

**BIOGRAPHICAL SKETCH**

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NAME: Warren, Zachary Eli

eRA COMMONS USER NAME (credential, e.g., agency login): WARRENZE

POSITION TITLE: Associate Professor of Pediatrics, Psychiatry, and Special Education

EDUCATION/TRAINING (*Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.*)

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
College of William and Mary, Williamsburg, VA	BA	05/1998	Psychology/Philosophy
The University of Miami, Miami, FL	MS	05/2002	Clinical Psychology
The University of Miami, Miami, FL	PhD	08/2005	Clinical Psychology
Children's Hospital Boston/Harvard Medical School, Boston, MA	Predoctoral Internship	08/2005	Clinical Psychology
The Medical University of South Carolina, Division of Genetics and Developmental Pediatrics, Charleston, SC	Postdoctoral Fellowship	08/2006	Clinical Psychology

**A. Personal Statement**

Dr. Warren received his Ph.D. in Clinical Psychology in 2005 from the University of Miami and is currently an Associate Professor of Pediatrics, Psychiatry, and Special Education at Vanderbilt University. He is the executive director of the Vanderbilt Kennedy Center's (VKC) Treatment and Research Institute on Autism Spectrum Disorders (TRIAD), Autism Clinical Services within the Division of Developmental Medicine at Vanderbilt Children's Hospital, and serves as co-PI of the Autism Speaks - Autism Treatment Network at Vanderbilt. His current research focuses on early detection and intervention for ASD, including explicit prospective studies of siblings at risk for ASD, as well as in the development of technological applications for early detection and intervention. Dr. Warren has received funding and support from AHRQ, Autism Speaks, CDC, NICHD, NIMH, NSF, the Simons Foundation and other agencies. Across these works, Dr. Warren has developed and implemented a REDCAP data system indexing families seen across VKC/TRIAD affiliated research programs and hospital-based clinical service programs. The system currently holds over 3,000 probands with core phenotypic measurements whose caregivers have consented for data sharing and future research contact. The database is presently used to facilitate co-recruitment across research programs, has historically been fully integrated with Vanderbilt's IDDRC recruitment core mechanisms, and utilizes NDAR identification processes for unique identification and data sharing. Recent funding for linkage with state birth and hospital records was also obtained with system for over 2/3 of population obtained. Dr. Warren has recently received funding through the Centers for Disease Control and Prevention Autism and Developmental Disabilities Monitoring Network to conduct public health surveillance of ASD/IDD in Tennessee. This work includes specific proposed linkage of the VKC/TRIAD database structure, with public health surveillance data systems (including Department of Health, Department of Education, and Department of Children's Service record), and with Vanderbilt's institutional structures for bioinformatics data capture (BioVU, Synthetic/Research Derivative). As such, Dr. Warren is extremely well positioned to serve as the administrative and scientific lead of this data structure within the current U54 application.

**B. Positions and Honors****Positions and Employment**

2004-2005	Predoctoral Internship in Clinical Psychology, The Children's Hospital Boston/Harvard Medical School, Boston, MA
2005-2006	Postdoctoral Fellow, The Medical University of South Carolina, Division of Genetics and Developmental Pediatrics; Charleston, SC
2005-2006	Adjunct Professor of Psychology, The College of Charleston; Charleston, SC

2006 – pres Vanderbilt University Medical Center / Vanderbilt Kennedy Center for Research on Human Development (VKC), Nashville, TN; Director, Treatment and Research Institute for Autism Spectrum Disorders (6/10-present); Director, Autism Clinical Services, Division of Developmental Medicine (6/10-present); Assistant Professor of Pediatrics (6/08-6/12), Psychiatry (9/06-6/12); Associate Professor of Pediatrics (7/12-present), Psychiatry (7/12-present), and Special Education (1/13-present)

### **Honors**

1994 - 1998 Monroe Scholar at the College of William and Mary  
1998 Cum Laude Graduate of the College of William and Mary  
2001 University of Miami Outstanding Teaching Assistant of Year (Psychology)  
2004 Carol Alson Fineman Award for excellence for work in child maltreatment, University of Miami  
2013 Early Career Award, American Association on Intellectual and Developmental Disabilities  
2014 Young Professional Award, Association of University Centers on Disabilities

### **Other Experience and Professional Memberships**

*Member:* American Psychological Association – Divisions 33 (MR/DD) and 53 (Clinical Child Psychology); Autism Speaks, Baby Sibling Research Consortium (*Associate Member*); International Society for Autism Research, Society for Developmental and Behavioral Pediatrics.

