

EXECUTIVE SUMMARY

What we do . . .

Research in the social and behavioral sciences ranges 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 behaviors ranging from overt actions to underlying psychological processes such as 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.

Where we have come from . . .

Since its inception in 2001, Penn State's Social Science Research Institute (SSRI) has promoted innovation and excellence in interdisciplinary research in 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 this 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 2014-2019 accomplishments of the SSRI, including those of its constituent units and affiliated faculty members, are documented in this 2020-2025 Strategic Plan. During the prior planning period, the Institute's resources were directed at promoting novel research, primarily in the following areas:

- The Human System
- Social Disparities
- Smart and Connected Health
- Innovative Methods
- Dissemination and Implementation Science

Integral to our faculty's accomplishments during the past planning cycle were the SSRI units' provision of a shared research infrastructure. The activities of the SSRI units range from research support (Survey Research Center, Computational and Spatial Analysis Core, Federal Statistical Research Data Center, and SSRI's Information Technology, Communication, and Administrative Services Units), to SSRI units that conduct and provide support in a particular social/behavioral science domain (Evidence to Impact Collaborative, Population Research Institute; Social, Life, and Engineering Sciences Imaging Center; Quantitative Developmental Systems Methodology Core), to research centers focused on particular problem areas (Center for Education Disparities Research, Clearinghouse on Military Family Readiness, Child Maltreatment Solutions Network, Consortium to Combat Substance Abuse). Four of SSRI's fourteen units were launched during the 2014-2019 planning period. Also, during the prior planning period, SSRI was involved in cluster hires of 19 new co-funded faculty members who will contribute to the research accomplishments in strategic

focus areas, including child maltreatment solutions, innovative methods and reducing disparities. This expansion of SSRI's faculty resources and infrastructure reflects the breadth, depth, and significance of research in the social and behavioral sciences across Penn State.

Where we are headed . . .

Consultations with SSRI's Steering Committee and Dean, Associate Research Dean and Department Head Advisory Boards affirmed our continued focus on our 2014-2019 strategic priorities. These priorities are set within the context of a rapidly changing world, key dimensions of which include population aging and diversification, economic insecurity, changes in the built and natural environments, spread of infectious disease and associated social disparities in education, health and access to resources that underlie growing attention to issues of social justice. At the center of SSRI's strategic priorities is the *place of human behavior*—a unique focus of study within the social and behavioral sciences- in adapting to change, in resilience in the face of challenges, and in enhancing the human condition, including the health and well-being of individuals, their social institutions, their built and natural environments, and their efforts to advance social justice.

Over the next five years, SSRI's activities and resources will be directed toward the following four strategic priorities. The 2020-2025 SSRI Strategic Plan document describes the scope and significance of each of these thematic areas.

- ***The Human System***: How environments and experiences “get under the skin” to affect stress and immune functions, social, cognitive, and affective neural processes, and gene-related mechanisms—and the ways in which these bio-psycho-social processes both shape and are shaped by human behavior, health and development.
- ***Social Disparities***: Discovery of causes and consequences and development of evidence-based policies and practices for remediating widening gaps in the health, education, and community resources of vulnerable populations, including racial/ethnic minorities, children and elders, rural populations, and military and veterans—toward promoting social justice.
- ***Smart and Connected Health***: Health and mental health promotion and disease prevention and treatment using novel methodologies (electronic devices, social media, human-technology hybrids), “big data” analytics, and other innovations for enhancing health and health behavior and optimizing health care and health care delivery using evidence-based practices and policies toward a sustainable health system.
- ***Data→Knowledge→Impact***: SSRI priorities also include two cross-cutting themes that will enable novel research in these and other substantive areas: ***Innovative Methods***—which emphasize novel approaches to research design and data collection, security, modeling and analysis pertaining to our targeted foci and beyond—and ***Dissemination and Implementation Science***, that is, scientific study of best methods for translating knowledge into policies, programs, practices, and products that achieve broad and sustained uptake and use toward enhancing the health and well-being of individuals, their communities, and the larger society.

How we will get there . . .

To facilitate significant advances in these strategic areas and social science, more generally, the SSRI will pursue a comprehensive implementation plan that includes three major elements.

- **Promote and support innovative, interdisciplinary and translational research and scholarship** through our funding mechanisms, workshops, working groups and consultation.
- **Maintain and nurture an exceptional workforce**, by creating a community of belonging and inclusivity and providing them with the resources and opportunity for growth.
- **Build and maintain accessible, sustainable, and shared research infrastructure**, including for data collection, security, analysis and knowledge implementation and dissemination.
- **Steward our resources** through continued attention to accessibility, transparent processes, and accountability with respect to the SSRI's funding mechanisms and supports.

In sum, during the 2020-2025 period, the SSRI will build on the achievements of Penn State's nationally and internationally renowned social and behavioral science faculty. The SSRI is committed to enhancing the University's standing in this broad and significant arena through the promotion of interdisciplinary innovation and excellence in research and the translation of data into knowledge that is broadly disseminated and applied to address significant social and human problems.

SSRI Leadership

Director: **Susan McHale**, PhD, Distinguished Professor of Human Development and Professor of Demography

Associate Directors:

Keith Aronson, PhD, Associate Research Professor of Biobehavioral Health

Sheri Berenbaum, PhD, Professor of Psychology and Pediatrics

Danielle Downs, PhD, Professor of Kinesiology and Obstetrics & Gynecology

Leif Jensen, PhD, Distinguished Professor of Rural Sociology and Demography

Koralyn Perez-Edgar, PhD, McCourtney Professor of Child Studies and Psychology

Joshua Smyth, PhD, Distinguished Professor of Biobehavioral Health and Medicine

SSRI Unit Leadership

Administrative Services Unit

Director: Barbara Rigg

Center for Educational Disparities Research

Director: Paul Morgan, PhD, Professor of Education and Demography

Child Maltreatment Solutions Network

Director: Jennie Noll, PhD, Professor of Human Development and Family Studies

Clearinghouse for Military Family Readiness

Director of Administration: Nicole Hurlbutt

Director of Research: Keith Aronson, PhD

Principal Scientist: Daniel Perkins, PhD, Professor of Family and Youth Resiliency and Policy

Communications Core

Director: Kristie Auman-Bauer

Computational and Spatial Analysis Core

Director: Guangqing Chi, PhD, Professor of Rural Sociology and Demography, and Public Health Sciences

Consortium to Combat Substance Abuse

Director: Stephanie Lanza, PhD, Professor of Biobehavioral Health

Evidence to Impact Collaborative

Director: Daniel Max Crowley, PhD, Associate Professor of Human Development and Family Studies

Federal Statistical Research Data Center

Director: Mark Roberts, PhD, Professor of Economics

Information Technology Unit

Director: Joseph Broniszewski

Population Research Institute

Director: Jennifer Glick, PhD, Arnold S. and Bette G. Hoffmann Professor in Sociology and Criminology,
Professor of Demography

Quantitative Developmental Systems Methodology Core

Director: Sy-Miin Chow, PhD, Professor of Human Development and Family Studies

Social, Life, and Engineering Sciences Imaging Center

Director: Michele Diaz, PhD, Associate Professor of Psychology and Linguistics

Survey Research Center

Faculty Director: Joshua Rosenberger, PhD, Assistant Professor of Biobehavioral Health

Operations Director: Diana Crom

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SOCIAL SCIENCE RESEARCH INSTITUTE

Strategic Plan 2020-2025

I. THE SOCIAL SCIENCE RESEARCH INSTITUTE

A. MISSION

The Social Science Research Institute (SSRI) 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 development and services to social and behavioral scientists at Penn State.

The human and social problems that are the SSRI's focus motivate broad engagement by researchers across the Penn State community. During the 2018-19 academic year (our most recent complete year of data), SSRI unit directors consulted on project and proposal development with 580 faculty members from 84 departments and centers within SSRI's five constituent colleges (Agricultural Sciences, Education, Health and Human Development, The Liberal Arts, and Medicine), as well as with faculty members from an additional 21 departments and units from the Colleges of Arts and Architecture, Business, Communications, Earth and Mineral Sciences, Engineering, Information Sciences and Technology, Law, Nursing, Penn State Commonwealth Campuses, ARL, Administrative Units, the Eberly College of Science, and external faculty (see Appendix A for 2018-2019 tracking data).

B. VALUES

SSRI plans and goals for the next five years (2020-2025) are informed and guided by the university's six core values.

INTEGRITY: We act with integrity and honesty in accordance with the highest academic, professional, and ethical standards.

RESPECT: We respect and honor the dignity of each person, embrace civil discourse, and foster a diverse and inclusive community.

RESPONSIBILITY: We act responsibly, and we are accountable for our decisions, actions, and their consequences.

DISCOVERY: We seek and create new knowledge and understanding, and foster creativity and innovation, for the benefit of our communities, society, and the environment.

EXCELLENCE: We strive for excellence in all our endeavors as individuals, an institution, and a leader in higher education.

COMMUNITY: We work together for the betterment of our University, the communities we serve, and the world.

C. CONSTITUENT UNITS

The SSRI advances its mission by providing leadership and vision at the university level, and through the activities of its 14 constituent units (Figure 1). A summary of each unit follows. Additional details can be located Appendix C: Overview of SSRI Units' Plans 2020-2025.

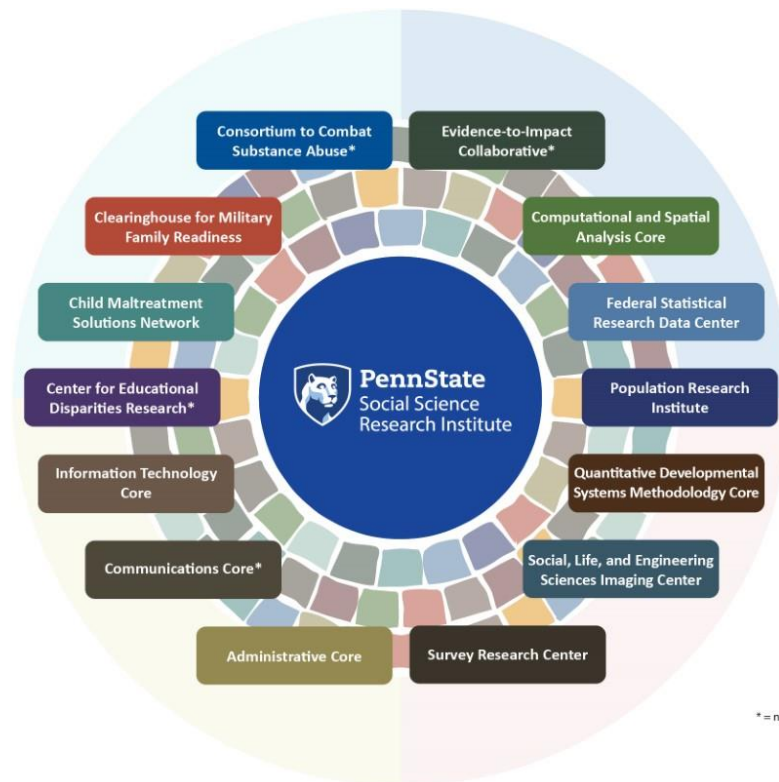


Figure 1. The Social Science Research Institute’s constituent units.

Center for Educational Disparities Research (CEDR) - Directed by Paul Morgan, PhD, Professor of Education and Demography, Penn State’s Social Science Research Institute and the College of Education have teamed up to establish the Center for Educational Disparities Research (CEDR) in order to close the educational opportunity gaps faced by minority and low-income children. CEDR was launched in 2016 with a mission to support and promote research focused on educational inequalities and the means by which they can be remedied. Educational disparities can result from children having untreated disabilities, being raised in less-advantaged homes and communities, and receiving lower-quality schooling. These disparities can extend over the life course, affecting adult employment outcomes, health and well-being. CEDR supports researchers of varied backgrounds—including sociology, developmental psychology, demography, educational and school psychology, and educational policy—by allowing them greater access to external funding, multi-disciplinary team opportunities, proposal assistance and mentoring and networking events.

Child Maltreatment Solutions Network (Network) - Directed by Jennie Noll, PhD, Professor of Human Development and Family Studies, the Network was launched in 2012 as a cluster-hire of 12 faculty who work as a cohesive team across 5 Colleges to combat child maltreatment through transdisciplinary research, education, and engagement. The Network provides pilot funds to spark innovative collaborations, conducts outreach activities including an annual conference/book series and community awareness events, and functions as Penn State's clearinghouse for information, public awareness, and communications pertaining to child abuse and neglect. The Network also has a very large education mission which includes an undergraduate minor in Child Maltreatment and Advocacy Studies (CMAS), a program to aid foster youth in advancing to and through higher education (the Fostering Lions Program), and a federal training grant (T32 HD101390:MPJs Jackson & Noll), beginning FA20, wherein a comprehensive, transdisciplinary training program will produce a pipeline of predoctoral and postdoctoral scholars prepared to significantly advance the field. In 2017 the Network was awarded the first ever P50 Capstone Center grant in child maltreatment studies by the NIH—a

mechanism designed to fund specialized research and training centers in high-priority fields of study with the expectation that these centers will emerge as a national resource for the entire field.

