

Naomi P. Friedman

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Employment

August 2013 – present Assistant Professor
University of Colorado Boulder
Institute for Behavioral Genetics
Department of Psychology and Neuroscience

2008 – 2013 Senior Research Associate
University of Colorado Boulder
Institute for Behavioral Genetics

2002 – 2008 Research Associate
University of Colorado Boulder
Institute for Behavioral Genetics

Education

2002 – 2005 Postdoctoral Trainee (HD007289) in Behavior Genetics
University of Colorado Boulder
Institute for Behavioral Genetics
Supervisor: Dr. John Hewitt

1996 – 2002 Ph.D. (2002) and M.A. (1998) in Cognitive Psychology
University of Colorado at Boulder
Advisor: Dr. Akira Miyake
Dissertation: *The Relations Among Inhibition and Interference Control Processes: A Latent Variable Analysis*
Thesis: *Differential Roles for Spatial and Verbal Working Memory in the Comprehension of Spatial Descriptions*

1992 – 1996 B.A. with highest honors in Psychology
University of Texas at Austin
Honor's Advisor: Dr. Philip Gough
Honor's Thesis: *The Role of World Knowledge in Concept Combination*

Honors, Awards, and Fellowships

1998 – 2001	National Science Foundation Graduate Research Fellowship
2000	University of Colorado Psychology Department Dozier Award
1998	University of Colorado Beverly Sears Dean's Small Grant
1996 (lifetime)	Phi Beta Kappa Honor Society
1992 – 1996	National Merit Scholarship

Research Interests

Specifying the mechanisms (both neural and genetic) underlying individual differences in executive functions -- the higher-level cognitive processes that regulate lower-level processes and thereby enable control over thoughts and actions -- and their relations to everyday self-regulation as well as various forms of psychopathology. I use a variety of approaches, including twin studies, neuroimaging, and computational modeling.

Current research projects:

- Genetic and environmental structure of executive functions, including longitudinal analyses of stability and change.
- fMRI imaging of multiple executive functions with a focus on the neural substrates of individual differences in performance.
- Phenotypic and genetic relations of executive functions to self-regulation abilities, drug use, and psychopathology (e.g., depression).
- Effects of marijuana use in adolescence and adulthood on cognitive ability.
- Computational modeling of the biological mechanisms underlying individual differences in executive functions.
- Relation of implicit racial bias to executive control.

Grants

Active:

R01 MH063207 (Hewitt)	02/15/14 – 1/31/19	3.0 summer
NIH/NIMH	\$2,250,000 (total costs)	
Role: Co-Investigator		

Neural Substrates of Executive Function: An fMRI Twin Study

The primary goals of this fMRI twin study (projected $N = 640$) are to determine whether the activity of particular neural circuits are associated with individual differences in executive functions, assess the genetic and environmental etiologies of individual differences in these neural indices, and examine whether the identified neural circuits mediate the relations between executive functions and current symptoms of psychopathology.

R01 HD068728-01 (Willcutt/Petrill)	04/15/11 – 01/31/16	1.2 calendar
NIH/NICHD	\$2,949,455 (total costs)	
Role: Co-Investigator		

Etiology and Neuropsychology of Math, Reading, ADHD, and Their Covariation

Reading disability, math disability, and attention-deficit/hyperactivity disorder are common disorders of childhood that often co-occur due to unknown causes. This study will administer measures of neuropsychological functioning to two large longitudinal studies of twins to assess the genetic, environmental, and neuropsychological factors that lead to stability and change in each disorder and the specific factors that lead to their frequent co-occurrence.

R21 MH102210-01A1 (Hankin) 07/01/14 – 06/30/16 1.0 calendar
 Subcontract to Institute for Behavioral Genetics (Friedman)
 NIH/NIMH \$687,072 (total costs), \$10,240 (sub only)

Links among adolescent executive function, effortful control and psychopathology

The proposed research will 1) examine the extent to which two distinct ways of assessing cognitive control, executive function task performance and the temperament dimension of effortful control may be interchangeable markers of the same latent construct, or separable, but related latent constructs; and 2) investigate the extent to which cognitive control, as conceptualized and assessed by multiple measures of executive function and effortful control, is broadly related to adolescent psychopathology (transdiagnostic) or relatively specific to common forms of psychopathological symptoms (depression, anxiety, ADHD).

