The National Institutes of Health Behavioral and Social Sciences Research Festival:

Recent Advances and Future Opportunities

Hosted by the
National Institutes of Health
Office of Behavioral and
Social Sciences Research and the
NIH Behavioral and Social Sciences
Research Coordinating Committee

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National Institutes of Health
Office of Behavioral and Social Sciences Research

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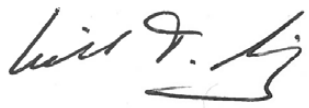
FOREWORD

Program coordination is a core mission of the National Institutes of Health's (NIH) Office of Behavioral and Social Sciences Research (OBSSR) and the NIH Behavioral and Social Sciences Research Coordinating Committee (BSSR-CC). With each NIH Institute and Center having behavioral and social sciences research (BSSR) objectives related to its own mission, it is the role of OBSSR to facilitate collaborative and cooperative opportunities where there are overlapping objectives and to identify and address gaps and new and emerging areas. To efficiently and effectively perform this mission, the OBSSR and the BSSR-CC hosted the Inaugural NIH Behavioral and Social Sciences Research Festival on December 2, 2016.

The research festival highlighted recently funded and impactful contributions of behavioral and social sciences to health research and explored new directions for health-related BSSR through panel discussions that addressed the synergy of basic and applied research, innovations in methodology and measurement, and the adoption of research findings into practice. Comprised of research presentations, town hall meetings, and a poster session, the purpose of this event was to highlight recent compelling BSSR supported by the NIH and provide networking opportunities for NIH staff and other participants. The impressive presentations of NIH grant awardees and intramural scientists highlighted the importance of NIH funding in the behavioral and social sciences to the Nation's health.

We continue to address challenges and opportunities in our field and work to advance the rigor and relevance of the BSSR portfolio that the NIH supports, but it is beneficial from time to time to take a short break from addressing what remains to be done and consider what has been accomplished. Thanks to the BSSR-CC; affiliated Institutes, Centers, and Offices; and the OBSSR staff for organizing such a successful event.



William T. Riley, Ph.D.
Associate Director for Behavioral and Social Sciences Research
Director, Office of Behavioral and Social Sciences Research, NIH

INTRODUCTION

On December 2, 2016, the OBSSR, in collaboration with the BSSR-CC, held the inaugural NIH Behavioral and Social Sciences Research Festival on the NIH campus. This new annual meeting was organized to inform the wider BSSR community, stakeholders, and NIH Institutes and Centers (ICs) about the latest BSSR funded by the NIH and its overall impact and importance across the entire field of biomedical research. Additional goals were to assist the ICs with the establishment of research priorities and the coordination of their programmatic efforts, thus minimizing redundancy and maximizing returns on NIH investments in BSSR.

The festival highlighted exciting research results, emerging areas, and innovations in health-related BSSR. The event was jointly organized by the OBSSR and the BSSR-CC, which enabled efficient leveraging of NIH resources and expertise. The BSSR-CC is comprised of program, review, and research staff from each IC who contributed a diverse and comprehensive perspective on the NIH BSSR portfolio, thus facilitating the selection of an outstanding array of speakers.

MEETING OVERVIEW

The research festival highlighted recently funded impactful contributions of BSSR to biomedical and health research and explored new directions for health-related BSSR through panel discussions that addressed the synergy between basic and applied research, innovations in methodology and measurement, and the adoption of research findings into practice.

Following the workshop introductions, participants attended three consecutive sessions consisting of scientific presentations that highlighted research funded by various ICs, followed by panel discussions.

The first session, entitled Synergy of Basic and Applied Behavioral and Social Sciences, included presentations on a range of research integrating genetic, neurobiological, and affective processes with socioeconomic health disparities and positive health behavior change.

The second session, Innovative Research Infrastructure, Methods, and Measures in BSSR, featured presentations describing advances in measurement of constructs, innovative study designs, and methods for data harmonization and integration.

The final session, Adoption of BSSR Findings into Research and Practice, focused on transdisciplinary and implementation science, including the interactions of attention and reward, team science and community-based collaborations, psychological resilience in the wake of disasters, and parenting programs in primary care to prevent disparities in school readiness.

The festival also included two town halls and a poster session. The town halls, one with NIH staff and the other with the research community, afforded participants an opportunity to discuss current issues affecting BSSR and provide suggestions for how the OBSSR and the NIH could help address these issues and implement solutions. Posters highlighted projects and initiatives funded by the various ICs and provided opportunities for networking, discussion, and coordination.

This meeting report includes minutes from the introductory speeches, scientific presentations, and panel discussions. The last section lists the work of 58 NIH-funded researchers that was highlighted by various NIH IC representatives, but was not in the final program due to workshop time constraints.

Opening Remarks

James M. Anderson, M.D., Ph.D., Deputy Director for Program Coordination, Planning, and Strategic Initiatives, NIH; Director, Division of Program Coordination, Planning, and Strategic Initiatives, NIH

William T. Riley, Ph.D., Associate Director for Behavioral and Social Sciences Research; Director, Office of Behavioral and Social Sciences Research, NIH

Dr. Anderson welcomed participants and briefly described the festival objectives. Dr. Riley provided an overview of the OBSSR 2017–2021 Strategic Plan and the state of behavioral and social sciences at the NIH for FY 2016. The plan's guiding principles include integration of BSSR into broader biomedical research efforts, coordination and collaboration with the ICs, and a focus on challenges that the OBSSR is uniquely positioned to address.

Dr. Riley thanked the expert working group that assisted the OBSSR in developing the new Strategic Plan. The plan includes four foundational processes, all of which are critical for meeting the OBSSR's mission, and three scientific priorities.

Details

The foundational processes are:

- Communicate BSSR findings.
- Coordinate BSSR programs across the NIH and integrate BSSR within the larger NIH biomedical research enterprise.
- Train the next generation of BSSR researchers.
- Evaluate the impact of BSSR and address scientific policies.

The scientific priorities are:

- Improve the synergy of basic and applied BSSR.
  - Improve the "broken pipeline" of communication between basic and applied research.
  - Identify gaps and strengthen the portfolio.

- Enhance the methods, measures, and data infrastructures to encourage a more holistic approach to behavioral and social sciences innovation.
  - Encourage data integration and replication in the behavioral and social sciences.
  - Develop and test new measurements.
  - Expand the repertoire of methods available to behavioral and social science researchers.

- Facilitate the adoption of BSSR findings in health research and practice.
  - Encourage mechanisms and interventions research.
  - Enhance the relevance and scalability of behavioral and social interventions.
  - Foster collaborations.

NIH grant funding for basic BSSR and overall BSSR increased gradually in FY 2016 compared to the previous 3 years. Among the active NIH funding announcements, several are intended to identify and address gaps. The OBSSR provides co-funded support annually for a variety of research projects and also supports training for NIH staff.

Panel 1

Synergy of Basic and Applied Behavioral and Social Sciences

PANEL 1: SYNERGY OF BASIC AND APPLIED BEHAVIORAL AND SOCIAL SCIENCES

Moderator: Lisbeth Nielsen, Ph.D., Chief, Individual Behavioral Processes Branch, Division of Behavioral and Social Research, National Institute on Aging, NIH

- ✓ ***Linking biological and health measures/outcomes to psychosocial and environmental targets is key to improving health outcomes.***

The first panel highlighted Priority One of OBSSR's 2017–2021 Strategic Plan, which is to "improve the synergy of basic and applied BSSR." The panel included presentations that described a range of research integrating genetic, neurobiological, and affective processes with socioeconomic health disparities and positive health behavior change.

Discovery research into the fundamental processes that influence behavior and social systems and their influences on health contributes to the NIH mission. Supporting BSSR that has a plausible pathway to, or implication for, health is a priority for the NIH, and the OBSSR assists the NIH by focusing its BSSR efforts on basic research potentially relevant to health. A range of BSSR areas have clear relevance to health—including, but not limited to, stress and resilience, social learning, self-regulation, decision making, executive control, and social influences on health and disease. Improved understanding of these and other influential BSSR mechanisms is critical to informing clinical and translational studies that can help improve health and well-being.

Presentation 1: A Glimpse of the Research Sponsored by the Center for Translational and Prevention Science

Gene H. Brody, Ph.D.
The University of Georgia

Key Points

- Economic hardship, stress, and caregiver depression can lead to adverse health conditions in impoverished, rural, African American youths.
- Family-centered prevention programs that include supportive caregiving can protect youths from these adverse conditions.
- Linking prevention measures, psychosocial targets, and biological outcomes relevant for health is key to improving health in these populations.

Highlighted by

National Institute on Drug Abuse

Presentation Summary

Dr. Gene H. Brody presented his research efforts toward preventing substance abuse, stress, and premature aging in African Americans living in impoverished rural counties in southeastern states through various intervention programs. He presented data from a cohort study linking the neurocognitive, inflammatory, and immune response measures in the brain with disease burden in a cohort of African Americans in Georgia, Louisiana, Mississippi, and North and South Carolina.

This longitudinal study analyzed the health effects of the Great Recession (2007–2010) on African American youths. Several systemic markers were obtained (e.g., inflammatory markers and stress hormones), and it was found that hardship during this economic period was linked to higher cardiometabolic risk, with elevated body mass index, blood pressure, inflammation, and stress hormones. Youth with downward economic mobility during the recession experienced accelerated aging compared to those with no economic hardship.

Dr. Brody introduced the hypothesis that supportive caregiving can protect youth from these adverse conditions and that protection can be measured through immune responses and brain activity. To address this idea, he conducted a separate study to assess the effect of supportive caregiving in children. Youth experiencing poverty across an 8-year period who were examined for cardiometabolic risk displayed differential biology (e.g., inflammation), which was exacerbated by the lack of supportive caregiving. In a separate finding in adolescents, exposure to high levels of racial discrimination accelerated biological aging and reduced life expectancy, while supportive caregiving ameliorated accelerated aging.

