Personal Statement

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1. Training and career trajectory

My education and training have been trans-disciplinary and, therefore, prepared me well for a leadership in the field of clinical psychology. I completed my B.A, *cum laude*, in Economics from Wellesley College in 1990. I then completed an M.A. in Developmental Psychology from Teachers' College at Columbia University in 1994 and a Ph.D. in clinical psychology from Boston University in 1999. Although my Ph.D. was in a psychology department, my thesis topic: The comorbidity of posttraumatic stress disorder and antisocial personality disorder: An epidemiological and genetic study began my introduction to Epidemiology. A National Institute of Mental Health (NIMH) National Research Service Award funded my doctoral work. I subsequently was a post-doctoral fellow in the Psychiatric Epidemiology Training Program at Columbia MSPH from 1999-2002. I then took a position as a Clinical Research Scientist/Assistant Professor of Psychology at the National Center for PTSD/Boston University. In that position, I applied for and received funding on the first round for an NIMH Career Development Award (K08) entitled "The Developmental Epidemiology of Posttraumatic Stress Disorder." I was recruited for a position as Assistant Professor in Psychiatric Epidemiology at the Harvard School of Public Health (HSPH) in 2004. I was promoted to Associate Professor in 2009. I am currently Professor (tenured) and Leader of the Psychiatric-Neurological Epidemiology Cluster in the Department of Epidemiology at MSPH.

My work is in the area of developmental and translational psychopathology, with a particular focus on posttraumatic stress disorder. I am honored to be considered for appointment to Distinguished Professor at CUNY in recognition of exceptional scholarly achievement. The criteria for appointment as a Distinguished Professor state:

> "Distinguished Professorships are reserved for faculty with records of exceptional performance by national and international standards of excellence in their profession. There must be substantial evidence of this exceptional performance, including significant quantities of high-quality work in areas of importance in their disciplines. . . . Since Distinguished Professor appointments are not provided solely to recognize past performance, there must be evidence that their quality of performance will continue."

Since I was promoted to Associate Professor, I have shown leadership in research, training and practice in the field of traumatic stress, particularly in the areas of the developmental and genetic epidemiology of posttraumatic stress disorder (PTSD). I believe these accomplishments, described in detail below and briefly summarized here, meet the criterion of "substantial evidence" of exceptional performance.

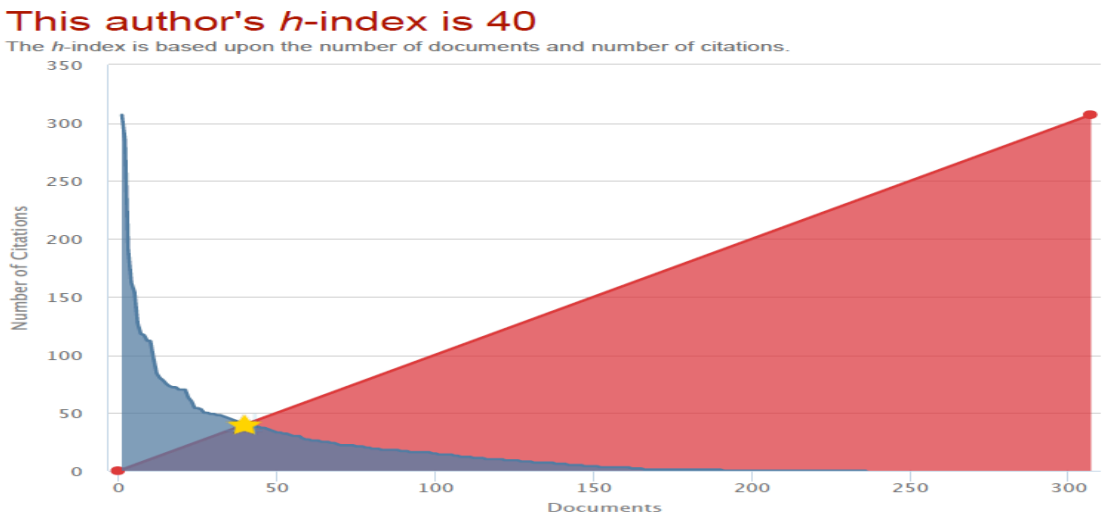
In research, I lead the two largest international efforts in PTSD psychiatric epidemiology and genetics. I am co-leader and founder of the PTSD working group for the World Health Organization World Mental Health Surveys (WHO-WMHS), the largest cross-national effort to document the prevalence, distribution and public health burden of mental disorders. I am also PI of the grant that funds that work. I am also co-founder and leader of the Psychiatric Genomics Consortium PTSD working group, the first international research consortium in PTSD and the first effort to bring together PTSD genomics researchers to conduct very large scale genomic analyses. I also lead the Psychiatric-Neurological Epidemiology Cluster of the Department of Epidemiology at MSPH. In this role, I have established the first school-wide MPH certificate program in Population Mental Health, led efforts in curriculum review and the development of new courses, and led two innovative and successful Columbia University Epidemiology Scientific Symposia (CUESS). I have also had substantial engagement in efforts that aim to translate traumatic stress science, and in particular have brought attention to issues related sexual violence. Centrally, I led a national effort to reform the Peace Corps prevention of and response to

