training grant from the NICHD since 1999. The PRI is one of 24 federally funded population research institutes in the United States and has been supported by an infrastructure grant from NICHD since 1991.

Quantitative Developmental Systems Methodology Core
www.quantdev.ssri.psu.edu

Director: Eric Loken, Ph.D.

The QuantDev Core, which is jointly supported by the SSRI and the College of Health and Human Development, has a four-fold mission: (1) developing new methods and improving on existing methods for the study of human behavior using innovative measurement, study design, and analysis techniques, and applying these techniques to study a range of issues including those related to positive behavior and health outcomes, and the dynamics of individuals and groups; (2) developing user-friendly algorithms and platforms for making these methods widely available; (3) promoting new methods such as ecological momentary assessment, dynamical systems modeling, and other innovative person-specific approaches; and (4) consulting and collaborating with a broad range of social scientists on research projects that span multiple levels and time-scales of behavior (cells to society, milliseconds to millennia, cradle to grave).

Census Research Data Center
www.psurdc.psu.edu

Director: Mark Roberts, Ph.D.

The RDC promotes faculty and graduate student research that uses the confidential and restricted data collected by the U.S. Census Bureau and the National Center for Health Statistics. Along with generous support from the Offices of the President and Vice President for Research, the SSRI, the PRI, University Libraries, and the Colleges of Agricultural Sciences, Health and Human Development, The Liberal Arts, and Science, Penn State's RDC is supported in part by a grant from the National Science Foundation, and is one of 18 such centers in the United States.

Social, Life, and Engineering Sciences Imaging Center
www.imaging.psu.edu

Director: Rick Gilmore, Ph.D.

The SLEIC fosters research in the social, behavioral, biological, engineering, and materials sciences where imaging methodologies play a central role. The SLEIC staff provides instrumentation, technological and domain expertise, educational opportunities, and financial support for conducting magnetic resonance imaging and electrophysiology experiments.

Survey Research Center
www.survey.psu.edu

Director: Kurt Johnson, Ph.D.
Academic Director: Eric Plutzer, Ph.D.

The SRC provides survey research services to faculty, graduate students, and institutional investigators. It promotes and contributes to the science of survey research methodology, assists faculty and student investigators to prepare effective proposals for external funding, and educates members of the Penn State community on best practices and emerging developments in the survey research field, which includes its graduate certificate program in survey research. The SRC houses the Dynamic, Real-time, Ecological, Ambulatory Methodologies (DREAM) initiative with the mission of supporting researchers in the use of innovative methods and emerging mobile technologies.

Service Cores

Administrative Core

Director: Sherry Yocum

The Administrative Core, in addition to its budgetary and human resources activities, is responsible for the tracking and evaluation activities pertaining to the SSRI's research supports. This includes Level 1 and Level 2 seed grants, facilitated research projects, Faculty Fellows Program, SLEIC and GIA Pilot Hours, grant proposal consultation with SSRI unit directors and co-directors around SSRI and external funding, and the SSRI/CYFC co-funded faculty.

Information Technology Core

Director: Joe Broniszewski

The IT Core provides strategic IT vision, leadership, and solutions to the faculty, staff, and students within the SSRI to enable them to meet their research goals, deliver results, and enhance the SSRI's position at Penn State and throughout the research community.

The SSRI Welcomes New Directors in 2014

On July 1, 2014, the SSRI welcomed new directors to its leadership team. Their knowledge and expertise will help to advance the SSRI's mission of fostering innovative, interdisciplinary research.

Michele Diaz, Ph.D.
Director, Social, Life, and Engineering Sciences Imaging Center
Associate Professor, Psychology

Michelle Frisco, Ph.D.
Associate Director, Population Research Institute
Associate Professor, Sociology and Demography

Patrick McClelland, M.A., M.S.
Assistant Director, Clearinghouse for Military Family Readiness

Joshua Smyth, Ph.D.
Associate Director, Social Science Research Institute
Associate Director, Children, Youth, and Families Consortium
Professor, Biobehavioral Health and Medicine
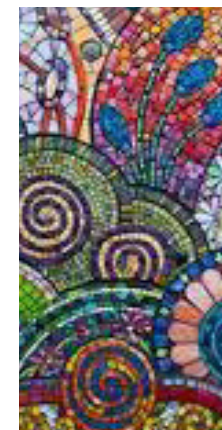
SSRI Events

Launch Event Recognizes Clearinghouse's Growth, Achievements
November 1, 2013

More than 100 military personnel and families, ROTC students, and other dignitaries gathered to launch the Clearinghouse for Military Family Readiness as a University-wide center and recognize its achievements. Since the work of the Clearinghouse began in 2009

Director Daniel Perkins speaks at the Clearinghouse for Military Family Readiness launch event at the Nittany Lion Inn.

under the leadership of Daniel Perkins, Professor of Family and Youth Resiliency and Policy, its activities have increased in scope, impact, and visibility. The event celebrated the Clearinghouse's exponential growth and success, which have relied on partnerships with numerous military stakeholders.

Conference Highlights New Census Bureau Research Data Center
April 7-8, 2014

Penn State's Population Research Institute (PRI) and Department of Economics held a conference to introduce the University's new Census Bureau Research Data Center (RDC). PRI Director Jennifer Van Hook, Professor of Sociology and Demography, and RDC Director Mark Roberts, Professor of Economics,

U.S Census Bureau Director John Thompson delivers a speech during the opening ceremony of Penn State's RDC.

organized the event that included almost 40 presenters from around the nation and more than 80 faculty and graduate students from across Penn State. The conference highlighted the RDC's

potential for enhancing research in the fields of economics, demography, statistics, sociology, and health services. Penn State's RDC is one of only 18 such centers in the United States.

Third Annual Conference Focuses on Family Dynamics and Risk
May 5-6, 2014

Researchers, practitioners, and students attended "Families at Risk: The Role of Parenting and Family Processes in Child Maltreatment and Intervention," the third in a series of annual conferences organized by the Network on Child Protection and Well-Being.

The conference was chaired by Douglas Teti, Professor of Human Development and Family Studies, Psychology, and Pediatrics, and included presentations on research and evidence-based intervention programs, as well as commentary on the challenges of building strong families in which

Nancy Kellogg, Professor of Pediatrics at the University of Texas Health Science Center (left), Margaret Wright, Professor of Psychology at Miami University, and Sherry Hamby, Professor of Psychology at Sewanee; The University of the South (far right) listen to Emily Putnam-Hornstein, Assistant Professor of Social Work, at the third annual Conference on Child Protection and Well-Being.

children thrive. Speakers discussed the need for researchers, policymakers, and practioners in local communities to address the complex issues of child protection through interdisciplinary and inter-professional collaborations. The fourth in the Network's conference series is scheduled for September 30-October 1, 2015 and is titled "New Frontiers in the Biology of Stress, Maltreatment, and Trauma: Opportunities for Translation and Resilience."

People in the SSRI

SSRI LEADERSHIP

Susan McHale, Ph.D.
Director / Professor, Human Development and Family Studies

Keith Aronson, Ph.D.
Associate Director / Graduate Faculty of Biohavioral Health

Douglas Teti, Ph.D.
Associate Director / Professor, Human Development and Family Studies, Psychology, and Pediatrics

SSRI INTERNAL ADVISORY BOARD

Joseph Broniszewski
Director, Information Technology Core

Rick Gilmore, Ph.D.
Director, Social, Life, and Engineering Sciences Imaging Center / Associate Professor, Psychology

Margaret Gray, M.P.A.
Assistant Director, Social Science Research Institute / Policy and Administration Director, Network on Child Protection and Well-Being

Leif Jensen, Ph.D.
Academic Director, Geographic Information Analysis Core / Distinguished Professor, Rural Sociology, Demography, and Sociology

Kurt Johnson, Ph.D.
Director, Survey Research Center

Eric Loken, Ph.D.
Director, Quantitative Developmental Systems Methodology Core / Research Associate Professor, Human Development

Jennie Noll, Ph.D.
Research and Education Director, Network on Child Protection and Well-Being / Professor, Human Development and Family Studies