Dr. Brody introduced his family-centered prevention programs for rural African American families: Strong African American Families (SAAF), Adults in the Making (AIM), and the SAAF Teen Program. Over an 8-year period, SAAF

Presentation 1: A Glimpse of the Research Sponsored by the Center for Translational and Prevention Science (continued)

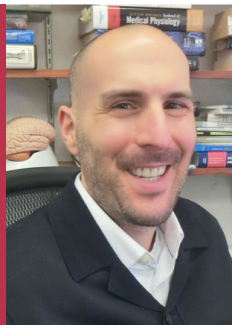
participants had a decrease in circulating inflammatory markers, which was linked to supportive parenting.

The next study focused on the effects of depression in caregivers (parents) on the prevention of epigenetic aging among offspring. Chronic economic hardship induces depression in caregivers; the effect on children forecasted accelerated aging, which was ameliorated by participation in SAAF. Last, neurobiological outcomes were analyzed; it was discovered that there were alterations in brain volume in the hippocampus and amygdala in children who lived in poverty and were experiencing stress. Participation in the SAAF program prevented these brain volume alterations.

Taken together, these findings demonstrated that linking prevention measures, psychosocial targets, and biological outcomes relevant for health is key to improving health in these populations.

Presentation 2: Neurobiology of Socioeconomic Health Disparities

Peter J. Gianaros, Ph.D.
University of Pittsburgh



Key Points

- Socioeconomic disadvantage has a negative effect on brain morphology.
- Synergy between neuroscience and health disparities research can lead to a better understanding of brain-based outcomes in various populations.

Highlighted by

National Heart, Lung, and Blood Institute

Presentation Summary

Dr. Peter J. Gianaros provided an overview of his research to understand the neurobiological effects of socioeconomic disadvantage, with a focus on cardiovascular health disparities. His research expands upon previous studies demonstrating that an individual's socioeconomic status affects health. Risk factors for heart disease, including systemic inflammation and metabolic syndrome components such as adiposity or smoking, can affect brain structure and function. His research lies within the context of environmental, psychosocial, and behavioral factors affecting brain function. He investigated whether area-related risks, such as area disadvantage and neighborhood characteristics, affect brain morphology and, if so, through which mechanistic pathways. Candidate pathways include cardiometabolic risk factors, brain morphology alterations, and hypothalamic-pituitary-adrenal axis activity. A study conducted on healthy adults in Pittsburgh assessed cardiometabolic risk factors, including adiposity, blood pressure, glucose, insulin, and lipids; evaluated neuroendocrine function by measuring salivary cortisol; and studied brain cortical and subcortical morphology. This study found a reduction in cortical brain

Presentation 2: Neurobiology of Socioeconomic Health Disparities (continued)

tissue volume, which was associated with greater area disadvantage.

Dr. Gianaros concluded by stating that living in disadvantaged areas is correlated with reduced cortical gray matter volume, which may involve cardiometabolic risks and neuroendocrine alterations. These findings show that neuroscience can provide complementary evidence to findings from the disparities literature and provide a better understanding of brain-based outcomes patterned by income, education, neighborhood, and occupation. He expressed the hope that neuroscientists and disparities scientists will have a greater interest in each other's work and stated that more integrative research and training are needed.

Presentation 3: Positive Affective Processes Underlying Positive Health Behavior Change

Barbara L. Frederickson, Ph.D.
The University of North Carolina at Chapel Hill

Key Points

- Positive affect can lead to positive spontaneous thoughts, which in turn create positive motives toward beneficial health behaviors.
- Positive affect can predict the maintenance of beneficial health behaviors such as exercise and meditation.

Highlighted by

National Center for Complementary and Integrative Health

Presentation Summary

Dr. Barbara L. Frederickson emphasized the benefits of positive health behaviors. Her research addressed the reasons enjoyment motivates the maintenance of positive health behaviors, while factors such as reduced willpower can adversely affect adherence. She introduced the Upward Spiral Theory of Lifestyle Change (USTLC), which measures how positive affect after beginning a positive behavior such as meditation predicted whether the behavior will continue. USTLC is rooted in neuroscience and the broaden-and-build theory of positive emotions. She reviewed the addiction and sickness literature, which demonstrates that dopamine is associated with desire, whereas inflammation is associated with reduced energy and less positive affect experience. Conversely, the psychology of wellness behavior involves proactive investing in one's future. The USTLC hypothesis states that positive emotions create nonconscious and increasing motives for wellness behaviors. USTLC has two layers: the "inner loop" of nonconscious motives for health behaviors, positive affect during health behaviors, and engagement in health behaviors, and the "outer loop" of increased positive affect that builds resources.

Presentation 3: Positive Affective Processes Underlying Positive Health Behavior Change (continued)

Dr. Frederickson illustrated examples of research on the inner and outer loops. Research on the inner loop in her laboratory found that positive spontaneous thoughts about physical activity function as nonconscious motives. A study was conducted to determine whether positive affect causes spontaneous positive thoughts and, in turn, whether spontaneous positive thoughts cause behavioral motives. Liking "funny" cartoons (positive affect) caused more spontaneous positive thoughts than "mixed" cartoons. Also, the study subjects' perceived positivity of spontaneous thoughts created behavioral intentions and plans for future engagement in that activity. The outer loop has two vantage resources: biological effects (heart rate variability) and psychological effects (prioritizing positivity). Positive affect from wellness behavior increased for people with higher levels of heart rate variability. By prioritizing positivity, a positive affect can be received from meditation. The current hypothesis is that prioritizing positivity creates nonconscious, increasing motives for physical activity.

Panel 1 Discussion

A meeting participant asked about interventions to reduce harsh parenting: Does the reduction in harsh parenting lead to an increase in positive thoughts or emotions of loving parenting? Dr. Brody referred to his study where prevention effects on inflammatory responses that were associated with intervention participation were mediated by increases in supportive "warmth" or decreases in "harshness."

Dr. Gianaros mentioned Dr. Frederickson's statement that the positivity of spontaneous thoughts may reinforce wellness behaviors like physical activity. He wondered if a lower socioeconomic gradient was associated with decreased spontaneous thoughts due to lack of resources in neighborhoods and factors individuals face such as working multiple jobs. Dr. Frederickson replied that there is a gradient in these thoughts patterning past behavior and that it would be interesting to analyze the demographic makeup of those experiencing these thoughts.

Dr. Gianaros alluded to Dr. Frederickson's findings that thoughts and engagement in wellness behavior are an investment in one's future, but he referenced other studies showing that disadvantage may produce a focus on the present, not the future.

Dr. Nielsen wondered if it is better to begin identifying persons early (e.g., during adolescence) for intervention, ameliorating disadvantages throughout the stages of development. Dr. Brody responded by saying that prevention is built on prevention strategies over time throughout life. Successful prevention programming must be developmentally appropriate.

A meeting participant inquired about the differential effects of area-level versus individual-level disadvantages and wondered why these occur and how they will affect the approach toward prevention. Dr. Gianaros explained that the differential effects can be due to experience-based effects on the brain, such as higher education

attainment. Targeting energy imbalance pathways may be the most relevant approach, along with targeting psychosocial factors. Dr. Brody expressed the need for better research on the protective processes that help youth navigate in dangerous environments.

Dr. Chloe Bird wondered if the panelists had discovered gender differences in their findings. Dr. Frederickson responded that she has observed this in her meditation studies, particularly on the activity side. Dr. Gianaros has not witnessed a moderating role for gender in his pathway studies. He mentioned that on a community level, his research will address factors for which disadvantage is a proxy, such as pollution exposure or safety.

A participant commented on how the timing of the intervention increases positive experiences by alluding to her own studies with teens in an alternative high school system who question the point of looking toward their future or improving their health because of daily threats to their safety. Dr. Brody responded that elevated stress hormones and living in the moment predicted an increase in drug use in his studied cohort.

Dr. Conrad Lyford asked how to disseminate research and implementation more broadly. Dr. Frederickson replied that some of her research shows interventions are inexpensive. In response, Dr. Brody said that his laboratory has an outreach program to release research findings in an understandable format through its website and is seeking other information on dissemination methods.

Panel 2

Innovative Research Infrastructure, Methods, and Measures in BSSR

PANEL 2: INNOVATIVE RESEARCH INFRASTRUCTURE, METHODS, AND MEASURES IN BSSR

Moderator: Richard Moser, Ph.D., Fellowship Training/Research Methods Coordinator, Office of the Associate Director, Behavioral Research Program, National Cancer Institute, NIH

- ✓ ***The use of novel data integration, harmonization, and analysis techniques can maximize data utility and lifespan.***
- ✓ ***Multimodal approaches to measurement and incorporation of novel, scalable methodologies are needed to advance health-related BSSR.***

Recent scientific and technological advances in the biomedical, behavioral, and social sciences are generating massive amounts of information from the molecular and genetic levels to clinical and community outcomes. These advances present new challenges. For instance, working with data generated across research disciplines increases the likelihood that the constructs of interest will be defined and measured differently. This limits the ability to harmonize data across disparate data sets. Computing power and interoperability—as well as data storage, archiving, retrieval, and visualization—also must be addressed. In addition, creating and managing big data will entail developing standards for transparency and, particularly in the behavioral and social sciences, will raise important ethical and privacy concerns.

The second panel highlighted Priority Two of OBSSR's 2017–2021 Strategic Plan, which is to "enhance and promote the research infrastructure, methods, and measures needed to support a more cumulative and integrated approach to behavioral and social sciences research." The second panel highlighted advances in measurement of constructs ranging from childhood irritability to the impact of aided hearing on language outcomes, and innovative study designs and methods for data harmonization and integration.

Presentation 1: Innovative Large-Scale Research Synthesis of Alcohol Interventions

Eun-Young Mun, Ph.D.
Rutgers University

Key Points

- Meta-analyses may be influenced by publication and reporting biases and subject to overuse as evidenced by redundant data reviews.
- Innovative meta-analysis methods, including individual participant data combined with aggregate data, can maximize clinical trial data utility.