Clearinghouse for Military Family Readiness (Clearinghouse) - The Clearinghouse, which opened in Spring 2010, focuses on issues that pertain to and promote the health and well-being of service members, veterans, and their families. The Clearinghouse uses interdisciplinary applied research and evaluation, implementation, and dissemination science to achieve these objectives. In addition, the Clearinghouse analyzes the evidence base for prevention and intervention programs and provides live technical assistance to professionals who work with the military population. The technical assistance website posts reports, training videos, research papers, and blogs that are timely and relevant resources for professionals and families. The Clearinghouse emphasizes program evaluation and program enhancement to advance the well-being of service members, veterans, and their families. Keith Aronson, PhD, Associate Research Professor serves as the Clearinghouse Director of Research, Nicole Hurlbutt, M.P.S. as Director of Operations, and Daniel Perkins, PhD, Professor of Youth and Family Resiliency and Policy as Principal Scientist.

Consortium to Combat Substance Abuse (CCSA) - Pennsylvania has been hit especially hard by the opioid epidemic, particularly its rural communities. Motivated by this health crisis, Penn State researchers are working to address the opioid crisis and the larger problems of substance misuse in Pennsylvania and beyond via the work of the CCSA. Launched in Fall, 2018, and directed by Stephanie Lanza, PhD, Professor of Biobehavioral Health, the CCSA draws on the expertise of researchers, educators, and practitioners from Penn State campuses across the state to catalyze Penn State's distinctive, interdisciplinary and translational strengths in research, education, and outreach efforts to address issues of substance misuse. CCSA faculty also are working to inform discussions at the local, state and national levels and to develop the most effective and efficient ways to impact health in the Commonwealth and beyond.

Evidence to Impact Collaboratory (EIC) - Launched in 2018 and directed by Max Crowley, PhD, Associate Professor of Human Development and Family Studies, the EIC serves as a hub for transdisciplinary efforts to facilitate the impact of research on policy and practice, alongside its sister units. The EIC acts as an incubator for the science of using social science—supporting access to high-value data, crafting actionable knowledge and using that knowledge to impact decision making and societal wellbeing. Central to these efforts are investments in sustained partnerships with policymakers at all levels of government. This work is exemplified by the EIC's three core infrastructures that include the (1) PSU Data Accelerator, (2) Benefit-Cost Unit and (3) Research-to-Policy Collaboration.

Computational and Spatial Analysis Core (CSA) - The CSA Core supports SSRI's mission by providing lifecycle scientific and technical services and scientific expertise in multi-scale complex data integration and analyses. Directed by Guangqing Chi, PhD, Professor of Rural Sociology and Demography, and Public Health Sciences, the CSA supports multi-dimensional and multi-scale data integration and analysis. The CSA provides resources and expertise in innovative social media analytics and also infuses cutting-edge methodological approaches and techniques into social and behavioral research.

Federal Statistical Research Data Center (RDC) - Directed by Mark Roberts, PhD, Professor of Economics the RDC opened in Spring, 2014. Initial financial support was provided by the Offices of the President and Vice President for Research, the SSRI and PRI, University Libraries, and the Colleges of Agricultural Sciences, Health and Human Development, The Liberal Arts, and Science, and a grant from the National Science Foundation. In 2016 Dr. Roberts formed a consortium with three institutions in Philadelphia, the University of Pennsylvania, Drexel University and the Federal Reserve Bank of Philadelphia, and applied for a branch of the PSU RDC to be opened at the Federal Reserve Bank. This was approved by Census and the Philadelphia Branch opened in 2017. That year Temple University joined the consortium and in 2018 the University of Pittsburgh joined the PSU RDC. Now the RDC has six institutions that jointly fund the operation expenses of the PSU and Philadelphia FSRDCs. In September 2019, Dr. Roberts submitted a proposal

to Census, joint with the five consortium members, to open a branch at the University of Pittsburgh. In May 2020, this proposal was approved and Pittsburgh is now in the queue for a future branch location of our RDC.

Population Research Institute (PRI) - Directed by Jennifer Glick, PhD, Arnold S. and Bette G. Hoffmann Professor in Sociology and Criminology, Professor of Demography, PRI is an interdisciplinary unit devoted to the scientific study of population dynamics, health and well-being. PRI has been supported by an infrastructure grant from NICHD since 1992 and is one of twenty-two NICHD funded population dynamics research centers in the United States. PRI supports the cutting edge research of more than ninety faculty affiliates across six colleges at Penn State and supports rigorous graduate and postgraduate training in population science through Penn State's dual-title degree in Demography and an NIH-supported T32 training program in the social environments of health.

Quantitative Developmental Systems Methodology Core (QuantDev) - The QuantDev Core is jointly supported by the College of Health and Human Development and the SSRI and is directed by Sy-Miin Chow, PhD, Professor of Human Development and Family Studies. QuantDev has the four-fold mission of: (1) developing new methods and improving on existing methods for the study of human behavior using innovative measurement, study design, and analysis techniques; (2) sharing methods expertise through tutorials, workshops, and publications; (3) providing leadership and support to move social scientists in the direction of new methods such as Ecological Momentary Assessment, Dynamical Systems Modeling, and other innovative person-specific approaches; and (4) consulting, collaborating, and innovating with a broad range of social scientists on research projects that span multiple levels and time-scales of behavior.

Social, Life, and Engineering Sciences Imaging Center (SLEIC) - Directed by Michele Diaz, PhD, Associate Professor of Psychology and Linguistics, the SLEIC fosters research in the social, behavioral, biological, engineering, and materials sciences where imaging methodologies play a central role by providing instrumentation, technological and domain expertise, educational opportunities, and financial support for conducting magnetic resonance imaging (MRI), electrophysiology (EEG, ERP), brain stimulation (tES), *functional Near Infrared Spectroscopy (fNIRS)*, and behavioral (eye-tracking) experiments. The SLEIC's high-field state-of-the-art MRI scanner is a 3T whole body human scanner that can provide structural and functional information about any region of the body and thus facilitate both clinical and basic science research. The SLEIC's 3T scanner is identical to the scanner housed at the Penn State Hershey College of Medicine, allowing for cross campus collaboration and study of both clinical and nonclinical populations.

Survey Research Center (SRC) - The SRC provides survey research services to faculty, graduate students, and institutional investigators, 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. The SRC contains multiple units that provide researchers with innovative data collection methods to assess ongoing behavior, experience, physiology, and environmental factors in people's natural settings. Joshua Rosenberger, PhD, Assistant Professor of Biobehavioral Health serves as the Faculty Director and Diana Crom is the Operations Director.

Administrative Core - Directed by Barbara Rigg, the administrative staff provide assistance and guidance to SSRI units for administrative and financial operations. These include grants and contracts, financial management, human resources, scheduling and project management. The administrative staff perform the day-to-day functions to help keep the units operate effectively and efficiently.

Communications Core - Directed by Kristie Auman-Bauer, the Communications Core promotes SSRI's mission by engaging a broad community of stakeholders in the Institute's activities via news releases, newsletters, social media, and website development. Additional efforts are directed at increasing the visibility of social science research to the broader community, including via a podcast series, *Insights from Experts* whose aim is to bridge the gap between research data

and real-world solutions, with a focus on policymakers. The Communications Core also provides internal communications support to SSRI faculty, staff, and students.

Information Technology Core - Directed by Joseph Broniszewski this Core provides strategic IT vision, leadership, and solutions to the faculty, staff, and students within SSRI to enable them to meet their research goals, deliver results, and enhance SSRI’s position at Penn State and throughout the research community.

D. COFUNDED FACULTY

The SSRI supports its mission by co-funding faculty in departments and colleges around the University. In addition to the 19 faculty members hired as SSRI cofunds during the last planning period, ongoing searches focused on reducing social disparities and combating substance misuse have resulted in two additional hires for the former and five additional hires for the latter initiative, and seven other searches focused on combating substance misuse will be conducted over the next two years.

Position Title	College	Department	Faculty Name
FA02			
Professor	Education	Educational Psychology, Counseling and Special Education	P. Karen Murphy
FA04			
Professor	Liberal Arts	Psychology	Cynthia Huang-Pollock
Professor	Health and Human Development	Biobehavioral Health	Rob Turrisi
FA05			
Associate Professor	Liberal Arts	Sociology and Criminology	Michelle Frisco
FA06			
Professor	Liberal Arts	Sociology and Criminology	Derek Kreager
Professor	Liberal Arts	Psychology	Kristin Buss
FA07			
Professor	Health and Human Development	Human Development and Family Studies	Lisa Gatzke-Kopps

Professor	Health and Human Development	Human Development and Family Studies	H. Harrington Cleveland
Professor	Liberal Arts	Psychology	Jenae Neiderhiser
Professor	Liberal Arts	Sociology and Criminology	Jennifer Van Hook
Associate Professor	Liberal Arts	Anthropology	David Puts
FA08			
Professor	Health and Human Development	Communication Disorders	Krista Wilkinson
FA10			
Associate Professor	Health and Human Development	Biobehavioral Health	Amy Snipes
Professor	Agricultural Sciences	Agricultural Economics, Society and Education	Daniel Perkins
FA11			
Professor	Health and Human Development	Biobehavioral Health	Joshua Smyth
Professor	Health and Human Development	Human Development and Family Studies	Charles Geier
Associate Professor	Liberal Arts	Psychology	K. Suzanne Scherf
Professor	Liberal Arts	Psychology	Koraly Perez-Edgar
Associate Professor	Agricultural Sciences / Health and Human Development	Food Science and Nutritional Sciences	Kathleen Keller
FA12			
Associate Professor	Education	Educational Theory and Policy	Soo-yong Byun
Professor	Health and Human Development	Human Development and Family Studies	Sy-Miin Chow

FA13			
Professor	Health and Human Development	Biobehavioral Health	Orfeu Buxton
Associate Professor	Health and Human Development	Nutritional Sciences	Gregory Shearer
Professor	Health and Human Development	Human Development and Family Studies	Jennie Noll
Associate Professor	Health and Human Development	Human Development and Family Studies	Chad Shenk
FA14			
Associate Professor	College of Medicine	Pediatrics	Brian Allen
Professor	College of Medicine	Pediatrics	Kent Hymel
Associate Professor	Health and Human Development	Biobehavioral Health	Idan Shalev
Professor	Health and Human Development	Biobehavioral Health	Christine Heim
Associate Professor	Liberal Arts	Psychology	Michele Diaz
SP15			
Professor	Agricultural Sciences	Agricultural Economics, Society and Education	Guangqing Chi
FA15			
Assistant Professor	Education	Educational Psychology, Counseling and Special Education	Carlomagno Panlilio
Assistant Professor	Nursing	Nursing	Sheridan Miyamoto
Assistant Professor	Health and Human Development	Biobehavioral Health	Hannah Schreier
Associate Professor	Education	Educational Psychology, Counseling and Special Education	Jennifer Frank

SP16			
Assistant Professor	Liberal Arts	Sociology and Criminology	Sarah Font
Professor	Liberal Arts	Sociology and Criminology	Jennifer Glick
Associate Professor	Liberal Arts	Psychology	Erika Lunkenheimer
FA17			
Associate Professor	Health and Human Development	Human Development and Family Studies	Christian Connell
SP18			
Professor	Liberal Arts	Psychology	Yolanda Jackson
FA18			
Assistant Professor	Health and Human Development	Human Development and Family Studies	Alexis Santos
Assistant Professor	Health and Human Development	Human Development and Family Studies	Kenneth Shores
Assistant Professor	Education	Educational Theory and Policy	Ericka Weathers
Assistant Professor	Education	Educational Theory and Policy	Maithreyi Gopalan
FA19			
Assistant Professor	Agricultural Sciences	Agricultural Economics, Society and Education	Heather Randall
Associate Professor	Health and Human Development	Biobehavioral Health	Emily Ansell
Professor	Liberal Arts	Psychology	Rina Eiden
FA20			
Professor	Engineering	Industrial and Manufacturing Engineering	Paul Griffin

Assistant Professor	Health and Human Development	Human Development and Family Studies	Abenaa Jones
Associate Professor	Health and Human Development	Human Development and Family Studies	Kelly Rullison
Assistant Professor	Earth and Mineral Sciences	Geography	Luisa Holmes

II. STRATEGIC THEMES 2020-2025

SSRI supports research with the potential to increase knowledge and benefit society in ways that advance social justice. This encompasses research at all stages along the translational spectrum: basic research (e.g., investigator-initiated discovery), preclinical/pre-applied research (e.g., biological bases of disorders, contextual influences on development), applied research (e.g., testing interventions), implementation (e.g., expanding interventions from the research environment into routine clinical care or educational practice in the general population), and public health (e.g., population-level health outcomes). Translational science is not unidirectional but involves research that reciprocally builds upon and informs the other stages along the spectrum (<https://ncats.nih.gov/translation/spectrum>). During the next strategic planning period SSRI’s investments will focus on (though not be limited to) five strategic priorities.

