OMB No. 0925-0001 and 0925-0002 (Rev. 09/17 Approved Through 03/31/2020)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Rachel Marsh, Ph.D.

eRA COMMONS USER NAME (credential, e.g., agency login): rm2205

POSITION TITLE: Irving Philips Professor of Medical Psychology (in 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 DateMM/YYYY | FIELD OF STUDY |
| --- | --- | --- | --- |
| Skidmore College, Saratoga Springs, NY | B.A. | 1997 | Psychology |
| City University of New York, New York, NY | Ph.D. | 2003 | Experimental Psychology |
| Department of Psychiatry, CUMC, New York, NY | Postdoctoral | 2006 | NIMH-Sponsored T32 Postdoctoral Research Fellowship in Developmental Psychobiology |
| Department of Psychiatry, CUMC, New York, NY | Postdoctoral | 2004 | NIMH-Sponsored T32 Postdoctoral Research Fellowship in Child and Adolescent Psychiatry |

**A. PERSONAL STATEMENT**

I am an experimental psychologist with expertise in the use of multimodal MRI techniquest to study developmental trajectories, uncover developmental alterations in childhood psychiatric disorders, and identify circuit-based targets for the development of novel treatment and prevention strategies. I direct the Cognitive Development and Neuroimaging Lab in the Department of Psychiatry at Columbia University Medical Center and MRI Research at the New York State Psychiatric Institute.

1. Marsh R, Gerber AJ, Peterson BS. Neuroimaging Studies of Normal Brain Development & Their Relevance for Understanding Childhood Neuropsychiatric Disorders. *Journal of the American Academy of Child and Adolescent Psychiatry,* 47/11: 1233-51, Nov 2008. PMCID: PMC2759682
2. Pagliaccio D, Cha J, He X, Cyr M, Yanes-Lukin P, Goldberg P, Fontaine M, Rynn MA, Marsh R. Structural neural markers of response to cognitive behavioral therapy in pediatric Obsessive-Compulsive Disorder, Journal of Child Psychology and Psychiatry, Dec 2019. doi:10.1111/jcpp.13191. PMCID – in Process.
3. Cyr M, Pagliaccio D, Yanes-Lukin P, Fontaine M, \*Rynn MA, \*Marsh R. Altered network connectivity predicts response to cognitive-behavioral therapy in pediatric Obsessive-Compulsive Disorder, Neuropsychopharmacology, NPP-19-0833R, PMCID – in Process.

**B. POSITIONS AND HONORS**

**Positions and Employment**

2006-2013 Assistant Professor in Clinical Psychology, Department of Psychiatry, Columbia University

Medical Center (CUMC)

2007-2011 Liaison Director for International Visiting Faculty in Child Psychiatry

2007-Present Training Faculty, “Research Training in Child Psychiatry” at CUMC (T32MH16434)

2013-Present Associate Professor of Medical Psychology, Department of Psychiatry, CUMC

2016-Present Director of MRI Research, the New York State Psychiatric Institute

**Honors, Awards, Leadership Positions, and Fellowships**

1997 Magna Cum Laude with Departmental Honors

1997 Psi Chi Honors Society

1999-2003 Teaching Fellowship in Psychology, CUNY

2002 Certification of Merit, MA Psychology Research Conference, New York University

2003-2006 NIMH-Sponsored Postdoctoral Fellow (T32MH16434), Department of Psychiatry, CUMC

2006-2011 NIMH Mentored Research Scientist Development Award (K01MH077652)

2007-2009 NARSAD Award

2007-2009 Award from the Sackler Institute of Developmental Psychobiology, CUMC

2013-Present Associate Member of the American College of Neuropsychopharmacology

2013-Present Member of the Society of Biological Psychiatry

2013-Present Member of the Operations Committee, MRI Unit, New York State Psychiatric Institute

2015-Present Co-Program Director of T32MH16434, Translational Research in Child Psychiatry