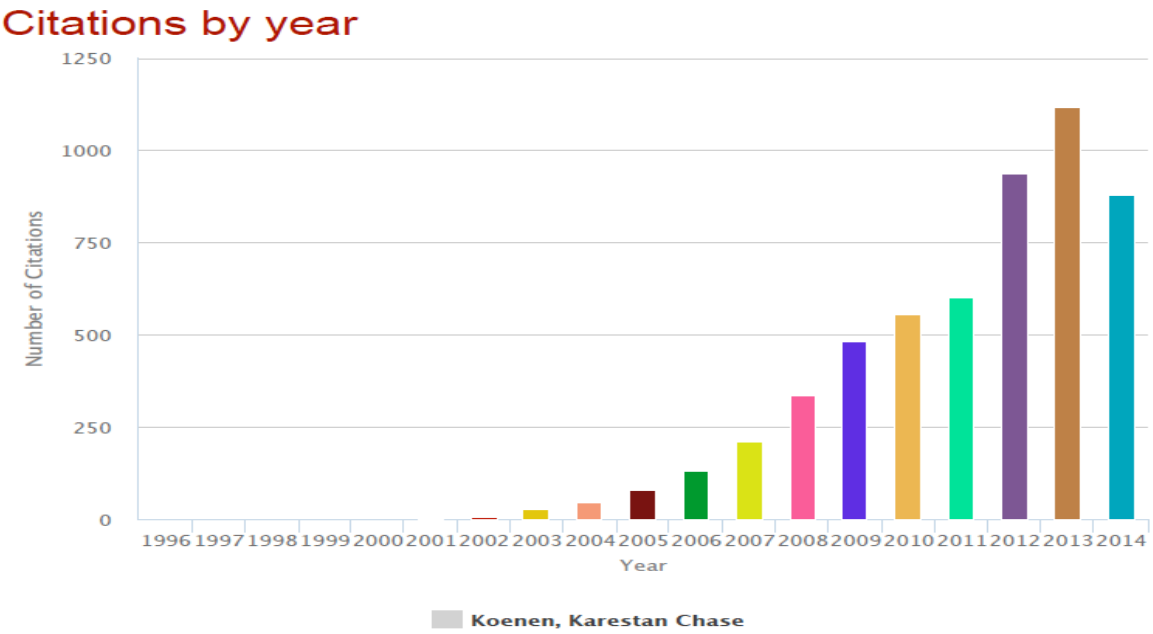
sexual assault that resulted in the passage of the Kate Puzey Peace Corps Volunteer Protection Act. In recognition of my efforts I was invited to the White House for the signing ceremony and received personal acknowledgement from President Obama. I am currently serving as elected President of the International Society for Traumatic Stress Studies, the pre-eminent international professional organization in my field. I was also founding Editor-in-Chief of the 2x2 Project, a website aimed at engaging the public in the conversation about public health science. Finally, I co-lead the Syria rape-mapping project with Women Under Siege, which in addition to receiving national media attention, has advised policy makers on Syria and received several awards from the Society for Epidemiologic Research.