A. The Human System

A1. Overview

The Human System is comprised of reciprocally influential processes that operate at and across multiple levels. It is an open system, whose processes are impacted by the social, natural and built environments. Equally important, humans also act to shape their environments through their behavior. Indeed, it is in large part through their individual and collective behavior that humans create the problems that plague the world, but also adapt to change, overcome challenges, and manifest resilience. Of special concern within the social and behavioral science is the role of human agency, including cognition and decision-making, imagination and motivation, emotion, and social interaction, in orchestrating and responding to influences on the human system that emanate from within and without.

A2. Capacity

The Penn State faculty includes world leaders in topics pertaining to human systems dynamics. From the study of neural processes in areas such as substance use in the new Consortium to Combat Substance Abuse (CCSA) and language (in the Center for Language Sciences) which are facilitated by infrastructure in the Social, Life and Engineering Imaging Center (SLEIC), to investigations of how environments and experiences “get under the skin” to affect stress and immune functions in the Child Maltreatment Solutions Network (Network) and Center for Healthy Aging (CHA), to research on the ways that genes work together with the environment to affect adjustment and health, social scientists at Penn State are exploring the ways in which environmental exposures, in conjunction with bio-psycho-social processes, shape and are shaped by human development and behavior. Our faculty also includes leading experts in methodologies for studying human systems dynamics such as in the Quantitative Developmental Methods Core.

A3. Accomplishments 2014-2019

SSRI supported faculty accomplishments encompass multiple aspects of the human system. Of note are research units that receive core funding from SSRI: The Child Maltreatment Solutions Network, the Consortium to Combat Substance

Abuse (CCSA), the Population Research Institute, and the Clearinghouse for Military Family Readiness. Research, education, and outreach in these centers are funded by multiple federal agencies and private foundations, including through program projects, training grants, contracts, and investigator-initiated research grants. SSRI faculty expertise in translational science ensures that cutting-edge research will be made accessible to practitioners and policy makers toward improving the lives of the residents of Pennsylvania and beyond.

We highlight successes in two areas: child maltreatment and substance abuse. In the area of child maltreatment, a program project (P50) was funded by the Eunice Kennedy Shriver National Institute of Child Health and Human Development. The project, “Penn State University's Translational Center for Child Maltreatment Studies TCCMS,” is led by Jennie Noll, and is a large-scale project with the Pennsylvania Department of Human Services. Aims are to understand the health outcomes of child maltreatment with the goal of designing interventions to promote resilience and reverse adverse outcomes, and to recognize and intervene to reduce trauma and its consequences. Through research, outreach, and dissemination and implementation, the TCCMS is a model center where transdisciplinary scientists work together with practitioners and policy-makers to implement solutions to the complex problem of child maltreatment.

The CCSA has focused on hiring faculty in multiple departments and colleges, with the aim to foster and facilitate the interdisciplinary work necessary to understand the causes and consequences of substance use, and to develop and implement effective programs, policies, and practices aimed at preventing and treating addiction and its spillover effects on children, families, and communities. The scope of the work is seen in the expertise of faculty hiring, ranging from departments focused on behavior (e.g., Psychology) to Engineering, with additional searches wrapping up and anticipated in departments in multiple colleges, including Education, Human Development, Liberal Arts, Medicine, Nursing, and at Commonwealth Campuses.

A4. Next Steps –Actions

During the 2020-2025 period, the SSRI will make new investments in research and scholarship in this broad area, funding strategic and investigator-initiated research, and scholarship across the translational spectrum. We will catalyze cross-institute collaborations to facilitate novel research on the physiological underpinnings of human behavior, health, and development, and on health risks associated with environmental exposures. Given the key role of behavior in many health problems, we will invest in research to identify mechanisms of behavior change and translating research findings into public health practices and policies.

1. A primary effort will be continuing to build the CCSA, including hiring a permanent director and completing the strategic hires of 12 new faculty members whose expertise spans the levels of the human system—from genes to the globe.

Metric: Number of collaborative publications and external grants

Metric: Successful recruitment of faculty, including director

Timeline: July 1, 2020 to June 30, 2025

2. We will expand collaborations with the Huck Life Sciences Institute to develop novel research on the physiological underpinnings of human behavior, health, and development. This includes collaborative research on the role of human behavior in the spread of infectious disease and the spillover effects of the COVID-19 pandemic to individual, family and community well-being; expanding work by the Network on the biological and social mechanisms underlying the consequences of early trauma; supporting efforts of the CCSA to illuminate

the physiological underpinnings of substance misuse and addiction; and supporting research in the Center for Healthy Aging on the role of life stressors and health behaviors in cognitive aging.

Metric: Institute sponsored/co-sponsored opportunities aimed at developing collaborations to support novel research on the physiological underpinnings of human behavior, health, and development; this includes, for example, RFAs for seed grants, working groups, and workshops

Metric: Number of collaborative publications and external grants

Timeline: July 1, 2020 to June 30, 2025

3. We will partner with the Institutes for Energy and Environment (IEE) to develop new research on risks associated with environmental exposures. Here, our focus will be on investments in the Population Research Institute's expertise in population health, including in issues of migration and immigration, the role of social networks in health and well-being, and spatial analysis for mapping and illuminating social and environmental factors in human health and well-being.

Metric: Collaborative publications and external grants

Metric: Institute sponsored/co-sponsored opportunities aimed at developing collaborations to support novel research on risks associated with environmental exposures; this includes, for example, RFAs for seed grants, working groups, and workshops. Focus will be on leverage strengths in PRI and Computational and Spatial Analysis Core

Timeline: July 1, 2020 to June 30, 2025

B. Social Disparities

B1. Overview

Social Disparities refer to the consequential inequities in the U.S. and globally in health and health care, education and employment opportunities, poverty risks, exposure to adverse environments, and other domains of life. Often these disparities are associated with race/ethnicity, immigrant status, gender, young and old age, place of residence, and other socio-political factors that shape opportunities and life chances and can intersect in detrimental ways that give rise to concerns about social justice. New science is needed on the causes, correlates, severity, nature, and consequences of disparities across persons and places. SSRI will lead this effort and thereby contribute to the evidence base needed for ameliorative policies, programs, and interventions toward a more socially just world.

B2. Capacity

Given the pervasiveness, breadth, and complexity of social disparities, most SSRI centers and institutes will enhance our contributions in this area. These include the Population Research Institute, Center for Educational Disparities Research, Penn State Federal Statistical Research Data Center, Computational and Spatial Analysis Core, Consortium to Combat Substance Abuse, Child Maltreatment Solutions Network, Evidence to Impact Collaborative, and Clearinghouse for Military Family Readiness. We will capitalize on our disciplinary diversity by encouraging the assembly of dynamic research teams that examine social disparities from different perspectives and using novel methodological approaches and promoting knowledge dissemination and application. SSRI will endeavor to coordinate relevant research within units so that it is being conducted not in isolation, but with an eye toward uncovering synergies.

B3. Accomplishments 2014-2019

Researchers have generated new scientific knowledge across the broad spectrum of social disparities. For example, SSRI support has contributed to the development of research and external awards aimed at illuminating system and social determinants of health and health disparities among foster children; nutrition education, healthy eating, and obesity among rural poor children; used Big Data analytics and network analyses to better understand the impact of

neighborhood disadvantage on children's health risks; and examined how race, ethnicity, and other sociocultural attributes interact with contextual characteristics to influence health and development outcomes.

Of note are achievements in research on social disparities across the rural-urban continuum with projects on income inequality, rural population health and aging, deaths of despair in rural America, and gendered disparities in agriculture. Two projects that were successfully funded exemplify this work. A new National Institute on Aging project, "Interdisciplinary Network on Rural Population Health and Aging" (NIH/NIA R24; PI: L. Jensen) has Penn State taking the lead in building national capacity for research on the health challenges facing rural elders and rural populations generally in the United States today by forming a network of scholars from Penn State and beyond and supporting new research through pilot grants, workshops, and grant proposal mentoring. The "Family Migration and Early Life Outcomes" Project –(NICHD P-01, PI: J. Glick) project is collecting longitudinal data on families in diverse sending communities in Central America, Asia and Africa to assess the timing of migration in children's lives to understand how migration from the family influences children's education, development, and well-being. The Pursuing Opportunities for Long-term Arctic Resilience for Infrastructure and Society project, (POLARIS) with co-PIs Davin Holen, Ann Tickamyer, Lance Howe, and Chris Maio investigates environmental migration, food security, and human-environment hotspots in response to climate change in Arctic indigenous communities. This transdisciplinary project involves demographers, sociologists, economists, K-12 educators, anthropologists, landscape and marine ecologists, and policy researchers from four institutes.

B4. Next Steps –Actions

During the 2020-2025 period SSRI will catalyze the next generation of research on social disparities operating domestically and internationally. Motivated by the imperative of social justice, we will pursue, build, and support a research agenda that foregrounds and blends scientific rigor with practical application in order to understand and ameliorate detrimental social and health disparities from the local to the global levels.

1. We will invest in translational research on health, education and other social disparities, drawing on the strength of new faculty hired as part of the Social and Health Disparities initiative.

Metric: Forums for dialogue and collaboration among faculty whose work pertains to social disparities

Metric: Seed funding for interdisciplinary research focused on reducing disparities

Metric: Collaborative publications and external grants

Timeline: July 1, 2020 to June 30, 2025

2. We will promote new science on the spatial aspects of social inequality including by drawing on the expertise and analytic resources of the Computational and Spatial Analysis Core and promoting use of data in the Federal Statistical Research Data Center and the Administrative Data Accelerator.

Metric: Seed funding for research on how social contexts of all types (e.g., neighborhoods, communities, labor markets, schools) impact disparities in economic, education, physical and mental health and other outcomes for social groups including racial/ethnic and gender groups

Timeline: July 1, 2020 to June 30, 2025

3. We will build on our growing international research portfolio to foster new work on global inequalities including through within- and between-country comparative analysis.

Metric: Collaborations with the Penn State Office of Global Programs, the College of Agricultural Sciences, Office of International Programs, and other college-level offices

Metric: Forums for dialogue and collaboration among faculty whose work pertains to social disparities

Metric: Collaborative publications and external grants

Timeline: July 1, 2020 to June 30, 2025

4. Recognizing that environmental and climate change risks are greater among certain populations and drawing on expertise in the Institutes of Energy and Environment, SSRI will promote research at the broad intersection between social disparities and the environment.

Metric: Forums for dialogue and collaboration among faculty whose work pertains to social disparities

Metric: Seed funding for research on climate changes and the environment and how the impact on disparities in economic, education, and physical and mental health and other outcomes for social groups including racial/ethnic and gender groups.

Metric: Collaborative publications and external grants

Timeline: July 1, 2020 to June 30, 2025

5. Both domestically and internationally, gender continues to shape opportunity structures and outcomes, often to the disadvantage of women and girls. At the same time there is increasing recognition of the complexity of gender and biological sex as constructs. SSRI follows the National Institutes of Health by acknowledging that sex and gender are distinct constructs that interact closely in ways that are not well understood. Penn State researchers have pushed this work forward, and SSRI will continue to promote groundbreaking research in this area.

Metric: Forums, including event featuring projects we funded this past year

Metric: Seed funding

Metric: External awards/papers including by those who we funded this past year

Timeline: July 1, 2020 to June 30, 2025

6. A challenge for some studies is recruiting vulnerable populations for research. To address this issue SSRI will work to develop new opportunities and approaches to promote community engagement for research.

Metric: Complete scoping review to explore the development of a community-based infrastructure that both supports new research by forging relationships with communities that may benefit from evidence-based interventions and policies

Timeline: July 1, 2020 to June 30, 2025

7. Social and health disparities operate at multiple scales and bridging across levels of analysis (e.g., from person to population) is a challenge. To address this challenge, SSRI will promote new interdisciplinary collaborations between researchers exploring social and health disparities in local contexts with those who focus on national trends toward micro-macro linkages.

Metric: Develop a platform for new interdisciplinary collaborations aimed at bridging from micro to macro levels to address social and health disparities

Metric: Seed grants

Metric: External awards and publications

Timeline: July 1, 2020 to June 30, 2025

C. Smart and Connected Health

C1. Overview

Smart and Connected Health (S&CH) captures opportunities for mental and physical health promotion and disease prevention and treatment that build on novel methodologies for data collection and care/intervention delivery, such as via the use of ambulatory assessment, wearable sensors, mHealth, social media, telehealth, and human-technology hybrid systems. In addition, novel theories and analytics that allow for real time analysis of multi-modal, multi-time scale

data can enable the development and delivery of adaptive interventions that can be delivered in real time and are tailored to the immediate needs and circumstances of the individual (“personalized health”). Emerging capabilities in big data and artificial intelligence provide additional opportunities to extend this work. These efforts are particularly exciting as they synergize with other goals of SSRI and Penn State.