**C. Contribution to Science**

**1. Typical and atypical development of cognitive control circuits.** Learning to control behaviors that conflict with personal and societal norms is of paramount importance for the healthy psychological development of children. This is a component of their developing more generally a capacity for ‘self-regulatory control,’ and disturbances in the maturation of this capacity likely contribute to the development of a variety of psychiatric disorders in which children have difficulty regulating their thoughts, emotions, and behaviors. Thus, much of my work has focused on using fMRI to study the functioning of the neural circuits that support control processes over development in both healthy individuals and in children with obsessive-compulsive spectrum disorders. The studies listed below each involved the use of a Simon task to assess brain function during the engagement of cognitive control and, specifically, the resolution of cognitive conflict. I served as the primary investigator or co-investigator on all of these studies.

1. Marsh R, Zhu HT, Schultz R, Quackenbush G, Royal R, Skudlarski P, Peterson BS. A developmental fMRI study of self-regulatory control. *Human Brain Mapping*, 27/11: 848-863. 2006. PMCID: PMC2292452
2. Marsh R, Zhu H, Skudlarski P, Wang Z, Peterson BS. A developmental fMRI study of self-regulatory control in Tourette Syndrome. *American Journal of Psychiatry,* 164/6: 955-966. 2007. PMCID: PMC2291294
3. Marsh R, Maia T, Peterson BS. Functional disturbances within frontostriatal circuits across multiple childhood psychopathologies. *American Journal of Psychiatry,* 166(6), 664-74. 2009. PMCID: PMC2734479
4. Wang, Z., Maia, T. V., Marsh, R., Colibazzi, T., Gerber, A., & Peterson, B. S. The neural circuits that generate tics in Tourette's syndrome. American Journal of Psychiatry.; 168(12): 1326-1337. 2011. PMCID: [PMC4246702](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4246702/)

**2**. **Neural mechanisms underlying OCD.** Much of my work has focused on using MRI to study the function and connectivity of circuits underlying processes that are dysfunctional in adults and children with OCD, specifically control and reward processes. My use of the Simon task in unmedicated adults with OCD precipitated my use of this task to study control processes in children and adolescents with OCD (R21MH104648), and I am now investigating whether these processes and circuits can be used as targets for treatments (R01MH104648). I am an active member of the ENIGMA-OCD Workgroup, an international consortium of 32 research groups focused on the study of OCD and as such, my data from OCD participants were included in large meta- and mega-analyses.

1. Marsh R, Horga G, Parashar N, Wang Z, Peterson BS, Simpson HB. Altered activation in fronto-striatal circuits during sequential processing in unmedicated adults with obsessive-compulsive disorder. *Biological Psychiatry,* 75 (8) 615-22. 2014. PMCID: PMC3722261.
2. ENIGMA-OCD Workgroup. Distinct subcortical volume alterations in pediatric and adult OCD: A worldwide meta- and mega-analysis. American Journal of Psychiatry. 2016 Sep 9; appiajp201616020201. [Epub ahead of print]
3. Marsh R, Tau GZ, Wang Z, Huo Y, Liu G, Packard MJ, Peterson BS, Simpson HB. Reward-based spatial learning in unmedicated adults with Obsessive-Compulsive Disorder. *American Journal of Psychiatry*. 172(4): 383-92 April 2015. PMCID: PMC4382407.
4. Pagliaccio D, Middleton R, Hezel D, Steinman S, Snorrason I, Gershkovich M, Campeas R, Pinto A, Van Meter P, Simpson HB, Marsh R. Task-based fMRI predicts response and remission to exposure therapy in Obsessive-Compulsive Disorder, *Proceedings of the National Academy of Sciences*, 116(41): 20346-20353. 2019. PMCID – in Process.

**3. Cognitive control circuits in Bulimia Nervosa** I was first to study the function and structure of the neural circuits that support control processes in adolescents with eating disorders, particularly Bulimia Nervosa (BN). My multi-modal imaging findings suggest that these processes are impaired in both adult and adolescent females with BN due to functional and anatomical disturbances in fronto-striatal and fronto-parietal circuits. These disturbances likely contribute to their inability to control eating behaviors. I served as the primary investigator on all of these studies.

