

The Social Science Research Institute

ANNUAL REPORT 2014 - 2015



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, the National Institutes of Health Office of Behavioral and Social Science Research has called for 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. 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 2014-2015 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 2014-2015 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 program in our faculty's efforts to obtain external funding for their research. A highlight of the year included the significant growth of our Network on Child Protection and Well-Being (read more on pages 16-17) and Clearinghouse for Military Family Readiness (read more on pages 13-14). The SSRI currently co-funds 37 faculty members located in 12 departments across five colleges (see page 5). Our co-funded faculty continue to make significant contributions to the SSRI's research portfolio at Penn State.

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 social and behavioral sciences remain 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



Susan McHale, Ph.D.

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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

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: Joshua Smyth, Ph.D.

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 science and outreach to advance the health and well-being of military service members and their families. The Clearinghouse utilizes a rigorous vetting process to place programs on a continuum of evidence, ranging from “ineffective” to “effective.” The Clearinghouse supports professionals as they make informed decisions about which programs fit specific situations and are worth the investment. Clearinghouse research and evaluation scientists employ systematic and innovative methods to conduct process and outcome evaluations of programs and services being used with military families. Clearinghouse implementation specialists provide education, consultation, and support to guide the professional successfully through the steps of effective, evidence-informed programming. Finally, the Clearinghouse develops learning products (e.g., instructor-led training, computer-based training, webinars, discussion boards, mlearning, elearning, pod casts, and blended learning) for Service members, family members, and professionals.

Computational and Spatial Analysis Core

www.ssri.psu.edu/services/geographic-information-analysis-core

Academic Director: Guangqing Chi, Ph.D.

Managing Director: Dan Nugent

The Computational and Spatial Analysis (CSA) Core promotes and enhances social science at Penn State by assisting SSRI researchers in incorporating geographic information into their research in creative and state-of-the-art ways. The Core includes staff with expertise in spatial statistics, advanced spatial analysis, exploratory spatial data analysis, spatial econometrics, and customized programming for geographic information systems (GIS), and it provides an online, interactive WebGIS platform. The CSA Core is ramping up on methodological innovations that use mobile technology in the collection of spatial data and social media data. The staff also provides essential services to support collection of intensive spatiotemporal data on individuals and in specific contexts and construction of contextual and ecological databases, as well as geospatial data acquisition, archiving, and management. Further, the CSA Core provides training in GIS and spatial analysis to SSRI affiliates and students.

Federal Statistical Research Data Center

www.psurdc.psu.edu

Director: Mark Roberts, Ph.D.

Penn State is home to one of 19 Federal Statistical Research Data Centers located around the country. These centers provide researchers with secure access to restricted economic, demographic, and health data collected by the U.S. Census Bureau, the National Center for Health Statistics, and the Agency for Healthcare Research and Quality. It is a vital resource for Penn State faculty and graduate student researchers in the fields of economics, business, demography, statistics, sociology, and health services. The center is supported by the Offices of the President and Vice President for Research, SSRI, PRI, University Libraries, and the Colleges of Agricultural Sciences, Health and Human Development, Liberal Arts, and Science and a grant from the National Science Foundation.

Network on Child Protection and Well-Being

www.protectchildren.psu.edu

Director: Jennie Noll, Ph.D.

Assistant Director: Sandee Kyler, M.S.

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: Michelle Frisco, Ph.D.

The PRI aims to advance the scientific understanding of human population dynamics by providing research supports to over 70 faculty affiliates and associates. Priority research areas include Communities, Neighborhoods and Spatial Processes, Immigration and Immigrant Integration, Social Change and Changing Families, Health and Inequality, and Crime and Punishment. 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 the NICHD since 1991.



Quantitative Developmental Systems Methodology Core

www.quantdev.ssri.psu.edu

Director: Eric Loken, Ph.D.

The Quantitative Developmental Systems Group (QuantDev), which is jointly supported by the SSRI and the College of Health and Human Development, has a three-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 using these techniques to study a range of issues including those related to positive behavior, health, neuroscience and education outcomes, and the dynamics of individuals and groups; (2) developing user-friendly algorithms and platforms for making these methods widely available for social science researchers working on ecological momentary assessment, dynamical systems, Big Data, and other innovative person-specific and time intensive data applications; and (3) 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).

Social, Life, and Engineering Sciences Imaging Center

www.imaging.psu.edu

Director: Michele Diaz, 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.

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 2014-2015

During the last year, the SSRI welcomed several new directors to its leadership team. Their knowledge and expertise will help advance the SSRI's mission of fostering innovative, interdisciplinary research.

Guangqing Chi, Ph.D.

Director, Geographic Information Analysis Core
Research Associate, Population Research Institute
Associate Professor of Rural Sociology and Demography

Sandee Kyler, M.S.

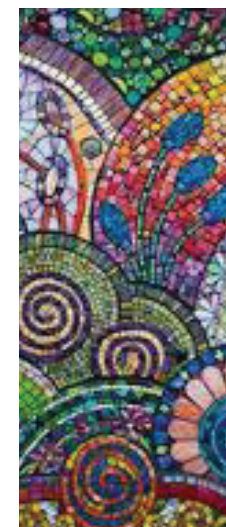
Assistant Director, Network on Child Protection and Well-Being

Jennie Noll, Ph.D.

Director, Network on Child Protection and Well-Being
Professor of Human Development and Family

Mark Roberts, Ph.D.

Director, Federal Statistical Research Data
Professor of Economics
Research Associate, National Bureau of Economic Research



People in the SSRI (2014 – 2015)

LEADERSHIP

Susan McHale, Ph.D.

Director / Distinguished Professor,
Human Development and Family
Studies

Keith Aronson, Ph.D.

Associate Director / Senior Research
Associate, Biobehavioral Health

Joshua Smyth, Ph.D.

Associate Director / Professor,
Biobehavioral Health and Medicine

INTERNAL ADVISORY BOARD

Yosef Bodovski

GIS Research Analyst

Joseph Broniszewski

Director, Information Technology Core

Guangqing Chi, Ph.D.

Academic Director, Computational
and Spatial Analysis Core / Associate
Professor, Rural Sociology and
Demography

Michele Diaz, Ph.D.

Director, Social, Life, and Engineering
Sciences Center / Professor,
Psychology

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.

Director, Network on Child Protection
and Well-Being / Professor, Human
Development and Family Studies

Daniel Nugent

Managing Director, Data, Programming
and Statistical Core

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, Federal Statistical Research
Data Center / Professor, Economics

Jennifer Van Hook, Ph.D.

Director, Population Research
Institute / Professor, Sociology and
Demography

Sherry Yocum

Director, Administrative Core

OVERSIGHT COMMITTEE

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)

Richard Roush, Ph.D.

Dean, College of Agricultural Sciences /
Professor, Entomology

Neil Sharkey, Ph.D.

Vice President, Office of the Vice
President for Research / Professor,
Kinesiology, Orthopedics and
Rehabilitation

Sheila Vrana, Ph.D.

Interim Vice Dean, Research and
Graduate Studies, College of
Medicine / Associate Professor of
Pharmacology

Susan Welch, Ph.D.

Dean, College of Liberal Arts /
Professor, Political Science

STEERING COMMITTEE

Karen Bierman, Ph.D.

Distinguished Professor, Psychology

Kathleen Bieschke, Ph.D.

Head, Department of Educational
Psychology, Counseling, and Special
Education / Professor, Counseling
Psychology

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

Benjamin Levi, M.D., Ph.D.

Professor, Pediatrics and Humanities

Shannon Monnat, Ph.D.

Assistant Professor, Rural Sociology,
Demography and Sociology

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 / Professor, Human
Development and Family Studies

Krista Wilkinson

Professor, Communication Sciences and
Disorders

Stephen Wilson

Associate Professor, Psychology

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.

Associate Professor, Educational Theory
and Policy

Guangqing Chi, Ph.D.