C2. Capacity

Penn State faculty in the social and behavioral sciences are recognized leaders in ambulatory and remote data capture and analysis, the development and evaluation of prevention and intervention programs for promoting mental health, health behaviors, and facilitating adjustment and resilience across the lifespan. They have also led the field in establishing evidence-based programs as the standard for professional practice – that is, the use of systematically collected, reliable and valid data (as opposed, for example, to intuition, tradition, and common sense) as the source of knowledge that is translated into health-related policy, programs and everyday health practices.

C3. Accomplishments 2014-2019

SSRI has been instrumental in supporting notable achievements in S&CH. Our substantive targets include the methods and science of ambulatory assessment; data analytic approaches for S&CH and intensive longitudinal data [ILD], health behaviors, and interventions in everyday life. Across each of these domains SSRI faculty are recognized international experts, and Penn State social and behavioral science faculty are publishing many high-impact articles in these areas. SSRI supported an international conference on ambulatory assessment that was hosted at Penn State; this conference both showcased Penn State expertise but also catalyzed work in this area at the outset of the last planning period. In addition to Penn State faculty holding many investigator-initiated grants (NIH, NSF) in S&CH, SSRI support has led to obtaining several major NIH grants:

In the methods and science of ambulatory assessment domain we have an NIH-funded Resource-Related Research Multi-Component Projects and Centers Cooperative Agreement [U2C] “Ambulatory methods for measuring cognitive change” (NIA; PI: M. Sliwinski). This project is developing innovative ambulatory methods that rely on mobile and sensor technology to measure the cognitive and behavioral function of people in their everyday life to provide more cost-effective, accurate, sensitive and ‘ecologically valid’ measurements of early signs of cognitive impairment.

A second large project focuses on health behaviors and interventions in everyday life, funded first by an NIH (NIA) Exploratory/Developmental Cooperative Agreement Phase I [UH2] that successfully transitioned to an NIH (NIA) Exploratory/Developmental Cooperative Agreement Phase II [UH3] “Everyday stress response targets in the science of behavior change” (PI: J. Smyth). This project has developed and is testing a dynamically personalized “just-in-time” intervention that provides tailored stress management at personalized moments of stress via smartphones, with the goal of reducing stress and enhancing the capacity of individuals to enact healthy behavior (physical activity, sleep) in everyday life.

C4. Next Steps –Actions

During the 2020-2025 plan period, the SSRI will invest in both strategic and investigator-initiated high impact Smart and Connected Health research. We see promise in domains from discovery to application, notably including the areas of innovative dynamic and naturalistic data capture, analytics for such data, and novel applications of dynamic and naturalistic data capture to develop and implement novel interventions.

1. SSRI will extend its support for faculty and units using ambulatory assessment and ecological momentary assessment designs, including those developing and testing innovative interventions for delivery in everyday life, for example, via remote and multi-modal data capture capacity in the Survey Research Center (SRC) and Computational and Spatial Analysis Core (CSA).

Metric: Support for SSRI units to provide relevant services (e.g., SRC, CSA)

Metric: Enhanced range and use of infrastructure and services provided by SSRI units to for S&CH research
Timeline: July 1, 2020 to June 30, 2025

2. We will continue our long-term investment in cutting edge analytic approaches to intensive longitudinal data (ILD), the optimization of interventions, and related topics. For example, we will continue to invest in efforts to support faculty developing innovative methods (e.g., Quant/Dev, EIC Benefit-Cost Unit) and look for new opportunities to expand and enhance such expertise.

Metric: RFAs, seed funding and other support for faculty in cutting edge analytic approaches to intensive longitudinal data (ILD), the optimization of real-time interventions, and related topics

Metric: Support for SSRI units providing services (e.g., QuantDev, CSA)

Timeline: July 1, 2020 to June 30, 2025

3. To promote novel interventions, we will evaluate opportunities to support efforts in these domains being coalesced into a more cohesive and active unit, perhaps focused on ambulatory, real-time prevention, and intervention.

Metric: Evaluation and report on possibilities for synthesized activities in S&CH

Timeline: July 1, 2020 to June 30, 2025

4. Supporting all of these aims as well as investigator-initiated work, we will continue our strong partnerships around Penn State. To this end, we will continue to seek synergies between our S&CH goals and related efforts by other Institutes (e.g., Penn State Clinical and Translational Science Institute (CTSI), Institute for Computational and Data Sciences (ICDS), Institutes of Energy and the Environment (IEE), The Huck Institutes (Huck) and Penn State Departments and Centers in ways that broaden our reach and impact. For example, we will work with the ICDS to identify a new “point person” to provide programming/research support for Smart and Connected Health development and scalability efforts, and we will also continue to enhance our partnerships with faculty in the engineering sciences around development of devices/sensors for health/behavioral monitoring and care/intervention delivery.

Metric: Collaborative seed grants in S&CH

Metric: External awards focused on S&CH

Metric: Identification and appointment of a “point person” to facilitate collaborations (notably between ICDS and SSRI, but others as well) and provide support for development and scalability of S&CH projects

Timeline: July 1, 2020 to June 30, 2025

D. Innovative Methods

D1. Overview

Social and behavioral science is built on and will continue to inspire the development of novel methods – which will be a sustained focus of SSRI’s investments during the 2020-2025 timeframe. Investments in Data and Methods focus on innovative approaches to research design, data access and collation, data security and archiving, and modeling and analysis towards translating data into new knowledge to advance research related to our strategic priorities and beyond.

D2. Capacity

Penn State’s social and behavioral science faculty members are internationally recognized for their expertise in quantitative and mixed methods, including population and spatial analysis in the Population Research Institute (PRI) and Computational and Spatial Analysis Core (CSA), dynamical systems modeling in the Quantitative Developmental Systems Core (Quant/Dev), novel neuroimaging analytics in the Social, Life and Engineering Sciences Imaging Center (SLEIC), as

well as intensive longitudinal data and real-time ambulatory assessment across multiple time-scales and levels of analysis. Our faculty in Quant/Dev, CSA, and the program in Social Data Analytics are also expanding expertise in big data, machine learning, and data visualization, and faculty in the Evidence to Impact Collaborative are fostering expertise in the ethical and privacy-protecting use of personally identifiable data. Our capacity around innovative research methods will continue to expand in the context of ongoing pre- and post-doctoral training programs in the PRI (NICHD T32 Family Demography Training Program), Prevention Research Center (NIDA T32 Prevention and Methodology Training Program), and Child Study Center (Institute for Education Sciences and U.S. Department of Education Training Interdisciplinary Educational Scientists Program). In addition, the Survey Research Center (SRC) provides infrastructure for a broad range of data collection approaches, from conventional survey data to real time and biomarker data collection.

D3. Accomplishments – 2014-2019

SSRI strategic investments in innovative methods have led to achievements in novel approaches to research design, data collection and visualization, data security and archiving, and modeling and analysis. These include the growth and expansion of SSRI units such as the CSA's Twitter Initiative and other college centers such as the Center for Healthy Aging in the College of Health and Human Development, the SAFE-T Center in the College of Nursing, and the Center for Big Data Analytics and Discovery Informatics in the College of Information Sciences and Technology and co-sponsored by the ICDS, Huck Institutes, and SSRI.

SSRI also provided seed funding for a broad range of interdisciplinary research teams that incorporated innovative methods and spanned across a variety of social and behavioral phenomena. Examples include research focused on brain function and sub-concussive injuries in sports, nutrition education for low-literacy caregivers, child maltreatment and sexual exploitation/trafficking and cyberbullying.

A recent award led by SSRI cofund and Director of the Quant/Dev Core Sy-Miin Chow focused on intensive longitudinal data analysis and provides an unprecedented opportunity to advance and shape the future landscape of health behavior science and related intervention practice. It was funded by a National Institute on Alcohol Abuse and Alcoholism Resource-Related Research Projects Cooperative Agreement [U24] "The Center for Innovation in Intensive Longitudinal Studies (CIILS)" and was part of the Intensive Longitudinal Behavior Network (ILHBN).

As another example of a new and innovative methods award, SSRI cofund Guangqing Chi (AESE, director of the CSA Core) is leading a project funded by the National Science Foundation "The Generalizability and Replicability of Twitter Data for Population Research." This project is aimed at developing methods for analyzing real-time, big, social media data, in particular, how Twitter data can be used to develop valid generalizations about population behaviors. More generally, the team aims to provide a foundation for novel advances in the use of social media data for scientific, health, and applied research.

D4. Next Steps –Actions

During the 2020-2025 period, the SSRI will continue to advance and expand the boundaries of innovation in novel methods. Strategic areas for growth and investment include big data, machine learning, computational and spatial analysis, dynamical systems modeling, neuroimaging, and data access, security, and archiving to enable a deeper understanding of social-behavioral phenomena and more readily quantify, explain, and predict future outcomes.

1. We will support ongoing efforts within the Quant/Dev Core to develop new dynamical systems modeling and analysis of multi-modal, multi-level, and multi-time scale data, grow our expertise in big data, machine learning, and data visualizations within the CSA Core, and build capacity within the SRC for novel methods of data collection. Success in these investment areas will increase Penn State's competitiveness for funding and further develop and attract talent and visibility to Penn State's social science community.

Metric: SSRI-sponsored opportunities (e.g., cofunded faculty, RFAs for seed grants, working groups, workshops, and conferences) aimed at promoting innovative methods in social-behavioral research

Metric: Efficient and effective infrastructure to support novel methods of data access and collation and modeling and analysis

Metric: Publications and external awards aimed at developing and applying innovative methods in social and behavioral research

Metric: Extent and breadth of the SRC's externally funded projects

Timeline: July 1, 2020 to June 30, 2025

2. We will continue to advance the breadth and depth of innovative methods through investments across SSRI's units and through collaborations with other institutes and colleges such as with the Center for Big Data Analytics and Discovery Informatics within ICDS, with Huck, and with the Colleges of Engineering and IST. We will focus on both discovery and on novel applications of existing methods to social and behavioral science, with particular attention to our strategic priorities.

Metric: Inter-institute sponsored/co-sponsored opportunities (e.g., RFAs, workshops) aimed at developing and/or applying innovative methodologies to research with a social/behavioral science component

Metric: External awards and publications involving inter-Institute collaborations that focus on the development/application of innovative methods in social/behavioral research

Timeline: July 1, 2020 to June 30, 2025

3. We will build and expand our recently launched Evidence to Impact Collaborative (EIC) infrastructure to establish Penn State's leadership in the ethical and secure acquisition, housing, linking, analysis, and translation of sensitive administrative data pertaining to human behavior, health, and development.

Metric: Growth in external awards using social science data assets from continued strategic investments in high value data assets

Metric: Reduction of researcher burden through growth in institutional data infrastructure to meet the evolving security and analytic needs of sensitive data

Metric: Increase in Commonwealth and Federal data partnerships for high impact social science research

Timeline: July 1, 2020 to June 30, 2025

4. We will expand our capacity for disseminating novel methods and their applications in social and behavioral science.

Metric: Continue to build SSRI website pages to disseminate information about and products developed within the Quant/Dev and CSA Cores, EIC and the SR

Metric: Website visits; consultations with Quant/Dev, CSA, SRC methodologists

Timeline: July 1, 2020 to June 30, 2025

E. Dissemination and Implementation Science

E1. Overview

Dissemination and Implementation (D&I) Science is aimed at advancing understanding of how to effectively and efficiently translate research evidence into effective programs, policies, practices and products. In the face of considerable investment in research and corresponding advances in knowledge about human behavior, health, and development, understanding of how this knowledge can best be translated into impact lags far behind. And, although a number of evidence-based programs and practices have been developed and proven effective, the vast majority of individuals, families, and communities never receive or access them. High and increasing rates of social and behavioral problems that can be prevented or ameliorated, including overweight and obesity, addiction, child maltreatment, school failure, unemployment, violence and social unrest, early mortality, and spread of infectious disease are the result. Such

evidence suggests that the return on investment for D&I research may exceed that for new discoveries. In short, to bridge the gap between research and impact, advancements in D&I are critical.

E2. Capacity

Dissemination research is directed at identifying the most effective ways of distributing science-based information and other materials (e.g., prevention programs; policy briefs) to public health, educational, governmental, or clinical, and lay audiences to spread science-based knowledge and enhance uptake of proven-effective innovations. Critical questions include how to best partner with and communicate with diverse communities and what dissemination modalities work best in connecting people and communities to innovations.