Daniel Perkins, Ph.D.
Director, Clearinghouse for Military Family Readiness / Professor, Family and Youth Resiliency and Policy

Eric Plutzer, Ph.D.
Academic Director, Survey Research Center / Professor, Political Science and Sociology

Mark Roberts, Ph.D.
Director, Census Research Data Center / Professor, Economics

Jennifer Van Hook, Ph.D.
Director, Population Research Institute / Professor, Sociology and Demography

Sherry Yocum
Director, Administrative Core

Yosef Bodovski
GIS Research Analyst

Jonathan McVerry
Manager, Communications

DEANS' OVERSIGHT COMMITTEE

Barbara Christ, Ph.D.
Interim Dean, College of Agricultural Sciences / Professor, Plant Pathology

Ann Crouter, Ph.D.
Dean, College of Health and Human Development / Professor, Human Development

Mukund Kulkarni, Ph.D.
Chancellor, Penn State Harrisburg / Professor, Business Administration

David Monk, Ph.D.
Dean, College of Education / Professor, Education (Educational Leadership)

Neil Sharkey, Ph.D.
Vice President, Office of the Vice President for Research / Professor, Kinesiology, Orthopaedics and Rehabilitation

Daniel Notterman, M.D.
Vice Dean, Research and Graduate Studies, College of Medicine

Susan Welch, Ph.D.
Dean, College of Liberal Arts / Professor, Political Science

SSRI STEERING COMMITTEE

Karen Bierman, Ph.D.
Distinguished Professor, Psychology

Kathleen Bieschke, Ph.D.
Head, Department of Educational Psychology, Counseling, and Special Education / Professor, Education

Orfeu Buxton, Ph.D.
Associate Professor, Biobehavioral Health

Jonathan Foulds, Ph.D.
Professor, Public Health Sciences and Psychiatry

Lisa Gatzke-Kopp, Ph.D.
Associate Professor, Human Development and Family Studies

Timothy Kelsey, Ph.D.
Professor, Agricultural Economics

Benjamin Levi, M.D., Ph.D.
Professor, Pediatrics and Humanities

Jennifer McCall-Hosenfeld, M.D.
Assistant Professor, Medicine and Public Health Services

Scott McDonald, Ph.D.
Associate Professor, Education (Science Education)

Claudia Mincemoyer, Ph.D.
Professor, Agriculture and Extension Education

Paul Morgan, Ph.D.
Associate Professor, Education

Daniel Perkins, Ph.D.
Professor, Family and Youth Resiliency and Policy

Rachel Smith, Ph.D.
Associate Professor, Communication Arts and Sciences and Human Development and Family Studies

Catherine Surra, Ph.D.
Director, Behavioral Sciences and Education

Krista Wilkinson
Professor, Communication Sciences and Disorders

Stephen Wilson
Assistant Professor, Psychology

SSRI CO-FUNDED FACULTY

Brian Allen, Psy.D.
Assistant Professor, Pediatrics

Rhonda Belue, Ph.D.
Associate Professor, Health Policy and Administration

Kristin Buss, Ph.D.
Professor, Psychology

Orfeu Buxton, Ph.D.
Associate Professor, Biobehavioral Health

Soo-yong Byun, Ph.D.
Assistant Professor, Education (Educational Theory and Policy)

Sy-Miin Chow, Ph.D.
Associate Professor, Human Development and Family Studies

Michelle Frisco, Ph.D.
Associate Professor, Sociology and Demography

Lisa Gatzke-Kopp, Ph.D.
Associate Professor, Human Development and Family Studies

Charles Geier, Ph.D.
Assistant Professor, Human Development and Family Studies

H. Harrington Cleveland, Ph.D.
Associate Professor, Human Development and Family Studies

Marianne Hillemeier, Ph.D.
Professor, Health Policy and Administration and Demography

Cynthia Huang-Pollack, Ph.D.
Associate Professor, Psychology

Kent Hymel, M.D.
Child Abuse Pediatrician

Kathleen Keller, Ph.D.
Assistant Professor, Nutritional Sciences and Food Science

Derek Kreager, Ph.D.
Associate Professor, Sociology and Criminology

Shannon Monnat, Ph.D.
Assistant Professor, Rural Sociology, Demography, and Sociology

P. Karen Murphy, Ph.D.
Professor, Educational and School Psychology and Special Education

Jenae Neiderhiser, Ph.D.
Professor, Psychology

Jennie Noll, Ph.D.
Professor, Human Development and Family Studies

Koraly Perez-Edgar, Ph.D.
Associate Professor, Psychology

Daniel Perkins, Ph.D.
Professor, Family and Youth Resiliency and Policy

David Puts, Ph.D.
Associate Professor, Anthropology

Kai Schafft, Ph.D.
Associate Professor, Education (Educational Leadership) and Rural Sociology

Suzy Scherf, Ph.D.
Assistant Professor, Psychology

Idan Shalev, Ph.D.
Assistant Professor, Biobehavioral Health

Gregory Shearer, Ph.D.
Associate Professor, Nutritional Sciences

Chad Shenk, Ph.D.
Assistant Professor, Human Development and Family Studies

Joshua Smyth, Ph.D.
Professor, Biobehavioral Health and Medicine

Shedra Amy Snipes, Ph.D.
Assistant Professor, Biobehavioral Health

Robert Turrisi, Ph.D.
Professor, Biobehavioral Health

Jennifer Van Hook, Ph.D.
Professor, Sociology and Demography

Nicole Webster, Ph.D.
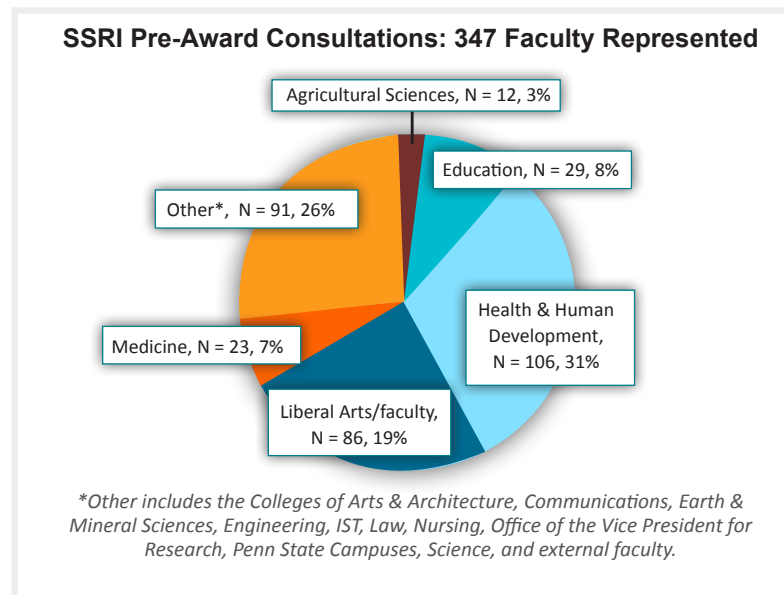Associate Professor, Youth and International Development

Krista Wilkinson, Ph.D.
Professor, Communication Sciences and Disorders

SSRI by the Numbers

SSRI CONSULTATIONS

An important service of the Social Science Research Institute is the provision of pre-award consultation by SSRI directors for faculty members pursuing grants in the social and behavioral sciences. During 2013-2014, SSRI Unit and Associate Directors met with 347 faculty members. Of these, 256 were affiliated with Penn State and came from 82 departments and units. The number of consultations by college is illustrated below. Consultations increased by 38 percent, from 252 in 2012-2013.