Consultant / Advisory Board:

R01 AA023974 01 (Vrieze) 09/25/14 – 08/30/17
 NIH/NIAAA \$1,703,861 (total costs)
 Role: Consultant

Social Media, Online Measures, and Substance Use Development in Adolescent Twins

The grant will investigate if and how social media exposure may relate to substance use and dependence, how this relationship evolves during adolescence, and the etiological sources of individual differences in this relationship in a sample of adolescent twins from Colorado.

HRD-1251590 (Ito) 09/01/13 – 08/31/16 0.1 academic
 NSF \$1,030,439 (total costs)
 Role: Advisory Board

Broadening Women's Participation in STEM: The Critical Role of Belonging

The purpose of the grant is to examine whether gender differences in belonging in part underlie gender differences in the representation and achievement within STEM, and importantly, what factors account for such belonging differences and how belonging affects academic outcomes.

Completed:

R01 MH063207 (Hewitt) 09/01/08 – 05/31/13 2.25 calendar
 NIH/NIMH \$1,873,084 (total costs)
 Role: Co-Investigator

Executive Functions and Self-Regulation: A Twin Study

This study examined genetic and environmental contributions to stability and change in executive functions during the transition from adolescence to young adulthood; the relations among self-regulation abilities in three domains as well as the genetic and environmental etiologies of individual differences in these self-regulation abilities in early adulthood; and the relationship between executive functions and self-regulation in early adulthood.

P50 MH079485 (Banich) 04/22/08 – 01/31/13 6.59 calendar
 NIH/NIMH \$968,982 (total subcontract)
 Role: Co-I of Project 4

IBSC: Determinants of Executive Function and Dysfunction: Project 4: Genetic Mechanisms of Executive Functions

The goal of this project was to use molecular genetic analyses in concert with computational modeling to begin to specify in more detail the biological substrates of individual differences in three correlated but separable executive functions: inhibiting prepotent responses, updating working memory, and shifting mental sets.

BCS-0847872 (Ito) 07/15/09 – 06/30/12 1.0 calendar
 NSF \$789,339 (total costs)
 Role: Co-PI

Collaborative Research: Individual Differences in Executive Functions and Expressions of Racial Biases

The goal of this study was to examine the role of executive control in individual differences in the expression of racial biases. Participants from three universities completed an executive function battery and measures of racial bias, including explicit, implicit, and motivation measures.

R01 HD050346 (Rhee) 09/01/07 – 06/30/12 0.96 calendar
 NIH/NICHD \$1,562,272 (total costs)
 Role: Co-Investigator

Testing a Developmental Model of Conduct Problems

The main goal of this study is to examine existing data from the Colorado Longitudinal Twin Study to test the developmental propensity model, which advances specific and testable hypotheses regarding the causes of conduct problems.

Friedman PI 03/01/07 – 02/29/09 0.6 calendar
 Henry Ford Hospital Sleep Center \$152,313 (total costs)

Individual Differences in Sleep Problems

The purpose of this project was to obtain preliminary information on insomnia and other sleep problems, as well as possibly related risk factors (e.g., stressful life events), in two large twin samples. The data will enable analyses on the etiology of these problems and their relations to the risk factors, as well as other analyses using a wide range of existing data already collected on these samples.

R03 MH075814 (Friedman) 06/01/06 – 05/31/08 6.84 calendar
 NIH/NIMH \$146,849 (total costs)
 Role: PI

Longitudinal Effects of Sleep Problems on Cognition

This project examined developmental patterns of sleep problems from ages 4 to 17, and their relations to concurrent and later cognitive abilities, including multiple executive functions.

R56 MH063207 (Hewitt)

06/01/07 – 05/31/08

3.0 calendar

NIH/NIMH

\$489,934 (total costs)

Role: Co-Investigator

Executive Functions and Self-Regulation: A Twin Study

Bridge funding for R01 MH063207.

Publications

*indicates senior authorship

Published and In-press Journal Papers:

1. Ito, T. A., **Friedman, N. P.**, Bartholow, B. D., Correll, J., Altamirano, L. J., Loersch, C., & Miyake, A. (2015). Toward a comprehensive model of executive cognitive function in implicit racial bias. *Journal of Personality and Social Psychology, 108*, 187-218. PMID: PMC4354845.
2. Vargas, I., **Friedman, N. P.**, & Drake, C. L. (2015). Vulnerability to stress-related sleep disturbance and insomnia: Investigating the link with comorbid depressive symptoms. *Translational Issues in Psychological Science, 1*, 57-66. PMID: NIHMS640170.
3. Reineberg, A. E., Andrews-Hanna, J. R., Depue, B., **Friedman, N. P.**, & Banich, M. T. (2015). Resting-state networks predict individual differences in common and specific aspects of executive function. *NeuroImage, 104*, 69-78. PMID: PMC4262251.
4. Drake, C., Vargas, I., Roth, T., & **Friedman, N. P.** (2015). Quantitative measures of nocturnal insomnia symptoms predict greater deficits across multiple daytime impairment domains. *Behavioral Sleep Medicine, 31*, 73-87. PMID: PMC4161662.
5. *Johnson, D. P., Whisman, M. A., Corley, R. P., Hewitt, J. K., & **Friedman, N. P.** (2014). Genetic and environmental influences on rumination and its covariation with depression. *Cognition and Emotion, 27*, 1270-1286. PMID: PMC4111768.
6. *Herd, S. A., O'Reilly, R. C., Hazy, T. E., Chatham, C. H., Brant, A. M., & **Friedman, N. P.** (2014). A neural network model of individual differences in task switching abilities. *Neuropsychologia, 62*, 375-389. PMID: PMC4167201.
7. Smith, A. K., Patel, D., Corley, R. C., **Friedman, N. P.**, Hewitt, J. K., Robinson, J. L., & Rhee, S. H. (2014). Testing alternative hypotheses regarding the association between behavioral inhibition and language skills in toddlerhood. *Child Development, 85*, 1569-1585. PMID: PMC4107130.
8. *Gustavson, D. E., Miyake, A., Hewitt, J. K., & **Friedman, N. P.** (2014). Genetic relations among procrastination, impulsivity, and goal-management ability: Implications for the evolutionary origin of procrastination. *Psychological Science, 25*, 1178-1188. PMID: PMC4185275.
9. Rhee, S. H., Boeldt, D. L., **Friedman, N. P.**, Corley, R. P., Hewitt, J. K., Young, S. E., Knafo, A., Robinson, J., Waldman, I. D., Van Hulle, C., & Zahn-Waxler, C. (2013). The role of language in Concern and Disregard for Others in the first years of life. *Developmental Psychology, 49*, 197-214. PMID: PMC3410981.

10. Rhee, S. H., **Friedman, N. P.**, Boeldt, D. L., Corley, R. P., Hewitt, J. K., Knafo, A., Lahey B. B., Robinson, J., Van Hulle, C., Waldman, I. D., Young, S. E., & Zahn-Waxler, C. (2013). Early concern and disregard for others as predictors of antisocial behavior. *Journal of Child Psychology and Psychiatry*, *54*, 157-166. PMID: PMC3547395.
11. Smith, A. K., Rhee, S. H., Corley, R. P., **Friedman, N. P.**, Hewitt, J. K., & Robinson, J. L. (2012). The magnitude of genetic and environmental influences on parental and observational measures of behavioral inhibition and shyness in toddlerhood. *Behavior Genetics*, *42*, 764-777. PMID: PMC3443291.
12. Miyake, A., & **Friedman, N. P.** (2012). The nature and organization of individual differences in executive functions: Four general conclusions. *Current Directions in Psychological Science*, *21*, 8-14. PMID: PMC3388901.
13. Rhee, S. H., Corley, R. P., **Friedman, N. P.**, Hewitt, J. K., Hink, L. K., Johnson, D. P., Robinson, J., Smith, A. K., & Young, S. E. (2012). The etiology of observed negative emotionality from 14 to 24 months. *Frontiers in Genetics*, *3*, 1-10. PMID: PMC3270250.
14. Godinez, D. A., **Friedman, N. P.**, Rhee, S. H., Miyake, A., & Hewitt, J. K. (2012). Phenotypic, genetic and environmental structure of the Wisconsin Card Sorting Task errors. *Behavior Genetics*, *42*, 209-220. PMID: PMC3392210.
15. *Chatham, C. H., Brant, A. M., Herd, S. A., Hazy, T. E., Miyake, A., O'Reilly, R. C., & **Friedman, N. P.** (2011). From the executive network to executive functions: A PBWM neural network model of the n-back task. *Journal of Cognitive Neuroscience*, *23*, 3598-3619. PMID: PMC3269304.
16. Drake, C. L., **Friedman, N. P.**, Wright, K. P., Jr., & Roth, T. R. (2011). Sleep reactivity and insomnia: Genetic and environmental influences. *Sleep*, *34*, 1179-1188. PMID: PMC3157659.
17. **Friedman, N. P.**, Miyake, A., Robinson, J. L., & Hewitt, J. K. (2011). Developmental trajectories in toddlers' self-restraint predict individual differences in executive functions 14 years later: A behavioral genetic analysis. *Developmental Psychology*, *47*, 1410-1430. PMID: PMC3168720.
18. **Friedman, N. P.**, Corley, R. P., Hewitt, J. K. & Wright, K. P. Jr. (2009). Individual differences in childhood sleep problems predict later cognitive executive control. *Sleep*, *32*, 323-333. PMID: PMC2647786.
19. Young, S. E., **Friedman, N. P.**, Miyake, A., Willcutt, E. G., Corley, R. P., Haberstick, B. C., & Hewitt, J. K. (2009). Behavioral disinhibition: Liability for externalizing spectrum disorders and its genetic and environmental relation to response inhibition across adolescence. *Journal of Abnormal Psychology*, *118*, 117-130. PMID: PMC2775710.
20. **Friedman, N. P.**, Miyake, A., Young, S. E., DeFries, J. C., Corley, R. P., & Hewitt, J. K. (2008). Individual Differences in executive functions are almost entirely genetic in origin. *Journal of Experimental Psychology: General*, *137*, 201-225. PMID: PMC2762790.
21. **Friedman, N. P.**, Haberstick, B. C., Willcutt, E. G., Miyake, A., Young, S. E., Corley, R. P., & Hewitt, J. K. (2007). Greater attention problems during childhood predict poorer executive functioning in late adolescence. *Psychological Science*, *18*, 893-900.
22. Timberlake, D. S., Hopper, C. J., Rhee, S. H., **Friedman, N. P.**, Haberstick, B. C., Lessem, J. M., &