Associate Professor, Agricultural
Economics, Sociology, & Education

Sy-Miin Chow, Ph.D.

Associate Professor, Human Development
and Family Studies

H. Harrington Cleveland, Ph.D.

Associate Professor, Human Development
and Family Studies

Michele Diaz, Ph.D.

Associate Professor, Psychology

Jennifer Frank, Ph.D.

Assistant Professor, Education, Curriculum
and Instruction

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

Christine Heim, Ph.D.

Professor, Biobehavioral Health

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 Schaffert, Ph.D.

Associate Professor, Education, Educational
Leadership and Rural Sociology

Suzu 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 Turrissi, 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 Events

Penn State's Inaugural Stratification Conference Focuses on Residential Inequality September 12-13, 2014

More than 150 social scientists and graduate students attended the first Penn State Stratification Conference, organized around the theme, "Residential Inequality in American Neighborhoods and Communities." The event featured discussions on various aspects of inequality—from the role of race and income in the segregation of neighborhoods to the consequences of the housing crisis of 2008-2009. Selected papers from the conference were later published in a special issue of *The Annals of the American Academy of Political and Social Science*.



Military Family Risk Expert Speaks at Symposium October 29, 2014

Penn State's Clearinghouse for Military Family Readiness hosted a symposium and panel discussion on how best to promote resiliency among military families. Keynote speaker Michelle Kees, Assistant Professor in Child and Adolescent Psychiatry at the University of Michigan Medical School, discussed the significant strain that was placed on military families during the Global War on Terror. She reported the results of her group intervention for military spouses, called HomeFront Strong, which was designed to promote positive psychological health, augment individual resiliency, and support family adjustment across the transitions of deployment and military life. After the talk, Dr. Kees contributed to a panel conversation with Penn State faculty and Department of Defense officials to discuss the use of evidence-based programs with military children, youth and families.



Events Mark Opening of Penn State's 'Bilingualism Matters' Chapter December 10-12, 2014

Dr. Antonella Sorace, Professor of Developmental Linguistics at the University of Edinburgh, visited Penn State in December of 2014 to discuss Bilingualism Matters, a program she founded in 2008. Bilingualism Matters engages parents, school and community leaders, and policy makers on the far-reaching benefits of bilingualism and to promote better understanding of bilingualism. While on her visit, Dr. Sorace officially name the Center for Language Science at Penn State as the first United States chapter of Bilingualism Matters. Dr. Sorace praised the work of the Center for Language Science—work that is strongly influencing knowledge in the field, but is also leading the world in training a new generation of scholars in bilingualism.



International Conference Brings Together Researchers to Discuss Ambulatory Assessment June 24-27, 2015

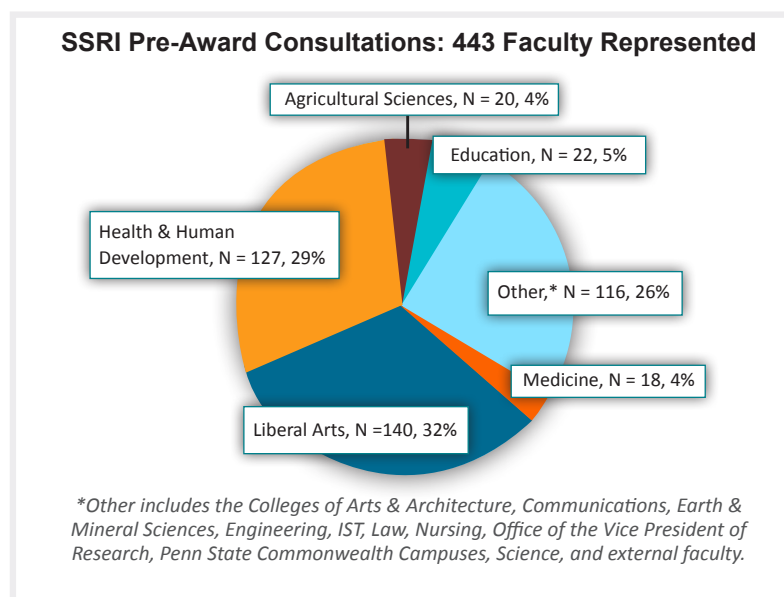
SSRI and Penn State's Department of Biobehavioral Health hosted more than 200 researchers and students from across the globe as part of the Society for Ambulatory's Assessment biennial conference, titled "Frontiers in Ambulatory Assessment." In a keynote address, Dr. Rosalind Picard, Professor of Media Arts and Sciences at MIT, discussed the rapidly evolving field of ambulatory assessment and described how ambulatory methodologies are being used to closely track mood, behaviors, and symptoms to shed new light on the manifestation of various psychiatric disorders. Other conference topics included ambulatory assessment in family and developmental contexts, and using ambulatory assessment to better understand stress and coping, sleep, and cognitive aging.



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 2014-2015, SSRI Unit and Associate Directors met with 443 faculty members. Of these, 420 were affiliated with Penn State and came from 90 departments and units. The number of consultations by college is illustrated below.

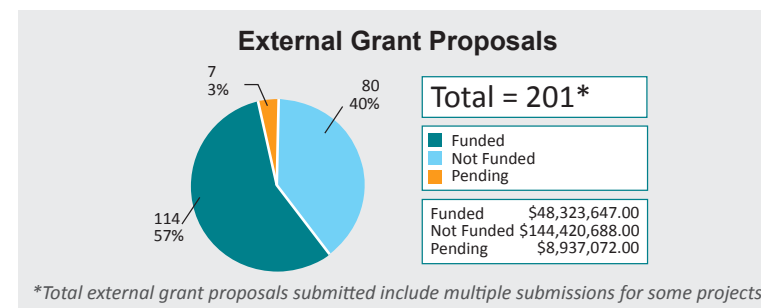


SSRI SEED GRANTS

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. Here is an overview of the outcomes realized by Level 1 and Level 2 grants since the program's inception.

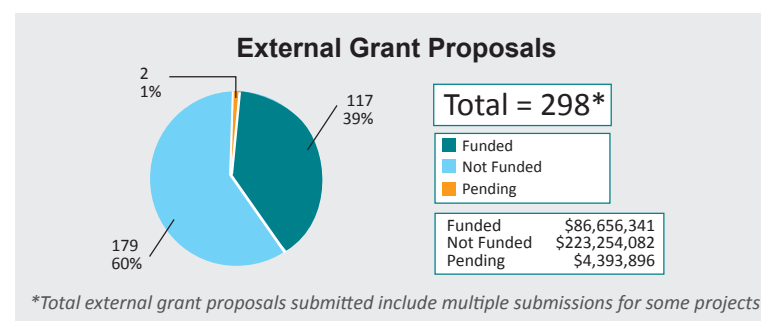
EXTERNAL GRANT PROPOSALS RESULTING FROM LEVEL 1 SEED GRANTS

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 RESULTING FROM LEVEL 2 SEED GRANTS

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





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.

“Live It” Program Gets College Students Out of Their Comfort Zones

Much of the research conducted by Dr. Meg Small, Assistant Director of the Bennett Pierce Prevention Research Center, is focused on identifying ways to translate research data into programs that benefit youth and their families. Dr. Small's previous research showed the strong influence that parents continue to have on their children as they transition into college. In one study, Dr. Small found that the amount of time spent communicating with parents on weekend days was associated—negatively—with the number of alcoholic drinks students consumed that day.

Having targeted the important role parents play in a college student's daily decision-making, Dr. Small created a pilot program called Rattle the Box that she designed to enhance the quality and quantity of parent-student communications. Parents filled small boxes with items that encouraged their students' involvement in healthful activities—such as hiking maps, packets of chamomile tea, or gift certificates for theater tickets and other local activities. In the pilot study, about 200 parents were given small boxes to fill and send to their students. The parents could use as many of the boxes as they wanted over a six-week period.