SSRI Pre-Award Consultations: 347 Faculty Represented

- Agricultural Sciences, N = 12, 3%
- Education, N = 29, 8%
- Other*, N = 91, 26%
- Health & Human Development, N = 106, 31%
- Medicine, N = 23, 7%
- Liberal Arts/faculty, N = 86, 19%

Other includes the Colleges of Arts & Architecture, Communications, Earth & Mineral Sciences, Engineering, IST, Law, Nursing, Office of the Vice President for Research, Penn State Campuses, Science, and external faculty.
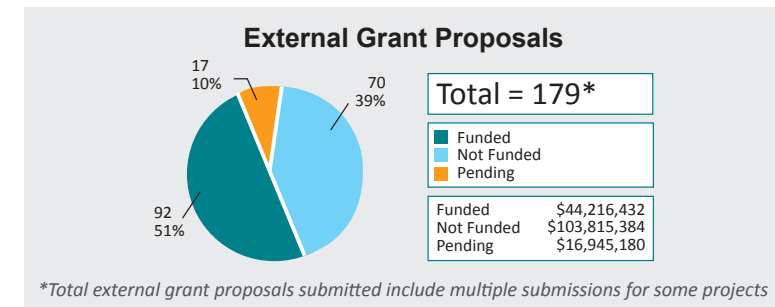
SSRI SEED GRANTS

The SSRI's grant program began in 1998. The Level 1 and Level 2 funding mechanisms are designed to assist Penn State faculty members to form interdisciplinary research teams directed at pursuing external funding. Below is an overview of the outcomes realized by Level 1 and Level 2 grants since their inception.
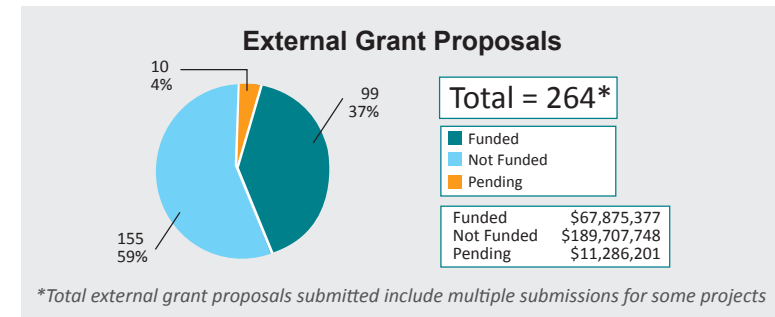
EXTERNAL GRANT PROPOSALS RESULTING FROM LEVEL 1 SEED GRANTS

Level 1 funds are typically used to form collaborative research teams to develop mutual interests, connect with other experts across the university, and build new research projects.

External Grant Proposals

- 17 / 10% (Pending)
- 70 / 39% (Not Funded)
- 92 / 51% (Funded)

Total = 179*

- Funded
- Not Funded
- Pending

Funded	$44,216,432
Not Funded	$103,815,384
Pending	$16,945,180

Total external grant proposals submitted include multiple submissions for some projects

EXTERNAL GRANT PROPOSALS RESULTING FROM LEVEL 2 SEED GRANTS

Level 2 funds primarily support feasibility and pilot studies that provide the basis of competitive external grant proposals.

External Grant Proposals

- 10 / 4% (Pending)
- 99 / 37% (Funded)
- 155 / 59% (Not Funded)

Total = 264*

- Funded
- Not Funded
- Pending

Funded	$67,875,377
Not Funded	$189,707,748
Pending	$11,286,201

*Total external grant proposals submitted include multiple submissions for some projects*

Strategic Research Initiatives

SSRI resources have been directed at promoting novel research in four primary areas. In this section, we showcase recent research in each area.

Promoting Behavior, Health, and Development in Children, Youth, and Families

Biological Bases of Behavior, Health, and Development
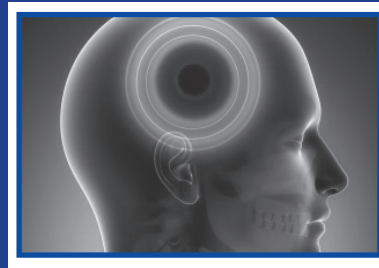
Social and Demographic Change

Innovative Methods

Promoting Behavior, Health, and Development in Children, Youth, and Families

Research on children, youth, and families at Penn State crosses the translational spectrum. It includes basic research on the developmental neuroscience of childhood psychopathology and gene-environment interactions in adolescent risk behavior. Researchers also conduct studies aimed at developing and evaluating interventions for promoting positive youth development and family relationships.

Education Program Encourages Students to Talk Their Way to Higher Comprehension

QUALITY TALK PROMOTES HIGH-LEVEL COMPREHENSION WITH THOUGHTFUL STUDENT DISCUSSION

In recent years, policymakers and researchers have begun to think more critically—and more urgently—about how the U.S. educational system can be revamped to provide top-notch learning and give students an edge in the global marketplace. This is what Karen Murphy, Professor of Educational and School Psychology and Special Education, hopes to do with her new program, Quality Talk.

Karen Murphy, Professor of Educational and School Psychology and Special Education

The Quality Talk Program

Aligning with the Common Core State Standards (new educational standards being implemented in most states), Quality Talk emphasizes critical analytic thinking and epistemic cognition to increase students' high-level comprehension of text in a variety of classroom settings and provides accompanying materials and training to participating teachers. Underlying Quality Talk are the ideas that "talk is a tool for thinking, and that certain kinds of talk can contribute to high-level comprehension."

The pilot program, which is designed for fourth and fifth graders, helps teachers promote higher-quality discussions that engage students. Teachers choose the topic and provide students with a variety of informative texts, from short stories to biographies. Students then discuss the text, with interpretive authority over the conversation, which allows them to share their experiences and feelings while thinking critically about the text, instead of reciting facts and general themes.

"The students we are working with are going through a critical transition in their education, from learning how to read to reading to learn. This is why our intervention is geared toward this age group."

- Karen Murphy, Professor of Educational and School Psychology and Special Education

The Unique Role of the Teacher

Quality Talk is unique because of the vital role teachers play in its implementation. Teachers participate in professional development sessions to learn about the Quality Talk model, undertake sample coding, and view example classroom discussions. They deliver Quality Talk mini lessons in their classrooms to teach students how to have high-quality discussions, and then they conduct several small-group discussions. Throughout the year, teachers review and reflect on past discussions by watching and coding video recordings. Discourse coaches from the Quality Talk team then review the videos with the teacher and provide ongoing support.

The Approach

"Are the students asking authentic questions? Are they considering alternative perspectives? Are they weighing the evidence? These are the talk indicators that teachers watch for and code," Dr. Murphy said. "The teacher has to step back from the process and encourage the students to take on interpretive authority over the text."

This approach promotes high-level comprehension by getting students invested in what they are reading. Teacher buy-in is important because teachers need to gradually release control to students and transition into the role of a participant-observer. Dr. Murphy and her team have found that when teachers talk less, students will fill in the gaps. The result is that students walk away from discussions with new knowledge gained through their own thinking and their classmates' ideas that emerge through conversation.

"The students work out the discussion themselves," Dr. Murphy said. "Once teachers get the sense that a high-level conversation will happen, they are able to let go and take on the role of facilitator."

"Many investigators who do research on discussion are concerned with engagement, but are not as concerned about the students achieving high-level comprehension outcomes," she said. "We are very focused on student outcomes. Quality Talk was created by combining the most effective aspects of existing discussion approaches with the goal of promoting high-level comprehension outcomes. It is also the only evidence-based approach that uses explicit discussion lessons with students."

Pilot Success

In its first and second years, Quality Talk was implemented in four classrooms in a local school, with six classrooms in two school districts participating in Quality Talk for the 2014–2015 school year. Discussions are underway for additional schools and classrooms to participate in the program next year.

The pilot project was funded by a grant from the Children, Youth, and Families Consortium. Dr. Murphy's endowment from Harry and Marion Royer Eberly Faculty Fellowship also supported the collection of pilot data. Dr. Murphy and her team were recently awarded a grant by the U.S. Department of Education to continue this research.

Visit: www.qualitytalk.psu.edu

Supporting Military Families Through Research

Many in the U.S. Military have loved ones— spouses, children, parents, and siblings— waiting for them at home, and their role in protecting their country can cause significant stress for their families. Children relocate and change schools frequently. Spouses are left alone for long stretches of time while their husbands or wives are away. And, fear can linger every day the loved one is away.

Forty-three percent of active duty military personnel are parents with one or more children, according to the Department of Defense (DOD). And, more than half of all active duty personnel have family responsibilities,

Kelly Davis, Research and Evaluation Scientist

defined as having a spouse, a child or children, or an adult dependent.