- Hewitt, J. K. (2007). College attendance and its effect on drinking behaviors in a longitudinal study of adolescents. *Alcoholism: Clinical and Experimental Research*, *31*, 1020-1030. [PMID: 17403064].
23. **Friedman, N. P.**, Miyake, A., Corley, R. P., Young, S. E., DeFries, J. C., & Hewitt, J. K. (2006). Not all executive functions are related to intelligence. *Psychological Science*, *17*, 172-179.
 24. **Friedman, N. P.**, & Miyake, A. (2005). Comparison of four scoring methods for the reading span test. *Behavior Research Methods*, *37*, 581-590.
 25. **Friedman, N. P.**, & Miyake, A. (2004). The reading span test and its predictive power for reading comprehension ability. *Journal of Memory and Language*, *51*, 136-158.
 26. **Friedman, N. P.**, & Miyake, A. (2004). The relations among inhibition and interference control processes: A latent variable analysis. *Journal of Experimental Psychology: General*, *133*, 101-135.
 27. Miyake, A., **Friedman, N. P.**, Rettinger, D. A., Shah, P., & Hegarty, M. (2001). How are visuospatial working memory, executive functioning, and spatial abilities related? A latent variable analysis. *Journal of Experimental Psychology: General*, *130*, 621-640.
 28. Miyake, A., **Friedman, N. P.**, Emerson, M. J., Witzki, A. H., However, A., & Wager, T. (2000). The unity and diversity of executive functions and their contributions to complex "frontal lobe" tasks: A latent variable analysis. *Cognitive Psychology*, *41*, 49-100.
 29. Miyake, A., Emerson, M. J., & **Friedman, N. P.** (2000). Assessment of executive functions in clinical settings: Problems and recommendations. *Seminars in Speech and Language*, *21*, 169-183.
 30. **Friedman, N. P.**, & Miyake, A. (2000). Differential roles for visuospatial and verbal working memory in situation model construction. *Journal of Experimental Psychology: General*, *129*, 61-83.
 31. Miyake, A., Emerson, M. J., & **Friedman, N. P.** (1999). Good interactions are hard to find. *Behavioral and Brain Sciences*, *22*, 108-109. Invited commentary on D. Caplan & G. S. Waters, Verbal working memory and sentence comprehension. *Behavioral and Brain Sciences*, *22*, 77-126.

Book Chapters:

1. Miyake, A., & **Friedman, N. P.** (1998). Individual differences in second language proficiency: Working memory as "language aptitude." In A. F. Healy & L. E. Bourne, Jr. (Eds.), *Foreign language learning: Psycholinguistic studies on training and retention* (pp. 339-364). Mahwah, NJ: Erlbaum.