Implementation research focuses on quality and effectiveness in the deployment of innovations. Issues that require further study include how context and culture impact implementation and best methods for: developing and improving practice partnerships, providing organizations and individuals with information on innovations, training to enhance understanding and delivery of innovations, and delivering coaching and technical assistance to ensure that innovations are adapted and sustained based on continuous quality improvement approaches. Implementation outcomes such as acceptability, appropriateness, adoption, cost, feasibility, fidelity, penetration, and sustainability of evidence-based program, policy, practice and product innovations also remain under-researched.

E3. Accomplishments 2014-2019

SSRI has supported research efforts in D&I Science, including large-scale community-based prevention programs that have resulted in significant improvements in targeted outcomes among large and diverse populations (e.g., decreased alcohol and drug use, increased school persistence) and have yielded critical insights into factors that predict high quality implementation. SSRI investments have been instrumental at facilitating partnerships with community and provider networks in diverse settings to undertake D&I research. SSRI faculty also are increasingly impacting state and federal policy including through SSRI's Clearinghouse for Military Family Readiness, Child Maltreatment Solutions Network, Evidence-to-Impact Collaborative, and Consortium to Combat Substance Abuse, as well as SSRI's partnering centers and institutes such as the Clinical and Translational Sciences Institute and the Prevention Research Center and its Evidence-based Prevention and Intervention Support (EPIS) Center.

The Clearinghouse offers one example of D&I social science. With continued funding from the Department of Defense through the National Institute of Food and Agriculture, the Clearinghouse website, www.militaryfamilies.psu.edu, provides a public portal where practitioners who work with military personnel and families can access detailed information on more than 1,400 evidenced-based and evidence-informed programs of individuals and families facing a broad domain of issues and challenges with up-to-date information on programs designed to improve couple and family relationships, decrease domestic and family violence, address psychological problems, and prevent suicide, among others. All programs were rigorously vetted for evidence of effectiveness by Clearinghouse research and evaluation scientists and placed on its Continuum of Evidence. In addition, Clearinghouse Technical Assistance (TA) engages professionals who work with military families and veterans in selecting, implementing, and evaluating evidence-based programs and practices to enhance veterans', service members' and their families' health and well-being. To date, Clearinghouse TA staff have addressed nearly 2,500 requests from professionals working with military families from around the globe.

A second example is the Research to Policy Collaboration (RPC) initiative led by faculty within the EIC, who developed a network of over 400 researchers from across the country whose expertise can be brought to bear on government policies pertaining to human and social well-being. To date the RPC team has worked with over 40 congressional offices focusing on a variety of child and family topics. With funding from the WT Grant foundation, this team is now conducting

a randomized controlled trial to test the effectiveness of the RPC’s training program for promoting research-policy collaborations. Initial evidence shows that congressional office staff report greater value of research and were 20% more likely to use research evidence language in legislative bills compared to offices in the control group. Researchers also report improved skills and policy engagement, and these effects were pronounced among under-represented scholars (i.e., female and persons of color).

E4. Next Steps –Actions

Given the evidence that dissemination and implementation research (D&I) is essential to the translation of science to practice and improving population health, the SSRI will increase support to researchers in this field during 2020-2025. These support efforts, including investments to develop a collaborative cadre of D&I researchers, provide training opportunities, and create new interdisciplinary research partnerships, among others will raise the visibility and impact of D&I research across the social and behavioral sciences at Penn State, nationally, and internationally.

1. We will prioritize hiring faculty with D&I expertise as part of our strategic hiring process, including within the Consortium to Combat Substance Abuse and will engage current cofunds in trainings around effective dissemination of their research.

Metric: Number of cofunded faculty with D&I expertise

Metric: Number of cofunded faculty involved in D&I training

Timeline: July 1, 2020 to June 30, 2025

2. We also will work to enhance synergies among researchers with D&I interests and expertise within and beyond SSRI by providing forums for discussion and exchange.

Metric: Institute sponsored/co-sponsored opportunities (e.g., RFAs, workshops) aimed at building capacity for translating social and behavioral research findings into actionable knowledge for policy makers

Metric: Policy focused activities by Penn State social/behavioral scientists (e.g., involvement in government task forces, briefings, testimonies, reports)

Metric: External awards and publications that include a D&I focus

Timeline: July 1, 2020 to June 30, 2025

3. We will develop dissemination outlets for social and behavioral science research.

Metric: Infrastructure for engagement and communication with community stakeholders and policy-makers within the Commonwealth and beyond including social media forums (e.g., Evidence to Impact Podcast), conferences

Timeline: July 1, 2020 to June 30, 2025

III. PROMOTING AND SUPPORTING RESEARCH STAFF

Supporting the development of our research staff is central to SSRI’s mission to promote innovation, excellence and impact in the social and behavioral sciences. Staff in our Administrative Services Unit, Communications Core and Information Technology Unit each play key and distinctive roles within SSRI and across the University. In addition, most of SSRI’s substantively-focused units include staff with specialized expertise. Essential to maintaining a committed and high-performing workforce are a climate of inclusivity and belonging, opportunities for professional development and salaries that compensate staff for their contributions—each of which will be the focus of SSRI attention during this plan period. Our research staff is disproportionately female and in jobs that tend to be less well-paid than other technical staff positions, an inequity that will be a particular focus. In addition, SSRI staff are also disproportionately White, and thus hiring persons of color for staff roles will be another special focus of SSRI efforts.

IV. TRACKING AND EVALUATION

The SSRI closely tracks the outcomes of its research investments. This information is used to adjust our mechanisms of support (which have changed over time) and to respond to the needs of researchers and changes in the external funding environment.

The SSRI continues to prepare an annual report of the outcomes of its funding mechanisms. These are results from our most recent completed report from the academic year 2018-2019. See **Appendix A** for additional tracking data examples and **Appendix B** for descriptions of funding mechanisms.

A. LEVEL 1 FUNDING

Level 1 funding (up to \$5,000)

Total number of L1 projects funded (Lifetime): 413

Total dollars invested in L1 projects (Lifetime): \$1.87 million

Total external grant dollars stemming from L1 funding (Lifetime): \$80.3 million

B. LEVEL 2 FUNDING

Level 2 funding (up to \$20,000)

Total number of L2 projects funded (Lifetime): 310

Total dollars invested in L2 projects (Lifetime): \$5.69 million

Total external grant dollars stemming from L2 funding (Lifetime): \$117 million

C. FACILITATED PROJECTS

Total number of Facilitated projects funded (Lifetime): 66

Total dollars invested in Facilitated projects (Lifetime): \$4.69 million

Total external grant dollars stemming from Facilitated funding (Lifetime): \$155 million

D. CO-FUNDED FACULTY

Total number of co-funded faculty positions (Lifetime): 74

Current co-funded positions (July 1, 2020): 51 (24 Full Professors, 16 Associate Professors, 11 Assistant Professors)

Total person years of funding (through June 30, 2019): 468

Total faculty salary costs (through June 30, 2019): \$21,454,525

Total grant award dollars secured by co-funded faculty (through June 30, 2019): \$198,275,913 (direct return dollars: \$157,795,474; indirect return dollars: \$38,334,378)

E. FACULTY FELLOWS

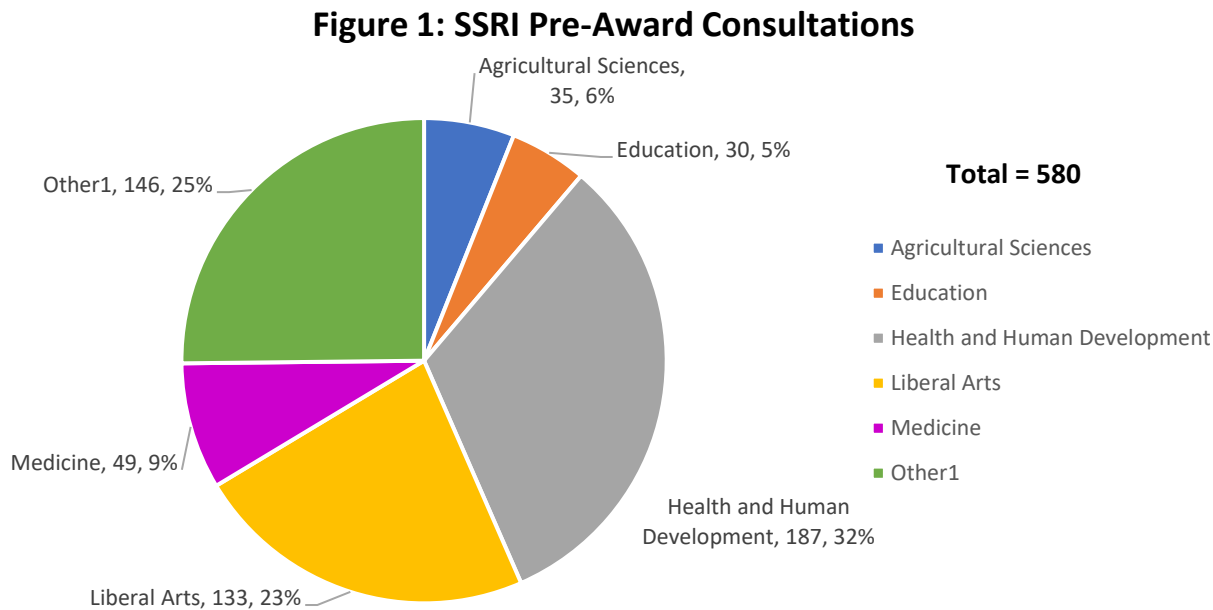
Total number Fellows (Lifetime): 29 (first began awarding faculty fellows in 2009)

Total costs (Lifetime): \$442,500

Total dollars in external funding (Lifetime): \$9.7 million

Appendix A: Tracking Data from 2018-2019 SSRI Administrative Report

Figure 1: SSRI Pre-Award Consultations



To capture the extent of involvement in faculty consultations, directors estimated the time they spent with each faculty member: 1= up to 60 minutes; 2 = 1-3 hours; 3 = more than 3 hours. On average, consultations per faculty lasted from 1-3 hours. This level was approximately evenly spread across all colleges and units (range = 1.72-2.35).

Table 1: SSRI Consultations

College	1	2	3	Total	Mean Involvement
Agricultural Sciences	6	11	18	35	2.34
Education	14	6	10	30	1.87
Health & Human Development	49	57	81	187	2.17
Liberal Arts	41	30	62	133	2.16
Medicine	9	14	26	49	2.35
Other	77	33	36	146	1.72
Total	196	151	233	580	2.10

¹ Other = Colleges of Arts & Architecture, Business, Communications, Earth and Mineral Sciences, Engineering, IST, Law, Nursing, Penn State Commonwealth Campuses, Science, ARL, Administrative units, and external faculty

Table 2: SSRI Research Support by Funding Mechanism – Open Projects¹

Mechanism	Open \$	# Faculty Involved	# Dept. Represented	# of Projects
Level 1	\$180,659	27	14	30
Level 2	\$977,460	49	27	50
Facilitated	\$1,416,252	8	3	9
Matching Funds	\$1,531,094	8	6	8
Faculty Fellows	\$178,500	11	7	11
Campus Fellows	\$10,000	2	2	2
Co-Funded Faculty	\$15,908,585	46	13	46
Other Faculty Support	\$749,466	10	8	10
Misc. (Keesler Graham Fellowship)	\$20,112	1	1	1
Total Active Dollars	\$20,972,128			

Note: Open Projects = Currently active projects, no final determination of outcome
See Appendix 1: All Open SSRI Projects

Figure 2a: Open SSRI Research Support by Mechanism

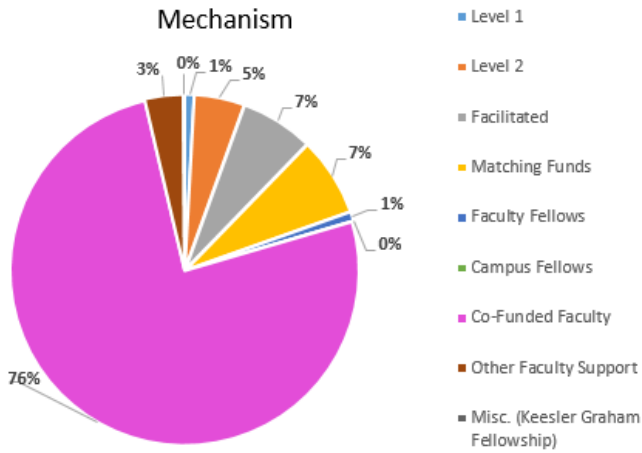


Figure 2b: Open SSRI Research Support by Mechanism (Excludes Co-Funded Faculty)