"It's an honor, but also a tremendous sacrifice, to serve in the military—for both the Service Member and the family," Research and Evaluation Scientist Kelly Davis said. "Those who lose a family member in service to the country may feel a mix of anger and pride."

Clearinghouse for Military Family Readiness

The Military Services make concerted efforts to help military families remain strong in challenging times. Launched in the fall of 2009, Penn State's Clearinghouse for Military Family Readiness was formed to conduct interdisciplinary, translational research with the goal of promoting the health and well-being of military service members and their families. The work of the Clearinghouse has grown exponentially from the time of its launch due to the establishment of trusting and collaborative partnerships with many military stakeholders.

In partnership with the DOD, for example, the Clearinghouse has built on research strengths at Penn State in the areas of human development, family studies, child psychology, implementation/dissemination science, clinical psychology, and education. Director Daniel Perkins, Professor of Family and Youth Resiliency and Policy, leads the growing center, which has expanded its applied research projects with funds from the DOD and each of the military services.

One of the Clearinghouse's chief initiatives is evaluating programs within the DOD that support military families. There are thousands of such programs in operation

and the Clearinghouse research and evaluation scientists develop strategies to assess their operational efficiencies and effectiveness as a means of increasing positive impacts of families. In order to do this, the scientists go beyond analysis of intervention program manuals. They conduct site visits, interview program staff and participants, and examine evaluation data.

Visit: www.militaryfamilies.psu.edu

"It is also very important to meet with the people who are running the program and the families who are receiving the services. Learning from on the ground experiences, we can better understand the many components of the SOS program and then figure out ways to assess whether and how they enhance the well-being of family members."
- Kelly Davis, Research and Evaluation Scientist

Survivor Outreach Services (SOS)
Visit: www.sos.army.mil

Survivor Outreach Services

Dr. Davis is leading a project to evaluate the Army's Survivor Outreach Services (SOS). The program provides long-term support to families of Fallen Soldiers. Military men and women who lose their lives leave behind grieving families who may need special support and assistance. No matter the rank, status, or circumstances of death, SOS educates Survivors about benefits, including financial support, education funding, housing, and health care services. Beyond such instrumental support, SOS also provides emotional support to grieving families and helps them continue to feel a part of the Army family as long as they desire.

There are 60 SOS locations around the world that are designed to provide families of Fallen Soldiers with dedicated outreach and support. Dr. Davis and her team visited four of the locations in their efforts to develop an evaluation plan to assess the effectiveness of the SOS.

The team interviewed survivors, SOS Support Coordinators, Financial Counselors, and representatives in related agencies at SOS offices to try to obtain a representative sample of perspectives on how the program works.

The next phase will involve using the data from the site visits to design an evaluation of the program so to provide evidence of whether the program benefits Survivors as intended. Dr. Davis said it can be difficult to create a single evaluation for a program that varies in how and where it is implemented.

"That is why our evaluation work is so important," she explained. "We need to identify what's working and what, if any, areas can be improved. Using this information, the goal is to help the Army make SOS the best program it can be."

Dr. Davis said she is proud to be a part of this important translational research and that she is excited about the new opportunities the Clearinghouse has created to support and work with military families.

"The evaluation of Army Survivor Outreach Services is a great example of applied research with a clear aim of providing data to inform decision-making for program improvement," said Dr. Perkins. "This is translational research in action in that it has direct impacts on families with loved ones who have made the ultimate sacrifice."
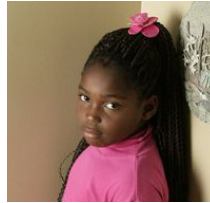
Experiential Avoidance Increases PTSD Risk

Child abuse is a reliable predictor of post-traumatic stress disorder, but not all children who have experienced abuse suffer from the disorder. Chad Shenk, Assistant Professor of Human Development and Family Studies, examined why some children who have suffered abuse and trauma develop PTSD and others do not.
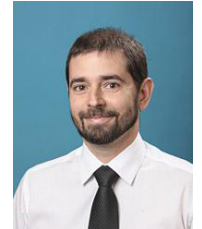
Chad Shenk, Assistant Professor of Human Development and Family Studies

The research, published in the February 2014 issue of *Development and Psychopathology*, found that adolescent girls who experienced maltreatment during the previous year and who talked about their painful experiences, thoughts, and emotions, were less likely to have PTSD symptoms one year later. In contrast, those who tried to avoid painful thoughts and emotions were significantly more likely to exhibit PTSD symptoms down the road.

"Avoidance is something we all do," Dr. Shenk said. "Sometimes it is easier not to think about something. But when we rely on avoidance as a coping strategy...that is when there may be negative consequences."

According to previous research, approximately 40 percent of maltreated children develop PTSD at some point in their lives. Dr. Shenk's research attempts to identify the factors that keep the remaining 60 percent from developing the disorder.

"Children and adolescents react very differently to abuse, and we don't yet know who is going to develop PTSD and who won't. This study was aimed at identifying some of the causal pathways to PTSD."

- Chad Shenk, Assistant Professor of Human Development and Family Studies

Dr. Shenk said previous research focuses on two different levels of analysis—neurological and psychological. One theory holds that PTSD is caused by dysregulation in neurobiological processes, including cortisol deficiencies or heightened suppression of respiratory sinus arrhythmia—each of which affects how individuals can remain calm during a time of stress. Another theory is based on experiential avoidance, characterized by the tendency to repress or deny negative feelings like fear, sadness, or shame. Dr. Shenk tested both theories, conducting analyses to determine which factors best accounted for PTSD symptoms.

"It would be inappropriate to say that these are competing theories, but in the literature they are often treated that way," he said. "I think these processes are related."

At three different points over two years, the research team examined girls who suffered from at least one of the three types of child maltreatment—physical abuse, sexual abuse, or neglect—during the previous year. The 51 maltreated adolescent girls were compared to 59 adolescent girls who had not experienced maltreatment.

Dr. Shenk said that figuring out which processes conferred the greatest risk for PTSD could provide a basis for prevention and clinical intervention programs.

"If we can identify the cause or risk pathway, then we know what to target clinically."

- Chad Shenk, Assistant Professor of Human Development and Family Studies

Also working on this project were Frank Putnam, Professor of Psychiatry at the University of North Carolina; Joseph Rausch, Associate Professor of Pediatrics at the University of Cincinnati College of Medicine; James Peugh, Assistant Professor of Pediatrics at the University of Cincinnati College of Medicine; and Jennie Noll, Professor of Human Development and Family Studies at Penn State and Director of Research and Education for the Network on Child Protection and Well-Being.
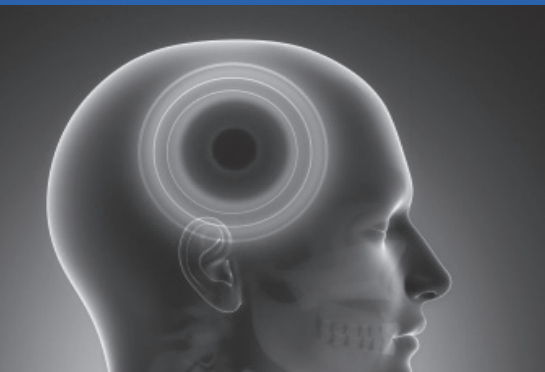
Biological Bases of Behavior, Health, and Development

Research in the social and behavioral sciences at Penn State examines the human system at multiple levels of analysis. Studies of the biological bases of human health and behavior include investigations of gene-environment interactions and the role of reward centers in the brain for risky behavior in adolescence, as well as analysis of the implications of daily experiences for adults' physiology and immune function. Capitalizing on Penn State's strength in the study of developmental processes, researchers are using neuroscience methods to examine development in domains ranging from perception and language to motor behavior. Collaborations with life and biomedical scientists are extending this work to the study of disorder and disease.