Manuscripts Submitted for Publication:

1. **Friedman, N. P.**, Herd, S. A., Hazy, T. E., Chatham, C. H., Kriete, T. E., Brant, A. M., & O'Reilly, R. C. (2015). *Neural network models of individual differences in executive functions*. Manuscript submitted for publication.
2. Gustavson, D. E., Miyake, A., Hewitt, J. K., & **Friedman, N. P.** (2015). *Understanding the cognitive and genetic underpinnings of procrastination: Evidence for shared genetic influences with goal management and executive function abilities*. Manuscript submitted for publication.
3. **Friedman, N. P.**, Miyake, A., Altamirano, L. J., Rhea, S. A., Corley, R. P., Young, S. E., & Hewitt, J. K.

(2015). *Stability and change in executive function abilities from late adolescence to early adulthood: A longitudinal twin study*. Manuscript submitted for publication.

Manuscripts in Preparation:

1. **Friedman, N. P.**, Rhee, S. H., Corley, R. C., Lessem, J. M., Hewitt, J. K., & Hopfer, C. J. (in preparation). *Marijuana use and impaired cognitive ability*.
2. **Friedman, N. P.**, Altamirano, L. J., Miyake, A., Corley, R. P., & Hewitt, J. K. (in preparation). *Relations between depression symptoms and executive functions across a ten-year period*.
3. Rhee, S. H., Friedman, N. P., Corley, R. P., Hewitt, J. K., Hink, L., Johnson, D. P., Smith Watts, A. K., Robinson, J., Waldman, I. D., & Zahn-Waxler, C. (in preparation). *An examination of the developmental propensity model of conduct problems*.
4. Johnson, D. P., Rhee, S. H., **Friedman, N. P.**, Corley, R. P., Munn-Chernoff, M. A., Hewitt, J. K., & Whisman, M. A. (in preparation). *A twin study examining rumination as a transdiagnostic risk factor for psychopathology*.

Conference Presentations

Presented:

1. **Friedman, N. P.**, Gustavson, D. E., Corley, R. P., Stallings, M. C., & Hewitt, J. K. (June, 2015). *Stability and change in the relations among executive functions and substance use and dependence from late adolescence to early adulthood*. Talk to be presented at the 45th annual meeting of the Behavior Genetics Association, San Diego, CA.
2. **Friedman, N. P.**, Rhee, S. H., Corley, R. P., Lessem, J. M., Stallings, M. C., Young, S. E., Wadsworth, S. J., & Hewitt, John K. (June, 2014). *Marijuana use and impaired cognitive ability*. Talk presented at the 44th annual meeting of the Behavior Genetics Association, Charlottesville, VA.
3. **Friedman, N. P.**, & Hewitt, J. K. (June, 2013). *Do working memory span and updating tasks measure the same thing? A twin study*. Talk presented at the 43rd annual meeting of the Behavior Genetics Association, Marseille, France.
4. **Friedman, N. P.**, Altamirano, L. J., Miyake, A., Young, S. E., Corley, R. P., & Hewitt, J. K. (June, 2012). Etiology of stability and change in executive functions from late adolescence to adulthood. *Behavior Genetics*, 42, 934-934. Talk presented at the 42nd annual meeting of the Behavior Genetics Association, Edinburgh, Scotland.
5. **Friedman, N. P.**, Roth, T., Wright, K. P., & Drake, C. L. (June 2009). Genetic and environmental relations between insomnia and intrusive thinking: The contribution of sleep reactivity to stress. *Sleep*, 32, A255-A255, Suppl. S. Talk presented at the 23rd annual meeting of the Associated Professional Sleep Societies, Seattle, WA.
6. **Friedman, N. P.**, Miyake, A., Young, S. E., Haberstick, B. C., Willcutt, E. G., & Hewitt, J. K. (January 2009). *Executive functions in the longitudinal twin study*. Poster presented at the 1st annual Conference on Executive Function, Boulder, CO.