2. Research

My research takes a life course approach to examining the interplay of social and biological factors in the etiology and consequences of common mental disorders. My life course translational approach to research is presented in *Lifecourse epidemiology of mental disorders,* for which I am lead editor, to be published by Oxford University press in November of 2013. This book is the first to lay out a comprehensive, multi-disciplinary, life course approach to mental disorders and is part of a prestigious life course epidemiology series of books published by Oxford. As stated above, the majority of my work has focused specifically on PTSD with a secondary focus on major depression (MD) and other anxiety disorders. I have published major papers on the epidemiology of PTSD[1, 2] in the U.S. population but, in my view, my central contributions have been in helping move the field towards recognizing the **developmental origins** of PTSD and other common mental disorders and in clarifying the role of **gene-environment interplay** in shaping population mental health, particularly PTSD. My work on gene-environment interplay has led me to investigate **epigenetics** and the **intergenerational transmission of trauma**. My work also extends to include investigation into the relation between **mental and physical health**. More recently, my work has extended to include **global mental health**, with particular emphasis on the cross-national epidemiology of trauma and posttraumatic stress disorder.

I have authored or co-authored over 200 peer-reviewed scholarly publications published or in press and have obtained almost 15 million dollars in peer-reviewed federal and foundation research grants on these research topics. I have published in the leading journals in my field including Science (IF=31.0), the Proceedings of the National Academy of Sciences (IF=9.7), American Journal of Epidemiology (IF=4.8), JAMA(IF=29.9), JAMA- Psychiatry (IF=13.8), American Journal of Psychiatry (IF=14.7), Nature Reviews Neuroscience (IF=31.7), Molecular Psychiatry (IF=14.9), Biological Psychiatry (IF=9.3), the Journal of the American Academy of Child and Adolescent Psychiatry (IF=6.9), the Journal of Child Psychology and Psychiatry (IF=5.4), Abnormal Psychology (IF=4.7), and the Journal of Consulting and Clinical Psychology IF= (5.0), Psychoneuroendocrinology (IF=5.2). My *h*-index is 40 (SCOPUS, October 2014). The 236 publications I have authored or co-authored which are listed in SCOPUS have been cited 5,417 times.





2.1. Developmental origins. When I started working in the area, PTSD was conceptualized as solely an outcome of trauma. I have moved the field towards viewing PTSD as an adverse outcome in a trajectory of risk begun at conception. This work, along with that of others, has contributed to a radical re-conceptualization of mental disorder etiology toward the view that all mental disorders, even those with apparent adult onsets, have their origins early in life and, perhaps, even in the experiences of prior generations. My work has shown that early childhood constitutional factors (e.g. temperament) and contextual factors (e.g. poverty) shape response to trauma over the life course.[3, 4] This work, particularly in relation to cognitive ability and PTSD, challenged long-held assumptions in the field; that is that the well-documented association between PTSD and low cognitive ability was due to the adverse effects of stress on the brain. My work has been among the first to show that rather than being a consequence of PTSD, low cognitive ability is vulnerability for PTSD and the association is genetically-mediated.[5] In addition, I published a major paper demonstrating that low early childhood IQ predicts both risk and severity of a range of adult psychiatric disorders.[6]