Work-Home Stress Study: An Interdisciplinary Success

RESEARCHERS COMBINE DISCIPLINARY KNOWLEDGE AND METHODS TO DEVELOP A NEW PERSPECTIVE ON STRESS AT HOME AND WORK
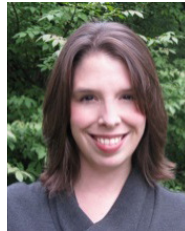
Sarah Damaske, Assistant Professor of Labor and Employment Relations, Sociology, and Women's Studies, was excited to learn about data collected as part of Professor of Biobehavioral Health (BBH) and Medicine Joshua Smyth's "Work and Daily Life" study. She thought the data could shed light on a question raised over a decade and a half ago by work-family sociologist Arlie Hochschild.

In her book, *The Time Bind*, Dr. Hochschild raised the question of whether work had replaced home as a "haven." While this question had received attention in the past, no one had directly measured individuals' physiological stress levels at home and at work and compared the two. Little did Dr. Damaske know that the ensuing collaboration would attract attention from national media and ignite conversations across the Internet.

How it all Began
It started during a discussion with Dr. Smyth. The two spoke about the data Dr. Smyth had collected from employed adults while at home and at work. Dr. Smyth thought there might be unexplored research questions that could be addressed with the data.

Drs. Smyth and Damaske and BBH post-doctoral scholar Matthew Zawadzki, began developing a research project that would soon have the BBC, NPR, The New York Times, the Wall Street Journal, and ABC World News calling Dr. Damaske's office.

Sarah Damaske, Assistant Professor of Labor and Employment Relations, Sociology, and Women's Studies

Joshua Smyth, Professor of Biobehavioral Health and Medicine

Matt Zawadzki, BBH Post-doctoral Scholar

Findings and Results

Publishing their study in *Social Science and Medicine*, the researchers found evidence that people's lives may be less stressful at work than at home. Examining cortisol level measurements, the researchers found that men and women—across marital statuses, education levels, and occupation levels—had lower levels of the stress hormone cortisol at work than at home.

The researchers also found that the relative reprieve from stress observed at work (as seen in lower levels of cortisol at work) was greater for those workers without children than for those with children living at home.

Although they did not have data to directly evaluate mechanisms underlying these results, the researchers speculated that there may be fewer benefits of the stress-reduction of work for parents than for non-parents. Alternatively, parents may experience some stress-relief at home from the presence of their children.

Drs. Damaske, Smyth, and Zawadzki also found evidence to suggest that there is a more complicated story. Employees reported feeling more subjective stress on work-days than on non-work days, suggesting that some stress from home may stem from the challenges of combining personal and family responsibilities with work responsibilities. Although the study's overall findings are consistent with the "work as haven" hypothesis, combining the responsibilities of work and home may increase individuals' subjective experience of stress.

"For me, the story of the paper is that we found a potential explanation for prior research that says work is beneficial to people's physical and mental health," Dr. Damaske said.

As testimony to the unique data and results of this collaboration, in the weeks after the study was published, Dr. Damaske received dozens of requests for interviews from national and international news outlets. Hundreds of people from around the world shared their opinions on the results, but the collaborative nature of the project was often forgotten in its coverage.

"The really exciting part to me is that we were able to come together and do this cool collaborative project. I wasn't fully ready for what came after," Dr. Damaske said.

Drs. Damaske and Smyth agree that despite some challenges, interdisciplinary research can yield innovative results. Sociology and Biobehavioral Health are drastically different in their languages and methods. Their journals and colleagues are different. For two researchers in seemingly unrelated fields, working together to find a common ground is integral in conducting this kind of research.

"The success story is taking methods and procedures that are common in one field and merging them with the theory and questions of another," Dr. Smyth said. "This gives you a unique contribution that can dramatically change the way people think. It works best when you can align your purposes and minimize any conflicts."

One does not simply find the areas that overlap within disciplines. Dr. Smyth said researchers who want to collaborate widely in interdisciplinary ways need to be willing to devote the time and energy to learn about new theories, lexicons, and furthermore, need to be "unafraid of looking naïve."

"You are going into an area where you do not know much...and that can feel very awkward," he said. "As researchers, our self-concepts are largely based on what we know, and you realize you don't know anything about this new field and it feels uncomfortable, but you have to persist and know you are there for a reason."

Dr. Damaske said the introduction to a new discipline can be intimidating, particularly one using different methodologies.

But when asked for advice for other junior faculty, she said that it is important to seek out new opportunities. "Biobehavioral Health does not sound like anything we do in Sociology. Being available and saying 'yes' to something new gave me the opportunity to be a part of this very exciting research," said Dr. Damaske.

"The sucess story is taking methods and procedures that are common in one field and merging them with the theory and questions of another."

Joshua Smyth
Professor of Biobehavioral Health and Medicine

"The really exciting part to me is that we were able to come together and do this cool collaborative project."

- Sarah Damaske, Assistant Professor of Labor and Employment Relations, Sociology, and Women's Studies

More Prep Time in the Kitchen May Improve Children's Health

STUDY FINDS THAT PARENTS WHO SPEND MORE TIME PREPARING MEALS HAVE CHILDREN WHO MAKE BETTER FOOD CHOICES

Getting children to eat a healthful diet can be a daily battle. New research shows that if parents want their children to make better food choices, they may need to spend more time in the kitchen.

In collaboration with Penn State researchers in the Departments of Food Science and Nutritional Sciences, Kathleen Keller, Assistant Professor of Nutritional Sciences and Food Science, explored factors affecting children's food choices. The researchers found that when they were given their own choices, children whose parents reported more time spent on food preparation at home decided to eat foods that were lower in energy density (a measure of calories per gram), such as milk, vegetables, and fruit, compared to children whose parents reported less food prep time.

Kathleen Keller, Assistant Professor of Nutritional Sciences and Food Science

Effects on Children's Food Choices

"In general, research shows that children tend to eat inadequate amounts of nutrient-rich foods, but instead eat large amounts of sugary and fatty foods," explained Food Science Graduate Student Catherine Shehan, a member of the research team. "It's encouraging to see that parents may affect the quality of their children's food choices outside the home by spending more time cooking."

"Some findings were not as surprising. For example, children really like cookies," said Dr. Keller. "But when we look at the correlation between foods they say they like and what they eat, you start to see some variability."

Parents brought their children to the Metabolic Kitchen and Children's Eating Behavior Lab on the University Park campus for the study. They filled out a survey asking about their food-preparation routines, which parent was the primary food preparer, and what foods their children preferred.

The children in the study were four to six years old. Dr. Keller said this is the age children begin to express food preferences. In the lab, each child was given a single sampling of a variety of foods (i.e., cookies, grapes, chicken nuggets, chips, tomatoes). After trying each food, they were able to eat as much of any of the foods they wanted.

"Parents who reported 14 to 16 hours a week of food preparation had children who ate healthier overall," Dr. Keller said. "This makes sense. Perhaps these children are exposed to a wider range of foods and therefore develop preferences for healthier, lower-density foods."

> *"Some findings were not as surprising. For example, children really like cookies, but when we look at the correlation between foods they say they like and what they eat, you start to see some variability."*
>
> *- Kathleen Keller, Assistant Professor of Nutritional Sciences and Food Science*

Innovations

"Nobody has investigated factors that could affect the relation between liking a food and eating a food," Dr. Keller said. "We are re-examining this association in a new way."

Next steps include enlisting involvement of experts from the Social, Life, and Engineering Sciences Imaging Center (SLEIC) for follow-up studies of neurological processes in children's food preferences. Future research also includes investigating the relations between other dimensions of food preferences—like packaging and branding—and children's eating behaviors.

This line of work has practical implications, such as developing cooking classes for parents and their children that demonstrate the importance of cooking healthy foods and other ways of encouraging children's and parents' involvement in food preparation.
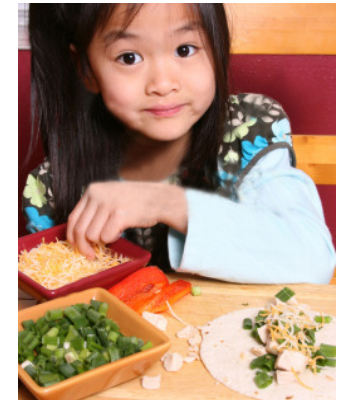
Helpful Hints for Parents

- Dr. Keller said that parents may get stuck in the habit of cooking what they think children like. It is good for children to experience a range of food to develop their preferences.