7. **Friedman, N. P.**, Roth, T., Wright, K. P., & Drake, C. L. (June 2008). Sleep reactivity to stress and insomnia: Genetic and environmental contributions. *Sleep*, *31*, A231-A231. Talk presented at the 22nd annual meeting of the Associated Professional Sleep Societies, Baltimore, MA.
8. **Friedman, N. P.**, & Wright, K. P. (June 2008). Individual differences in childhood sleep problems predict cognitive executive functioning in late adolescence. *Sleep*, *31*, A371-A371. Talk presented at the 22nd annual meeting of the Associated Professional Sleep Societies, Baltimore, MA.
9. **Friedman, N. P.**, Miyake, A., Hewitt, J. K., Young, S. E., DeFries, J. C., & Corley, R. (November 2003). *The relations between specific and general executive function abilities, IQ, and working memory: A latent variable analysis*. Poster presented at the 42nd annual meeting of the Psychonomic Society, Vancouver, Canada.
10. **Friedman, N. P.**, & Miyake, A. (November 2002). *The relations among inhibition and interference control processes: A latent variable analysis*. Poster presented at the 41st annual meeting of the Psychonomic Society, Kansas City, MO.
11. Miyake, A., **Friedman, N. P.**, Emerson, M. J., Witzki, A. H., Howerter, A., & Wager, T. (June 1999). *The unity and diversity of executive functions: A latent variable approach*. Poster presented at the 11th annual meeting of the American Psychological Society, Denver, CO.
12. **Friedman, N. P.**, & Miyake, A. (November 1998). *Differential roles for visuospatial and verbal working memory in situation model construction*. Poster presented at the 37th annual meeting of the Psychonomic Society, Dallas, TX.

Contributed:

1. Gustavson, D. E., Miyake, A., Hewitt, J. K., & **Friedman, N. P.** (June, 2015). *Understanding the cognitive and genetic underpinnings of procrastination: Evidence for shared genetic Influences with goal management and executive function abilities*. Talk to be presented by Dan Gustavson at the 45th annual meeting of the Behavior Genetics Association, San Diego, CA.
2. Woodward, K. E., Corley, R. P., **Friedman, N. P.**, Hatoum, A. S., Hewitt, J. K., Huibregtse, B., Rhee, S. H., & Stallings, M. C. (June, 2015). *Child language development and later alcohol use behaviors*. Talk to be presented by Kerri Woodward at the 45th annual meeting of the Behavior Genetics Association, San Diego, CA.
3. Hatoum, A. S., Rhee, S. H., Corley, R. P., Hewitt, J. K., & **Friedman, N. P.** (June, 2015). *Genetic variance in executive functioning accounts for some of the comorbidity in internalizing and externalizing behavior*. Talk to be presented by Alexander Hatoum at the 45th annual meeting of the Behavior Genetics Association, San Diego, CA.
4. Benca, C., Derringer, J., Corley, R. P., Hewitt, J. K., & **Friedman, N. P.** (June, 2015). *Predicting neural correlates of executive functioning with genetic risk scores for psychiatric disorders*. Talk to be presented by Chelsie Benca at the 45th annual meeting of the Behavior Genetics Association, San Diego, CA.
5. Gustavson, D. E., Miyake, A., Hewitt, J. K., & **Friedman, N. P.** (June, 2014). *Genetic relations among procrastination, impulsivity, and goal-management ability*. Talk presented by Dan Gustavson at the 44th annual meeting of the Behavior Genetics Association, Charlottesville, VA.

