BIOGRAPHICAL SKETCH

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NAME: Barch, Deanna Marie

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

POSITION TITLE: Chair, Department of Psychological & Brain Sciences & Gregory B. Couch Professor of Psychiatry

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
Northwestern University, Evanston Illinois	B.A.	1987	Psychology
University of Illinois at Urbana-Champaign	M.A.	1991	Clinical Psychology
University of Illinois at Urbana-Champaign	Ph.D.	1993	Clinical Psychology

A. Personal Statement

My research program is focused on understanding the developmental interplay among cognition, emotion, and brain function to better understand the development and longitudinal change in brain structure and function that supports cognitive and affective function across the lifespan, and in both health and disease. I was a Co-Investigator on the Human Connectome Project, and leader of the Subject Recruitment and Phenotyping Team. In addition, I was the leader of the pilot Lifespan expansion of the HCP, which modified the methods developed as part of the HCP for use across the lifespan, including both older adults (through age 85) and young children (down to age 5). I am now multiple-PI of the Developmental extension of the Human Connectome Project (HCP-D), and co-I on the Human Connectome Project Aging, where we have continued data collection with a large-scale study using the HCP methods to again assess brain development across the life span, ranging from age 5 to age 100. I am also one of the site PIs for the ABCD study. I play a central role in both the HCP and ABCD studies, in terms of neuroimaging and other phenotype measures, for example, neurocognitive, resting state connectivity, and mental health. I have expertise in applying connectivity approaches to assess brain circuitry associated with clinically-relevant populations and behaviors, as well as using diffusion imaging, structural imaging and task related activation to understand brain development. I am well suited to be a multiple-PI on this analysis proposal of the HCP-D and ABCD data because of my extensive expertise in studying brain development in relationship to behavior in both health and expertise. The current is HCP-D is primarily focused on data collection and methods development. This proposal will build on these data collection efforts to answer central questions about how brain structure, function, and connectivity unfolds as a function of age versus different indicators of pubertal status and how this relates to risk for increases in internalizing symptoms as a function of puberty, with replication in the ABCD data to establish robustness and generalizability.

Ongoing and recently completed projects that I would like to highlight include:

U01 MH109589
Van Essen & Barch (Co-PIs)
06/01/2016-08/31/2021
Human Connectome Project - Development

U01 DA041120
Madden, Barch, & Heath (Co-PIs)
09/30/2015-05/31/2027

Adolescent Brain and Cognitive Development – USA (ABCD-USA)

R01 MH090786
Luby & Barch (Co-PIs)
04/01/2015-03/31/2021
Neuroimaging in Early Onset Depression: Longitudinal Assessment of Brain Changes

Citations:

1. Somerville, L. H., Bookheimer, S., Buckner, R L, Burgess, G. C., Curtiss, S. W., Dapretto, M., Elam, J. S., Gaffrey, M. S., Harms, M. P., Hodge, C., Kandala, S., Kastman, E. K., Nichols, T. E., Schlaggar, B. L., Smith, S. M., Thomas, K. M., Yacoub, E., Van Essen, D. C., & **Barch, D. M.** (2018). The lifespan human connectome project in development: A large-scale study of brain connectivity development in 5-21 year olds. *Neuroimage*, 183, 456-468. PMCID: PMC6416053.
2. **Barch, D. M.,** Shirtcliff, E. A., *Elsayed, N. M., Whalen, D., Gilbert, K., Vogel., A. C., Tillman, R., & Luby, J. L. (2020). Testosterone and hippocampal trajectories mediate relationship of poverty to emotion dysregulation and depression: A longitudinal study. *Proceedings of the National Academy of Sciences, 117,* 22015-22023. PMCID: PMC7486761
3. **Barch, D. M.,** Albaugh, M. D., Avenevoli, S., Chang, L., Clark, D. B., Glantz, M. D., Hudziak, J. J., Jernigan, T. L., Tapert, S. F., Yurgelun-Todd, D., Alia-Klein, N., Potter, A. S., Paulus, M. P., Prouty, D., Zucker, R. A., & Sher, K. J. (2018). Demographic, physical, and mental health assessments in the Adolescent Brain and Cognitive Development Study: Rationale and description. *Developmental Cognitive Neuroscience, 52,* 55-66. PMCID: PMC5934320
4. Gorham. L. & **Barch, D. M.** (2020). White matter tract integrity, involvement in sports, and depression in children. *Child Psychiatry and Human Development, 51,* 490-501. PMCID: PMC7448287