Highlighted by

National Institute on Alcohol Abuse and Alcoholism

Presentation Summary

Dr. Eun-Young Mun presented an overview of her research in Project INTEGRATE to synthesize data from alcohol intervention studies on college students. She raised concerns about meta-analysis reviews and clinical trials, highlighting two new reviews that challenge the standards of preclinical research. The NIH recently identified challenges in clinical trials such as overly complex designs and small sample sizes and proposed changes to minimize resource waste and enhance both quality and efficiency. Some opportunities for new research include developing a new set of expertise and tools in the era of extended shelf life of clinical trials and developing tools to see each new trial in the context of the existing trials so as not to waste resources and to channel existing resources into more promising directions.

Dr. Mun described meta-analysis as the new method of combating the widely discussed crisis of reproducibility in research. However, publication and selective reporting biases are among the many criticisms of traditional meta-analysis methods. One rising concern about meta-analysis is overuse of the method, resulting in redundant data reviews.

Dr. Mun introduced an approach to meta-analysis that maximizes the use of data. Project INTEGRATE strives to combine individual participant data (IPD) and aggregate data. One advantage of IPD is that it accommodates individual-level missing data and avoids biases. The use of aggregate data alone is not sufficient in meta-analysis. She concluded by stating that clinical trials data are underutilized or misused. She stressed the importance of more innovative meta-analyses, using IPD, and developing new capabilities for the extended lifespan of trial data.

Presentation 2: The Measurement of Irritability

Argyris Stringaris, M.D., Ph.D.
National Institute of Mental Health, NIH

Key Points

- Irritability can become pathological and is associated with increased risk for suicide.
- Using multimodal approaches for accurate measurement of irritability is imperative for clinical diagnosis and treatments; however, aligning temporal scales of measurements utilizing various methods (brain scans, questionnaires, lab samples, etc.) remains a significant challenge.

Highlighted by

National Institute of Mental Health

Presentation Summary

Dr. Argyris Stringaris presented findings that addressed the importance of measuring irritability, defining it as inter-individual differences in proneness to anger that may become pathological. Measurements are necessary to make clinical decisions about diagnosis and treatments. He introduced his study of multi-method measurement, which includes clinical rating, brain scans, cortisol levels, and subject questionnaires. Different measures serve different purposes, and each method must be both concise and scalable.

Irritability is a potent modifier of the environment compared to other emotions. It is associated with doubling the risk for suicidality up to 30 years later and leading to educational impairment and reduced income. Irritability was measured through two approaches, questionnaires and experiments. The clinical interviews captured intensity, frequencies, and duration of outbursts, as well as context and consequences. Experimentally induced frustration defined irritability as a response to blocked goal attainment. Results using the affective Posner task to measure frustration showed that brain activity, observed through magnetic resonance imaging (MRI), is affected by irritability.

Dr. Stringaris pointed out the challenge of aligning time scales in his research. MRI data capture takes an average of 6 minutes; analysis of irritability in this timeframe is difficult. He expressed interest in other types of data collection approaches, including automated, continuous facial affect recognition and ecological momentary assessment.

Presentation 3: The Effects of Aided Hearing on Language Outcomes of Children with Mild to Severe Hearing Loss

J. Bruce Tomblin, Ph.D.
The University of Iowa

Key Points

- There is a positive correlation between the amount of speech information obtained and increased language skills in children with mild-to-severe hearing loss.
- Hearing aids not only increase audition, but also function as speech and language aids for children.

Highlighted by

National Institute on Deafness and Other Communication Disorders

Presentation Summary

Dr. J. Bruce Tomblin introduced his research on children with reduced hearing, which measured outcomes such as language skills, academic abilities, and family outcomes, to study the effects of a clinical intervention involving hearing aids. Exposure to linguistic input and access to quality interactions promotes language development, leading to the hypothesis that enhanced audibility with hearing aids would offer protection against poor language development. To address this, an accelerated longitudinal study was designed to include children ages 7 years or younger. The Speech Intelligibility Index (SII) measured the audibility of speech and usable hearing threshold provided by a hearing aid. SII measures the degree of access to speech information from hearing aids. It was discovered that a correlation exists between the children's hearing status without hearing aids and the information received from a hearing aid.

Dr. Tomblin discovered through growth curve analysis that aided audibility contributes to language growth, and older children presented with increased language growth. Analysis of the daily use of the hearing aid in children showed a strong correlation between the reports from parents and the digital recording log of the hearing aid. Improvement in language development depended in part on the length of time hearing aids were used. Children wearing hearing aids 10 hours or more each day demonstrated improved language development when compared to children wearing hearing aids for less time.

Dr. Tomblin concluded that the degree to which a child obtains more speech information is associated with better language, and greater daily use of hearing aids improved outcomes in the moderate-to-severe study group. Hearing aids are, therefore, also speech and language aids for children.

Panel 2 Discussion

Dr. Aisha Langford wondered if Dr. Mun provides training for her experimental methods and whether she had reservations or "lessons learned" from critiquing her peers. Dr. Mun stated that there is no software available to train others to use her study methods, but she is developing a statistical theory for its application in biostatistics. Dr. Moser noted that some of the panelists' research does not tightly follow the practice of combining data and using common measures. He wondered what minimum characteristic measure is required to do so. Dr. Mun responded that with only one common item, linking can be tenuous. The ideal is to have multiple common items across the board. Dr. Tomblin added that the solution in his field is to look at the various dimensions of language measurements, which may not be fully captured in studies.

Panel 3

Adoption of Behavioral and Social Sciences Research Findings into Research and Practice

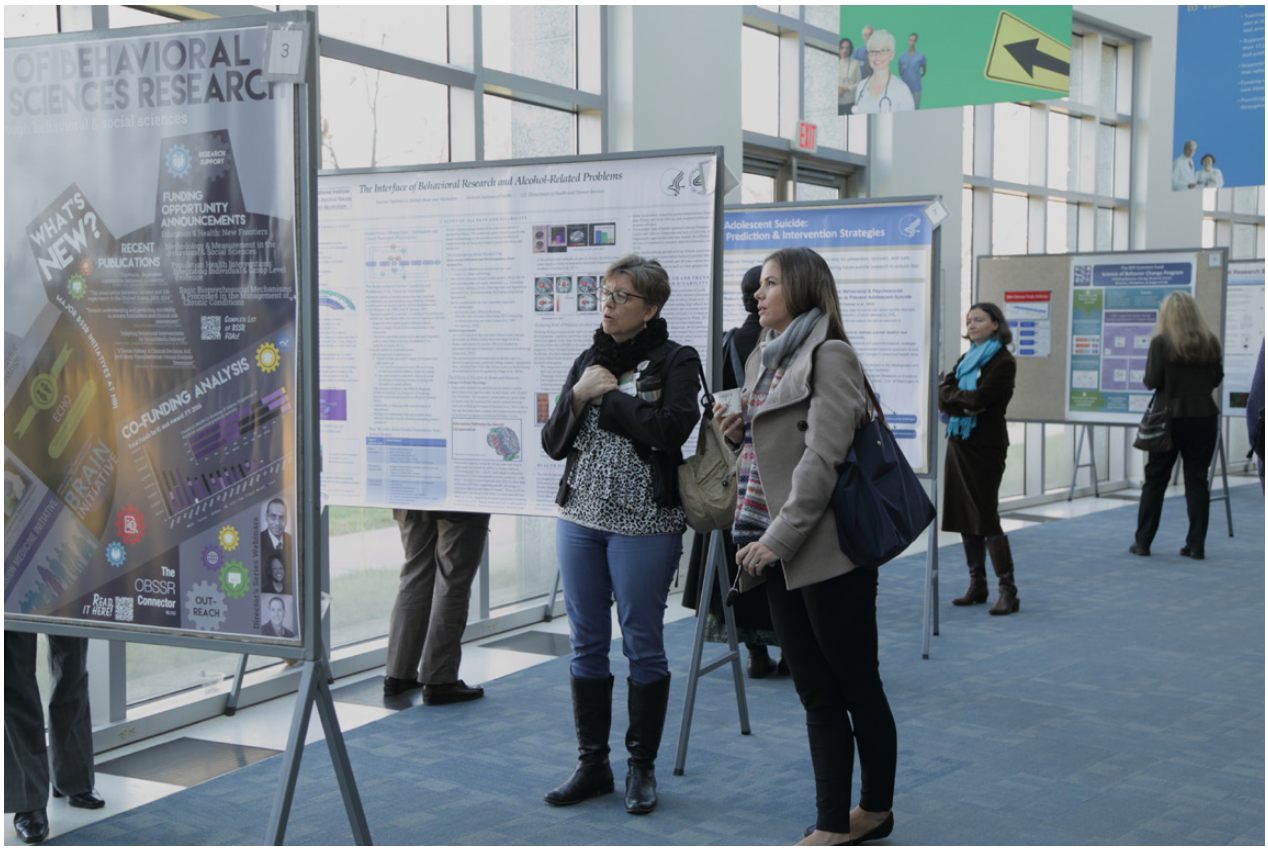
PANEL 3: ADOPTION OF BEHAVIORAL AND SOCIAL SCIENCES RESEARCH FINDINGS INTO RESEARCH AND PRACTICE

Moderator: Gila Neta, Ph.D., Epidemiologist and Program Director, Implementation Science Team, Division of Cancer Control and Population Sciences, National Cancer Institute, NIH

- ✓ ***The pipeline from basic science to population change can be enhanced significantly by fostering meaningful transdisciplinary collaborations.***

A significant gap exists between what research shows will improve health and what is provided to individuals, families, communities, and organizations to improve health. Behavioral and social science interventions at the individual and population levels have significantly improved the Nation's health; much more could be achieved, however, if the chasm between research and practice was reduced and the time from research findings to widespread application was shortened.

The final panel highlighted Priority Three of OBSSR's 2017–2021 Strategic Plan, which is to "facilitate the adoption of behavioral and social sciences research findings in health research and in practice." The presentations described transdisciplinary and implementation science research, including the interactions of attention and reward, team science and community-based collaborations in energetics, psychological resilience in the wake of disasters, and parenting programs in primary care to prevent disparities in school readiness.