1. Marsh R, Steinglass JE, Gerber AJ, O’Leary KG, Wang z, Walsh BT, Peterson BS. Deficient activity in the neural systems that mediate self-regulatory control in Bulimia Nervosa. *Archives of General Psychiatry*, 66/1: 51-63. 2009. PMCID: PMC2759684
2. Marsh R, Horga G, Wang Z, Wang P, Klahr KW, Berner LA, Walsh BT, Peterson BT. An fMRI study of self-regulatory control and conflict resolution in adolescents with Bulimia Nervosa. *American Journal of Psychiatry*, 168 (11): 1210-20. 2011. PMCID: PMC3328859.
3. Marsh R, Stefan, M, Bansal R, Hao X, Walsh BT, Peterson BS. Anatomical characteristics of the cerebral surface in bulimia nervosa, *Biological Psychiatry,* 77 (7): 616-23. 2015. PMCID: PMC3933456.
4. He X, Stefan M, Terranova K, Steinglass J, Marsh R. Altered white matter microstructure in adolescents and adults with Bulimia Nervosa. *Neuropsychopharmacology,* 41(7): 1841-48. 2016. PMCID: PMC4869053.

**Complete List of Published Work in My Bibliography:** <http://www.ncbi.nlm.nih.gov/sites/myncbi/rachel.marsh.1/bibliography/41155130/public/?sort=date&direction=ascending>.

**D. Additional Information: Research Support and/or Scholastic Performance**

Ongoing Research Support

1R01MH115024 Marsh & Fitzgerald (Co-PIs) 07/01/2018-06/30/2022

Task-control Circuits as Targets for Obsessive Compulsive Behaviors in Children

The goal of this study is to pinpoint the specific cognitive control processes and task control circuits that change with changes in obsessive-compulsive symptoms in young children (ages 6 to 12 years).

1R01MH117983 Marsh, Spann, & Monk (Co-PIs) 07/01/2018-06/30/2023

Intergenerational Transmission of Deficits in Self-Regulatory Control

This study will identify circuit-based markers of regulatory deficits that are passed inter-generationally and persist from infancy to childhood, setting the stage for future research aimed at engaging these circuits as targets for prevention strategies

NIMH, 2 T32 MH016434-36 Marsh & Veenstra-Vanderweele(Co-PDs) 07/01/2015-06/30/2020

Translational Research Training in Child Psychiatry

This training program will produce translational scientists who study the causal pathways

underlying psychiatric symptoms and improve the treatment of neurodevelopmental illnesses. Our integrated

training program will launch neuroscience-oriented clinician-scientists and translationally-oriented basic

neuroscientists, all of whom will carry a cross-disciplinary perspective forward into their independent careers.

Completed Research Support

1R01MH104648 Marsh & Simpson (Co-PIs) 04/01/2014-03/31/2018

Control and Reward Circuits as Targets for Repetitive Behaviors

The aim of this study is to identify changes in specific neural circuits that are associated with changes in symptoms in individuals with Obsessive-compulsive disorder.

R01MH090062-01A1 Marsh (PI) 07/01/2011-05/31/2018

A Longitudinal Multimodal MRI Study of Adolescents with Bulimia Nervosa

The goal of this project is to assess changes in the structure, function, and connectivity of frontostriatal circuits in adolescents with Bulimia Nervosa that contribute to illness persistence.

R21MH101441-01A1 Marsh & Rynn (Co-PIs) 06/1/2014-4/31/2016

The Functioning of Overlapping Frontostriatal Circuits in Children with OCD

In this project we are assessing the functioning of the neural circuits that support cognitive control, habit learning, and reward processing in un-medicated children (ages 6-12) with Obsessive-Compulsive Disorder.