A major aspect of my work on developmental origins has been in the genomics of PTSD. My work has contributed to a paradigm shift toward viewing studies of gene-environment interplay essential for understanding the etiology of PTSD and other stress-related mental disorders. When I began to do research in this area during graduate school, the idea of investigating genetic influences on PTSD was taboo. Moreover, biological studies of PTSD and other mental disorders were the focus of small case-control studies in biological psychiatry and not population-representative studies. This shift from PTSD as a entirely environmentally disorder to one influenced by genetic factors and from small-case control studies to large population based studies is evidenced in my co-founding and leading the PTSD working group within the Psychiatric Genomics Consortium. The goal of the PTSD working group is to bring together PTSD researchers from across the globe to conduct mega-analyses of PTSD genome-wide association studies (GWAS) and other PTSD biomarkers. As of October 2013, the working group has obtained commitments of approximately 70,000 samples including over 20,000 cases for GWAS mega-analyses.

My work on gene-environment interplay has been both conceptual and empirical. Most recently, my conceptual work has focused on rethinking on the public health genetics paradigm, arguing for a population health approach to genetic research [19]. This work extends to epigenetics research [20], including a systematic review of epigenetic studies of mood and anxiety disorders and a paper laying out an epidemiologic approach to epigenetic studies [21, 22]. In my conceptual work related to PTSD, I was invited to co-author a major review on the biology of PTSD [23]. I have also written several papers designed to set a research agenda for the study of gene-environment interaction in PTSD and major depression [24-28] and am asked to write commentaries on other investigator's work in this area [29, 30]. I have expanded this work to include considerations of the interactions of social context, genetic, and epigenetic factors in psychiatric disorders more broadly [20, 31, 32].

In my empirical work, I am focused on a scientific agenda that incorporates genomics to identify the biological pathways via which adverse environments – from individual-level exposures such as childhood abuse to macro-social factors increase vulnerability to and impair recovery from PTSD and other stress-related mental disorders. This work has been funded through NIH and foundation grants. My empirical work in this area has taken both genome-wide and candidate gene approaches. I was a co-author on the first GWAS of PTSD, implicating the *RORA* gene as well as a replication of this finding [33, 34]. I recently published the first GWAS of PTSD in women, implicating a novel lincRNA [35]. In terms of candidate gene studies, I have a major paper under revision that examined the association of over 300 genes with PTSD. The results implicated *SLC18A2*, a novel gene for PTSD that has been associated with other neuropsychiatric disorders, and replicated this in an independent sample.

My early work focused on how variation in neurobiological stress response system moderates the association between childhood adversity and common mental disorders. For example, I published the first paper showing an association between variation in *FKBP5*, a glucocorticoid receptor-regulating cochaperone of stress proteins, and peri-traumatic dissociation, one aspect of acute stress response known to predict the development of PTSD [36]. I also published a paper documenting variation in *CRHR1* (corticotrophin-releasing hormone receptor 1) and onset and course of PTSD in physically-injured children [37]. Using data from a unique sample of older adults exposed to the 2004 Florida hurricanes, I published the first paper of which I am aware documenting that macro-social context modifies genetic risk of PTSD and MD following hurricane exposure [38]. My group has led or collaborated on numerous other genetic studies of PTSD, MD and other anxiety disorders [32, 39-45].

More recently, I have also actively pursued a series of studies aimed at understanding how epigenetic processes may explain the well-documented association between adversity and common mental disorders [47-50]. My work has shown that epigenetic variation modifies the effect of trauma exposure

on risk of PTSD, over and above common genetic variation [51]. This work is cutting edge in integrating the study of biological mechanisms into traditional psychiatric epidemiologic study designs and offers promise in identifying how adversity 'gets under the skin' and produces mental disorder. Moreover, epigenetic processes such as DNA methylation are modifiable, therefore, this work may direct us to interventions aimed at preventing or ameliorating the effects of adversity on mental health over the life course. I currently have several large, funded, epigenetic studies underway focused on identifying functional epigenetic signatures of PTSD in a range of populations including adults in urban Detroit and first-responders to the World Trade Center terrorist attacks.