*Editorial Board Member:* Autism, Journal of Autism and Developmental Disorders

*External Expert Consultant:* Interagency Autism Coordinating Committee (IACC : Services and Lifespan Issues

### **C. Contribution to Science**

#### **1. Conducted high-impact evidence-based practice reviews regarding ASD detection and intervention.**

Dr. Warren has served as the ASD content lead across several evidence-based systematic reviews funded by the Agency for Health Care Research and Quality (AHRQ) and the United States Preventative Services Task Force (USPSTF). These projects have been coordinated and supported through the Vanderbilt Evidence-based Practice Center (EPC) and have resulted in foundational reviews and publications utilized across agencies and health-care entities charged with making funding (clinical and research) and practice decisions around ASD lifespan services (e.g., findings delivered to state Medicaid medical directors, USPSTF review for decision recommendations regarding ASD screening).

- a) **Warren Z. E.**, McPheeters, M.L., Sathe, N.A., Foss-Feig, J.H., Glasser, A.M., Veenstra-VanderWeele, J. (2011) A systematic review of early intensive intervention for autism spectrum disorders. *Pediatrics*, 127, e1303 -e1311.
- b) **Warren Z. E.**, Veenstra VanderWeele, J, Stone, W., et al. (2011) Therapies for Children with Autism Spectrum Disorders. Comparative Effectiveness Review (Prepared by the Vanderbilt Evidence-based Practice Center No. 290-02- HHS 290 2007 10065 I) AHRQ Publication Rockville, MD: Agency for Healthcare Research and Quality.
- c) Weitlauf AS, McPheeters ML, Peters B, Sathe N, Travis R, Aiello R, Williamson E, Veenstra-VanderWeele J, Krishnaswami S, Jerome R, **Warren Z.E.** (2014). Therapies for Children With Autism Spectrum Disorder: Behavioral Interventions Update. Comparative Effectiveness Review No. 137. (Prepared by the Vanderbilt Evidence-based Practice Center under Contract No. 290-2012-00009-1.) AHRQ Publication No. 14-EHC036-EF.
- d) Taylor, J., Veenstra-VanderWeele, M.D., Dove, D., Sathe, N., McPheeters, M., & **Warren, Z.E.** (2012). A systematic review of vocational interventions for adolescents and young adults with autism spectrum disorders. *Pediatrics*, 130, 531-538.

#### **2. Designed and studied novel methods for advancing earliest detection of ASD and eliminating health-care disparities associated with diagnosis.**

Dr. Warren has championed initiatives for developing novel methods and tools for reducing the age of detection of ASD with special emphasis on underserved populations. This has included rigorous evaluation of methods for realizing ASD detection within the medical home (e.g., within pediatric primary care settings) as well studies of novel tools/methods for ASD screening and surveillance in high-risk populations. Dr. Warren has routinely received national and international invitations to provide trainings regarding within practice identification process (e.g., STAT-MD training) across varied systems of care. His research has also documented the need to develop and critically evaluate the psychometric properties (e.g., reporting biases, novel metrics for reducing identification errors) of common ASD screening instruments in order to address diagnostic delays for children later identified with ASD.

- a. **Warren, Z.E.**, Stone, W.L., & Humberd, Q. (2009). A Training model for the diagnosis of autism in community pediatric practice. *Journal of Developmental and Behavioral Pediatrics*, 30, 442-446.
- b. **Warren, Z.E.**, Vehorn, A., Dohrmann, E., Nicholson, A., Sutcliffe, J., & Veenstra-VanderWeele, J. (2012). Accuracy of phenotyping children with autism based on parent report: What specifically do we gain phenotyping 'rapidly'? *Autism Research*, 5, 31-38.
- c. Swanson, A.R., **Warren, Z.E.**, Stone, W.L., Vehorn, A., Dohrmann, E., & Humberd, Q. (2014). The diagnosis of autism in community pediatric settings: Does advanced training facilitate practice change. *Autism*, 18(5): 555-556.
- d. Taylor, C., Vehorn, A., Hylan, N., Weitlauf, A., & **Warren, Z.E.** (2014). Can metrics of reporting bias enhance early autism screening measures. *Journal of Autism and Developmental Disorders*, 44, 2375-2380. DOI 10.1007/s10803-014-2099-5. PMC: 4134403

### 3. Pioneered application of innovative intelligent systems to ASD detection and intervention.

For the past 7 years, Dr. Warren has co-directed an engineering lab (Co-I Nilanjan Sarkar, Ph.D., Vanderbilt Robotics and Autonomous Systems Lab) explicitly focused on developing and applying intelligent technologies for meaningful use in ASD intervention. The team has developed several autonomous adaptive intervention systems utilizing robotic and virtual reality technologies to address core symptom challenges across the lifespan (i.e., infant/toddlers to young adults). This includes development of non-invasive gaze detection systems across three-dimensional learning environments and affectively sensitive social communication paradigms. Results of this research have demonstrated the potential of intelligent systems to act as accelerant technologies aiding detection and later intervention strategies. Findings suggest that systems capable of attending to processing differences in addition to performance differences are much more to overcome traditional generalization challenges of common intervention approaches. The team is currently building advanced systems for understanding and acting upon early differences in social attention and sensory processing in infants at-risk for ASD.