“Students not only drank less on days when they communicated more with their parents, they exercised more and ate better too. These findings got me asking: ‘How can we use what we know about parenting during young adulthood to promote healthy living? What can we do to engage students and parents? What are the best ways to widely disseminate a program that is effective and not cost prohibitive? How do we best evaluate the program's impact?’”

- Meg Small, Assistant Director of the Bennett Pierce Prevention Research Center

To keep parent-student participants engaged, Dr. Small and her team maintained communication with them throughout the six weeks by updating the Rattle the Box website with new activities. Parents also received weekly newsletters with recommendations about upcoming events, as well as location and weather information to help with planning. “For example, the parent newsletters said, ‘If you're going to suggest a hike, it's going to be sunny on Wednesday’, do it then,” Dr. Small explained. “The goal was to provide the best situations for facilitating students' discoveries on campus and in the community so they would be able to learn about themselves and try out activities that might be outside of their comfort zones.”

To assess program impact at the conclusion of the six weeks, 120 parents took part in a post-program discussion with the research team. Three-quarters of parents sent a Rattle the Box package. Overall, parents reported having a very positive experience. Program organizers also surveyed participating restaurants and retailers. Although the shops were happy to have the increased interest and business, they asked for a simpler way for students to pay for their services. There were opportunities to streamline the process to benefit all parties.

Based on results from the pilot and the feedback she received from Rattle the Box participants, Dr. Small made a number of changes to the program—including its name—now called Live It. The program continued to focus on the goal of facilitating parent-student communication about the student's involvement in campus and community activities. To implement Live It, Dr. Small built a broader selection of activities, dropped activities that were not popular, and engaged with more University partners to identify students who could benefit the most from participation. She also needed a mode of purchase that would be simpler and easy to use by students and retailers.



Meg Small,
Assistant Director
of the Bennett
Pierce Prevention
Research Center



When the program is widely implemented in late 2015, Live It cards will be available to all Penn State students.

Dr. Small traded in the Box for a debit card, allowing parents to deposit “experiences” on the card and students to use the card to pay for their chosen activities. To use the Live It program, parents access a custom built website to select activities they think their student would enjoy. The parents deposit money, as needed, on their student’s Live It card, and the student can use the card to purchase the chosen activity—or another Live It activity that the student and parent agree on.

“Live It gets college students to think differently about community engagement, to be active, and to accomplish personal goals,”

- Meg Small, Assistant Director of the Bennett Pierce Prevention Research Center

To pilot Live It, the research team followed 200 summer-start students for five weeks. Half of the students participated in Live It and the other half did not. Participants in both groups were surveyed before and after the summer term. Live It students received \$50 on their card to be used over the five week period. Dr. Small hired interns to lead events and trips, as well as coordinate discussions to enhance engagement.



“The list of vetted, Live It activities is long and continues to grow, and includes a range of free and low-cost options. The Live It website serves as an up-to-date resource for students and features a Happy Valley bucket list, a calendar of events, and an RSVP list to see how many students are attending the events.”

- Meg Small



Following the program, the 100 students who participated in Live It scored lower on a measure of alcohol use as compared with their classmates who did not participate. Live It students also reported being more active and feeling more connected to Penn State and the surrounding community compared to the non-Live It students. They were also more likely to agree that Penn State and the surrounding community had a lot to offer them.

“In the end, they also feel better about themselves and their time at Penn State. Students want to be challenged outside of class, and Facebook, Twitter, and YouTube aren’t necessarily going to do that,” stated Dr. Small.

Visit the website: www.liveitu.com

When a Child is Diagnosed with Autism, TeleConsult Helps Overseas Military Families Cope

Between 30 and 40 children born into military families serving overseas were diagnosed with autism spectrum disorder (ASD) in 2014, a number that has been steadily increasing in the last decade. According to the American Psychiatric Association, ASD includes a range of conditions classified as neurodevelopmental disorders, such as autism and Asperger's syndrome. ASD is characterized by serious deficits in communication and social interaction. Children with ASD also may display restricted, repetitive patterns of behavior, interests, or activities. ASD is usually diagnosed within the first two years of life, yet in milder cases, may not be identified until later in childhood or adolescence.

“When a child is diagnosed with ASD, families are often shocked and feel overwhelmed and sometimes devastated,” said Dr. Cristin Hall, Assistant Professor of School Psychology. “For military families serving overseas, the experience can be even more difficult as they are thousands of miles away from home, separated from much needed social support. Access to treatment opportunities can also be limited overseas. Even when there are local resources in place, they may not be adequate.”



*Dr. Cristin Hall,
Assistant Professor of
School Psychology*

Penn State researchers saw a need to build an online program that would provide these military families with timely assistance in coming to terms with the diagnosis, learning more about ASD resources, making informed decisions about parenting practices, and pursuing evidence-based treatments.

“When a child is diagnosed with ASD, families are often shocked and feel overwhelmed and sometimes devastated.”

- Dr. Cristin Hall, Assistant Professor of School Psychology

To assist military families who have children diagnosed with ASD, Dr. Hall and Dr. Erica Culler, Research and Evaluation Scientist at Penn State's Clearinghouse for Military Family Readiness, are piloting a web-based family advocacy and consultation program. The program, called TeleConsult, is designed to provide social support, information, and online learning tools to families residing overseas who have a child recently diagnosed with ASD.

“We know that the earlier children diagnosed with ASD receive appropriate services, the better they do across a host of developmental and learning outcomes. We also know that children on the spectrum often need different types or amounts of support. This can be difficult for parents to negotiate without help,” explained Dr. Hall. “The way TeleConsult works is that families learn about us through their diagnosing pediatrician, speech therapist or other professionals who work with children with ASD, through social media, or by word of mouth. They can come to us for assistance. We can help by providing a range of options to support their needs and goals.”



Telehealth online programing has been implemented and studied before in rural and remote populations, but a recent review of the literature found only eight studies that examined telehealth services applied specifically to ASD. While seven of the eight studies reported successful implementation of telehealth practices, the number of participants across all the studies was small. In addition, only one described building a sustainable model, and none of the studies delivered a supportive intervention for parents dealing with a child's recent diagnosis of ASD.

Instead, the TeleConsult project is grounded in a model of providing assistance with family decision-making and transitional supports. Contacts, consultation, and materials are available online—hosted on the Clearinghouse for Military Family Readiness website—for easy access for families, practitioners, and military professionals. Individuals and families who do not wish to participate in the TeleConsult research project can also access the free, online learning materials and resources.

The TeleConsult Project has four goals:

1. **Develop consultation and training protocols** so military families can make informed treatment decisions.
2. **Create online learning materials and discussion boards** to educate families and raise awareness about ASD and related stress management, child and parent advocacy, and empirically-based treatments.
3. **Collect preliminary data** on parent stress and self-efficacy, child symptom levels, and parental knowledge and satisfaction with TeleConsult.
4. **Build an understanding** of the use and feasibility of TeleConsult by analyzing completed training protocols, session notes, and feedback from participants.

The Remote Check-Up

The Remote Check-Up is a three-session module based on the Family Check-Up, developed by Dr. Thomas Dishion and colleagues at Arizona State University. The Check-Up encourages families to explore, with the help of a professional, their needs and goals, and services that would be helpful to them.

After the Remote Check-Up, three primary service options are available:

1. Parents may choose to review online learning materials focused on stress management, coping, relevant laws and advocacy, and evidence-based treatments for ASD. At the end of the learning module, parents are encouraged to use the moderated discussion board to clarify content and connect with other military parents.
2. Families may choose to receive behavioral consultations for problematic child behaviors. TeleConsult staff strategize with parents to identify and implement simple behavioral interventions such as positive reinforcement, time-out, and token economies.
3. Parents may choose to receive assistance with care coordination at the school, in the community, and on the installation.