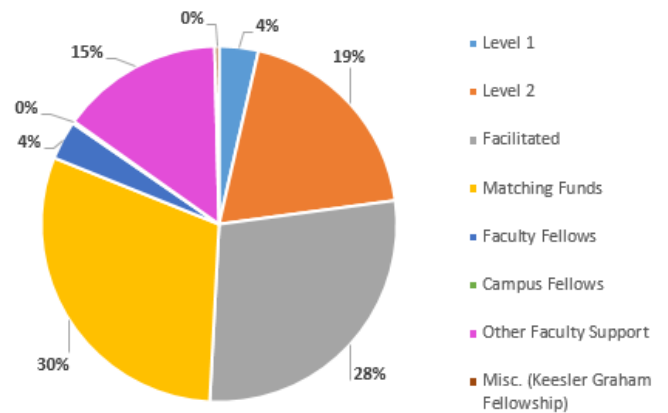


Figure 3: SSRI Research Support by College - Open Projects

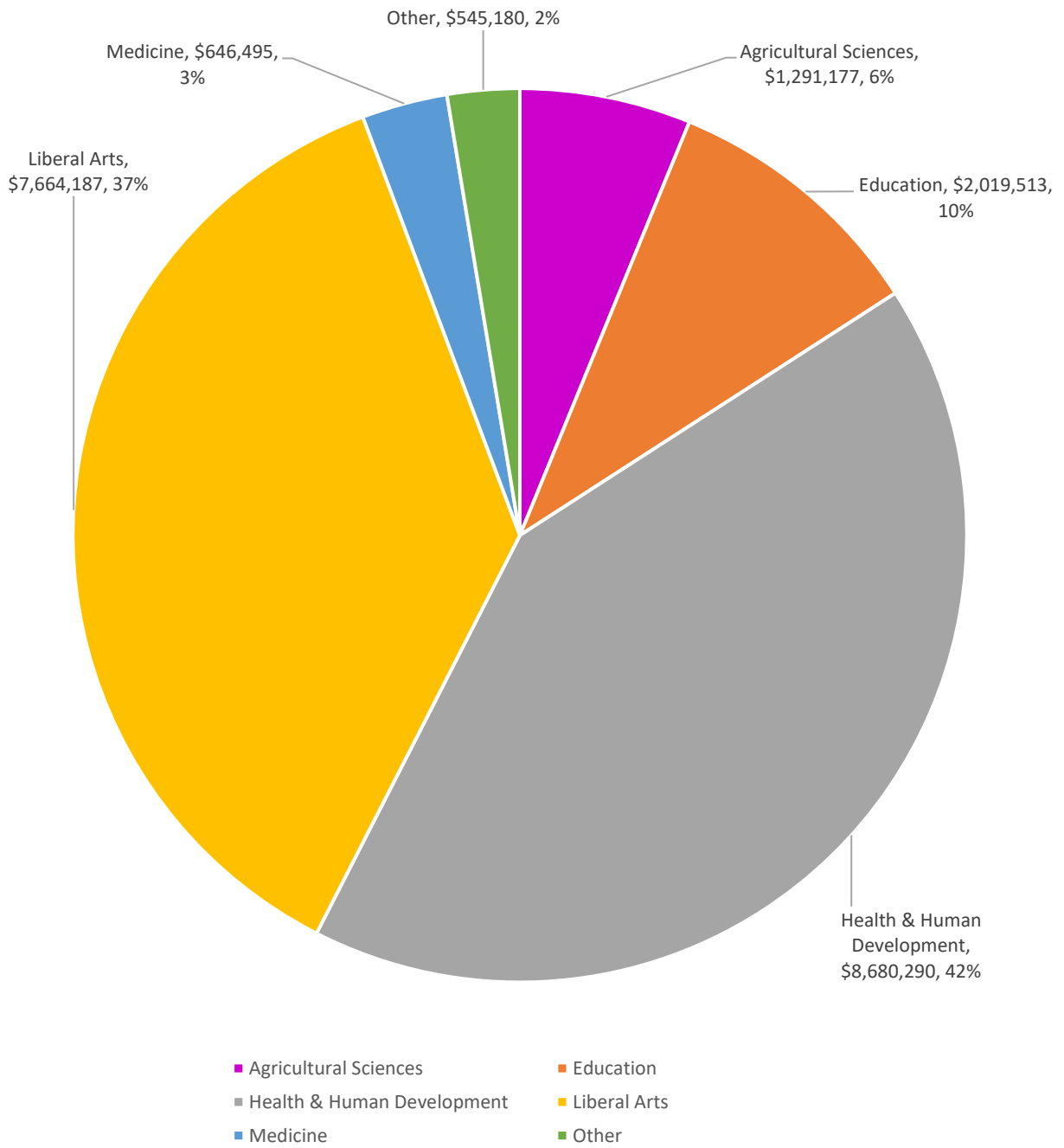
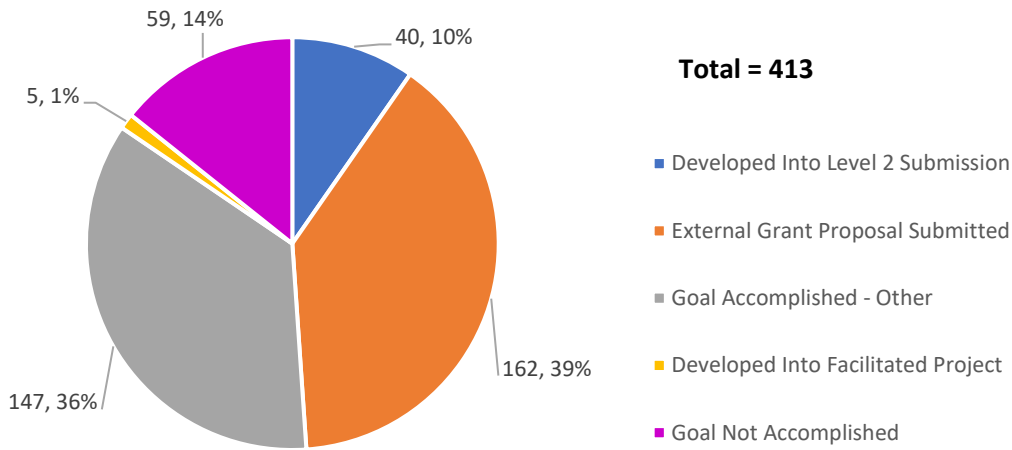
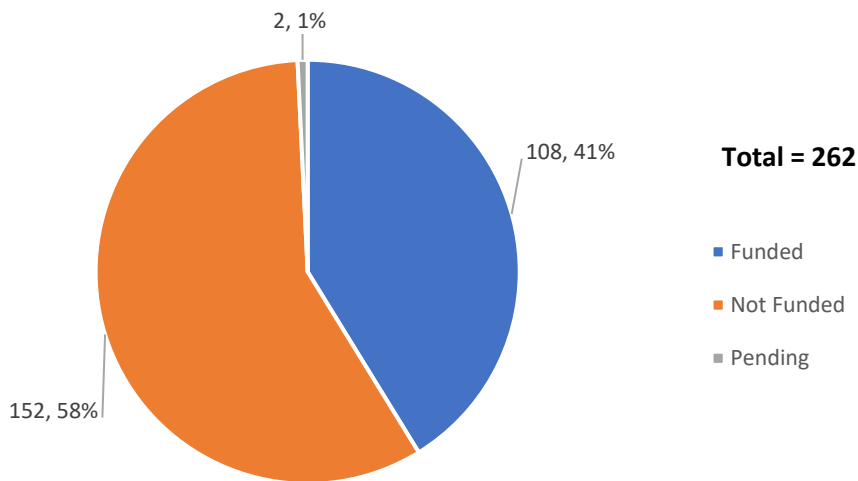


Figure 4: Outcomes of Closed Level 1 Grants (Lifetime)



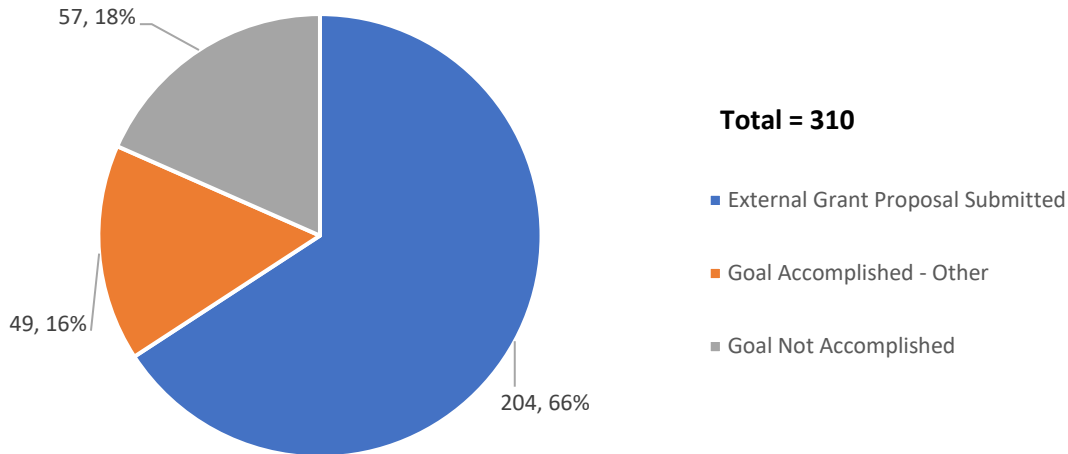
Level 1 projects have been completed with a total investment over \$1.87 million

Figure 5: External Grant Proposals Submitted



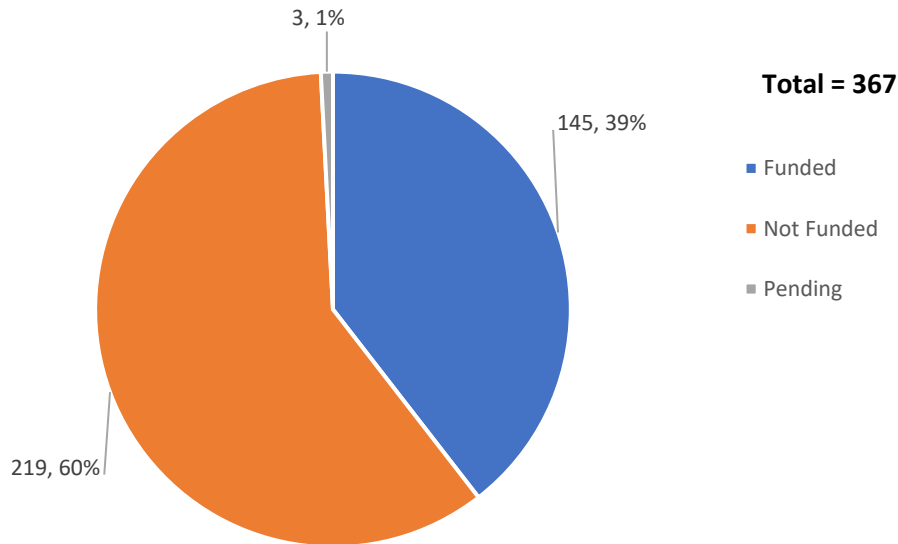
Total external grant proposals submitted include multiple submissions of some Level 1 projects

Figure 6: Outcomes of Closed Level 2 Grants (Lifetime)



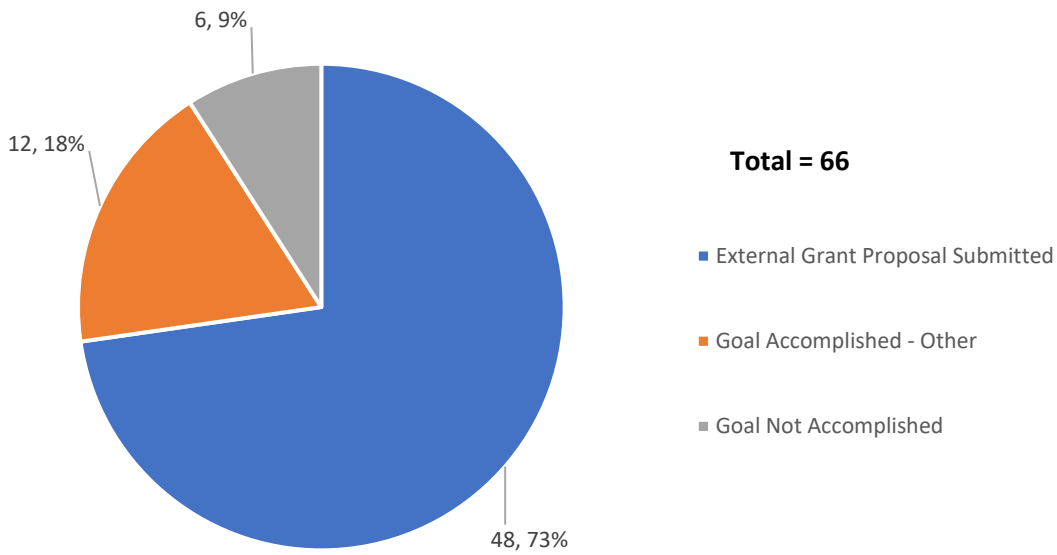
Level 2 projects have been completed with a total investment of \$5.69 million