B. Positions, Scientific Appointments, and Honors

Positions and Scientific Appointments

2020-Present	Inaugural Editor of *Biological Psychiatry: Global Open Science*
2018-Present	One Mind, Scientific Advisory Board
2016-Present	Brain Behavior Research Foundation Scientific Council
2016-2020	Chair, Association for Psychological Science Publication Committee
2014-Present	Associate Editor *Biological Psychiatry*
2014-Present	Chair, Department of Psychological & Brain Sciences, Washington University
2014-2016	DSM Revision Steering Committee
2013-2018	NIMH Scientific Council
2010-2015	PCSAS Accreditation Committee
2009-Present	NIH Research Diagnostic Criteria Steering Committee
2008-2014	DSM-V Psychosis Committee
2007-2014	Editor – Cognitive, Affective, and Behavioral Neuroscience
2005-Present	Editorial Board – Schizophrenia Bulletin
2007-Present	Consulting Editor– Journal of Abnormal Psychology
2000-2007	Associate Editor – Journal of Abnormal Psychology
2008-Present	Professor of Psychology, Psychiatry & Radiology, Washington University
2003-2008	Associate Professor of Psychology, Psychiatry & Radiology, Washington University
1998-2003	Assistant Professor of Psychology, Washington University
1997-1998	Assistant Professor of Psychiatry, Western Psychiatric Institute and Clinic, University of Pittsburgh Medical School
1994-1997	Post-Doctoral Fellow, Western Psychiatric Institute and Clinic, University of Pittsburgh
1993-1994	Clinical Psychology Intern, Western Psychiatric Institute and Clinic, University of Pittsburgh

Honors

2021	Elected Member of the American Academy of Arts and Sciences
2020	Elected Member of the National Academy of Medicine
2018	Fellow, American College of Neuropsychopharmacology
2018	NIMH Method to Extend Research in Time (MERIT) Award

2018 Elected to the Society of Experimental Psychologists
2016 Arthur Holly Compton Faculty Achievement Award, Washington University
2016 Academic Women's Network Mentorship Award, Washington University
2013 Member, American College of Neuropsychopharmacology
2011 Gregory B. Couch Professor of Psychiatry
2010 Special Recognition, Outstanding Faculty Mentor Award, Graduate Student Senate, Washington University
2009 Fellow, Association of Psychological Science
2007 NAMI St. Louis Outstanding Scientist Award
2005 Visiting Fellow, Clare Hall Center for Advanced Studies, Cambridge University
2004 Special Recognition, Outstanding Faculty Mentor Award, Graduate Student Senate, Washington University
2002 The Joseph Zubin Memorial Fund Award
2002 American Psychological Association (APA) Distinguished Scientific Award for Early Career Contribution to Psychology in the area of Psychopathology
1999-2000 Outstanding Faculty Mentor Award, Graduate Student Senate, Washington University
1997 Society for the Science of Clinical Psychology Outstanding Dissertation Award
1997 International Congress on Schizophrenia Research Young Investigator's Award
1994-1996 NIMH Post-Doctoral Fellowship, Clinical Research Training for Psychologists
1992 Ed Scheiderer Memorial Research Award, University of Illinois at Urbana-Champaign,
1990 The Honor Society of Phi Kappa Phi, University of Illinois at Urbana-Champaign,
1988-1989 University Fellowship, University of Illinois at Urbana-Champaign, Champaign, Illinois
1986 Benton J. Underwood Summer Research Fellowship, Northwestern University
1983-1987 National Merit Scholarship, Northwestern University, Evanston, Illinois