- a) **Warren, Z.E.**, Zheng, Zhi, Swanson, A., Bekele, E., Zhang, L., Crittendon, J., Weitlauf, A., Sarkar, N. (2014). Can robotic interaction improve joint attention skills. *Journal of Autism and Developmental Disorders*. DOI 10.1007/s10803-013-1918-4. PMC: 3980197
- b) **Warren, Z.E.**, Zheng, Z, Shuvajit, D., Young, E.M., Swanson, A., Weitlauf, A., & Sarkar, N. (*In Press*). Development of a robotic intervention platform for young children with ASD. *Journal of Autism and Developmental Disorders: Special Issue on Technology*
- c) Lahiri, U., **Warren, Z.E.**, and Sarkar, N. (2011). Design of a gaze-sensitive virtual social interactive system for children with autism. *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, 19, 443-452.
- d) Bekele, E., Crittendon, J., Zheng, Z., Swanson, A., Weitlauf, A., **Warren, Z.E.**, & Sarkar, N. (2014). Assessing the utility of a virtual environment for enhancing facial affect recognition in adolescents with autism. *Journal of Autism and Developmental Disorders*. 44(7):1641-50.

### 4. Translated findings regarding parent stress into novel care/intervention paradigms

Dr. Warren's early work documented the extreme emotional challenges of families of young children in the aftermath of specific ASD diagnosis, the effects of such challenges on service access, and the need for novel care paradigms incorporating and directly addressing. In this regard these works formed the foundation for currently funded trials and outreach initiatives examining the impact of direct treatment of parent stress (e.g., Mindfulness-based Stress Reduction) with evidence based early intervention strategies as well as work examining the viability of different early intensive service models in community settings (e.g., ACE trial of ESDM vs. DTT within military base setting).

- a) Taylor, J. T. & **Warren, Z.E.** (2012). Maternal depressive symptoms following autism spectrum diagnosis. *Journal of Autism and Developmental Disorders*, 42, 141-1408.
- b) **Warren, Z.E.**, Vehorn, A., Dohrmann, E., Newsom, C., & Taylor, J.L. (2013). Service implementation and maternal distress surrounding evaluation recommendations for young children diagnosed with autism. *Autism: International Journal of Research and Practice*, 17, 693-700. PMC: 3943420
- c) Weitlauf, A., Vehorn, A., Taylor, J.T., & **Warren, Z.E.** (2014). Relationship satisfaction, parenting stress, and depression in mothers of children with autism. *Autism: International Journal of Research and Practice*, 18, 194-198.
- d) Veenstra-VanderWeele, J. & **Warren Z.E.** (2015). Intervention in the context of

development: Pathways toward new treatments. *Neuropsychopharmacology*, DOI: 10.1038/npp.2014.232

## 5. Enhanced understanding of the core neurodevelopmental features of ASD.

Dr. Warren has been active in exploring our fundamental optimal understanding of the core features of ASD and how to translate this understanding to optimized diagnostic criteria and practices. He worked as a phenotype lead on consortium projects (Simons Simplex Collection) with findings directly linked to novel DSM-5 criteria, has collaborated on studies developing tools for measuring changes in core features over time (AIM), and has examined the challenges associated with demarcating severity within our current nosology.

- a) Lord, C., Petkova, E., Hus, V., Gan, W., Martin, D., Ousley, O., Guy, L., Bernier, R, Gerdts, J., Algermissen, M., Whitaker, A., Sutcliffe, J., **Warren, Z.E.**, et al. (2012). A multi-site study of the clinical diagnosis of different autism spectrum disorders. *Archives of General Psychiatry*, 69, 306-313.
- b) **Warren, Z. E.** & Veenstra-Vander Weele, J. (2011). Social communication deficits in the general population: How far out does the autism spectrum go? *Journal of the American Academy of Child and Adolescent Psychiatry*, 50, 326-328. PMID: 2142117230.
- c) Kanne, S.M., Mazurek, M.O., Sikora, D., Bellando, J., Branum-Martin, L., Handen, B., Katz, T., Feedman, B., Powell, M.P., & **Warren, Z.E.** (2014). The Autism Impact Measure (AIM): Initial development of a new tool for treatment outcome measurement. *Journal of Autism and Developmental Disorders*, 44, 168-179.
- d) Weitlauf, A. S., Vehorn, A., Gotham, K., & **Warren, Z.E.** (2014). DSM-V "Levels of support:" A comment on discrepant conceptualizations of severity in ASD. *Journal of Autism and Developmental Disorders*, 44, 471-476.