Figure 7: External Grant Proposals Submitted



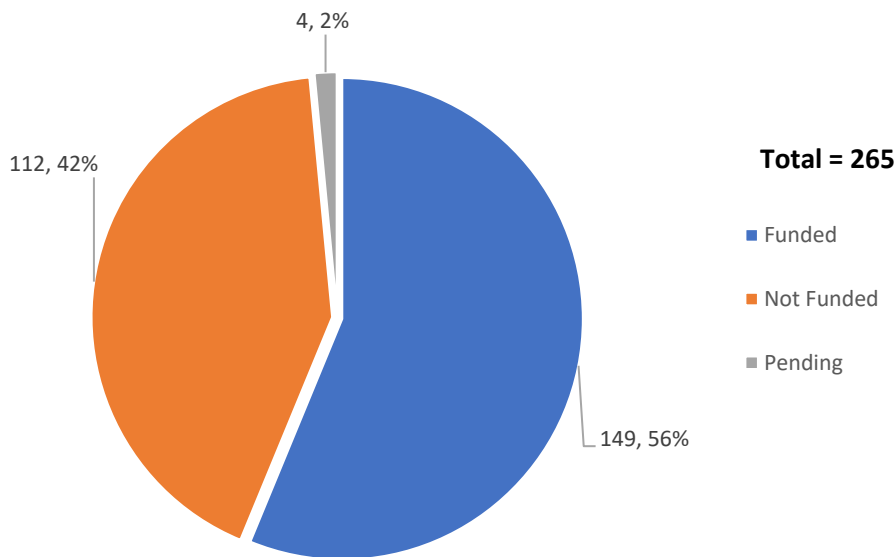
Total external grant proposals submitted include multiple submissions of some Level 2 projects

Figure 8: Outcomes of Closed Facilitated Grants (Lifetime)



Facilitated projects have been completed with a total investment of \$4.69 million

Figure 9: External Grant Proposals Submitted



Total external grant proposals submitted include multiple submissions of some facilitated projects

Appendix B: SSRI Funding Mechanisms

The SSRI offers interdisciplinary researchers internal funding mechanisms to support the development of new, cutting-edge research from its early conceptualization and team building stage through external grant proposal submissions. These are outlined below:

Level 1 Funding (\$500-\$5,000): The Level 1 mechanism is primarily designed to assist PSU social science faculty at University Park and the College of Medicine to form interdisciplinary research teams directed at pursuing external funding by supporting meetings to discuss mutual interests, develop research questions, identify leaders, conduct literature reviews, and collect pilot data. Although external collaborators may be included, our focus is on developing ongoing PSU teams. Monies are frequently used for the development of new, innovative research projects aimed at attracting external funding, the creation of interdisciplinary networking groups, support for meetings (including travel), graduate assistant time, paying outside consultants, and small pilot studies.

Level 2 Funding (\$5,001-\$20,000): The Level 2 mechanism is primarily designed to assist PSU social science faculty at University Park and the College of Medicine to advance their research by securing extramural funding. Although research teams can include students, post docs, faculty from other institutions and other external collaborators, our goal is to support interdisciplinary teams from Penn State's faculty. Level 2 funding is designed to support research projects with specific research questions, a well-conceived theoretical basis, an identified team of Penn State faculty collaborators, and the potential to gain external funding. Monies are typically used for innovative interdisciplinary research, training, and integrated research-outreach projects that involve collaborations involving Penn State faculty; innovative workgroups or conferences that might include outside speakers and consultants; travel, consultants, graduate student time (but not tuition), or hourly support of activities; and salary replacement cost of \$7,500.

Facilitated Funding (\$20,001 and above): Facilitated funding is designed to encourage grant experienced, senior researchers to lead new interdisciplinary teams on research projects with high transformational/translational potential. Monies are often used to hire project staff, post-docs, graduate students, and to conduct pilot studies.

Faculty Fellowships (up to \$22,500): The SSRI Faculty Fellows Program at University Park and the College of Medicine supports faculty members in the social and behavioral sciences to develop new interdisciplinary collaborations aimed at building a novel line of sustainable research through securing external funding. Priority is given to proposals that are congruent with the SSRI's interdisciplinary mission and its strategic foci: The Human System, Social Disparities, Smart and Connected Health, Innovative Methods, and Dissemination and Implementation Science. **Mentored Fellowships** provide funding for a faculty member for up to two course releases during an academic year (up to \$7,500 per course or the equivalent for those who do not have resident instruction responsibilities) during an academic year for study and training in new research areas with the guidance and support of a mentor or mentor team. The mentor/mentor team will also receive up to \$1,000 in summer supplement. **Collaborative Fellowships** provide funding for a new team of faculty members for up to three course releases (up to \$7,500 per course, and no more than one release per faculty member on the team) to develop a novel, interdisciplinary project.

Commonwealth Campuses Research Collaboration Development Fellowship Program: Commonwealth Campuses and core multi-user faculty and research facility staff at the Interdisciplinary Institutes at University Park and at the College of Medicine, the Office of the Senior Vice President of Research (OSVPR), in collaboration with the Provost's Office, the

Office of the Vice President for Commonwealth Campuses (OVPC), the College of Medicine, the College of Earth and Mineral Sciences, the College of Engineering, the Eberly College of Science, and the College of Health and Human Development supports the Commonwealth Campuses Research Collaboration Development Program. Through this program, Commonwealth Campus faculty are provided the opportunity to submit research proposals that will require access to Penn State's shared facilities (equipment, instruments, capabilities, and/or expertise). The goals of this program are to build the foundation for collaborative research environment, build relationships between researchers at UP and CoM facilities/institutes and faculty and students at Commonwealth Campuses, accelerate research and strengthen opportunities for submission of high-quality publications and proposals, and increase opportunities for engaging with funding agencies and industry. The program will consist of the following types of support for the Commonwealth Campus Faculty: equipment use time and facility staff time, consumables (if necessary), and travel expenses to and from campuses and Interdisciplinary Institutes. For SSRI applications, \$500 will be provided for the UP mentor.

Special Funding Opportunities: The SSRI frequently offers special funding opportunities to catalyze new research activities. Examples include:

- Pilot MRI scanning hours
- Pilot GIA hours
- Special Calls and Collaborative seed funding, including with other OSVPR Institutes
 - Health and Environment RFA
 - Twitter RFA
 - COVID19 RFA
 - Autism Spectrum Disorder RFA
 - Gender Equity RFA
 - Combating Opioid and Other Substance Misuse RFAs
- Matching funds for externally funded, interdisciplinary proposals
- Frances Keesler Graham Early Career Professorship

Appendix C: Overview of SSRI Units' Plans 2020-2025

Within the SSRI, fourteen—four of which have been launched since our last strategic planning process in 2014/2019—support and advance social science at Penn State. These units, including their missions, and planned initiatives for 2020-2025 are outlined in the following pages.

I. Center for Educational Disparities Research (CEDR)

A. Mission: CEDR opened in June 2016. Its mission is to support faculty research that advances new knowledge and understanding of educational disparities and how they might be remedied. This includes leadership and support to Penn State social scientists on research projects using a range of quantitative and qualitative methods across the preschool, school, and postsecondary time periods. Priorities include narrowing achievement and opportunity gaps that are disproportionality experienced by children who are low-income, racial and ethnic minorities, emergent bilinguals, and/or have disabilities.

B. Initiatives: Increase the involvement in high-impact, transformative research on educational disparities by Penn State faculty, particularly as externally funded including by governmental agencies, develop innovative approaches for more impactful research-to-practice and -policy translations, continue to build collaborative relations with faculty in the Colleges of Education, Liberal Arts, Medicine, and Health and Human Development at Penn State, pursue opportunities for external training or infrastructure funding.

C. Accomplishments (2014-2019): CEDR has helped secure funding from the Institute of Education Sciences, the Spencer Foundation, and the National Science Foundation. Three co-funded faculty were successfully hired to advance research on Innovative Methods and Health Disparities. Faculty affiliates have published work in *Child Development*, *Nature*, and the *American Educational Research Journal*, as well as had their work cited by the National Academies of Sciences, Engineering, and Medicine.

II. Child Maltreatment Solutions Network (Network)

A. Mission: The Child Maltreatment Solutions Network (Network) serves as a National resource dedicated to solving the complex problem of child maltreatment. The Network (1) conducts impactful new science that will change the health and developmental trajectories for individuals and families affected by or at risk of child maltreatment, (2) accelerates the translation of science to practice and policy change, (3) provides opportunities to train and educate the next generation of child maltreatment professionals, and (4) increases awareness to mobilize public investment in prevention and treatment. We are a Network of transdisciplinary scientists working in conjunction with advocates, practitioners, and policy makers to create dynamic system-wide solutions.

B. Initiatives: The Network's overarching initiative includes emerging as a national resource where a cadre of transdisciplinary scientists work in conjunction with advocates, practitioners, and policy makers to (1) resource, conduct, and disseminate impactful, high quality new science that can change health and developmental trajectories for victims, (2) mobilize public investment in child maltreatment prevention and treatment, (3) accelerate science to practice, (4) spark dynamic system-wide solutions, and (5) support and nurture the current and next generation of scientists to do the same. By becoming a valuable, nonpartisan resource of information, and exposing policy makers to impactful science, the Solutions Network is fast developing into a national leader for engaging the political process and coalescing to mobilizing sustainable change.

C. Accomplishments (2014- 2019): Over the past 5 years Network faculty have secured grants totaling ~\$36M from state and federal agencies (\$26M active; \$10M Pending) including a \$7,716,839 P50 Capstone Center grant, the Translational

Center for Child Maltreatment Studies (P50HD089922, PI: Noll). The Administrative Core of the P50 supports a national coalition of over 350 scientists and practitioners who form a rapid-response team producing policy briefs and summaries of relevant research in response to requests from state and federal legislative offices. Examples of the impact of this Core and coalition include a Congressional briefing focused on the reauthorization of the Child Abuse Prevention and Treatment Act (CAPTA) to the House and Senate (Dec, 2018; Testimony from CMSN faculty Noll & Font) and a Congressional hearing (March, 2019; Testimony from Jackson).

III. Clearinghouse for Military Family Readiness (Clearinghouse)

A. Mission: Engage in and foster interdisciplinary applied research and evaluation, translational and implementation science, and outreach efforts that promote the health and well-being of military service members, veterans, and their families.

B. Initiatives: To increase the involvement of Clearinghouse and other Pennsylvania State University faculty members in research that promotes the well-being of service members, veterans, and military families. Develop innovative approaches for more efficient research-to-practice translation in the military and veteran contexts. Continue to build and strengthen collaborative relationships with the Department of Defense (DoD), Service branches, Veterans Health Administration, and community-based providers of services and supports. And to actively pursue the development of opportunities for external research funding from a variety of sources including the federal government, private-public partnerships, foundations, and private citizens.

C. Accomplishments (2014- 2019): Over the past 5 years, the Clearinghouse has been awarded approximately \$48 million in external funding. These awards have come from the DoD, each of the Service branches, National Institute of Child Health and Human Development (NICHD), the Henry M. Jackson Foundation, and The Heinz Endowments. This funding has supported studies that examine a range of practical and timely issues including, but not limited to, the following: suicide prevention, cost-benefit evaluations of military programs, family adaptation to deployment, and military-to-veteran transitions. In the last 5 years, the Clearinghouse was also awarded the Penn State University Community Partnership Award and was a national finalist for the Kellogg Foundation University Community Partnership Award. The Clearinghouse currently employs 50 full-time staff who are fully funded on external grants.

IV. Consortium to Combat Substance Abuse (CCSA)

A. Mission: Launched in October 2018, the CCSA was established as an interdisciplinary and translational, University-wide initiative with a mission to bring together researchers and invest resources to develop and implement evidence-based approaches to address substance abuse locally, state-wide, and nationally.

B. Initiatives: Continue to build research capacity by: (a) completing hiring of 12 new faculty members in co-funded positions, (b) administering a seed grant program (for interdisciplinary teams) and a faculty fellows program (for Commonwealth campus faculty), and (c) establishing and supporting active research working group teams focused on solving specific issues related to substance misuse. Convene key stakeholders by organizing an annual high-impact conference at University Park that convenes researchers, policymakers, and funders to think big and focus on solutions. Identify mechanisms to incentivize and support researchers to pursue large external grants (including training grants and program projects, as well as large foundation-funded projects) related to solving issues of substance misuse.

C. Accomplishments (2014- 2019): Since the CCSA was formed (approx. 1.5 years ago), we have administered a competitive program for departments across colleges and campuses to apply for 12 co-funded faculty positions; 11 slots have been awarded to units and we anticipate having filled 5 positions by Fall 2020. We have awarded 13 seed grants to interdisciplinary teams and awarded 4 faculty fellowships to build partnerships with local organizations in the fight

against substance misuse. New interdisciplinary teams have formed to compete for large awards to address substance misuse, including our team's application to the MacArthur 100&Change competition involving faculty from prevention, biobehavioral health, criminology, and medicine. In addition to administering a seed grant program and establishing 7 new, interdisciplinary research working groups, CCSA held a highly successful first annual conference at University Park.