Presentation 1: Advancing a Modern Science of Obesity: The Washington University Transdisciplinary Research in Energetics and Cancer (TREC) Initiative

Sarah Gehlert, Ph.D.
Washington University

Key Points

- The pipeline from basic science to population change can be enhanced significantly by fostering meaningful transdisciplinary collaborations among researchers.
- Advancing translational science can in part be achieved by linking proper epidemiological methods to mechanistic basic sciences and biological processes.

Highlighted by

National Cancer Institute

Presentation Summary

Dr. Sarah Gehlert described the TREC initiative at Washington University (WU) in St. Louis. The mission of TREC is to integrate diverse disciplines to find interventions across the lifespan to reduce the burden of obesity and cancer and improve population health. Five centers operate four projects involving 30 disciplines, which include medicine, genetics, biochemistry, and others. WU TREC's focus is to accelerate the transition from basic science to population change through transdisciplinary and translational research. WU TREC includes several transdisciplinary connections and interactions that encourage feedback between projects. This structure promotes translation of results and encourages investigators to publish in journals that span disciplines.

Dr. Gehlert outlined the objectives and approaches of the four WU TREC projects:

- Measure the effect of a high-fat diet and changes in metabolic bioenergetics on prostate gland development and susceptibility to prostate cancer in male offspring, using an animal model of transgenerational transmission of prostate proliferation in pups.
- Determine whether physical activity and obesity influence sexual and urinary function in men with localized prostate cancer, using a longitudinal study on physical activity and prostate cancer outcomes in African American men.
- Examine worksite wellness policies across Missouri, using an employee survey to determine the role of workplace policy in shaping obesogenic behaviors.
- Combine traditional epidemiological methods with community-based participatory research to produce a better understanding of cancer risk, using a model building on the social determinants of obesity in non-Hodgkin lymphoma and other cancers.

Presentation 1: Advancing a Modern Science of Obesity: The Washington University Transdisciplinary Research in Energetics and Cancer (TREC) Initiative (continued)

The goal of the WU TREC shared model is to foster communication by bringing in outside experts and linking projects. A longitudinal study using social network analysis was conducted of TREC's transdisciplinary ties, in which all of the investigators were surveyed to identify existing collaborations with other researchers. An increase in the ratio of cross-site ties through grants, publications, mentorship, or other means was observed from 2011–2013 to 2013–2014, resulting in investigators' leveraging expertise and resources across sites. The number of publications and presentations doubled; mentorship also increased during this period, which is another positive outcome of the initiative.

Dr. Gehlert hypothesized that the mechanisms maximizing effectiveness include ongoing dialog between projects, internal and external advisory boards, and tracking of collaborations. Some lessons learned for advancing translational science include tying in proper epidemiological methods to mechanistic basic sciences and engaging scientists in understanding cancer-related changes. Funding transdisciplinary team science can increase research success and translation, leading to improved population health for a given level of support.

Presentation 2: How Reward Shapes Attention

Marty G. Woldorff, Ph.D.
Duke University

Key Points

- Attention and reward both improve task performance.
- Capitalizing on the attention-reward interaction findings may have implications for modifying behaviors/outcomes in society, such as in educational, rehabilitation, and addiction treatment settings.

Highlighted by

National Institute of Neurological Disorders and Stroke

Presentation Summary

Dr. Marty G. Woldorff introduced the concept of neural mechanisms of attention, describing attention as a fundamental cognitive function critical for human navigation. He presented data from Posner and colleagues demonstrating that in visual field studies, a person who is cued to a particular area of a visual field has a faster response time to a target because attention has been shifted to that area of the visual field. In humans, recording the brain's electrical activity by electroencephalogram (EEG) measures the effects of special attention or target stimulus processes. Within the brain, an "attentional control network" controls allocation and direction by sending signals during tasks.

Dr. Woldorff discussed a study from his laboratory showing activation of the frontoparietal control network in the brain after a cue observed by EEG and functional MRI (fMRI). After activation, sensory biasing in the visual region occurs causing enhanced responses to a target. In the laboratory, a proactive attention control cuing to a particular stimulus such as color is assessed. Reactive attention control in the real world more often occurs as a response to environmental stimuli like loud sounds or flashing light. He explained the effects of reward and cuing of reward

Presentation 2: How Reward Shapes Attention (continued)

in preparation for upcoming tasks. The most noted example of this is the Monetary Incentive Delay Task. A cue alerts the subject that a reward would be given upon the performance of a task; faster reaction times and performance are observed when there is a reward than when there is no reward.

As seen in studies, attention and reward both improve performance but focus on different areas of the brain. Promise of a reward generates a cue-triggered increase in brain activity and, as seen with EEG, marshals the attention-control circuits. An fMRI shows that reward activates subcortical reward circuits and the frontoparietal attention control network of the brain.

Measuring target-reward associations, Dr. Woldorff determined that if a reward was attached to an irrelevant environmental item, the subject was more distracted or had less attention. The fMRI and Event-Related Potentials (ERP) were used to investigate the neural mechanisms and reward-processing circuits. The feedback-related ERP activity predicted expectation of reward, and choice behavior showed that a person can guess whether they will win a reward through feedback. Subjects are presented with a feedback stimulus that indicated a high, neutral, or low probability of winning. After several trials, subjects learned to bet high, neutral, or low. Therefore, when one learns that a certain stimulus cue is a high predictor of winning, attention shifts to that cue. Dr. Woldorff concluded with an outline of potential ways to translate attention-reward interaction findings into society, for example in educational settings, training protocols, rehabilitation for neurological disorders involving relearning of brain processes, decision-making, marketing, and addiction treatment.

Presentation 3: Deepwater Horizon's Oil Spill: Research Foundations for Psychological Resilience Programs in the Gulf

Lynn M. Grattan, Ph.D.
University of Maryland Medical Center

Key Points

- Disasters have profound effects on communities and individuals, including effects on behavior and mental health.
- Activating resilient pathways in individuals through prevention and early, post-acute, and sustained interventions confers protective benefits against these effects.

Highlighted by
National Institute of Environmental Health Sciences

Presentation Summary

Dr. Lynn M. Grattan provided the contextual framework for her research on resilience after the Deepwater Horizon oil spill disaster, stressing the importance of disaster research. Resilience is the quality enabling an individual to thrive despite adversity and is a protective mechanism against the development of mental health problems. Disasters occur daily and have far-reaching effects on the economy through work disruption. National and international directives teach people how to respond and enhance their resilience.

Dr. Grattan introduced the British Petroleum (BP) Deepwater Horizon oil platform explosion of 2010 as a model for assessing how disaster affects mental and behavioral factors. This spill resulted in great environmental and human impacts: 206 million gallons of oil were spilled along 950 miles of shoreline, resulting in 11 deaths including six suicides, and the destruction of several small businesses. BP responded with financial compensation and counseling to fishermen.

Dr. Grattan's study examined how the oil spill influenced mental health in Baldwin County, Alabama, and Franklin County, Florida. Characteristics and predictors of resilience were assessed in 300 adults who were mainly seafood workers and fishermen, and a community-based participatory research model was developed. A wide range of psychological reactivity was observed, with depression and anxiety being the predominant symptoms. Income loss, not the actual spill, had a stronger association with mental health status. Anger-related anxiety was elevated in 2010 and decreased over time. Linear regression analysis showed that coping through disengagement was the strongest predictor of depression in the cohort 2 to 5 years post-spill. Disengagement coping is defined as psychological disengagement from problems (e.g., daydreaming,

Presentation 3: Deepwater Horizon's Oil Spill: Research Foundations for Psychological Resilience Programs in the Gulf (continued)

sleep, self-distraction) and includes giving up effort toward problem solving, increased substance abuse, and/or use of humor. In the same study, social support declined over time, which was associated with changes in mood disturbance. Depression rates in the Florida community improved more slowly than in the Alabama community for unknown reasons. Alabama, however, had more dense family networks than Florida.

Dr. Grattan presented a Conceptual Framework of Resilience Activation model designed to activate resilience in individuals. Within this model, the assumption is that most people have the latent capacity to be resilient after a disaster, with resilience attributes at either the individual or community level. Such factors as alcohol use, social networks, and fair distribution of community resources were analyzed. Individuals with low alcohol consumptions benefited from social support and had better mental health outcomes; therefore, activating support is important.

Implications for practical interventions and discussion with community leaders include the importance of prevention and of early, post-acute, and sustained interventions. Certain interventions to date include job retention programs; services for psychological, substance use, and domestic violence issues; and assistance with grant writing for needed community services.

Presentation 4: Prevention of Disparities in School Readiness Through Promotion of Parenting in Pediatric Primary Care

Alan L. Mendelsohn, M.D.
New York University School of Medicine

Key Points

- Primary prevention strategies that increase positive parent-child interactions improve parental coping with psychosocial stressors and improve child development.
- Primary preventions that build on interrelationships between cognitive and social emotional pathways are a promising component of a public health strategy to reduce health disparities in economically disadvantaged populations.

Highlighted by
***Eunice Kennedy Shriver* National Institute of Child Health and Human Development**

Presentation Summary

Dr. Alan L. Mendelsohn presented his research analyzing poverty-related disparities that begin in early childhood and affect educational, economic, and health outcomes throughout life. Approximately 44 percent of fourth graders from economically poor families have reading difficulties. His work is focused on the use of primary prevention beginning in early childhood with parent-child interactions and pediatric primary care (PPC). He emphasized PPC as a universal platform for promoting parenting and school readiness in children through early population-scalable interventions. "Reach Out and Read" (ROR)—the most studied, proven reading intervention—demonstrated that PPC can be effectively utilized for population-level access and delivery of low-cost prevention.

Through the Video Interaction Project (VIP), Dr. Mendelsohn builds on the ROR model to increase effectiveness by adding interventionists who work with families, playing and reading aloud. The core activity is a video recording of parent-child interactions with a toy or book, followed by parent review to promote self-reflection. Parents function as observers and are encouraged to be active participants in their child's development, and goals are set for home activities. A randomized control study, Bellevue Project for Early Language, Literacy and Education Success (BELLE), compared the effectiveness of VIP to routine care. Following low-income families with children between birth and 3 years of age over a 3-year period showed that the VIP increased parent-child interactions in reading and playing, reduced physical punishment, improved parental coping with psychosocial stressors, reduced maternal depressive symptoms and child behavioral problems, and improved child development.