My work in epigenetics has been conducted in parallel with a series of studies linking the Nurse's Health Study II with the Growing Up Today Study (GUTS). I have been investigating the question of whether maternal experiences of trauma are associated with adverse outcomes in their offspring. I was senior author on a paper documenting the intergenerational association between maternal and offspring trauma and posttraumatic stress disorder [52]. The Faculty of 1000 Psychiatry evaluated this paper. I have now extended this work to examine other outcomes in the offspring including BMI, smoking and other health behaviors as well as depression and drug use.

Future directions for my work on developmental origins largely focus around my leadership of the PTSD working group of the Psychiatric Genomics Consortium. We are in the process of conducting the first mega-analysis of GWAS of PTSD. This is a major effort and focus of my time at the moment and we are in the midst of preparing a consortium grant proposal for which I will be the lead-PI. Meanwhile, I also continue to pursue work on how to incorporate genetic factors, and particularly findings from GWAS studies, into epidemiologic studies of stress and psychopathology and explore hypotheses related to genotype-by-social environment interaction. For example, in recent work we have shown that neighborhood social cohesion modifies genetic risk of smoking in urban-dwelling African American adults [46]. We are extending these findings to a much larger sample to pursue systematic investigations of gene-environment interactions at multiple levels. I am also actively collaborating with neuroscientists to examine the relation between methylation in peripheral tissues and brain function, to identify meaningful peripheral epigenetic markers of brain function that can be incorporated in to human studies. A longer-term goal of the epigenetic work is to investigate the behavioral and biological mechanisms underlying the intergenerational associations we observe for maternal trauma and child outcomes and to identify potential targets for intervention. I currently have four NIH grants under review to pursue this epigenetic work.

2.2. Mental health and physical health. I have also extended my work in developmental origins to examine the relation between mental disorders and risk of later negative physical health outcomes over the life course. The age of onset of PTSD and other mental disorders is far earlier (childhood or early adolescence) than that of most of the common physical disorders that account for the majority of morbidity and mortality (e.g. cardiovascular disease, diabetes). However important questions remain as to whether, when, and how mental health problems *cause* chronic physical disease. I have examined these questions in a series of papers examining the relation between childhood adversity and mental health problems and biomarkers of cardio-metabolic risk in youth [7-11]. This work includes a major paper demonstrating that heightened inflammation in childhood may be a pathway through which early behavior problems increase risk for adult chronic diseases [12]. The results indicate behavioral problems in childhood put children on the path to ill health much earlier than previously realized, suggesting health professionals need to monitor both the physical and mental health of children with behavioral problems in order to identify those at risk as early as possible.
I have also investigated the question of whether PTSD *causes* adverse physical health outcomes, with a particular interest in testing whether remission (effective treatment) of PTSD would reduce adverse physical health effects. I published several papers documenting the predictive association between PTSD and incident cardiovascular disease as well as several reviews on this topic;[13-16] these papers

have opened new directions in the field. This work includes a paper in press showing that women with PTSD have higher BMI and gain weight at a faster rate than women exposed to trauma who do not develop PTSD. The effect of PTSD on BMI is reduced in women whose PTSD remits [17].

There are at least two new directions I am pursuing for my work on the relation between mental and physical health. First, I am following up on my findings in relation to childhood behavioral problems and inflammation through collaborations with clinical researchers to examine whether interventions effective for improving child behavior also impact cardio-metabolic biomarkers. Second, I am following up my work on PTSD and physical health through applying causal inference methods to obtain improved estimates of the causal effect of PTSD on physical health, to identify the biological mechanisms underlying observed relationships and to integrate assessments of risk biomarkers into PTSD treatment studies. An important translational question that has not been examined is whether effective treatment of PTSD can reverse the disorders' adverse impact on physical health. I currently have 3 large grant proposals under review pursuing these questions in relation to a range of outcomes including cardiovascular disease, type-2-diabetes, and cognitive functioning.