### More Publications:

- 38 of 53 total works available at NCBI  
<http://www.ncbi.nlm.nih.gov/sites/myncbi/zachary.warren.1/bibliography/47668889/public/>

## D. Research Support

### Ongoing:

1 U53 DD01170-01 (Warren - PI)  
CDC

1/1/15 – 12-31-18

Enhancing Public Health Surveillance of Autism Spectrum Disorder and Other Developmental Disabilities through the Autism and Developmental Disabilities Monitoring (ADDM) Network Vanderbilt University  
This public health surveillance contract with the CDC affords for public health surveillance strategy for estimates of ASD prevalence in Tennessee.

1R21 MH103518-01 (Sarkar)  
NIMH – R21 / R33

4/1/14 – 2/28/19

Adaptive Robotic Intervention Architecture for Autism Intervention

This R21 / R33 project constructs a non-invasive gaze detection paradigm within a mixed reality co-robotic intervention environment with hopes of shifting core joint attention skills in preschoolers with ASD  
Role: Co-I

R01 MH091102-01A1 (Sarkar)  
NIH/NIMH

12/01/10 – 11/31/15

Adaptive Response Technology for Autism Spectrum Disorders Intervention

The specific aim of this project is to refine intelligent adaptive response technology and design both adaptive behavior and social tasks in a VR environment for clinical application with children with ASD.

Role: Co-I

CBET-1264462 (Sarkar)  
NSF

08/15/13 – 07/31/16

Individualized Adaptive Robot-Mediated Intervention Architecture for Autism

This work focuses on the design of closed-looped adaptive robotic systems as potential intervention tools for young children with ASD.

Role: Co-I

HRSA R40MC27706 (Weitlauf) 09/01/14 - 08/31/17  
Does Mindfulness Training Enhance Early Evidence-based Parent-coaching Interventions?  
This randomized controlled trial examines the impact of Mindfulness Based Stress Reduction in enhancing parent mediated interventions for young children with ASD.  
Role: Co – I

R01 MH100030 - Rogers PI (Univ. of California at Davis) 03/28/13 – 04/1/18  
NIH/NICHD  
Intervention Effects of Intensity and Delivery Style for Toddlers With ASD  
This NIH Autism Center of Excellence (ACE) Network proposal is an RCT of ESDM and DTT treatment models of early intensive intervention  
Role: Co-Investigator – Training and Education Core Director (subcontract to Yoder VU PI)

R01 1HD073984-01 – Sikich PI (UNC) 07/01/12 – 06/30/17  
NIH/NICHD  
Study of Oxytocin in ASD to improve Reciprocal Social Behaviors.  
This ACE proposal outlines a large, multisite, randomized clinical trial of intranasal oxytocin in children and adolescents with autism spectrum disorders.  
Role: Co-Investigator (subcontract to Sanders VU Co-PI)

Malow/Warren/Sanders (Co-PI) 1/1/15 -12/31/18  
Autism Speaks  
Autism Treatment Network: Cooperative Multi-Center Program for Research and Treatment of Autism  
The goal of this multi-site Autism Treatment Network is to improve medical treatment of children and adolescents with autism by establishing standards of clinical care based on evidence-based outcomes.  
Role: Co-PI

5T73 MC00050-12-2 Reimschisel (PI) 07/01/11 – 06/30/16  
Health Resources and Services Administration  
Leadership Education in Neurodevelopmental and Related Disabilities (LEND) Project  
The purpose of the LEND program is to provide advanced training in developmental disabilities.  
Role: Core faculty member

Recently Completed:

HHSN275-2012-00005-I – Newschaffer (Drexel) 9/30/13 – 3/31/15  
Drexel University/Westat Corporation  
Development and Validation of an Autism Case Confirmation Approach for Use in NCS  
Developed and ASD case-confirmation approaches for use in the National Children's Study.  
Role: Vanderbilt site PI

R01 HD039961 - Fein PI (Univ of Connecticut) 04/01/09 – 11/30/14  
NIH/NICHD  
Early Detection of Developmental Disorders  
Examined effectiveness of the MCHAT-R/F in younger siblings of children with ASD.  
Role: Vanderbilt site PI

R01 HD057284 - Stone PI (Univ of Washington) 09/30/08 – 07/31/14  
NIH/NICHD  
Social-Emotional Development of Infants At-Risk for Autism Spectrum Disorders  
Examined the early development of attentional and affective mechanisms in siblings of children with ASD.  
Role: Vanderbilt site PI