Presentation 4: Prevention of Disparities in School Readiness Through Promotion of Parenting in Pediatric Primary Care (continued)

The next phase of BELLE analyzed the expansion of VIP to older children 3 to 5 years of age in families who participated initially in VIP. A factorial design determined optimal dosing and timing. An additive effect of VIP was observed in the children, with continual improvement of what had been observed from birth to age 3: increased parent-child interactions, school readiness, and early school achievement.

Dr. Mendelsohn highlighted some work in progress to assess the long-term effects of VIP through elementary school and to develop a manual for the program and a 3-day training course for interventionists. Several projects are underway simultaneously, including the New York City (NYC) Council's citywide primary prevention program, City's First Readers; the NYC Department of Health and Mental Hygiene's early childhood initiative, Smart Beginnings, in NYC and Pittsburgh, Pennsylvania; a program at the Hurley Medical Center in Flint, Michigan; and a program that has been adapted for international use in Boa Vista, Brazil.

He concluded by saying that his findings underscore the need for primary prevention for families in poverty and for initiatives that build on interrelationships between cognitive and social emotional pathways of disparities. His findings also support a role for PPC as one component of a public health strategy for primary prevention.

Panel 3 Discussion

A meeting participant asked how much translation of BSSR is happening, including such specific services as financial counseling following disasters. Dr. Grattan responded that they offer no financial counseling, but do recommend it. Pastors, local psychologists, and social workers from the umbrella agency Franklin's Promise Coalition deliver many recommended services. These individuals were involved in the project, but not in the data collection phase. The meeting participant also asked how high-risk areas are identified, how the prevention is planned around those areas, and whether communities are made aware of these agencies or resources. Dr. Grattan responded by saying that the prevention plan has not been implemented yet.

Dr. Mendelsohn clarified that video interaction in schools refers to a follow-up assessment in classrooms. Regarding the translation of his research, he is engaged heavily in implementation through the NYC health system.

A meeting participant asked Dr. Gehlert what changes arose as a result of dialogue, such as talking to the university provost. Dr. Gehlert responded that they modified the promotion process and tenure system and assembled a committee of university scholars. They also encouraged the provost and chancellor to put together campus awards to incentivize co-teaching across disciplines on campus. This dialogue between her research team and the university demonstrates that communication with university administrators changed the institution's culture and maximized capacity for research translation.

A participant asked Dr. Mendelsohn about the development of manuals and trainings, noting that this process requires a different skill set. Dr. Mendelsohn responded that this parent education program enlisted educators with Bachelor's degrees as the interventionists. He hopes

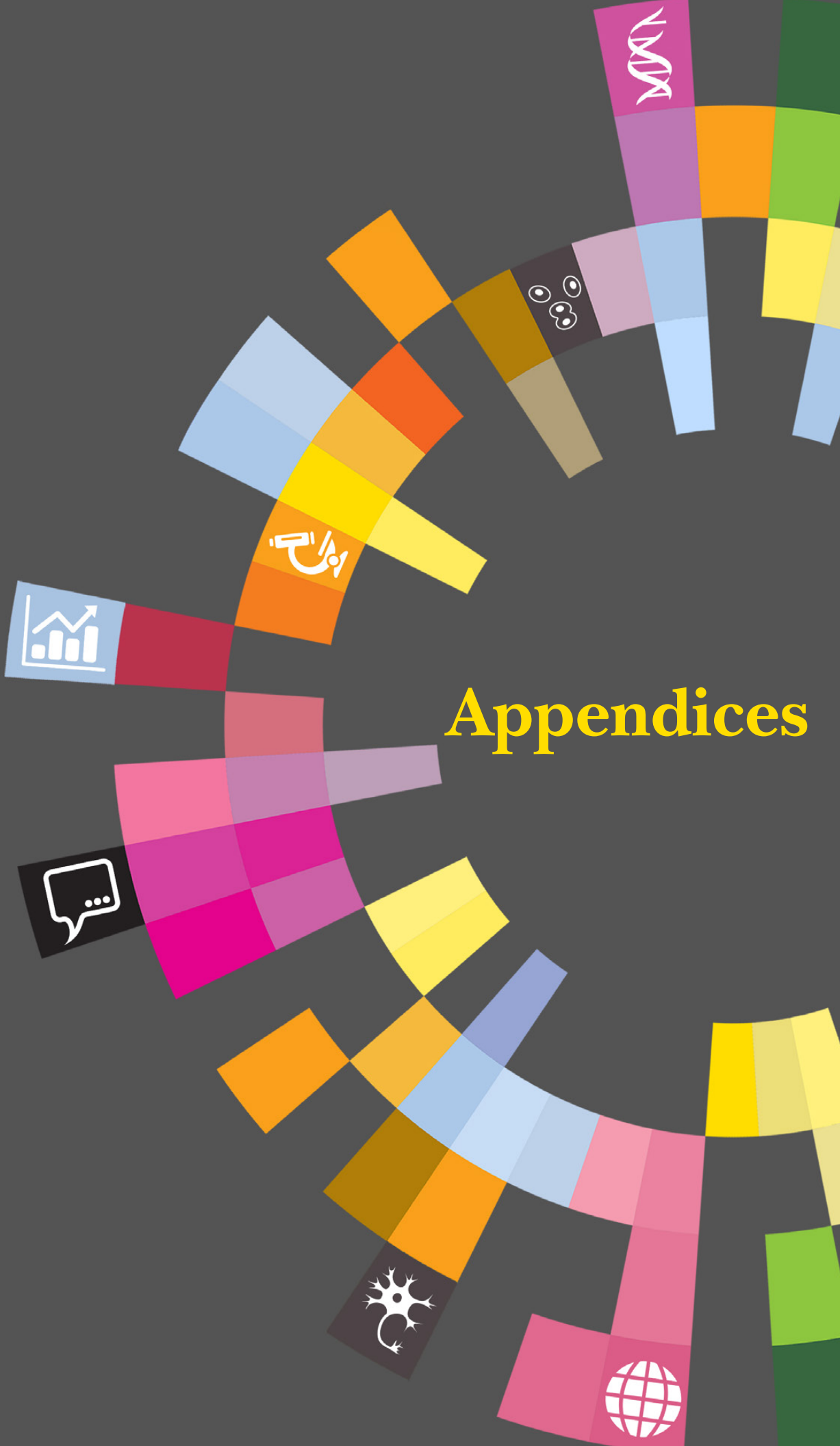
to incorporate community health care workers in the future. The goal is to have interventionists trained in psychology.

Dr. Neta asked the panelists how implementation science informs their research and how their research can inform strategies for interventionists or implementation scientists. Dr. Gehlert said that she brought in the implementation and dissemination core the first day and is attempting to put projects together and promote site wellness programs through employers—for example, by focusing on pregnant workers and weight reduction during pregnancy. Dr. Mendelsohn added that his research is aimed at basic cognitive neuroscience, and much of what he does has translational implications; the goal is for his research to be used by people doing translational work.

ADJOURNMENT AND CLOSING REMARKS

Wendy Smith, M.A., Ph.D., BCB, Associate Director, OBSSR, NIH

Dr. Wendy Smith commented that one goal of the meeting had been to highlight excellence in BSSR supported across the NIH ICs. A meeting summary will be made publicly available on the OBSSR website. She thanked OBSSR, the planning committee and presenters, and the meeting participants for attending and adjourned the meeting.



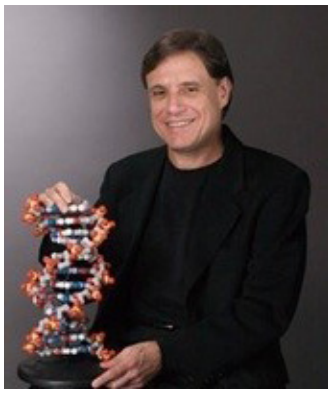
Appendices

Appendix I: Agenda

8:30–8:40 AM	**Welcome and Opening Remarks** *James. M. Anderson, M.D., Ph.D.* NIH Deputy Director for Program Coordination, Planning, and Strategic Initiatives Director, NIH Division of Program Coordination, Planning, and Strategic Initiatives
8:40–9:15 AM	**State of Behavioral and Social Sciences** *William T. Riley, Ph.D.* NIH Associate Director for Behavioral and Social Sciences Director, Office of Behavioral and Social Sciences Research, NIH
9:15–10:35 AM	**Panel 1: Synergy of Basic and Applied Behavioral and Social Sciences** *Moderator: Lisbeth Nielsen, Ph.D., National Institute on Aging, NIH* • NIDA: Gene Brody, Ph.D. A Glimpse of the Research Sponsored by the Center for Translational and Prevention Science • NHLBI: Peter Gianaros, Ph.D. Neurobiology of Socioeconomic Health Disparities • NCCIH: Barbara Fredrickson, Ph.D. Positive Affective Processes Underlying Positive Health Behavior Change
10:35–10:50 AM	**Break**
10:50 AM–12:00 PM	**TOWN HALL: Moving Behavioral and Social Sciences Research Forward** A time for colleagues to collaborate and discuss issues affecting the BSSR community **Track 1:** Office of Behavioral and Social Sciences Research Serving the NIH **Track 2:** Office of Behavioral and Social Sciences Research Serving the Research Community
12:00–1:15 PM	**Lunch and NIH Program Poster Session**