TeleConsult is unique in that the “dosage” of sessions is not contingent on assumptions about family needs, but rather (after the initial check-up) is decided upon collaboratively with families, using motivational interviewing techniques. Drs. Hall and Culler expect this pilot study to lead to the development of a far-reaching and easily accessible telehealth program that can be provided to military or civilian families who have children with special needs.

Joining Dr. Hall and Culler on the study are Dr. Daniel Perkins, Professor of Family and Youth Resiliency and Policy and Director of the Clearinghouse; Dr. Shirley Woika, Associate Professor of School Psychology; and Dr. Pamela Wolfe, Associate Professor of Special Education.

You can connect to the TeleConsult website at <http://teleconsult.militaryfamilies.psu.edu>.
Learn more about the Family Check-Up at <https://reachinstitute.asu.edu/family-check-up>.

“People with PTSD become fearful of encountering any stimuli, such as sights, sounds, or recollections of the trauma they endured in the past.”

- Dr. Janet Welsh, Research Scientist at Penn State's Clearinghouse for Military Family Readiness



Study Examines the Importance of Protocol Adherence in Evidence-Based Treatments of PTSD

Since the beginning of the Global War on Terror, more than 2 million service members have been deployed—often more than once—to combat zones in Iraq and Afghanistan. The prevalence of post-traumatic stress disorder (PTSD) among such service members is between 13 and 20 percent. These rates likely underestimate the true prevalence of the disorder, since service members often avoid seeking help due to the stigma associated with a PTSD diagnosis. Yet when service members fail to share their mental health symptoms and concerns, they miss the opportunity to receive help from professionals.

Common symptoms of PTSD include re-experiencing the trauma in both mental and physical ways, having nightmares of the trauma, and feelings such as guilt, hostility, hyper-vigilance and hopelessness. In many respects, however, PTSD is a disorder of anxious avoidance. “People with PTSD become fearful of encountering any stimuli, such as sights, sounds, or individuals who remind them of the trauma they endured in the past,” explained Dr. Janet Welsh, a research scientist at Penn State’s Clearinghouse for Military Family Readiness. “As a result, they never learn that their present fears and need for avoidance are unfounded.”



Dr. Janet Welsh,
Research Scientist
at Penn State's
Clearinghouse for
Military Family
Readiness

The most successful treatments for PTSD are those that do not allow individuals to avoid their experiences of the trauma and its impact on their lives. “It seems paradoxical in a way, but these treatments direct patients to repeatedly think about, imagine, describe, and discuss the trauma — so as to diminish its emotional and physiological impact on the person,” said Dr. Keith Aronson, a clinical psychologist and Associate Director of the SSRI and the Clearinghouse.



Dr. Keith Aronson,
Associate Director
of the SSRI and the
Clearinghouse

Evidence-based Treatments (EBTs)

A recent scientific review by the Institute of Medicine (IOM) found that there is currently little solid evidence that the treatment of PTSD among veterans and active duty service members is effective. Despite the requirement that evidence-based treatments (EBTs) be used in the military context, the report concluded that even when EBTs are used, they may not always be implemented with fidelity.

“There is a big difference between using an EBT and using it the right way — that is, in a way that adheres to the clinical protocol,” noted Dr. Welsh, who is an expert on evidence-based program implementation and evaluation. “Protocol adherence occurs when the intervention



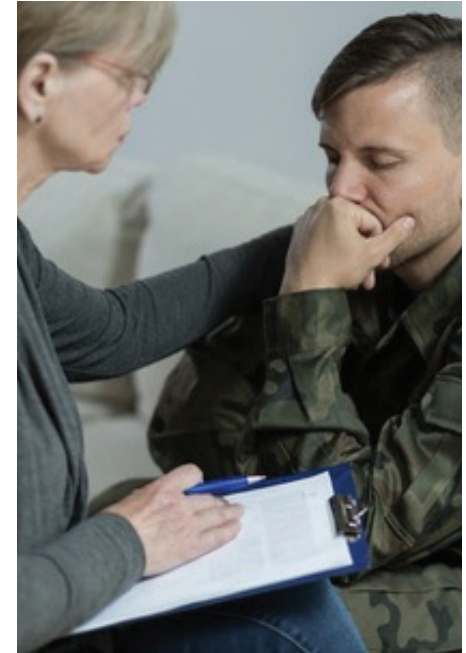
is delivered in accordance with the EBT treatment manual. For example, in many PTSD treatments the first session provides the participant with a great deal of scientific information about PTSD — how it happens, the common symptoms, what maintains the symptoms, and how the treatment works. Each subsequent session builds on the prior one, so executing the treatment in order is critical.” stated Dr. Welsh.

Drs. Aronson and Welsh co-led a study to examine the quality of implementation of two EBTs used in the treatment of PTSD among active duty service members: Prolonged Exposure Therapy (PET) and Cognitive Processing Therapy (CPT). Their goal was to determine whether clinical outcomes were better for service members who received a higher proportion of treatment sessions that adhered to the EBT protocol.

Collecting the Data

“We collected data from an outpatient Air Force PTSD clinic that offers both PET and CPT,” Dr. Aronson said. “Our goal was to learn how treatment implementation actually worked in the clinic setting. To conduct the study we examined the clinical notes from each treatment session of 134 service members who had been seen in the clinic. All of the participants completed multiple PTSD symptom measures during the course of treatment so we could examine how they changed over time.”

A significant majority of the patients were white males on active duty in the Air Force who received treatment from a psychologist, social worker, or clinic intern. About 75 percent of the patients identified their trauma as “combat related.”



The results revealed:

- A majority (65 percent) of all patient encounters followed the EBT protocol.
- Only 29 percent of the patients completed the recommended number of protocol sessions.
- Among those not receiving all protocol sessions, 85 percent left treatment of their own accord.

“In terms of the importance of adhering to protocol, the results were very clear,” stated Dr. Welsh. “As adherence to protocol increased, PTSD symptoms decreased. These were clinically significant reductions because patients receiving a high proportion of protocol adherent sessions no longer had a diagnosis of PTSD at the completion of treatment.” In contrast, the symptoms of those patients receiving a low proportion of protocol adherent sessions did not improve at all. In fact, as the number of treatment sessions went beyond the number recommended by the protocol, the symptoms worsened slightly.



Dr. Daniel Perkins,
Director of the
Clearinghouse for
Military Family
Readiness

The Clearinghouse partnered with the United States Air Force to conduct this study. Also working on this study were Dr. Anya Fedotova, U.S. Air Force, Dr. Nicole Morgan, Clearinghouse Research and Evaluation Scientist, and Dr. Daniel Perkins, Professor of Family and Youth Resiliency and Policy and Director of the Clearinghouse. In addition, Dr. Joel Winnick, Clearinghouse Research and Evaluation Scientist, Dr. Erica Culler, Clearinghouse Research and Evaluation Scientist, Dr. Cristin Hall, Assistant Professor of School Psychology, and Nicole Breeden, Clearinghouse Graduate Research Assistant, contributed to the study.



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.

Childhood Sexual Abuse of Girls and Premature Cognitive Aging

For nearly 20 years, Dr. Jennie Noll, Professor of Human Development and Family Studies and Director of the Network on Child Protection and Well-Being, has been following a large group of individuals who were exposed to child abuse.

"I have literally been watching the girls and women in this study grow up before my eyes. It has been an amazing journey thus far. We have learned a great deal about the impact abuse has on victims. No story is typical, but overall there are themes of hardship and challenge, yet also of incredible bravery, resilience, and growth."

- Jennie Noll, Professor of Human Development and Family Studies and Director of the Network on Child Protection and Well-Being



Dr. Jennie Noll,
Professor of Human Development and Family Studies and Director of the Network on Child Protection and Well-Being

With her colleagues, Drs. Frank Putnam (University of North Carolina School of Medicine) and Penelope Trickett (University of Southern California School of Social Work), Dr. Noll has been part of a National Institute of Child Health and Human Development (NICHD)-funded project entitled the Female Growth and Development Study (FGDS). FGDS is the largest and longest study of the long-term sequelae of sexual abuse ever conducted. When the study began in 1987, the average age of the girls in the sample was 10 years. Today, the "girls" have reached midlife, and many now have their own children.