- "Parents aren't always good reporters of what their children like," she said. "They will say, 'He never eats vegetables' …and in the other room their child is eating them up."

- She suggests that parents keep at it and not become discouraged when children refuse to eat broccoli, kiwi, or other unfamiliar vegetables and fruits. Continuing to diversify their in-home menus may encourage children to make healthier choices in the future.

Dr. Keller is a co-funded faculty member in the SSRI. Other investigators on this study are Nutritional Sciences Research Scientists Terri Cravener and Haley Schlechter under the supervision of Dr. Keller and John Hayes, Assistant Professor of Food Science.

Social and Demographic Change

Critical human problems are evident around the globe in the context of dramatic demographic and social change. Fertility continues to decline in industrialized nations even as the global population grows. Low fertility rates coupled with increases in longevity produce a rapidly increasing aging population within the industrialized world. Emerging patterns of population migration mean that the ethnic composition of communities in the United States and around the world is changing. At Penn State, researchers in the Population Research Institute examine what this changing landscape means for human behavior, health and development, and identify ways for families and communities to best support the well-being of their members in a context of rapid social change.

Identifying Health Care Disparities Among Hispanics

RESEARCH PROJECT TO EXAMINE THE HEALTH CARE CHALLENGES HISPANICS FACE IN DIFFERENT AREAS OF THE UNITED STATES

Health care disparities have become an increasingly important issue in the United States, with researchers and policymakers searching for ways to provide every citizen with equal access to care. There are a number of under-served populations throughout the country, but compared to other groups, Hispanics have long experienced considerable barriers to receiving high-quality health care.

According to a Pew Research study, nearly half of Hispanics in the United States are foreign-born, many have limited English proficiency and knowledge about when, where, and how to access health care. Changing migration patterns over the past 30 years, as well as an emergence of large Hispanic populations in areas with a historically small number of Hispanics, have led researchers to ask whether these new destinations can address the health care needs of this minority group.

Grants and Funding

Shannon Monnat, Assistant Professor of Rural Sociology, Demography, and Sociology, wanted to explore whether living in different parts of the United States—specifically metropolitan vs. non-metropolitan—was linked to health care disparities among Hispanics. Working in the newly opened Census Research Data Center (RDC) on the University Park campus, Dr. Monnat will be able to do just this.

Shannon Monnat, Assistant Professor of Rural Sociology, Demography, and Sociology

Supported by a grant from the National Science Foundation and funding from Penn State funds, the RDC provides researchers with access to data collected by the U.S. Census Bureau and the National Center for Health Statistics.

Hispanic Population Locations

Dr. Monnat explained that, starting in the early 1980s, Hispanic populations began migrating to smaller cities and rural areas that historically have very small or nonexistent Hispanic populations. However, these smaller communities may not have the social and health care infrastructure to handle the influx of new residents. Further, the characteristics of Hispanics who move to these new destinations may be quite different from those of Hispanics living in areas with historically large Hispanic populations.

For example, the jobs that Hispanics tend to find in new destinations, particularly those located in rural areas, may not offer health insurance.

Health Care Challenges

Health care providers in new destinations may be less likely to offer bilingual services than those in established destinations. In preliminary research, Dr. Monnat found that Hispanics living in new destinations may only be better served when those new destinations are located in metropolitan areas. Hispanics who are living in new rural destinations appear to be at high risk of not having health insurance and not having access to a personal doctor.

With recent funding from the Robert Wood Johnson Foundation, Dr. Monnat hopes to identify whether the health care disparities between Hispanics living in new vs. established metropolitan and non-metropolitan destinations can be accounted for by individual human capital characteristics, namely income, education, and English-language proficiency, or the characteristics of the communities they are moving into, including community economic disadvantage, labor force opportunities, and health care infrastructure. She is also interested in exploring the role that country of birth plays in health care access. To address her research goals, Dr. Monnat will analyze restricted RDC geographic data from approximately 1,500 counties in the United States.

Using the Research Data Center
Most publicly available health-related data do not include indicators of where respondents reside. "In order to answer my research questions, I need to be able to identify the counties in which Hispanics are living in so that I can determine whether they are living in a new or established destination and how rural or urban the county is in which they reside," Dr. Monnat said. "The RDC allows me to do this by providing access to data with geocodes. For my project, I will be able to link individual-level data to contextual data using the FIPS (Federal Information Processing Standard) code. This will allow me to conduct a much more rich and interesting analysis than what I would be able to do without the geographic identifiers."

With access to restricted data through the RDC, support from the Population Research Institute, and funding from the Stanford Center on the Study of Poverty and Inequality, the Robert Wood Johnson Foundation, and the SSRI, Dr. Monnat will be able to provide new insights into the conditions of Hispanics in the United States that may shed light on determinants of health disparities.

> *"In order to answer my research questions, I need to be able to identify the counties in which Hispanics are living so that I can determine whether they are living in a new or established destination and how rural or urban the county is in which they reside."*
>
> *- Shannon Monnat, Assistant Professor of Rural Sociology, Demography, and Sociology*

Study Finds Racial/Ethnic Disparities in ADHD Diagnoses by Kindergarten Entry

Attention deficit/hyperactivity disorder (ADHD) can occur in children before they reach kindergarten. To date, little research has been conducted on health disparities that may be occurring at this age. Research by Paul Morgan, Associate Professor of Education, found that, compared to otherwise similar white children, those who are black or from non-English speaking households, are less likely to be diagnosed with ADHD.

Paul Morgan, Associate Professor of Education

The study, published in *The Journal of Child Psychology and Psychiatry*, analyzed longitudinal data from a large, nationally representative cohort of U.S. children. The researchers found that the odds that black children would receive an ADHD diagnosis were 70 percent lower than the odds for otherwise similar white children. A disparity for Hispanic children was explained by use of language other than English in the home, suggesting that this may be a barrier to ADHD diagnosis during early childhood.

"This study should give health researchers and practitioners an accurate estimate of the extent to which racial/ethnic minority children may be experiencing disparities in ADHD diagnosis in the United States," said Dr. Morgan.

"Not much is known about ADHD diagnosis before kindergarten, although the American Academy of Pediatrics considers it a condition that may require behavioral and pharmacological treatment by this time."

– Paul Morgan, Associate Professor of Education

The researchers studied children between the ages of 24 and 60 months, because previous studies found that ADHD can emerge during this time. The study controlled for a range of potential confounding factors, including socio-economic status, general cognitive functioning, and ADHD-related behavioral functioning.

Dr. Morgan suggested that cultural and/or linguistic barriers may inhibit health professionals from soliciting developmental concerns from minority families and so explain the observed disparities. It also may be that a lack of awareness regarding the early onset of the disorder or reluctance to have their child labeled as disabled may mean that minority parents are less likely to seek a professional evaluation.

"Certainly you don't want to diagnose a child with ADHD who doesn't have it," Dr. Morgan added. "But if a child with the disorder isn't receiving effective treatment, he or she is at much greater risk for struggling at school. Such difficulties can cascade very quickly over time and place the child at much greater risk for a range of negative outcomes."

Dr. Morgan said he hopes the findings will lead pediatricians, psychiatrists, teachers and school-based health professionals to be sensitive to and accurately diagnose ADHD in minority children.

"There are comparatively few studies examining child outcomes as early as school entry," he said. "We are finding that ADHD diagnosis disparities can occur as early as the beginning of kindergarten, which places undiagnosed children with the disorder at a big disadvantage just as they are beginning their school careers.

Also participating in this project were Marianne Hillemeier, Professor of Health Policy and Administration and Demography; George Farkas, Professor of Education at the University of California-Irvine; and Steve Maczuga, Research Programmer with the Population Research Institute.

Dr. Morgan said he hopes the findings will lead pediatricians, psychiatrists, teachers and school-based health professionals to be sensitive to and accurately diagnose ADHD in minority children.