1:15–2:35 PM	**Panel 2: Innovative Research Infrastructure, Methods and Measures in BSSR** *Moderator: Richard Moser, Ph.D., National Cancer Institute, NIH* • NIAAA: Eun-Young Mun, Ph.D. Innovative Large-scale Synthesis of Alcohol Interventions • NIMH: Argyris Stringaris, M.D., Ph.D. Measuring Irritability in Children • NIDCD: J. Bruce Tomblin, Ph.D. The Effects of Aided Hearing on Language Outcomes of Children with Mild to Severe Hearing Loss
2:35–2:55 PM	**Break**
2:55–4:35 PM	**Panel 3: Adoption of Behavioral and Social Sciences Research Findings into Research and Practice** *Moderator: Gila Neta, Ph.D., National Cancer Institute, NIH* • NCI: Sarah Gehlert, Ph.D. Advancing a Modern Science of Obesity: The WU Transdisciplinary Research in Energetics and Cancer Initiative • NINDS: Marty G. Woldorff, Ph.D. The Interactions of Attention and Reward • NIEHS: Lynn M. Grattan, Ph.D. Lessons Learned from the Deepwater Horizon Oil Spill: Building Programs for Psychological Resilience in Gulf Coast Communities • NICHD: Alan L. Mendelsohn, M.D. Prevention of Disparities in School Readiness through Promotion of Parenting in Pediatric Primary Care
4:35–4:50 PM	**Closing Remarks** *Wendy B. Smith, M.A., Ph.D., BCB* Associate Director, Office of Behavioral and Social Sciences Research, NIH

Appendix II: Speaker Biographies



Gene H. Brody, Ph.D., Regents' Professor and Director, Center for Family Research, The University of Georgia

Dr. Gene H. Brody is a Regents' Professor of Child and Family Development and Director of the Center for Family Research. He is an internationally recognized expert on the risk and protective mechanisms that forecast substance use and other problem behaviors among rural African American youth and has translated his findings into efficacious preventive interventions for youth ranging in age from 11 to 19 years. Dr. Brody is the author of more than 350 publications, many of which focus on African American youth development or substance use prevention.

Barbara L. Frederickson, Ph.D., Kenan Distinguished Professor, Director, Positive Emotions and Psychophysiology Laboratory, Department of Psychology and Neuroscience, The University of North Carolina at Chapel Hill

Among the most highly cited scholars in psychology, Dr. Barbara L. Frederickson is most known for her "broaden-and-build theory of positive emotions," foundational within positive psychology for providing a blueprint for how pleasant emotional states, as fleeting as they are, contribute to resilience, well-being, and health. She is director of the Positive Emotions and Psychophysiology Laboratory at the University of North Carolina at Chapel Hill (UNC-Chapel Hill), founding co-chair of the Association of Positive Emotion Laboratories, and current president of the International Positive Psychology Association.

Dr. Fredrickson has published approximately 140 peer-reviewed articles and book chapters, and her general audience books, Positivity (2009, www.positivityratio.com) and Love 2.0 (2013, www.positivityresonance.com), have been translated for more than 30 foreign markets.

Dr. Fredrickson's research is funded by the National Institutes of Health (National Cancer Institute, National Institute on Aging, National Center for Complementary and Integrative Health, National Institute of Mental Health, National Institute of Nursing Research) and has been recognized with numerous honors, including the inaugural Templeton Prize in Positive Psychology from the American Psychological Association, the Career Trajectory Award from the Society of Experimental Social Psychology, and the inaugural Christopher Peterson Gold Medal from the International Positive Psychology Association.

In 2014, she was identified as the 13th most influential psychologist alive today contributing to counseling psychology. In 2015, through a partnership between UNC-Chapel Hill and Coursera, Dr. Fredrickson began teaching a free online course on positive psychology that has attracted more than 150,000 learners worldwide. Through this and other means, her work influences scholars and practitioners worldwide within education, business, health care, the military, and beyond.

Dr. Fredrickson was born and raised in Minnesota and graduated *summa cum laude* from Carleton College in Northfield, Minnesota (1986). She received her Ph.D. in psychology from Stanford University (1990), with a minor in organizational behavior, and postdoctoral training in psychophysiology from the University of California at Berkeley (1990–1992). Prior to joining the faculty at UNC-Chapel Hill, she held faculty positions at Duke University and the University of Michigan.

Sarah Gehlert, Ph.D., E. Desmond Lee Professor of Racial and Ethnic Diversity, Washington University in St. Louis; Co-Director, Transdisciplinary Research on Energetics and Cancer

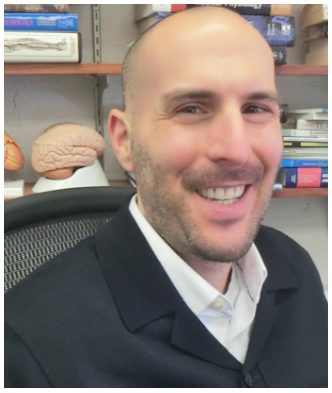
Dr. Sarah Gehlert is the E. Desmond Lee Professor of Racial and Ethnic Diversity at the Brown School and a professor in the Department of Surgery of the School of Medicine. She is a scholar in Washington University's Institute of Public Health. Dr. Gehlert is the co-program leader of the Prevention and Control Program of the Alvin J. Siteman Cancer Center, co-director of the Transdisciplinary Center on Energetics and Cancer, and training program director of the Program for the Elimination of Cancer Disparities. Dr. Gehlert serves as senior advisor of the Center for Community-Engaged Research of the Institutes of Clinical and Translational Sciences.

Dr. Gehlert joined the Brown School in 2009 from the University of Chicago, where she was the Helen Ross Professor in the School of Social Service Administration, the Institute for Mind and Biology, and the Department of Comparative Human Development. While at the School of Social Service Administration, Dr. Gehlert served as the Deputy Dean for Research. She was the associate director of the University of Chicago's NIH-funded Institute for Translational Medicine (a Clinical and Translational Science Award) and co-chaired its Community Translation Science Cluster. She also was the principal investigator and director of the university's NIH-funded Center for Interdisciplinary Health Disparities Research. She directed the university's Maternal and Child Health Training Program from 1992 to 1998 and was principal investigator on an NIMH-funded community-based study of rural and urban women's health and mental health from 1997 to 2001. She was co-principal investigator and core leader of the Health Disparities and Communities Core of the Centers for Disease Control and Prevention-funded Chicago Center of Excellence in Health Promotion Economics from 2004 to 2007.

Dr. Gehlert's publications focus on social influences on health, especially the health of vulnerable populations. Currently, she is working on the influences of neighborhood and community violence and unsafe housing on psychosocial functioning among African American women newly diagnosed with breast cancer, with an eye toward how these factors "get under the skin" to affect gene expression and tumorigenesis. She has a special interest in the biology of women's behavior.

Dr. Gehlert was a member of the Board of Scientific Counselors of the National Human Genome Research Institute at the NIH until January 2016. She is a member of the Council for Extramural Grants at the American Cancer Society and of the steering committee of the California Breast Cancer

Research Program. She is an inaugural fellow of the American Academy of Social Work and Social Welfare (AASWSW) and the Society for Social Work and Research and a fellow of the Academy of Transdisciplinary Learning and Advanced Studies. She is past president of the Society for Social Work and Research and incoming president of AASWSW, and she serves on the editorial boards of *Health & Social Work, Social Work Research*, and *Social Service Review* and as managing editor of the *Transdisciplinary Journal of Science and Engineering.*



Peter J. Gianaros, Ph.D., Professor of Psychology and Psychiatry, University of Pittsburgh

Dr. Peter J. Gianaros is a professor of psychology and the director of the Multimodal Neuroimaging Training Program at the University of Pittsburgh. He holds faculty appointments in the Center for the Neural Basis of Cognition, the Center for Neuroscience, and the Department of Psychiatry. Dr. Gianaros received his Ph.D. in psychology from the Pennsylvania State University. He then served as a postdoctoral fellow in the Cardiovascular Behavioral Medicine Research Training Program at the University of Pittsburgh before joining the faculty. He received the Herbert Weiner Early Career Award from the American Psychosomatic Society in 2008 and the Distinguished Scientific Award for Early Career Contributions to Psychology from the American Psychological Association in 2010. Dr. Gianaros' laboratory conducts research on the neurobiology of stress, cardiovascular disease risk, and socioeconomic health disparities.

Lynn M. Grattan, Ph.D., Associate Professor of Neurology, University of Maryland Medical Center

Dr. Lynn M. Grattan is an associate professor of neurology, psychiatry, epidemiology and public health at the University of Maryland School of Medicine, where she also serves as director of the clinical neuropsychology division. Her primary area of research is in the psychological and neuropsychological impacts and recovery of coastal communities in distress as a result of exposure to marine biotoxins or natural or technological disasters. Dr. Grattan currently is the primary investigator of two National Institutes of Health/National Institute of Environmental Health Sciences (NIEHS)-funded studies. These include the investigation of domoic acid neurotoxicity in Native Americans in the Pacific Northwest and the impacts of the Deepwater Horizon Oil Spill on individuals and families in the northeastern Gulf of Mexico. She recently completed studies of the resilience of Maryland watermen after Superstorm Sandy, funded by the Office of Disaster Preparedness and Research. She has served as chairperson for the NIEHS Resilience Working Group and participated in the OppNet Resilience Concept Development Workshop led by the Office of Behavioral and Social Sciences Research. Because of her experience and expertise in coastal

communities and environmental hazards, Dr. Grattan regularly participates on national and regional committees that plan, direct, or fund harmful algal bloom research. She has published numerous articles and book chapters in her field of research and has served as guest editor or reviewer for multiple journals.