2.3. Global Mental Health. I currently lead the PTSD working group for the World Health Organization (WHO)-World Mental Health (WMH) Surveys. The working group is focused on a program of research that examines risk and protective factors for the three stages of PTSD: trauma exposure, onset, and chronic course cross-nationally. Because the development of PTSD is conditional on trauma exposure, PTSD may be the most preventable of mental disorders. The goal of this work is to identify when, where and how to intervene with regard to PTSD by identifying malleable and robust risk factors for the different phases of PTSD and provide novel information on how cultural diversity influences each of these phases. Under my leadership, this working group has produced a number of important papers including the first cross-national validation of a dissociative subtype [53] of PTSD and epidemiologic evidence for complex PTSD [54]. I have also mentored junior investigators from other (non-US) countries and this has produced papers on the epidemiology of trauma exposure and PTSD in Northern Ireland [55] and South Africa [56] among others. **The future directions for this work** include the WMH-Genetics Initiative led by myself and Jordan Smoller that will involve incorporating the genetic data available from over 30,000 participants to develop genotype-by-environment models for PTSD cross-nationally.

2.4. Awards and Honors. I have received several awards in recognition of my research accomplishments and significant contribution to the field of psychopathology and particularly in the area of traumatic stress. I was elected to the Presidency of the International Society of Traumatic Stress Studies in 2011, an honor usually only achieved by persons at a much later stage in their career. I was also selected to serve on the major Institute of Medicine Committee on Assessment of Ongoing Efforts in the Treatment of PTSD (2010-2014). My research accomplishments have also been recognized by my being elected to Fellow in the American Psychopathological Association in 2013 and by my leadership of the PTSD working group within the WHO-WMH Surveys and co-leadership of the PTSD working group within the Psychiatric Genomics Consortium. The Faculty of 1000 has recognized my work. For example, I was senior author on a paper evaluated by the Faculty 1000 Psychiatry in 2012 [52]. For my translational work in traumatic stress, I have received numerous honors including being named Woman of the Week by the Women in the World Foundation.

These accomplishments come in addition to those I received earlier in my career. In 2005, I received two early career awards in recognition of my work, the Robins-Guze Award from the American Psychopathological Association and the Chaim Danieli Young Professional Award for Excellence in Research in Traumatic Stress from the International Society for Traumatic Stress Studies (ISTSS). In 2006 I was nominated for the 2006 Presidential Early Career Award for Scientists and Engineers.

3. Practice

3.1. Policy. Over the past two years, I have increasingly sought opportunities to translate my research into policies that will reduce the public health burden of mental disorders. My most visible work in this area is related to global sexual violence. I lead the effort to transform the Peace Corps prevention of and response to sexual assault. In this regard, I testified at the Full House Foreign Affairs Committee Hearings, 'Peace Corps At 50', published Op-Eds in the Boston Globe and on CNN and a letter in the Washington Post, lobbied for reforms through media appearances (e.g. ABC's 20-20 with Brian Ross, the New York Times) and in meetings with House and Senate staff, and organized a coalition of activists, sexual assault survivors and family members, and returned Peace Corps volunteers. We were successful in passing the Kate Puzey Peace Corps Volunteer Protection Act that was signed into law by President Obama on November 21, 2011. I am currently engaged in enforcing implementation of Kate's law by maintaining pressure on the Peace Corps by working closely with the White House as well as House and Senate Staff. I have also expanded my work in this area, guest blogging for the Women's Media Center's Women Under Siege Project and appearing in media. I most recently appeared on the Katie Couric Show, discussing the impact of sexual assault at universities.

3*.2. Communication.* I served as founding Editor-in-Chief of the 2x2 project, a website that aims to inform the health conversation through timely and effective communication of emerging public health science. We launched the2x2project.org in September 2012 and it has become highly visible in a short time. At this writing the website has posted over 100 articles on topics ranging from obesity to Hurricane Sandy. The 2x2 project has had over 15,000 unique visitors and almost 800 likes on face book; several articles that have had 1000s of page views and dozens of shares. Our top postings have been cited in places such as the New York Times and CNN Money. I continue working with the project as Editor Emerita.