Innovative Methods

Advances in the social and behavioral sciences will rest on novel approaches to research design, measurement, data collection, and analysis. Such new approaches will allow investigators to address the complexities of human and social systems. For many years, research in the social and behavioral sciences at Penn State has both driven and been driven by the development of novel research methods. Collaborations between social scientists and researchers in Computer Science, Engineering, and other disciplines are beginning to yield new directions in the development of data collection devices and computational approaches for data modeling, mining, simulation, and analysis.

Merging Two Methods to Enhance Smoking Research

Smoking is an expensive behavior. Beyond the price of cigarettes, estimates suggest that smoking costs the United States hundreds of billions of dollars each year in the form of medical expenses and lost productivity. Although there has been extensive work on the consequences of smoking, researchers still do not have a firm grasp as to why smokers continue this unhealthy behavior despite the myriad anti-smoking campaigns.

With help from the Dynamic Real-Time Ecological Ambulatory Methodologies (DREAM) initiative within Penn State's Survey Research Center (SRC) and the Social, Life, and Engineering Sciences Imaging Center (SLEIC), Assistant Professor of Psychology Stephen Wilson is building a case to combine two research methods—ecological momentary assessment (EMA) and functional magnetic resonance imaging (fMRI) to gain a unique view into smokers' behavior. The technology of EMA provides researchers access to smokers' day-to-day experiences and routines outside the lab, while fMRI enables researchers to peer into the brain to see what drives smokers' choices. Dr. Wilson says using the two methods together holds great potential for the field of tobacco research and intervention.

Stephen Wilson, Assistant Professor of Psychology

A Unique Combination

"FMRI, like a lot of techniques in the lab, has a lot of constraints, but it's a very sensitive way to see how parts of the brain that are important for motivation are responding," he said. "Instead of a standardized protocol, EMA allows you to sample each person's changing experiences as they go about their day."

For the EMA side of the research, Dr. Wilson's team uses smartphone technology to track participants' thoughts and choices throughout the day. Through the smartphones, participants—typically smokers who have been smoking for more than a year—are signaled five or six times a day to answer questions about their immediate experiences, such as "How are you feeling?" or "When was the last time you smoked?" Sometimes the participants are asked to perform tasks.

The fMRI portion of the research analyzes participants' blood oxygenation and flow in response to neural activity, with the goal of uncovering the brain mechanisms that underlie participants' behavior. While the participants' brains are being scanned, the researchers ask them to perform particular tasks.

"The tasks that we use include simple decision-making questions," Dr. Wilson said. "For example, you have an 80 percent chance of winning a dollar or a 40 percent chance of winning $2.50. Which do you take? This taps into how people process information about risk and reward."

With fMRI as a tool, Dr. Wilson and his team can see changes in the pattern of brain activation when someone makes a certain choice.
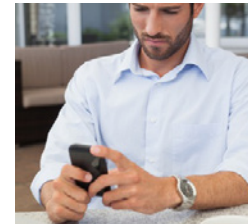
"Using the two approaches, we look at reward in the brain and reward out in the real world," Dr. Wilson said. "This way we can get at the same kinds behaviors with two different methods."
- Stephen Wilson, Assistant Professor of Psychology

Aside from a few challenges, such as the potential time burden to participants, Dr. Wilson said the synergy between these two methods could lead to new understanding of why people become addicted, how they make decisions when they are addicted, and how they can quit.

Innovative Treatments

He added that the pairing of real world and laboratory methods opens the door to a new treatment method called ecological momentary intervention (EMI). Just like EMA reaches out to participants to study them throughout the day, EMI uses mobile technology to provide treatments and interventions to individuals in real time and in their natural settings.

"We can put smokers in the [fMRI] scanner," Dr. Wilson said. "We can measure information processing at the neurological level by assessing brain activity, and then we can assign interventions delivered via their smartphones that are tailored to the individual and respond in a dynamic way to the individuals' daily experiences and needs."

This real-time intervention would be a unique way for smokers to learn how to quit and serve as a constant form of help after they leave the lab. And, findings from this ongoing project can inform further EMI research.

Dr. Wilson said support from DREAM and SLEIC, both within the SSRI, provided an opportunity to see that this combination thrives.

"DREAM provides many of the services researchers need to do a study like this," he said. "You can rent smart phones. The staff will program them for you. No matter your experience, DREAM is flexible and very helpful when it comes to putting together a research project."

"SLEIC also provides a wonderful resource, as it brings together the technology and expertise that is required to conduct cutting-edge fMRI research."

The SSRI provided the seed funding that allowed the research team to build this collaboration, conduct the study, and publish the results.

"This research project was a great idea, but without seed funding it would have stayed a great idea. The SSRI allowed us to build a pilot. It's really exciting to look forward to answering questions about human behavior in a new way."

- Stephen Wilson, Assistant Professor of Psychology
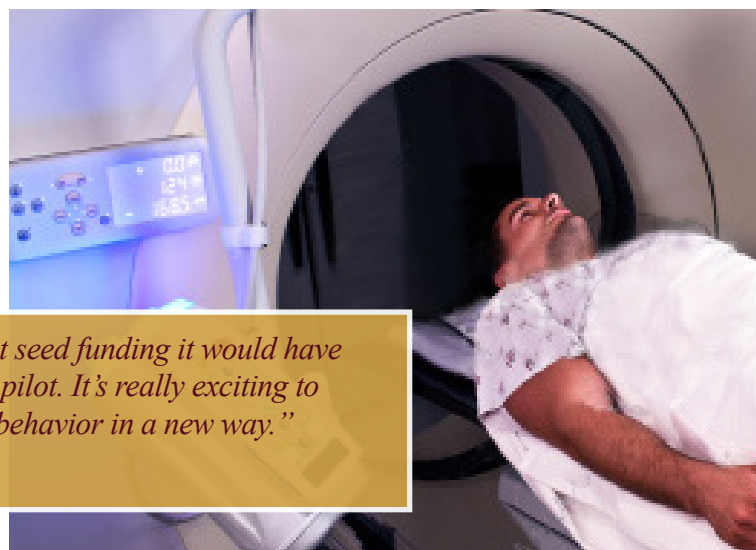
When Children Begin to Self-Regulate

LEARNING FROM CHILDREN WHO CAN SHOW A LITTLE RESTRAINT

A toddler is sitting at a table. On a dish in front of her is a cookie—which she is told not to eat until given permission. The child's instinct may be to grab and swallow the sugary morsel (a prepotent process), but she is doing her best to follow directions. She finds ways to distract herself. She looks at the ceiling and starts singing—anything to keep her mind off of the tasty treat (executive processes). This child is self-regulating.

Researchers have many ways of studying self-regulation using a wide variety of theories, terminology, and measurement strategies. The National Institutes of Health (NIH), however, identified the lack of unity in this important field as a barrier to its progress.

Pamela Cole, Professor of Psychology and Human Development and Family Studies

To address this concern, in collaboration with colleagues in Pathways to Competence, a research initiative in Penn State's Child Study Center, Liberal Arts Research Professor of Psychology and Human Development and Family Studies Pamela Cole had an idea to bring a team together with the goal of identifying a cross-cutting model. Dr. Cole and Associate Professor of Human Development and Family Studies and Psychology Nilam Ram recognized that Penn State had the ideal combination of developmental scientists and methodologists to advance the study of self-regulation.

Nilam Ram, Associate Professor of Human Development and Family Studies and Psychology

"Neuroscience, social psychology, developmental psychology…We read work from all of these different literatures to see if there were any commonalities in how self-regulation is understood," Dr. Cole said. "The disciplines define and measure self-regulation differently, but we believe there is a common core, and that is what we want to find and define."

Working with seven other scholars, they crafted a conceptual model of self-regulation that could potentially expand the opportunities for new, cross-disciplinary research and the development of novel analytic approaches for modeling self-regulation processes.

Prepotent responses are like impulses, or knee jerk reactions. For example, a child's initial response to a fear-invoking stimulus—like the approach of an unfamiliar peer—may be to cry. However, humans have evolved the capacity to adjust their reactions with executive processes using higher order areas of the brain to moderate impulsive responses. Collecting information and reasoning through a situation may allow a child to calm his fear. As children get older, they become more skilled in self-regulation.