Alan L. Mendelsohn, M.D., Associate Professor of Pediatrics and Population Health, New York University School of Medicine

Dr. Alan L. Mendelsohn is a developmental-behavioral pediatrician and associate professor of pediatrics and population health at New York University (NYU) School of Medicine and Bellevue Hospital Center. Dr. Mendelsohn's research focuses on poverty-related disparities in child development and school readiness and pediatric primary care as a population-level platform for prevention of disparities through promotion of reading aloud and play. Dr. Mendelsohn was among the first to show that provision of children's books in the context of guidance and modeling during well child visits (Reach Out and Read [ROR]) can lead to increased parent-child reading activities and child vocabulary; the low cost and easy scalability of the ROR model has led to its dissemination across the United States, where it reaches approximately 25 percent of low income children from birth to 5 years of age. Subsequently, he has led development of the Video Interaction Project (VIP), which builds on ROR by adding a parenting facilitator who video-records parents and children interacting using toys and books provided by the program, then watches the video with the parent to reinforce strengths in the interaction and promote self-reflection. He is primary investigator of a National Institutes of Health/*Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD) R01-funded randomized controlled trial (RCT) to study VIP impacts through elementary school (Bellevue Project for Early Language, Literacy, and Education Success [BELLE]). This RCT has shown large impacts on parenting behaviors and on social emotional development, as well as reductions in key psychosocial stressors such as maternal depressive symptoms and parenting stress. Work is in progress to disseminate VIP across New York City (through a New York City Council initiative [City's First Readers] and through the New York City Department of Health and Mental Hygiene) and nationally. In addition, Dr. Mendelsohn is one of three primary investigators of a new NIH/NICHD R01-funded RCT called Smart Beginnings, which is testing a tiered approach to prevention. In Smart Beginnings, all low-income families receive primary prevention through ROR and VIP, while those with risks identified through enhanced screening additionally receive secondary/tertiary prevention through a home visiting program called Family Check Up. Dr. Mendelsohn also is engaged in international work; he co-leads a cluster RCT of an intervention in which elements of ROR and VIP are adapted for educational childcare settings in northern Brazil. Dr. Mendelsohn is co-author of an instrument to assess the cognitive home environment in low-income households (StimQ) that has been utilized by investigators in the United States and internationally. In 2014, Dr. Mendelsohn was honored to be named as NYU Clinical and Translational Science Institute (NIH/National Center for Advancing Translational Sciences) Translational Research Mentor of the Year. Dr. Mendelsohn was recently appointed as chair of the NICHD Biobehavioral and Behavioral Sciences Subcommittee.

Eun-Young Mun, Ph.D., Associate Professor, Center of Alcohol Studies and Graduate School of Applied and Professional Psychology, Rutgers University

Dr. Eun-Young Mun joined the Center of Alcohol Studies at Rutgers in 2006 after 4 years on the faculty of the University of Alabama at Birmingham. She holds a joint appointment in the department of clinical psychology at the Graduate School of Applied and Professional Psychology and as a graduate faculty member in the departments of psychology and statistics at the School of Arts and Sciences. She has researched developmental processes through which one's risk for the development of alcohol problems is maintained, intensified, or ameliorated throughout the life span using longitudinal, experimental, and intervention data. She is particularly interested in methodological innovations for clinical science and comparative effectiveness research on brief alcohol interventions for young adults. For the past several years, she has focused on examining the overall treatment effect sizes of brief motivational interventions for college students in a large-scale research synthesis study entitled "Project INTEGRATE," utilizing individual participant-level data combined from 24 single studies.

Argyris Stringaris, M.D., Ph.D., MRCPsych, Chief, Mood Brain and Development Unit, National Institute of Mental Health, National Institutes of Health

Dr. Argyris Stringaris researches and treats depression and related conditions in young people. He trained in Child & Adolescent Psychiatry at the Maudsley Hospital in London (MRCPsych) and received his Ph.D. from the Institute of Psychiatry, King's College London. He served as an attending physician (consultant psychiatrist) at the National and Specialist Mood Disorder Clinic at the Maudsley and was a senior lecturer at the Institute of Psychiatry. He held an advanced Wellcome Trust fellowship and his research was funded by the National Institute of Health Research and the UK Biomedical Centre. His work on mood disorders has been awarded the 2014 Klingenstein Foundation Prize by the American Academy of Child and Adolescent Psychiatry and the 2010 Research Prize from the European Psychiatric Association. His most recent book (co-authored with Eric Taylor) was published by Oxford University Press and awarded a High Commendation by the British Medical Association (2016).

Dr. Stringaris is interested in how mood is generated and maintained and seeks to use this knowledge to improve the treatment of young people with depression and related conditions. He uses neuroimaging, epidemiology, and treatment studies (cognitive behavioral therapy and medication) to probe brain mechanisms involved in mood and emotion processing. He has a special interest in reward processing and how it relates to patient's feelings and decision making. A central part of his work is to improve the way we measure mood using multimethod-multisource approaches.

J. Bruce Tomblin, Ph.D., Professor Emeritus, Spriestersbach Distinguished Professor, Department of Communication Sciences and Disorders, The University of Iowa

Dr. J. Bruce Tomblin's research has been concerned with the causes and consequences of individual differences in language development and disorders. With respect to the first topic, causes, he focused on pathways that run through multiple levels of causation ranging from genetic and environmental through brain and cognitive learning systems. The second topic concerns the study of important aspects of children's well-being that are associated with individual differences in communication abilities. Dr. Tomblin has served as a principal investigator on several awards from NIH's National Institute on Deafness and Other Communication Disorders and authored many publications on genetic influences on individual differences in language development and outcomes of children with language impairment, particularly concerning the study of academic, behavioral, and psychological outcomes during childhood.

Marty G. Woldorff, Ph.D., Professor, Departments of Psychiatry, Psychology and Neuroscience, and Neurobiology, Center for Cognitive Neuroscience, Duke University

Dr. Marty G. Woldorff is a professor at Duke University with appointments in the departments of psychiatry, psychology and neuroscience, and neurobiology and with a laboratory based at the Duke Center for Cognitive Neuroscience. Dr. Woldorff's main research interests have been in advancing our understanding of the neural mechanisms of attention. At each and every moment of our lives, we are bombarded by a welter of sensory information coming at us from a myriad of directions and through our various sensory modalities—much more than we can fully process. We must continuously select and extract the most important information from this welter of sensory inputs. How the human brain accomplishes this is one of the core challenges of modern cognitive neuroscience. Dr. Woldorff uses a combination of electrophysiological (ERP, MEG) and functional neuroimaging (fMRI) methods to study the time course, functional neuroanatomy, and mechanisms of attentional processes. This multimethodological approach is directed along several main lines of research: (1) the influence of attention on sensory and perceptual processing; (2) cognitive and attentional control mechanisms; (3) the role of attention in multisensory environments; (4) the interactive relationship between attention and reward; and (5) the role of attention in perceptual awareness. He will be presenting on his work funded by the National Institute of Neurological Disorders and Stroke (R01NS051048) investigating the interactive relationship between attention and reward, including discussing some of the potential translational applications of such research. For more information on Dr. Woldorff's research and publications, please visit www.woldorfflab.org.

Appendix III: Highlighted NIH-Funded Research

The intention of the NIH Behavioral and Social Sciences Research Festival is to highlight the diverse and exciting research being done throughout the NIH, both through extramural grants and within intramural laboratories. Although the event could accommodate only 10 speakers, the table below includes a list of 52 researchers who were nominated by their respective NIH Institutes and Centers (IC) to highlight BSSR supported by that IC. To be included, the research must have been conducted within the previous 2 years (fiscal year 2015–2016) and must have resulted in published articles related to any of the topical themes of the 2016 festival's three panels. The following list is organized by Institute.

Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD)

Karen Bierman
Project Title: Head Start REDI Classroom and Home Visiting Programs: Long-Term Follow-up
Key Publication: Effects of Head Start REDI on Children's Outcomes 1 Year Later in Different Kindergarten Contexts

Clancy B. Blair
Project Title: Stress, Self-Regulation, and Psychopathology in Middle Childhood
Key Publication: Measuring Executive Function in Early Childhood: A Case for Formative Measurement

Alan Mendelsohn
Project Title: Promoting Early School Readiness in Primary Healthcare
Key Publication: Addressing Disparities in School Readiness Through Promotion of Parenting in Well-Child Care: The Broader Context of Let's Read

Susanne Muehlschlegel
Project Title: Improving Clinical Decisions for Critically Ill Traumatic Brain Injury Patients
Key Publication: Decision Aids and Shared Decision-Making in Neurocritical Care: An Unmet Need in Our Neuro-ICUs

Elizabeth Skidmore
Project Title: Closing Gap in Stroke Rehabilitation: Early Intervention for Cognitive Disability
Key Publication: Strategy Training Shows Promise for Addressing Disability in the First 6 Months After Stroke

Lyn Turkstra
Project Title: Social Perception and Social Communication in Adults with Traumatic Brain Injury
Key Publication: The Female Advantage: Sex as a Possible Protective Factor Against Emotion Recognition Impairment Following Traumatic Brain Injury

Maeve Wallace
Project Title: Postdoctoral Fellowship in Reproductive Health and Determinants
Key Publication: Preterm Birth in the Context of Increasing Income Inequality

National Cancer Institute (NCI)

Sarah Gehlert or Graham Colditz
Project Title: Program for the Elimination of Cancer Disparities
Key Publication: Toward a Modern Science of Obesity at Washington University: How We Do It and What Is the Payoff?