C. Contributions to Science

1. A major stream of my research has focused on focused on the development and use of tools to measure resting state functional connectivity and task related activation, both to understand normative brain function and development across the lifespan and to understand altered brain organization in psychopathology. In particular, I have played a major role in the Human Connectome Project, an NIH sponsored initiative to develop state of the art tools to measure in vivo human structural and functional brain connectivity. I lead the teams that developed the behavioral phenotyping and task-based fMRI, co-lead the recruitment and assessment team, co-lead a team focused on developing methods for de-nosing resting state fMRI data, and lead the development of a shortened Lifespan HCP protocol suitable for use with special populations, such as children, older adults and those with psychopathology.

a. Smith, S., Nichols, T., Vidauree, D., Winkler, A., Behrens, T., Glasser, M., Ugurbil, K., **Barch, D. M.,** Van Essen, D., & Miller, K. (2015). A "positive-negative" mode of population co-variation links brain connectivity, demographics and behavior. *Nature Neuroscience*, *18*, 1565-1567. PMCID: PMC4625579
b. Lerman-Sinkoff, D. B., Sui, J., Rachakonda, S., Kandala, S., Calhoun, V. D., & **Barch, D. M.** (2017). Multimodal neural correlates of cognitive control in the Human Connectome Project. *Neuroimage, 163,* 41-54. PMCID: PMC5731484.
c. Lopez, K. C., Kandala, S., Marek, S., & **Barch, D. M.** (2020). Development of network topology and functional connectivity of the prefrontal cortex. *Cerebral Cortex, 30,* 2489-2505.
d. Marek, S., Tervo-Clemmens, B., Nielsen, A. N., Wheelock, M. D., Miller, R. L., Laumann, T. O., Earl, E., Foran, W. W., Cordova, M., Doyle, O., Perrone, A., Miranda-Dominguez, O., Feczko, E., Sturgeon, D., Graham, A., Hermosillo, R., Snider, K., Galassi, A., Nagel, B. J., Ewing, S. W. F., Eggebrecht, A. T., Garavan, H., Dale, A. M., Greene, D. J., **Barch, D. M**., Fair, D. A., Luna, B., & Dosenbach, N. U. F. (2019). Identifying reproducible individual differences in childhood functional brain networks: An ABCD study. *Dev Cogn Neurosci, 40*, 100706. PMCID: PMC6927479

2. A major line of my research has focused on identifying neurobiological and psychological mechanisms contributing to mood disorders, with the goal of identifying predictive markers that will help guide early intervention across the life span. The work in adult and adolescent depression has identified an important role for abnormalities in emotion reactivity, emotion regulation and incentive processing in the onset, course and maintenance of depression. However, my collaborator Joan Luby and others have established that depression

can onset as early as preschool, though little was known about similarities or differences at a neurobiological level. Our work has shown that children with preschool onset depression experience increased reactivity of the amygdala to sad faces, abnormal connectivity of the amygdala to prefrontal and parietal cognitive control regions, altered connectivity of the subgenual cingulate, and abnormal volumes of the insula, hippocampus and ventral medial prefrontal cortex. Further, we have shown that volume of the insula and reactivity of the amygdala predict subsequent risk for depression in both preschool and school aged children, providing initial evidence of biomarkers that might be predictive of risk for depression onset or recurrence in young children.

a. **Barch, D. M**., Gaffrey, M. S., Botteron, K. N., Belden, A. C., & Luby, J. L. (2012). Functional brain activation to emotionally valenced faces in school aged children with a history of preschool onset depression. *Biological Psychiatry, 12, 1035-1042.* PMCID: PMC3498571
b. Belden, A. C., Irvin, K., Hajcak, G., Kappenman, E. S., Kelley, D., Karlow, S., Luby, J. L., & **Barch, D. M**. (2016). Neural correlates of reward processing in depressed and healthy preschool children: An ERP study of the reward positivity. *Journal of the American Academy of Child and Adolescent Psychiatry, 55,* 1081-1089*.* PMCID: PMC5131532.
c. Luking, K. R., Pagliaccio, D., Luby, J. L., **Barch, D. M**. (2016). Depression risk predicts blunted response to candy gains and enhanced responses to candy loses in healthy children. *Journal of the American Academy of Child and Adolescent Psychiatry, 55, 328-337.* PMCID: PMC4808567
d. Donohue, M. R., Whalen, D. J., Gilbert, K.E., Hennefield, L., **Barch, D. M**., & Luby, J. L.. (2019). Preschool depression: A diagnostic reality. *Current Psychiatry Reports, 21,* 128. PMCID: PMC7259424