V. Evidence to Impact Collaborative (EIC)

A. Mission: Accelerating the transformation of science into human benefit through optimization of social investments and leveraging cross-system collaborations.

B. Initiatives: The EIC, launched in January 2019, seeks to (1) expand accelerator operations to meet growing demand (i.e., engineer improved data sharing environments in partnership with stakeholders across the university, increase flexible and linked data assets), (2) increase efforts to map the impact of policies, programs, practices, and products onto public budgets (i.e., increased training in economic evaluation, budget maker engagement, facilitating high-quality benefit-cost analyses), (3) grow and optimize formal models for translating research to policy and practice (i.e., build a digital platform to expand implementation of the research-to-policy collaboration model, incubate data driven policy outreach for disseminating social science research, increase capacity to respond to requests for national and international implementation of formal models).

C. Accomplishments (2014-2019): The EIC has helped establish the first University's NIST 800-171 compliant data enclave for sensitive social science and health data and its first research-specific HIPPA Covered Component at PSU. With these systems in place, we have grown PSU data holdings significantly with sensitive demographic, housing financial asset, health, education, and child welfare data on over 80% of the US population. We have also supported significant growth of PA government data and research partnerships through the creation of a hybrid integrative data system, as well as, developed and tested a replicable model for formally translating research to federal and state legislative and executive agencies. This has included dissemination of PSU research to nearly every state and federal congressional office through strategic messaging trials—with sustained collaborations with over 100 members of US Congress, including numerous policy briefs, congressional briefings, testimonies, and responses to legislative requests for scientific evidence.

VI. Computational and Spatial Analysis Core (CSA)

A. Mission: Promote and enhance Penn State social science by developing and applying innovative spatial and big data methods.

B. Initiatives: The CSA Core started the Twitter Initiative in 2016 to build an infrastructure for collecting and managing Twitter data as well as the capacity in processing and analyzing the data for social and behavioral research. The Core has collected 50 terabytes of data. The Core's infrastructure includes a high-performance computing environment where all data are managed and analyzed. These resources support about ten funded projects.

C. Accomplishments (2014- 2019): The CSA Core has substantially expanded the portfolio of funded projects by collaborating with PIs from Colleges of AS, LA, HHD, Medicine, Engineering, Education, Nursing, IST, and Science. It has established expertise in integrating and analyzing large, multi-dimensional, multi-scale, spatial, historical, individual, and contextual datasets as well as big social media data. The Core leads a \$3M NSF project on socio-environmental- infrastructural dynamics in coastal Arctic Indigenous communities and a \$.5M NSF project to generalize Twitter data for social science research.

VII. Federal Statistical Research Data Center (RDC)

A. Mission: Provide and operate the secure data center in Paterno Library that supports faculty and graduate student research using the confidential data from the U.S. Census Bureau, National Center for Health Statistics, and Bureau of Labor Statistics. These data include demographic data from the population censuses and surveys, establishment data from the economic censuses and surveys, labor market data from the BLS, and health data from the NCHS surveys. The PSU RDC is one of 30 centers that are in operation at universities and Federal Reserve Banks across the country.

B. Initiatives: The RDC will continue to provide the necessary secure environment and computing infrastructure to access the restricted data; provide expert advice and administrative support for faculty who are writing proposals to use the data; provide training for new users; and promote collaboration and exchange by developing and maintaining a common resource and forum for scholarly interaction.

The director, Professor Mark Roberts, will continue outreach efforts to publicize the RDC to PSU researchers. He has also been engaged in efforts to increase the number of institutions that are part of our consortium.

C. Accomplishments (2014- 2019): We currently have 11 active projects, with 5 more recently approved projects waiting for researcher security clearance, and 2 more projects under review by Census. Of the active and approved projects, 8 were approved within the past year. We also have two projects that completed within the past few months, that are now starting to submit papers for review. We have 24 active PSU researchers with security clearance, as well as 4 applications pending. We also provide access to 7 researchers from other institutions, including University of Pittsburgh. In September we submitted a proposal, joint with our five consortium members, to Census to open a branch at the University of Pittsburgh. It was approved and Pittsburgh is now in the queue for a future branch location.

VIII. Population Research Institute (PRI)

A. Mission: The Population Research Institute (PRI) at the Pennsylvania State University seeks to advance scientific understanding of human population dynamics and processes. PRI supports scholarship in four broad primary research areas: (1) Families, Networks and Social Change; (2) Migration and Immigrant Adaptation; (3) Neighborhoods, Communities and Spatial Processes; and (4) Social Determinants of Health Disparities and Population Health.

B. Initiatives: Looking forward, PRI is moving to support three emerging areas of strength at Penn State and importance to human population dynamics: (1) Lifespan health and the role of early life and social environments on health in old age; (2) Interactions of the natural and human systems and the role of changes in the natural environment to promote population movement and alter population health patterns across the globe and (3) Biodemography – an integration of biological components in research on population dynamics and processes. All three of these areas are emerging foci from PRI's existing primary research areas. PRI is pledged to expand research and expertise in these areas by supporting (1) the newly funded T32 on social environments and population health, (2) working groups of faculty, postdoctoral scholars and graduate students in each of these areas and (3) providing seed grants and research support services that can expand the external research portfolio in these three new areas.

C. Accomplishments (2014- 2019): PRI's impact is evident from the large collaborative research projects initiated and supported by PRI affiliates (in excess of \$60 million dollars over five years); contributions of affiliates to policy initiatives and debates on topics including migration, natural disasters and population health; And, the productivity of junior scholars who receive support from PRI seed grants, working groups and services.

PRI is currently in year four of its NICHD infrastructure grant (P2C). Over the course of the past four years, PRI has provided more than \$300,000 in seed grants to faculty from five different colleges at Penn State. Overall, PRI faculty

have secured more than \$25 million dollars in external awards directly submitted and administered by PRI and upwards of \$40 million more dollars in grants supported by PRI activities and administered by other units. PRI is most proud of its development activities for junior scholars through working groups, grant writing workshops and signature events and is pleased that many of the external awards in the past four years have been to junior faculty mentored and supported by PRI. Indeed, PRI is frequently cited as an attraction for new hires when accepting faculty positions at Penn State.

VIX. Quantitative Developmental Systems Methodology Core (Quant Dev)

A. Mission: Develop new methods and improve on existing methods for the study of human behavior using innovative measurement, study design, and analysis techniques, and use these techniques to study a range of issues including those related to positive behavior and health outcomes, and the dynamics of individuals and groups. Disseminate methods expertise through tutorials, workshops, and publications. Provide leadership and support to move social scientists in the direction of new approaches and methods related to such approaches as Ecological Momentary Assessment, Dynamical Systems Modeling, and other innovative person-specific approaches. Collaborate, consult, and innovate 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).

B. Initiatives: Development of new methods and models for analysis of human data (human social interaction data, intensive data appropriate for the study of dynamical systems) that contribute toward building the PSU “brand” in methods for analysis of behavioral change; offer collaboration and provide methods consultation to faculty in the social and behavioral sciences.

C. Accomplishments (2014- 2019): During 2014-2019 QuantDev has developed a variety of new data collection, study designs, and data analysis methods. The group has propelled the PSU methods “brand” through production of over 150 publications and high-profile placement in journals such as Nature. QuantDev personnel have collaborated and/or consulted with more than 75 unique faculty per year and developed a web-based repository of tutorials and public data that attract more than 1000 unique visitors per month

X. Social, Life, and Engineering Sciences Imaging Center (SLEIC)

A. Mission: Foster research in the social, behavioral, biological, engineering, and materials sciences where imaging methodologies play a central role by providing instrumentation, technological and domain expertise, educational opportunities, and financial support for conducting magnetic resonance imaging (MRI), optical imaging (fNIRs), electrophysiology (EEG, ERP), brain stimulation (tES), and behavioral (eye-tracking) experiments.

B. Initiatives: Promote new externally funded projects by providing technical support and pilot hours; Foster novel research through identifying and supporting clusters of strength in areas such as lifespan development, underserved populations, child maltreatment, addiction, affect, brain trauma, and/or cognition; Build connections beyond the social and behavioral sciences toward novel research directions; Facilitate multi-model imaging (e.g., EEG-fMRI, tES-fNIRs).

C. Accomplishments (2014- 2019): Over the past 5 years we have become largely self-sufficient. Last year we were able to meet 100% of our expenses, and conservative estimates project that we will recover approximately 85% of our cost this year. This is due to an influx of new neuroimaging faculty, their success in obtaining external funding, as well as the center’s efforts providing state-of-the-art facilities, efficient operations, and facilitating research projects.

XI. Survey Research Center (SRC)

A. Mission: Provide high quality survey research services to faculty, graduate students, and institutional investigators; promote and contribute to the science of survey research methodology; assist faculty and student investigators to prepare effective proposals for external funding; and educate members of the Penn State community on best practices and emerging developments in the survey research field.

B. Initiatives: Evolving our capacity for data collection on mobile platforms providing the ability for BYOD (bring your own device) research as well as passive data collection; stay up-to-date on novel survey methods, implement best practices and innovate when projects provide the basis of doing so; be deliberate in hiring practices to increase diversity; maintain return on investment; improve project management capacity to enhance quality control and interact with PI's to engage them collaboratively to assess methodological approaches both pre and post grant award.

C. Accomplishments (2014- 2019): Over the past 5 years, SRC supported ~100 projects with an estimated total of parent grant awards (total costs, all years) of over \$75 million dollars. As a result of successful cross training conducted, all core staff are now capable of working across multiple modes of data collection within the center. An increase in external projects has resulted in the hiring of research staff across more than 10 states and collaborations with outside agencies such as NASA.

XII. Administrative Core

A. Mission: Provide outstanding administrative support to the faculty, staff and students within SSRI to minimize their burden regarding administrative tasks and enable them to focus on their research at Penn State and throughout the research community.

B. Initiatives: The administrative staff provide assistance to the assigned units for administrative and financial operations. This could include grants and contracts, financial management, human resources, scheduling and project management. The administrative staff perform the day-to-day functions to help keep the units operate effectively and efficiently.

C. Accomplishments (2014- 2019): We have increased financial staff for SRC to meet the growing needs of the survey research. Training for all the administrative staff was provided via the Brown Bag with Barbara sessions. Topics included IBIS, SIMS, SIMBA, Travel, etc. Continuity of services were performed during staff turnover and retirements. Standard processes were streamlined to increase efficiencies for administrative staff and units.

XIII. Communications Core

A. Mission: The goal of SSRI's Communications Core is to facilitate communications to develop a cooperative and interactive relationship with SSRI's centers and affiliate faculty, to develop outreach mechanisms designed to reach outside audiences, and promote the Institute's five strategic priorities.

B. Initiatives: The SSRI Communications Core keeps its audiences informed via the creation of distribution of a weekly newsletter and news releases on research and events, the development of center websites and social media platforms, maintaining mailing lists, producing publications such as the annual report, brochures, and other promotional materials, and cross promoting with other institutes, colleges, and the Office of Strategic Communications at Penn State.

C. Accomplishments (2014- 2019): During the last four years, SSRI has established four new websites, redesigned nine center websites, and increased site visits from 2,700 to 15,200. Additionally, SSRI's social media presence was established with the development of four platforms and a monthly podcast series. Other methods of communications,

such as our weekly newsletter, brochures, and annual report, were redesigned to expand reach, and news release distributions increased to over 325 releases published in the four-year period.

XIV. Information Technology Core

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

B. Initiatives: Promote all IT staff as local experts who bridge the gap between local needs and the diversity of services offered at SSRI, VPR, ITS, and the cloud; continue to document and standardize SSRI IT processes, procedures (including infrastructure), and policies; provide professional development and team building to best support SSRI in a changing landscape; support machine learning and AI; continue to find cost savings in IT expenditures; support the data (including Big Data) storage, analysis, and presentation needs of our researchers including by partnering with other organizations as appropriate. Each IT staff member will become a local expert in an emerging technology. The areas we are currently planning to cover are Amazon Web Services, storage, LAMDA (a web technology), Microsoft Office 365, ACI system, machine learning, and restricted data.

C. Accomplishments (2014- 2019): The SSRI IT developed a number of new systems to improve research, including a new Hadoop cluster for twitter data analysis (PRI), a new IP phone system (SRC) which saved several thousand dollars, refitted the student lab with new computers (PRI), piloted new storage solutions for the video team (CMFR), upgraded the VPN tunnel for the MRI system (SLEIC), added new web infrastructure (SSRI), and set up a new conference room (CMFR). In addition to in house systems, we migrated all of SSRI to new university services including VM hosts, Office 365 (including email), Enterprise Active Directory, the university's backup service (UBI), domain name services, and patch management. Lastly, we consolidated four server rooms, almost a dozen servers (hardware), and several storage arrays, saving the cost of replacement.