Collaborating To Study Cognitive Aging

In September 2014, Dr. Noll was awarded additional funding to continue to track the original study participants who will be aged 38 to 40 years. Dr. Noll, whose graduate training was in developmental psychology and methodology, joined forces on the study with Drs. Martin Sliwinski and David Almeida, both Professors of Human Development and Family Studies and members of the Penn State Center for Healthy Aging.

"The three main aims of the grant will be the assessment of physical health outcomes, intergenerational transmission of the effects of sexual abuse, and the identification of mechanisms of resilience," explained Dr. Noll.

Asking More Questions

Of the 200 women in the original FGDS, half have been sexually abused. The other half, a group of women matched on a number of characteristics (e.g., age, race, neighborhood, and family constellation), has never been exposed to abuse.



Dr. Noll noticed a few years ago that the women in the study who had suffered abuse were displaying significantly more cognitive problems such as problem solving and reasoning than those in the matched control group. In a paper published in the journal *Pediatrics* in 2010, Dr. Noll reported that female victims of sexual abuse scored lower on reasoning and memory tests.

"I thought it was too early for these women to be showing signs of cognitive aging. Normally, we wouldn't start seeing these symptoms until individuals reach their late 60s. That's why I immediately thought of collaborating with Marty Sliwinski and Dave Almeida. I knew I was going to need their expertise in how and why cognition changes as people age."

- Jennie Noll, Professor of Human Development and Family Studies and Director of the Network on Child Protection and Well-Being

In addition to measuring the vocabulary and reasoning of the study participants, the new grant adds a number of assessments known to be age sensitive—that is, tasks on which performance declines with age. These include speed of information processing, visual attention, verbal and visual episodic memory of information processing, and visual acuity. “These additional tests will enable us to more accurately pinpoint cognitive deficits,” explained Dr. Noll. “Once we have better assessments of cognitive functioning among our participants, we can match them to appropriate interventions that are designed to enhance cognitive functioning.”

The participants will also complete 14 days of daily diaries to describe their experiences of stressors and how they cope with them. This procedure was added so the research team could better understand how everyday stress may impact the women’s cognitive functioning.

There is strong evidence that exposure to chronic stress is harmful to physiological and psychological functioning, but effective coping can lessen some of these problematic outcomes. However, if individuals who have been exposed to abuse are not as cognitively adept, they may be at particular risk for negative reactions to stressors.

“This new study will help us disentangle the impact of early trauma of sexual abuse, and the everyday stressors our participants experience in their present day lives,” said Dr. Noll. “We have evidence from the FDGS that cognitive processes are impacted by early stress—that childhood sexual abuse has negative implications for brain development. Now we will be able to understand if current chronic stressors add more fuel to the fire of premature cognitive aging among those with a history of sexual abuse.”

The grant is funded with monies designated for research aimed at reversing the effects of chronic negative life conditions. “We want systematic evidence provided by our science to inform what we can do in midlife to change the impacts of abuse,” she said. “For instance, can we train people at midlife to cope better so cognitive processes are preserved longer? We think the study will help inform these kinds of critical questions.”

Dr. Noll said there are no other studies of stress that examine these stress-coping-cognition processes across the lifespan. “This is a good opportunity to advance several fields all at once,” she said.



Complications at Birth May Accelerate Aging

STRESSED BABIES MAY BE LIKE MINI-PRESIDENTS

The stress of being the U.S. president takes a toll – the constant pressure on those who hold the office leaves them indelibly marked. By the time a four or eight-year term is complete, presidents often look significantly older than might be expected given their chronological age – hair grays, wrinkles deepen, some lose their vim and vigor. This says nothing of how they age on the inside. It is pretty clear that the stress of running the United States accelerates the aging process.

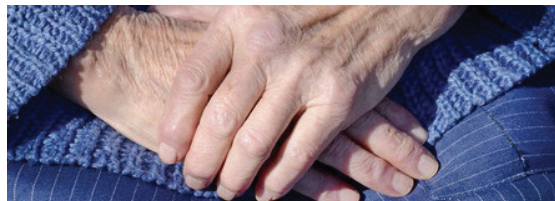


Dr. Idan Shalev,
Assistant Professor of
Biobehavioral Health

New research shows that when babies are exposed to stress and other complications before and shortly after birth, they too can age at an accelerated pace – a pace which, once set in motion, can last a lifetime.

In a study published in the November 2014 issue of *Pediatrics*, Dr. Idan Shalev, Assistant Professor of Biobehavioral Health and member of the Network on Child Protection and Well-Being, links the stress of perinatal complications to advanced aging by midlife – evidenced both in the way people looked on the outside (appearing older) and on the inside at the cellular level.

The research was based on Barker's hypothesis, also called the thrifty phenotype, a theory proposed by physician and epidemiologist David Barker in 1990. The theory is that stressful events at birth, such as reduced fetal growth – perhaps due to poor maternal nutrition – are associated with higher rates of morbidity and earlier mortality.



To identify the underlying biological mechanisms behind accelerated aging, Dr. Shalev and his colleagues used data collected from more than 1,000 individuals who participated in the Dunedin Multidisciplinary Health and Development Study. The Dunedin Study is a longitudinal investigation of health, development, and behavior of a large cohort of individuals born in New Zealand in 1972-1973. Each participant has been tracked since birth over the past four decades.

"I was interested in identifying mechanisms at the molecular level that help to explain the premature aging process," explained Dr. Shalev. "The study sought to determine what is going on at and around the time of an infant's birth and link those experiences and events to health and disease status several decades later."

Nearly 26 percent of the study participants experienced one perinatal complication, and 11 percent experienced two or more. Examples of complications were maternal health problems at the time of birth such as diabetes, hypertension, eclampsia, and accidental hemorrhage. Infant complications included premature birth, low birth weight, small size for gestational age, low Apgar score, and major or minor neurological signs such as jitteriness, tenseness, or limpness.

"An early stressful environment changes the body's structure, physiology, and metabolism in ways that have long-lasting impacts. These impacts include serious chronic conditions such as hypertension, diabetes, stroke, coronary heart disease, and others."

- Dr. Idan Shalev, Assistant Professor
of Biobehavioral Health

CELLULAR CHANGES DUE TO EARLY BIOLOGICAL INSULTS ARE ASSOCIATED WITH SIGNS OF AGING

Dr. Shalev said that, during the gestational and prenatal periods, critical developmental processes are occurring throughout the human system. Perinatal complications (those occurring shortly before or after birth) appear to have a serious effect on the structure of chromosomes, specifically the telomeres that are located at the tips of chromosomes and protect them from deterioration. Telomeres naturally deteriorate or shorten as a person ages. When a birth has complications, however, telomere health declines early, jumpstarting the aging process.

“From the start, cells are older than they should be in individuals who experience birth complications,” Dr. Shalev said. “This early-life programming sets the stage for the child’s life and the apparent ‘age’ of his or her cells.”

Through blood sampling, the research team found that study participants who had experienced perinatal complications had shorter telomeres than those who had not. They also found that individuals who experienced two or more complications had the shortest telomeres.

“This is important,” Dr. Shalev said. “We know short telomeres link to biological complications, which link to health problems later in life. If you are a clinician and learn that your patient had complications at birth, you can suggest interventions that help maintain telomere length and slow aging.”



Telomere changes happen at the cellular level and cannot be seen with the naked eye. But, the effects of perinatal complications do not end at cellular aging. Dr. Shalev and his colleagues found that some effects of complications are quite visible—including how old individuals’ faces appear to others. The researchers recruited a panel of undergraduate students and showed them photographs of the study participants at age 38. The student raters were asked to estimate the age range of the individual in each photograph and decide if each individual was “young looking” or “old looking.”