I also co-lead the Syria Rape-Mapping Project hosted by the Women's Media Center's Women Under Siege Project. The goal of this project is to record and map sexual violence in the Syrian conflict in real-time to assess the scope of sexualized violence in the conflict and inform interventions both for refugees and for Syrian nationals post-conflict. This work is funded through the Global Health Initiative at MSPH and has been covered widely in the mainstream media, including on NPR's All Things Considered.

4. Other Professional Engagement and Service

4.1 National and international service and leadership. My national and international professional service activities, like my research, are primarily focused in the area of developmental and translational psychopathology research, with a specific focus on PTSD. Most important has been my leadership of the International Society for Traumatic Stress Studies (ISTSS) and the American Psychopathological Association (APPA), the major profession organizations in my field. I am currently President of ISTSS. I have served on the Board of Directors of ISTSS for 5 years and on the Executive Committee for four years – as Secretary, Vice President, then President-elect and now President. I was also Chair of the Awards Committee and Deputy Program Chair for the ISTSS annual meeting for three years. I was elected to membership in APPA in 2005, to fellow in 2013 and served as Councilor on the APPA Council from 2009-2012. I was also invited to and have served on the major Institute of Medicine Committee on Assessment of Ongoing Efforts in the Treatment of PTSD (2010-2014).

I am currently on the Editorial Board for *Depression & Anxiety.* I have also served as an Associate Editor for the *Journal of Psychological Trauma* and for the *Encyclopedia of Psychological Trauma* and was a Statistical Reviewer for the *Journal of Traumatic Stress.* In addition, I serve as consulting reviewer for

over 30 journals including all of the major journals in my field (e.g. Archives of General Psychiatry, American Journal of Psychiatry, Biological Psychiatry, American Journal of Epidemiology, JAMA).

My contributions to the field have also been recognized by my being asked to serve on numerous Scientific Advisory Boards (SAB). Most prominently, I serve on the SAB for the Department of Veteran's Affairs PTSD Genetics Research Program. We have received funding to conduct the largest GWAS of PTSD to date in Iraq and Afghanistan war veterans. I also serve on the SAB for the National Center for PTSD, which is the largest government-lead effort in PTSD research and treatment in the VA. I am on SABs for numerous important traumatic stress initiatives including: the Neuroimaging and Genetics Core of the Center of Excellence for Research on Returning War Veterans, CTXVHCS, Waco Campus; The Tulsa Institute for Trauma Abuse and Neglect (TITAN) at The University of Tulsa; the PTSD Genomic Use Case for the Million Veterans Project Platform, Department of Veterans Affairs.

I have had the honor of being invited to give numerous presentations on my research nationally and internationally. These are detailed on my CV. I have been an active grant reviewer for the National Institutes of Health, the Welcome Trust, the Netherlands Organization for Scientific Research, Department of Defense, Clinical Science Research & Development Service Cooperative Studies Scientific Evaluation Committee Department of Veterans Affairs Cooperative Studies Program, and the South African Medical Research Council and for the State of California's Tobacco-Related Disease Research Program.

4.2 Departmental, school-wide and university service. My major service at Columbia is as leader of the Psychiatric-Neurological Epidemiology Cluster in the Department of Epidemiology. I also serve on the Chair's Leadership Group and the Steering Committee for the Psychiatric Epidemiology Training Program. At Harvard University, I was an Affiliated Faculty Member (be invitation only) of the Harvard Center on the Developing Child (HCDC). At HCDC, I served on the Steering Committee and Chaired the Biomarkers Working Group for the Early Childhood Innovation Project. Within HSPH, I served on the Doctoral Exam and Doctoral and Masters Admissions Committees in the Department of Social and Behavioral Sciences and in the Department of Epidemiology. In addition, I served on the Steering Committee for the Psychiatric Epidemiology Concentration.

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