6. Benca, C., Derringer, J., Corley, R. P., Hewitt, J. K., & **Friedman, N. P.** (June, 2014). *Predicting executive functioning with genetic risk scores for psychiatric disorders*. Talk presented by Chelsie Benca at the 44th annual meeting of the Behavior Genetics Association, Charlottesville, VA.
7. Woodward, K. E., Boeldt, D. L., Corley, R. P., DiLalla, L. F., **Friedman, N. P.**, Hewitt, J. K., Mullineaux, P., Robinson, J. L., & Rhee, S. H. (June, 2014). *Gene-environment correlation as predictive of positive parenting behaviors*. Talk presented by Kerri Woodward at the 44th annual meeting of the Behavior Genetics Association, Charlottesville, VA.
8. Gustavson, D. E., Miyake, A., Hewitt, J. K., & **Friedman, N. P.** (March, 2014). *Genetic relations among procrastination, impulsivity, and goal-management ability: Implication for the evolutionary origin of procrastination*. Poster presented by Dan Gustavson at the 2014 International Workshop on Statistical Genetic Methods for Human Complex Traits, Boulder, CO.
9. Kerr, G. T., Altamirano, L. J., **Friedman, N. P.**, Miyake, A., Correll, J., Bartholow, B. D., & Ito, T. A. (February, 2014). *Understanding conflict monitoring during an implicit racial bias task: The relationship between error-related negativities, executive functioning, and control*. Poster presented by Geoffrey Kerr at the 15th annual meeting of the Society for Personality and Social Psychology, Austin, TX.
10. Smith, A. K., Rhee, S. H., **Friedman, N. P.**, Corley, R. P., Hewitt, J. K., & Robinson, J. (June, 2013). *The longitudinal association between temperament in toddlerhood and executive functions in late adolescence*. Talk presented by Ashley Smith at the 43rd annual meeting of the Behavior Genetics Association, Marseille, France.
11. Altamirano, L. J., Hewitt, J. K., & **Friedman, N. P.** (June, 2013). *Phenotypic and genetic relationships among short-term memory, working memory, and intelligence*. Poster presented by Lee Altamirano at the 43rd annual meeting of the Behavior Genetics Association, Marseille, France.
12. Benca, C., **Friedman, N. P.**, Derringer, J., Corley, R. P., Young, S. E., & Hewitt, J. K. (June, 2013). *Predicting individual differences in executive functions with a genetic risk score for behavioral disinhibition*. Poster presented by Chelsie Benca at the 43rd annual meeting of the Behavior Genetics Association, Marseille, France.
13. Smith, A. K., Rhee, S. H., **Friedman, N. P.**, Corley, R. P., Hewitt, J. K., Hink, L., & Robinson, J. (April, 2013). *The Developmental association between temperament and self-restraint in toddlerhood*. Poster presented by Ashley Smith at the 2013 biennial meeting of the Society for Research in Child Development, Seattle, WA.
14. Kerr, G. T., Altamirano, L. J., **Friedman, N. P.**, Miyake, A., Correll, J., Bartholow, B. D., & Ito, T. A. (January, 2013). *Making an effort: 1/f noise in a racial bias task correlates with executive function and motivation to control prejudice*. Poster presented by Geoffrey Kerr at the 14th annual Meeting of the Society for Personality and Social Psychology, New Orleans, LA.
15. Hink, L. K., Rhee, S. H., Smith, A. K., Corley, R. P., **Friedman, N. P.**, Hewitt, J. K., & Robinson, J. (June, 2012). Genetic and environmental influences on the association between temperament in toddlerhood and personality in adolescence. *Behavior Genetics*, 42, 938-938. Talk presented by Laura Hink at the 42nd annual meeting of the Behavior Genetics Association, Edinburgh, Scotland.
16. Johnson, D. P., Whisman, M. A., Miyake, A., Altamirano, L. J., Hewitt, J. K., & **Friedman, N. P.** (June,

- 2012). Genetic and environmental influences on rumination and depression. *Behavior Genetics*, *42*, 942-942. Talk presented by Daniel Johnson at the 42nd annual meeting of the Behavior Genetics Association, Edinburgh, Scotland.
17. Rhee, S. H., Corley, R. P., **Friedman, N. P.**, Hewitt, J. K., Hink, L. K., Johnson, D. P., Lahey, B. B., Robinson, J., Smith, A. K., Waldman, I. D., Young, S. E., & Zahn-Waxler, C. (June, 2012). Testing a developmental propensity model of conduct problems. *Behavior Genetics*, *42*, 963-964. Talk presented by Soo Rhee at the 42nd annual meeting of the Behavior Genetics Association, Edinburgh, Scotland.
 18. Smith, A. K., Rhee, S. H., **Friedman, N. P.**, Corley, R. P., Hewitt, J. K., & Robinson, J. (June, 2012). Genetic and environmental influences on the association between temperament and self-restraint in toddlerhood. *Behavior Genetics*, *42*, 968-968. Talk presented by Ashley Smith at the 42nd annual meeting of the Behavior Genetics Association, Edinburgh, Scotland.
 19. Vandever, J. M., **Friedman, N. P.**, Corley, R. P., Miyake, A., Young, S. E., Hewitt, J. K., & Stallings, M. C. (June, 2012). The role of executive functioning in the progression from substance use to dependence. *Behavior Genetics*, *42*, 974-974. Poster presented by Joanna Vandever at the 42nd annual meeting of the Behavior Genetics Association, Edinburgh, Scotland.
 20. Kerr, G. T., Altamirano, L. J., **Friedman, N. P.**, Miyake, A., Correll, J., Bartholow, B. D., & Ito, T. A. (January, 2012). *Executive function predicts controlled processing during implicit racial bias tasks*. Poster presented by Geoffrey Kerr at the 13th annual Meeting of the Society for Personality and Social Psychology, San Diego, CA.
 21. Ito, T. A., Correll, J., Bartholow, B. D., **Friedman, N. P.**, Miyake, A., & Altamirano, L. J. (January 2012). *Implicit racial bias is more than automatic associations: The role of executive function*. Talk presented by Tiffany Ito at the 13th annual meeting of the Society of Personality and Social Psychology, San Diego, CA.
 22. Vandever, J. M., **Friedman, N. P.**, Young, S. E., Miyake, A., Corley, R. P., Hewitt, J. K., & Stallings, M. C. (September 2011). *From regular substance use to substance dependence: The role of executive functioning and related genetic influences*. Poster presented by Joanna Vandever at the XIXth World Congress on Psychiatric Genetics, Washington, DC.
 23. Smith, A. K., Rhee, S. H., Corley, R. P., **Friedman, N. P.**, Hewitt, J. K., Hink, L., & Robinson, J. L. (June 2011). The magnitude of genetic and environmental influences on parental and observational measures of behavioral inhibition in toddlerhood. *Behavior Genetics*, *41*, 936-936. Talk presented by Ashley Smith at the 41st annual meeting of the Behavior Genetics Association, Newport, RI.
 24. Rhee, S. H., Boeldt, D. L., Corley, R. P., DiLalla, E., **Friedman, N. P.**, Hewitt, J. K., Lahey, B. B., Mullineaux, P., Robinson, J. L., Smith, A. K., Waldman, I., & Young, S. E. (June 2011). The role of early cognitive ability and positive parenting on antisocial behavior. *Behavior Genetics*, *41*, 933-933. Talk presented by Soo Rhee at the 41st annual meeting of the Behavior Genetics Association, Newport, RI.
 25. Herd, S. A., **Friedman, N. P.**, Chatham, C. H., Hazy, T. E., Brant, A. M., & O'Reilly, R. C. (April 2011). *Towards neural network models linking genetics to individual differences in executive functions*. Poster presented by Seth Herd at the 18th annual meeting of the Cognitive Neuroscience Society, San Francisco, CA