Heather Greenlee
Project Title: Implementing Dietary Change Among Hispanic Breast Cancer Survivors
Key Publication: Long-Term Diet and Biomarker Changes After a Short-Term Intervention Among Hispanic Breast Cancer Survivors: The *¡Cocinar Para Su Salud!* Randomized Control Trial

Aaron Hipp
Project Title: Emerging Technologies: Assessing Physical Activity with Webcams and Crowdsourcing
Key Publication: Webcams, Crowdsourcing, and Enhanced Crosswalks: Developing a Novel Method to Analyze Active Transportation

Louis A. Penner
Project Title: Resources, Parent-Child Communication, and Adjustment to Pediatric Cancer
Key Publication: The Effects of Oncologist Implicit Racial Biases in Racially Discordant Oncology Interactions

Kurt Ribisl
Project Title: Maximizing State and Local Policies to Restrict Tobacco Marketing at Point of Sale
Key Publication: Integrating Tobacco Control and Obesity Prevention Initiatives at Retail Outlets

James Sallis
Project Title: IPEN Adolescent: International Study of Built Environments and Physical Activity
Key Publication: Physical Activity in Relation to Urban Environments in 14 Cities Worldwide: A Cross-Sectional Study

Erica Sloan
Project Title: Adrenergic Regulation of Tumor Inflammation and Metastatic Dissemination
Key Publication: How Stress Affects Cancer's Spread

National Center for Complementary and Integrative Health (NCCIH)

Helen Julia Burgess
Project Title: Circadian Phase Assessments at Home
Key Publication: Home Circadian Phase Assessments with Measures of Compliance Yield Accurate Dim Light Melatonin Onsets

Daniel C. Cherkin
Project Title: Comparison of CAM and Conventional Mind-Body Therapies for Chronic Back Pain
Key Publication: Effect of Mindfulness-Based Stress Reduction vs. Cognitive Behavioral Therapy or Usual Care on Back Pain and Functional Limitations in Adults with Chronic Low Back Pain

Barbara Lee Fredrickson
Project Title: Nonconscious Affective and Physiological Mediators of Behavioral Decision Making
Key Publication: Beyond Emotional Benefits: Physical Activity and Sedentary Behaviour Affect Psychosocial Resources Through Emotions

Eric J. Lenze
Project Title: Mindfulness-Based Stress Reduction and Cognitive Function in Stress and Aging
Key Publication: Ecologic Momentary Assessment Versus Standard Assessment Instruments for Measuring Mindfulness, Depressed Mood, and Anxiety Among Older Adults

Julie L. Wetherell
Project Title: Mindfulness-Based Stress Reduction and Cognitive Function in Stress and Aging
Key Publication: Ecologic Momentary Assessment Versus Standard Assessment Instruments for Measuring Mindfulness, Depressed Mood, and Anxiety Among Older Adults

Fadel Zeidan
Project Title: Brain Mechanisms Supporting Mindfulness-Based Pain Relief
Key Publication: Mindfulness Meditation-Based Pain Relief Is Not Mediated by Endogenous Opioids

National Heart, Lung, and Blood Institute (NHLBI)

James A. Blumenthal
Project Title: Stress Management and Biomarkers of Risk in Cardiac Rehabilitation
Key Publication: Enhancing Cardiac Rehabilitation with Stress Management Training: A Randomized, Clinical Efficacy Trial

Stephen B. Fawcett
Project Title: The Healthy Communities Study
Key Publication: Measuring Community Programs and Policies in the Healthy Communities Study

Peter J. Gianaros
Project Title: Neurobiological Pathways Linking Stress and Emotion to Atherosclerosis
Key Publication: Community Socioeconomic Disadvantage in Midlife Relates to Cortical Morphology via Neuroendocrine and Cardiometabolic Pathways

ORBIT Team
Project Title: The Obesity-Related Behavioral Intervention Trials
Key Publication: From Ideas to Efficacy: The ORBIT Model for Developing Behavioral Treatments for Chronic Diseases

Michael G. Perri
Project Title: Rural Lifestyle Intervention Treatment Effectiveness Trial (Rural LITE)
Key Publication: Comparative Effectiveness of Three Doses of Weight-Loss Counseling: Two-Year Findings from the Rural LITE Trial

National Institute on Alcohol Abuse and Alcoholism (NIAAA)

Courtney L. Bagge
Project Title: The Acute Alcohol-Suicide Attempt Relation as a Function of Alcohol Use Disorders
Key Publication: Alcohol Use to Facilitate a Suicide Attempt: An Event-Based Examination

Kate B. Carey
Project Title: Brief Alcohol Interventions by Counselor and Computer
Key Publication: Alcohol Interventions for Greek Letter Organizations: A Systematic Review and Meta-Analysis, 1987 to 2014

Mark S. Kaplan
Project Title: Economic Contraction and Alcohol-Related Suicides: A Multilevel Analysis
Key Publication: Heavy Alcohol Use Among Suicide Decedents Relative to a Nonsuicide Comparison Group: Gender-Specific Effects of Economic Contraction

Kelli Ann Komro
Project Title: Cherokee Nation Prevention Trial: Interactive Effects of Environment and SBIRT
Key Publication: Prevention Trial in the Cherokee Nation: Design of a Randomized Community Trial

Eun-Young Mun
Project Title: Innovative Analyses of Alcohol Intervention Trials for College Students
Key Publication: A Hierarchical Multi-Unidimensional IRT Approach for Analyzing Sparse, Multi-Group Data for Integrative Data Analysis

National Institute on Deafness and Other Communication Disorders (NIDCD)

Suzanne Boyce
Project Title: Improving Clinical Speech Remediation with Ultrasound Technology
Key Publication: Acquiring Rhoticity Across Languages: An Ultrasound Study of Differentiating Tongue Movements

Julie Mennella
Project Title: Efficacy of Bitter Taste Blockers on Flavor Acceptance in Pediatric Populations
Key Publication: "A Spoonful of Sugar Helps the Medicine Go Down": Bitter Masking by Sucrose Among Children and Adults

Daniel Merfeld
Project Title: Employing Vestibular Thresholds to Improve Patient Diagnosis
Key Publication: Modeling Human Perception of Orientation in Altered Gravity

Mary Pat Moeller
Project Title: Outcomes of School-Age Children Who Are Hard of Hearing
Key Publication: Assessing Vocal Development in Infants and Toddlers Who Are Hard of Hearing: A Parent-Report Tool

Leslie Vosshall
Project Title: Neuropeptide Regulation of Mosquito Host-Seeking Behavior
Key Publication: Olfactory Perception of Chemically Diverse Molecules

National Institute on Drug Abuse (NIDA)

Gene H. Brody
Project Title: A Transdisciplinary Center Focused on Rural African American Families
Key Publication: Family-Centered Prevention Ameliorates the Longitudinal Association Between Risky Family Processes and Epigenetic Aging

C. Hendricks Brown
Project Title: Center for Prevention Implementation Methodology for Drug Abuse and HIV (Ce-PIM)
Key Publication: Characterizing Implementation Strategies Using a Systems Engineering Survey and Interview Tool: A Comparison Across 10 Prevention Programs for Drug Abuse and HIV Sexual Risk Behavior

Kathleen M. Carroll and Hedy Kober
Project Title: Maximizing Effectiveness of Cognitive Behavior Therapy and Contingency Management
Key Publication: Neurofunctional Reward Processing Changes in Cocaine Dependence During Recovery

Donna Lynn Coffman
Project Title: Casual Mediation in Non-Randomized and Multilevel Intervention Research
Key Publication: Optimization of Multicomponent Behavioral and Biobehavioral Interventions for the Prevention and Treatment of HIV/AIDS

Michael Churton Neale
Project Title: Psychometric and Genetic Assessments of Substance Use
Key Publication: Minor Allele Frequency Changes the Nature of Genotype by Environment Interactions

National Institute of Environmental Health Sciences (NIEHS)

Annie Belcourt
Project Title: Residential Wood Smoke Interventions Improving Health in Native American Populations
Key Publication: Racial Discrimination's Influence on Smoking Rates Among American Indian Alaska Native Two-Spirit Individuals: Does Pain Play a Role?

Lynn Grattan
Project Title: Psychological Responses to Deepwater Horizon
Key Publication: The Resilience Activation Framework: A Conceptual Model of How Access to Social Resources Promotes Adaptation and Rapid Recovery in Post-Disaster Settings

National Institute of Mental Health (NIMH)

Jennifer Johnson
Project Title: Effects of Prisoner Re-entry Context on Cognitive Ability to Manage Mental Health at Re-entry
Key Publication: Hazardously Drinking Jailed Women: Post-Release Perceived Needs and Risk of Reincarceration

Sebastian Linnemayr
Project Title: Variable Rewards Incentives for ART Adherence in Uganda
Key Publication: Behavioral Economics Matters for HIV Research: The Impact of Behavioral Biases on Adherence to Antiretrovirals

Kathleen Merikangas
Project Title: Large Scale Population-Based Studies of Mental Disorders Including High-Risk Designs and Prospective Longitudinal Research
Key Publication: The Philadelphia Neurodevelopmental Cohort: Constructing a Deep Phenotyping Collaborative

Aaron Seitz
Project Title: Understanding Mediating and Moderating Factors that Determine Transfer of Working Memory Training
Key Publication: How to Build Better Memory Training Games

Argyris Stringaris
Project Title: Developmental Irritability as Dimension from Childhood
Key Publication: The Status of Irritability in Psychiatry: A Conceptual and Quantitative Review

Martha Wadsworth
Project Title: Preventing Internalizing Psychopathology in Preadolescents Exposed to Chronic Stress
Key Publication: A Longitudinal Examination of the Adaptation to Poverty-Related Stress Model: Predicting Child and Adolescent Adjustment over Time

National Institute of Neurological Disorders and Stroke (NINDS)

Michael S. Beauchamp
Project Title: Neural Mechanisms of Optimal Multisensory Integration
Key Publication: Similar Frequency of the McGurk Effect in Large Samples of Native Mandarin Chinese and American English Speakers, Experimental Brain Research

Ruth Ottman
Project Title: Psychosocial Impact of Genetics in Epilepsy
Key Publication: Genetic Causal Attribution of Epilepsy and Its Implications for Felt Stigma

Nirao Shah
Project Title: Characterization of Sexual Dimorphism in the Brain
Key Publication: Sex-Dependent Changes in Metabolism and Behavior, as well as Reduced Anxiety After Eliminating Ventromedial Hypothalamus Excitatory Output

Marty Woldorff
Project Title: Attentional Mechanisms in Multisensory Environments
Key Publication: Altruistic Traits Are Predicted by Neural Responses to Monetary Outcomes for Self vs. Charity

NIH BEHAVIORAL AND SOCIAL SCIENCES RESEARCH COORDINATING COMMITTEE

The National Institutes of Health (NIH) Behavioral and Social Sciences Research Coordinating Committee (BSSR-CC) was established to enhance information exchange, communication, integration, and coordination of behavioral and social sciences research/training activities at the NIH. Formerly known as the NIH Health and Behavior Coordinating Committee, the committee's name was changed in 1996 to emphasize its relationship with the Office of Behavioral and Social Sciences Research, Office of the Director, NIH. The NIH Institute/Center Directors participate in the Coordinating Committee through their appointment of a member and an alternate.

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