The study participants who had complications during birth were significantly more likely to be rated as older and old looking. Further, individuals with two or more complications looked older than those with one, and much older than those without any complications at birth. “It’s like what happens to U.S presidents in a very short amount of time,” Dr. Shalev said. “These individuals actually appear to be older than their chronological age, we believe because of what stress did to their cells when their cells were developing.”



President George W. Bush shown when taking office in 2001 and again in 2009.

Of course, an individual’s stressful experiences are not limited to the perinatal period. The researchers considered other factors that could affect cellular aging (such as physical and mental health problems) and facial aging (such as due to sun exposure and smoking). They found that even after controlling for these environmental factors, perinatal complications continued to uniquely predict telomere health and perceptions of facial aging.

Intervention Opportunities and Future Steps

Many factors determine whether or not there will be complications at birth. According to Dr. Shalev, it is unlikely that preventing all these causes will be possible in the near future. As the connection between pre- and perinatal insults and telomere health become clearer, however, scientists may be able to develop treatments to limit or reverse accelerated aging effects that start very early in life.

“There are ways to maintain and perhaps even lengthen telomeres,” Dr. Shalev said. “Activities like healthy eating, exercise, and meditation, for example, have been found to slow telomere erosion. For now, adopting a more active and healthy lifestyle is probably the best way to keep telomeres long.”

Dr. Shalev conducted this work with Drs. Avshalom Caspi and Terrie Moffitt from Duke University and several international collaborators from the United Kingdom and New Zealand.

Scientists Collect Data and Bring Science to Schools in the ‘Brain Bus’

Research in the area of language science has demonstrated that there are cognitive benefits to being bilingual. These include improved ability to pay attention and to seamlessly switch between cognitive tasks. These positive effects accrue across the lifespan. Children who grow up speaking two or more languages are better at adjusting to environmental changes. Elderly bilinguals experience less cognitive decline compared to their monolingual counterparts

As humans age, their cognitive processes change. For example, researchers find that learning a second language is best done at a very young age while the brain is malleable and ripe for learning. A child's brain is ready-made for absorbing a new language and, contrary to popular belief, a second language does not negatively affect the child's ability to speak his or her native language. However, little is known about the cognitive mechanisms underlying lexical (vocabulary) and syntactic (grammar) learning. Many linguistic studies examine adult-aged second language learners with the hope of understanding these learning processes, but little research has been done with children learning a second or foreign language at school. Professor of Psychology and Linguistics, Dr. Janet Van Hell, is literally driving the bus on research toward understanding the way children learn a second language.

Dr. Van Hell is leading an NSF-funded study that uses behavioral and electrophysiological (Event-Related brain Potential, ERP) measures to study children's lexical and syntactic learning processes. Along with her colleagues, she is assessing bilingual children in a research van called the Brain Bus.

With support from the Social Science Research Institute, the researchers retrofitted a recreational vehicle with brain imaging technology so they could visit area schools to collect data. “It's a great opportunity to visit the children in a space they're familiar with,” Dr. Van Hell said. “In the, past we would have to recruit them and their parents would drive long distances to come to our lab. With the Brain Bus, we go right to the student. The Brain Bus is a welcoming and friendly facility.”

Monitoring Stages

Dr. Van Hell and her colleagues are recruiting second-language learners from schools and universities in central Pennsylvania and are



Dr. Janet Van Hell,
Professor of Psychology
and Linguistics

studying them at these three stages to monitor their development as bilinguals:

Stage 1 - Kindergarten level (ages 5 and 6).

Stage 2 - During sixth grade (ages 11 and 12)

Stage 3 - During young adulthood (around 18).

“At these three stages, we examine novice second language learners and we build a better understanding of the neural plasticity of language learning at different ages,” she said. “We also examine how variations in first and second language proficiency, attention, working memory, and attitude influence second language learning.”

The data will pinpoint the cognitive and neural mechanisms that help children build their vocabularies and learn to arrange words properly when speaking or writing in their second language.



In the Brain Bus, students hear or read words or sentences while wearing an elastic cap with electrodes that measure electrical activity in the brain. For example, if an English speaking student is learning Spanish, the researchers will ask the student to read or listen to sentences in Spanish. Some of the sentences will contain mistakes and some will not. Using ERP methodology, the researchers measure brain activity as the student reads or listens to each sentence.

“One of the things we are seeing is that, when students read an incorrect sentence—one that contains a grammatical error—their brain reacts differently compared to when they read a grammatically correct sentence. For some grammatical structures we see this early in second language learning,” says Dr. Van Hell. “When given a pencil-and-paper task, these beginning learners perform at chance level when we ask them to identify the grammatical error in the sentence, but when we present these same sentences while measuring their brain activity, the ERP measures indicate that their brains notice the grammatical error. It’s been fascinating to see that beginning learners are not yet able to articulate whether or not there is a problem with the sentence, but their brains already recognize that something is not quite right with the grammar.”

Observations like this can help teachers understand how children learn. Instead of getting frustrated that children are struggling with concepts, it can help to know that their brains are trying to work them out. Dr. Van Hell said data from her study will also help promote effective classroom instruction such as through creating lessons built around the student’s age and brain capacity for learning a new language. Studying second language learners of different ages will also provide insights into basic questions in neurocognitive science related to neural plasticity and constraints in learning related to age and cognitive executive functions.

“It’s been fascinating to see that beginning learners are not yet able to articulate whether or not there is a problem with the sentence, but their brains already recognize that something is not quite right with the grammar.” - Dr. Janet Van Hell

Benefits Beyond Research

Dr. Van Hell said the benefits of the Brain Bus extend beyond research. In addition to collecting data, the bus is also used to host demonstrations at schools and other community locations. She sees the van as a form of outreach and an appealing introduction to science for elementary and middle school students.

“We are bringing science to the schools in a new and exciting way,” she said. “We are exposing language and brain science to students who most likely won’t learn about these fields until at least high school.”

The Brain Bus also serves as a long-term investment as it gets students interested in science early in their academic lives. At a recent brain science demonstration, she noted significant diversity in the socioeconomic and ethnic backgrounds of the students and parents, and an especially high number of girls showing an interest in brain science. “Much like language, it’s a great idea to start exposing children to science early,” she added. “Build awareness. Build knowledge. Build the interest that will turn these kids into scientists 10 to 25 years from now.”

Dr. Van Hell directs the Bilingualism and Language Development (BiLD) Lab that focuses on the cognitive and neurocognitive processes related to language development, second language learning, and bilingual individuals’ use of two languages.

You can visit BiLD lab website at <http://bild.la.psu.edu/>

Dr. Janet Van Hell collaborates on this study with Drs. Ping Li, Professor of Psychology, Linguistics, and Information Science and Technology; Katharine Donnelly Adams, Post-Doctoral Researcher, and Darren Tanner, Assistant Professor of Linguistics at the University of Illinois at Urbana-Champaign.



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.

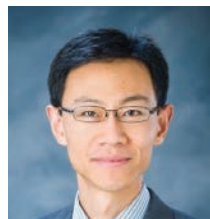
Chi Awarded Grant from the National Science Foundation to Study Response to Disasters

Guangqing Chi, Associate Professor of Rural Sociology and Demography and Director of the Computational and Spatial Analysis Core in the Social Science and Population Research Institutes, is the recipient of a grant from the National Science Foundation to study the interconnection of population and infrastructure in response to disasters.

The project, titled “Population–Infrastructure Nexus: A Heterogeneous Flow–based Approach for Responding to Disruptions in Interdependent Infrastructure Systems,” is a collaborative research project with Xiaopeng Li, Assistant Professor of Civil and Environmental Engineering at Mississippi State University.