3. Another major stream of my research has focused on focused on understand the nature and correlates of early suicidal ideation as well as treatment for early depression. We have shown that suicidal ideation emerging early in childhood predicts continuing suicidal ideation into school age. We have also found that early suicidal ideation is associated with family conflict and impulsivity, but unfortunately is not well addressed by treatments that effectively reduce early depression.

a. Whalen, D. J., Dixon-Gordon, K., Belden, A. C., **Barch, D. M.** & Luby, J. L. (2015). Correlates and consequences of preschool-onset suicidality. *Journal of the American Academy of Child and Adolescent Psychiatry, 54 (11),* 926-937. PMCID: PMC4677777
b. Luby, J.L., Whalen, D., Tillman, R., & **Barch, D. M.** (2019). Clinical and psychosocial characteristic of depressed young children with suicidal ideation. *Journal of the American Academy of Child Psychiatry, 58,* 117-127.
c. Whalen, D. **Barch, D.M.,** & Luby, J. L. (2018). Highlighting risk for suicide from a developmental perspective. *Clinical Psychology: Science and Practice, 25,* e12229*.*
d. DeVille, D. C., Whalen, D., Breslin, F. J., Morris, A. A., Khalsa, S. S., Paulus, M., P., & **Barch, D. M.** (2020). Predictors of suicidal ideation and behavior in children in the Adolescent Brain and Cognitive Development Study. *JAMA Network Open, 3, e1920956.* PMCID: PMC7261143

4) Another major focus of my work has been to examine how early environmental factors impact the develop of brain function and structures in children and adolescents. To date, we have focused on both the detrimental effects of poverty and early stress, and the ways in which familiar and maternal support may moderate or mediate such impacts. This work has shown that early poverty and stress alters the structure and function of the amygdala and the hippocampal, including the functional connectivity of these regions, and that such functional connectivity in part mediates the relationship of poverty to later internalizing psychopathology. Importantly, we have also seen that maternal support mediates some of these effects, in particular poverty relationships to hippocampal volume. We have also conducted several studies of the trajectory of brain development, showing that disruptions in puberty hormones and hippocampal development mediate the relationships between early poverty and later emotion regulation and depression deficits.

a. Luby, J. L., Belden, A., Botteron, K., Marrus, N., Harms, M. P., Babb, C., Nishino, T., & **Barch, D. M**. (2013). The effects of poverty on childhood brain development: The mediating effect of caregiving and stressful life events. *JAMA: Pediatrics, 167, 1135-1142.* PMCID: PMC4001721
b. **Barch, D. M**., *Pagliaccio, D., Belden, A., Harms, M. P., Gaffrey, M. S., Sylvester, C., Tilman, R., & Luby, J. L. (2016). Effect of hippocampal and amygdala connectivity on the relationship between preschool poverty and school-age depression. *American Journal of Psychiatry, 173,* 625-634. PMCID: PMC4932860
c. Luby, J. L., Tillman, R., Gilbert, K., & **Barch, D. M**. (2019). Association of timing of adverse life experiences and caregiver support in childhood: Regionally specific effects on brain development. *JAMA Open Network, 2*, e1911426. PMCID: PMC6751767

d. **Barch, D. M.,** Shirtcliff, E. A., *Elsayed, N. M., Whalen, D., Gilbert, K., Vogel., A. C., Tillman, R., & Luby, J. L. (2020). Testosterone and hippocampal trajectories mediate relationship of poverty to emotion dysregulation and depression: A longitudinal study. *Proceedings of the National Academy of Sciences, 117,* 22015-22023. PMCID: PMC7486761

Complete List of Published Work in MyBibliography:

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