"The methodologists can bring new analytic approaches to the study of human behavior, and that's what's fabulous."

- Pamela Cole, Professor of Psychology and Human Development and Family Studies

Adapting models from biology, economics, meteorology, physics and engineering, the group is building new mathematical models to capture the complexities of regulatory processes and testing these models against data in the researchers' archives.

Biologists, for example, have developed elegant mathematical models for the interplay between different species of animals. When foxes have the opportunity to meet rabbits, one species tends to eat the other. That process invokes positive progression for the foxes, but negative progression for rabbits. Applying this model, the methodologists are checking whether self-regulation processes can, in specific contexts, also be characterized as predator-prey relations, with the executive processes "eating" the impulsive ones.

The Methods

Unlike many researchers who use questionnaires to describe self-regulation, the Penn State developmental scientists contribute observational and physiological data that allow the team to study how these change over the course of an emotion-eliciting situation.

"Investigators from HDFS and Psychology have collected troves of data over the last 10 years," Dr. Ram said. "We are pooling all of these data and checking how well these new models explain children's behavior as it unfolds in the real world."

Research shows that children who self-regulate well make better decisions as adolescents and adults—such as avoiding drugs, drinking, and other risky behaviors.

Merging together the wealth of observations of children's behavior collected by Penn State researchers, developmental scientists' expertise about children and how they grow, and the expertise in mathematical modeling of faculty members in the Quantitative Developmental Systems Methodology Core, the new team is advancing understanding of the nature of early regulatory processes.

"The implications are immense. When we can better understand how self-regulation processes play out in real time, we'll be much better positioned to help children develop the skills they need to negotiate their worlds in effective and healthy ways," Dr. Ram said.

Child Study Center, Visit: www.csc.psych.psu.edu
Quantitative Developmental Systems Methodology Core, Visit: www.quantdev.ssri.psu.edu

What to Say and When to Say it

PROGRAM USES ARTIFICIAL INTELLIGENCE TO HELP TEACHERS LEARN HOW TO INTERVENE DURING BULLYING SCENARIOS

Approximately one in three children in the United States is negatively affected by bullying (National Center for Education Statistics and Bureau of Justice Statistics, 2008-2009). The effects can hinder a child's development and complicate his or her family-life, place in the community, and status at school. Bullied children have a higher likelihood of suffering serious mental problems in later life, including depression, anxiety, and irregular sleeping and eating.

1 in 3 U.S. Children
are negatively affected by bullying

Teachers can play a critical role in preventing and intervening in bullying-related incidences. But that can be easier said than done for many in the teaching profession. Strategies for preventing and intervening in bullying are skills many teachers are forced to learn "on the job." Without sufficient opportunities to practice talking with students about bullying, many teachers may avoid getting involved in peer conflicts in fear of worsening the situation. However, preparing teachers to effectively engage students in these, and other "difficult conversations," is an important unmet need in many teacher preparation programs.

Few, if any, beginning teachers have opportunities to practice how to have "critical conversations" with students before they begin teaching. Many beginning teachers simply do not know where to start in talking with children about important, but difficult topics like bullying, alcohol or drug use, or suspected child abuse. However, the manner in which beginning teachers engage youth in these conversations can have important long-term consequences. The need to prepare teachers to "hit the ground running"

concerned Jennifer Frank, Assistant Professor of Education (principal investigator) and Deborah Schussler, Associate Professor of Education (co-principal investigator) who saw a need for an interactive training tool designed to help teachers practice engaging in difficult "critical conversations" before they get to the classroom.

"The first situation you have (as a new teacher) is so important," Dr. Schussler said. "It's real. And that's the pedagogical dimension of this project. How can we give teachers practice in how to engage students in critical conversations without the possibility of worsening a child's situation with a bullying peer or peer group?"

Jennifer Frank, Assistant Professor of Education

Deborah Schussler, Associate Professor of Education

Prevention Programs Today

Current educational programs rely on in-class role-playing with other students, which according to Dr. Frank, can often be inefficient and often ineffective. Typically, in-class role play is time limited, student performances are rarely documented, and there is inadequate "think-time" for teachers to make connections between content learning and applied practice. The investigators saw a need for developing instructional supports that put the teacher candidates "in the moment" with real-life situations to handle. They also wanted to slow down normal conversations so that the beginning teachers have time to think deeply about how they would ideally like to respond and document these responses so they can review, reflect, and improve on their performance.

"When faced with a difficult and emotionally provocative student situation in the classroom, many new teachers struggle with what to say and when to say it," Dr. Frank said. "Typically, those skills develop over the course of several years and lots of learning through trial and error. What we are trying to do here is speed up the learning process."

Developing Interventions with Artificial Intelligence (AI)

The team's project is two-fold: develop practical bullying protocols for teachers and build the technology to support a virtualized version of classroom role play. Drs. Frank and Schussler, with help from Penn State's Teaching and Learning with Technology (TLT) unit and two graduate students, developed an artificially intelligent pedagogical agent to mimic bullying scenarios.

The pedagogical agent is an on-screen computer program that uses AI to engage users in a simulated conversation. For example, if the user types, "How are you feeling today?" the program might reply, "I am feeling sad." The team has also systematically programmed in more provocative responses so that it challenges teacher candidates to think through optimally supportive responses.
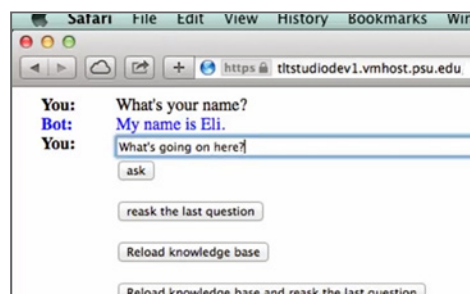
The pedagogical agent creates a virtual bullying situation for teachers to practice intervening.

The pedagogical agent uses AI programming developed by the project team to give teachers a way to practice intervention efforts outside the classroom. It also sets the stage for teachers to practice following prevention and intervention protocols. Users are given a hypothetical scenario. They choose a character to speak to (bully victim, or parent), and then engage in a back-and-forth conversation that challenges them to ask the right questions and respond thoughtfully until the problem is resolved.

"These are critical conversations we're trying to create," Dr. Schussler said. Currently, the pedagogical agent can recognize more than 600 phrases and learns as more users utilize the system. The program is designed to simulate the responses of children in the fifth grade, an age when students typically start to experience bullying. The entire intervention is logged so users can review their conversations and receive coaching on their responses afterward.

Challenging Teachers

"We program the agent to produce particular phrases that often get under the skin," Dr. Frank said. "Phrases like 'I hate you' challenge the teachers to stop and think about what to say. Afterward, they can review their log, and with help from a coach, learn what to say during a real bullying incident and how to say it."

This type of training is drastically different than many bullying prevention programs that schools employ today. First, many of the current programs focus on prevention. The agent trains teachers to feel more confident when the time comes to intervene.

"There are a lot of bullying prevention programs that focus on training in social skills or modifying environmental contingencies. That's great and very important. But when it does happen…what should teachers do and say? How can they effectively intervene in the situation when they are needed?"

- Jennifer Frank, Assistant Professor of Education

With the pedagogical agent, teachers can try out different approaches without discouraging an actual student, and have a record of the conversation to review after the fact. With its success, Dr. Frank said the program can be used to educate teachers, parents, and other adults who work with children on how to intervene in many areas in which difficult conversations are likely to arise including sex education, drug and alcohol use, and child maltreatment.

The program is funded by the Center for Online Innovation in Learning. Along with Drs. Frank and Schussler, Patricia Jennings, Associate Professor of Education at the University of Virginia, is a co-principal investigator. Tsan-Kuang Lee of the TLT is the program's lead programmer and developer. Research Assistants Emily Chukusky (Psychology) and Alex Collopy (Education) assisted with coding the questions and answers for the pedagogical agent.

Visit: www.ed.psu.edu/virturalroleplay   /   On Twitter: @PSUVirtualrp

The Social Science Research Institute
The Pennsylvania State University
114 Henderson Building
University Park, PA 16802
www.ssri.psu.edu