Reducing the instability and vulnerability of the critical and complex population–infrastructure system is essential for a more resilient and efficient society. Catastrophic events, such as the Northeast Blackout of 2003 and Hurricane Sandy in 2012, shut down or interrupted essential and interdependent components of our national infrastructure, such as electric networks, fuel supplies, and transportation systems. This vulnerability is heightened by changing population dynamics that impose serious challenges to the nation’s infrastructure system in efficiently responding to both moderate disturbances and extreme events.

The primary goal of this interdisciplinary research project, says Chi, is to increase the resilience of the U.S. interdependent population–infrastructure system during disturbances of various magnitudes, ranging from operational uncertainties to major disruptions.



*Dr. Guangqing Chi,
Associate Professor of
Rural Sociology and
Demography*

He adds that the research will contribute to the development of “smart communities/cities” where multiple stakeholders can work together to achieve common goals.

Another goal of this research is to develop innovative educational and training modules to provide a vision of efficient, resilient, and socially vital communities and built environments as well as the means to achieve them.

For the project, researchers plan to develop a framework to assess the critical and complex interdependence of various infrastructure systems and population groups. The framework will also assist city planners in analyzing short-term mobility behaviors as well as the long-term social and demographic evolution of the interconnection of population and infrastructure.

Chi says that the model will be integrated with a cyber-communications system based on self-organized “swarm intelligence” to create a realistic system in which individuals and groups, by communicating their available information, behave in a unified, cohesive manner.



New Conference Series to Foster Interdisciplinary Conversations about Population Health Research and Advancements

Despite the tremendous amount of resources spent on health care in the U.S., Americans live shorter and less healthy lives than residents of other high income nations. In the U.S., very large health disparities exist across social class, race, and gender. These trends have fueled research interest in U.S. population health trends, problems and improvement from scholars from a range of backgrounds including public health, medicine, demography, social epidemiology, sociology, psychology, economics and many other disciplines.

Connecting population health researchers and knowledge across fields to better understand how these phenomena drive population health problems is difficult. This is unsurprising when one considers that a wide range of population health problems have origins in multiple causes studied by researchers with different areas of expertise. For example, the physical environment of one's neighborhood, social status, genetic predispositions, and physiological processes in the body all contribute to population health problems like cancer, obesity and poor mental health.



*Dr. Michelle Frisco,
Associate Professor
of Sociology and
Demography*

dissemination of findings is often limited to outlets that are targeted to specific disciplines. There generally has not been a natural venue for the range of investigators in population health science to convene.” Frisco is working to change that by developing a series of conferences aimed at connecting population health scientists from a range of disciplines so they can share knowledge that can be used to help improve the health of the U.S. population and reduce social disparities in health.

Population health research is an interdisciplinary field focusing on the health outcomes of groups (e.g., workers at a workplace, neighborhood residents, racial/ethnic groups, or a nation's citizens) and the levels and distributions of health within and across populations. Health is recognized as the product of multiple determinants at the genetic, biologic, behavioral, social, and environmental levels and their interactions among individuals and groups and across time and generations.

“Professional societies typically connect scientists within a discipline,” said Michelle Frisco, Associate Professor of Sociology & Demography and Associate Director of the Population Research Institute. “In addition, federal funding opportunities often focus on supporting scientists working within a particular field of study or on a particular health condition. Even when cross-disciplinary collaborations occur,



Population Health Science Conferences

The conferences are being developed with funding from the Robert Wood Johnson Foundation and are a collaborative initiative between Penn State's Population Research Institute, the Institute for Policy and Social Research at the University of Kansas and the Interdisciplinary Association for Population Health Science.

The initial conference, "Building Bridges to Improve Population Health", was held on September 29th at the National Academy of Sciences in Washington, D.C. in collaboration with the Institute of Medicine's Roundtable on Population Health Improvement.

"Experts discussed how to deal with persistent problems like health disparities, new technological innovations in population health research, and how researchers can better translate their findings so that they can be used by professionals in non-academic sectors who are developing interventions to improve population health," Dr. Frisco said.

For example, the agenda for the first conference included a session wherein researchers discussed unique ways that technology can be used to improve population health research and interventions.

"One session discussed unique ways that technology can help researchers and doctors understand the geospatial context of asthma attacks. Another described collaborative efforts between population health researchers and Facebook that are aimed at reducing suicide."

- Dr. Michelle Frisco, Associate Professor of Sociology and Demography

Other conference sessions were aimed at connecting researchers from different disciplines who are studying specific population health problems including obesity, mental health, and health disparities.



The second and third conferences, to be held in 2016 and 2017, will be larger, multi-day events. "The conference series will be a step toward creating a network of scientists from different disciplines who have a natural venue to meet, share knowledge and develop collaborative research projects," stated Frisco. "We are also striving to make the next two conferences relevant to practitioners who want to learn more about the research this network of scientists is developing. We expect that this will lead to increased translation of research to develop interventions and programs to improve population health and foster the Culture of Health that the Robert Wood Johnson Foundation envisions."

All conferences are open to the public. The agenda for the first meeting is available at: <http://www.cvent.com/events/population-health-conference-2015/event-summary-3ca06ad8b4fe478da86378e0c8bd7a78.aspx>



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.

Ecological Momentary Assessment Methodology Uncovers a Micro View of Bipolar Disorder Symptoms

Individuals with bipolar disorder (BD) suffer from episodes of both depression and mild or intense mania. On the one hand, depression is characterized by sad mood, lethargy, poor concentration, helplessness, and hopelessness. In contrast, mania is characterized by feelings of euphoria, high energy, grandiosity, and impulsivity, as well as racing or illogical thoughts. The intensity of these mood changes can be powerful, and their duration is unpredictable, but can vary between long lasting (several days or longer) to ephemeral (lasting a day or less).

In a nationally representative sample, the lifetime prevalence of BD was one percent; about two percent of the population experienced sub-threshold BD in which symptoms were evident but full diagnostic criteria were not met. However, there is evidence that the true prevalence may be substantially higher because BD is easily misdiagnosed as only depression or psychotic disorder, and it often co-occurs with other psychiatric problems such as anxiety and drug abuse, among others. Moreover, it often takes years before individuals suffering with BD seek treatment.

“Bipolar disorder is a lifelong problem that is prevalent and frequently disabling,” said Dr. Erika Saunders, Associate Professor and Chair of the Department of Psychiatry and director of the Mood Disorders Program in Penn State’s College of Medicine. “Though BD is an episodic illness, individuals with the disorder suffer from depressive symptoms about



*Dr. Erika Saunders,
Associate Professor
and Chair of the
Department of
Psychiatry*

one-third of the time, and manic symptoms roughly 9-10 percent of the time. The symptom picture makes it difficult for many patients to achieve their life goals in areas such as education, career, and interpersonal relationships.”



Challenges in the Treatment of BD

Because the causes of BD are not yet known, there are many uncertainties about both medication and behavioral treatment. For example, while depression is most often experienced in people with BD, anti-depressants are not typically effective. Lithium, a mood stabilizer, is often the first line treatment for BD although it is not well established that lithium is effective in combating depressive symptoms. Anti-convulsive and anti-psychotic medicines have also been used with varying levels of success. A better understanding of the neurobiology and subjective experience of BD will be central to developing more effective treatments.

Saunders and her colleagues are working on several fronts to improve the treatment of BD. Her work primarily focuses on understanding the genetic and biological characteristics of BD. She aims to identify reliable markers of the illness in both its above and below diagnostic threshold manifestations.

“Increasingly, BD is being understood as a heritable neurodevelopmental disorder with clinical manifestations emerging many years before a diagnosis is made.”

- Dr. Erika Saunders

“There are likely both genetic predispositions and other risk factors. Psychological, neuroendocrine, and circadian rhythm vulnerabilities are all being investigated. Stress reactivity, including due to the functioning of the hypothalamic-pituitary-adrenal axis and even sensitive temperaments, which become more prominent through adolescence and into adulthood, have also been linked to BD.”

Tackling a Major Methodological Problem in the Study of BD

Beyond understanding various markers of the disorder, Dr. Saunders is also working on developing a fine-grained understanding of what it is like to live with BD symptoms. This requires learning a great deal more about a person’s everyday experience.

“To maximize the utility of markers in treatment, we need a much better understanding of the symptom picture,” said Saunders. “Studies to date have typically asked patients to report on their symptoms, sometimes long after they become evident. Using this more global approach, patients look back in time, sometimes over many months, and describe the ups and downs of their moods. This approach is fraught with limitations.”

Saunders suggested that traditional methods are helpful for understanding the major fluctuations in a patient's mood and thoughts because these substantial changes are easier for patients to remember. Smaller fluctuations can be more difficult to recall. "These less dramatic day-to-day or even hour-to-hour chronic fluctuations are simply not understood, but they likely hold lots of clues as to how the disorder operates," said Saunders.

To explore the smaller mood fluctuations, Saunders reached out to Penn State colleagues who have developed innovative ways to collect data in real-time in a patient's natural environment. Instead of recalling a mood event from weeks before, ecological momentary assessment (EMA) technology asks patients how they are feeling at a given point in time on multiple occasions throughout the day.

EMA allows researchers to capture data about emotions and behaviors as they occur naturally—rather than in a lab or clinic setting. Using mobile devices like smartphones, researchers can strategically survey patients with a few brief questions to better understand the relations among symptoms, mood changes, and daily activities throughout the day.

Working with the DREAM Team

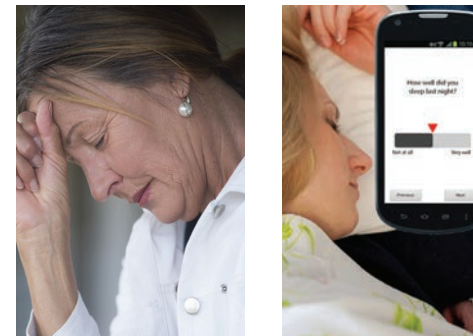
Penn State's Survey Research Center offers a resource called Dynamic Real-time Ecological Ambulatory Methodologies (DREAM) to help researchers with EMA data collection. DREAM provides a variety of services including EMA device rentals, survey programming, and consultation on collecting and using EMA data.

"DREAM was extremely helpful in many areas of our work on BD," noted Saunders. "We consulted with DREAM extensively on how best to capture the moment-to-moment variability of BD symptoms among our participants. They provided us with ideas on how to focus our data collection and be brief so we could collect multiple data points randomly throughout the day. EMA was completely new to us, so we learned quite a lot from DREAM." Additionally, the use of smartphones for EMA data collection was well-received by study participants.

Dietary Intervention Study

Saunders is also using smartphones for a dietary intervention study with BD patients. The dietary intervention is designed to reduce inflammation by modifying intake of omega-3 and omega-6 polyunsaturated fatty acids. Inflammation is of particular interest because of its recent linkage to the development of BD. Study participants use smartphones programmed by DREAM to answer questions throughout the day about their current mood, stress level, how they slept, and other aspects of their daily lives. Although the results of the study are not yet available, the data will be analyzed to determine if the dietary intervention positively impacted these outcomes.

"EMA is helping us develop a very rich understanding of how BD is experienced," said Saunders. "By capturing data in real-time, we will undoubtedly have a better understanding of the true, fluctuating nature of mood variability in BD. We are confident this will yield more effective psychiatric and behavioral treatments."



Saunders' collaborators on her pilot study were PSU College of Medicine students Summer Schultz and Stefani Schwartz, and project coordinator Aubrey Reider. Collaborators on the dietary study include Drs. Stanley Rapoport and Chris Ramsden of the National Institutes of Health, Aubrey Reider, and Dr. Alan Gelenberg, also of the Department of Psychiatry at the Penn State College of Medicine.

You can learn more about DREAM here:
<http://www.survey.psu.edu/dream>



The Effects of International Child Labor Policies on Academic Achievement

The Education for All movement, led by the United Nations Educational, Scientific, and Cultural Organization (UNESCO), has declared education to be a fundamental human right. The International Labor Organization (ILO), a United Nations agency, has campaigned to reform legal codes and to restrict and regulate employment during the years when school is compulsory. Partly as a result of ILO efforts, the number of out-of-school children has dramatically decreased. However, there are now more children who are both working and going to school.

The ILO defines child labor as work that “deprives children of their childhood, potential, dignity, and is harmful to their physical and mental development.” This includes jobs that are not only dangerous—like mining or factory work—but also strenuous work tasks and long hours. The ILO set a minimum age to work full time at 15 years in most countries and 14 years in some developing countries. Children between 13 and 15 (most countries) and 12 and 14 (developing countries) are allowed to partake in light, part-time work.



Dr. Soo-yong Byun, Associate Professor of Educational Theory and Policy

“Students who also work are likely to come from disadvantaged backgrounds,” stated Dr. Soo-yong Byun, Associate Professor of Educational Theory and Policy, a Penn State Children, Youth and Families Consortium co-funded faculty member, and an affiliate of the Population Research Institute. “Research conducted outside the U.S. tends to find that working students perform more poorly in school.”

Dr. Byun and his colleagues undertook a study to investigate:

- Cross-national differences in the prevalence of student employment
- The relations between student employment and math and science performance
- Whether national policies are related to student employment
- Whether the relations between student employment and academic performance vary across countries, depending on a country’s standing on several socio-economic variables

The researchers also included a dichotomous (either/or) variable directly related to the country’s regulation of child employment – whether or not a country had ratified ILO child labor codes and recommendations.

“Each country is different in how it runs its education systems and treats its students, and the economies are different. In addition to the ILO laws, it is important to understand how different cultures, educational systems, and government policies affect achievement in science and math from country to country. These factors interact with each other.”

- Dr. Soo-yong Byun, Associate Professor of Educational Theory and Policy



In this study, which was published in *Comparative Education Review*, Dr. Byun analyzed data from the 2003 Trends in International Mathematics and Science Study (TIMSS). This dataset included more than 173,000 eighth graders (13-14 years old) from 47 countries, as well as national performance ratings in science and math. First, The TIMSS assessed how much time students spent working at a paid job before or after school. The TIMSS also yielded data on students' knowledge of math and science.

Analyzing the Data

Dr. Byun discovered that approximately 30 percent of eighth graders across the globe were employed in some sort of paid work outside the home. "It was surprising," said Dr. Byun, commenting on the number of working children. "And it's not only poor countries. Countries like the United States and Italy also have a substantial number of students working at this age."

The study further revealed that there was no significant change in the total number of working eighth grade students after ILO laws went into effect. "Our analyses suggest that children are now juggling both a job and school, instead of just a job or school," he said. "Research has shown that children who attend school full-time perform significantly better than children who maintain a job while going to school." According to Dr. Byun, all governments should try to prevent children from working. "Education is simply too important," he says.



Despite the lack of change in the number of working students, the researchers found a post-ILO increase in science and math achievement across all countries. The degree of increase depended on the country's social and economic characteristics, including gross domestic product (GDP), years of compulsory education, and percentage of GDP devoted to education. Despite the overall increase, Dr. Byun found significant achievement gaps between working students and non-working students. Those gaps varied most significantly in math. For example, in South Africa, students who worked while attending school had math scores that were on average 46 points below those students who did not work. Similar gaps were found for science achievement scores.



"Parents may feel that making their child work will generate immediate revenue for the family, especially in poor countries, but it's a bit of a short-sighted trap. The positives of attending school full-time outweigh the positives of working and schooling simultaneously. Education gets people out of poverty and sets them up for a better, healthier life."

- Dr. Soo-yong Byun, Associate Professor of Educational Theory and Policy

Dr. Byun's collaborators on this project included Dr. Adrienne Henck, a former Research Assistant in the Department of Education Policy Studies, and Dr. David Post, Professor of Educational Theory and Policy and Comparative and International Education.

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