26. Vandever, J. M., Miyake, A., Young, S. E., **Friedman, N. P.**, Corley, R. P., Hewitt, J. K., & Stallings, M. C. (October 2010). *Behavioral disinhibition and executive functions: Genetic relations are stronger for substance use than substance dependence*. Poster presented by Joanna Vandever at the XVIIIth World Congress on Psychiatric Genetics, Athens, Greece.
27. Altamirano, L. J., **Friedman, N. P.**, & Miyake, A. (September 2010). *Stability of the structure of executive functions from late adolescence to young adulthood*. Poster presented by Lee Altamirano at the 5th European Working Memory Workshop, Civita Castellana, Italy.
28. Chatham, C. H., Brant, A. M., Herd, S. A., Hazy, T. E., Miyake, A., O'Reilly, R. C., & **Friedman, N. P.** (November 2009). *From the executive network to executive functions: A PBWM neural network model of the n-back task*. Talk and poster presented by Christopher Chatham at the 4th Computational Cognitive Neuroscience Society Conference, Boston, MA.
29. **Friedman, N. P.**, Miyake, A. (September 2009). *Developmental differences in toddlers' behavioral restraint predict general executive function ability 14 years later*. Talk presented by Akira Miyake at the 16th European Society for Cognitive Psychology (ESCoP) Conference, Krakow, Poland.
30. Altamirano, L. J., Miyake, A., & **Friedman, N. P.** (September 2009). *Goal neglect subtypes show contrasting relationships with executive abilities*. Poster presented by Lee Altamirano at the 16th European Society for Cognitive Psychology (ESCoP) Conference, Krakow, Poland.
31. Miyake, A., & **Friedman, N. P.** (September 2008). *How are working memory capacity, updating ability, and general intelligence related?: A behavioral genetic analysis*. Talk presented by Akira Miyake at the 4th European Workshop on Working Memory, Bristol, UK.
32. Rhee, S. H., Zahn-Waxler, C., Robinson, J. L., Corley, R. C., **Friedman, N. P.**, Hewitt, J. K., Young, S. E., Haberstick, B. C., & Van Hulle, C. A. (March, 2007). *The relationship between empathy/prosocial behavior and cognitive ability in a longitudinal sample of young twins*. Symposium poster presented by Soo Rhee at the 2007 biennial meeting of the Society for Research in Child Development, Boston, MA.
33. Miyake, A., **Friedman, N. P.**, & Saito, S. (November 2005). *The role of processing durations in working memory span performance: Experimental and correlational investigations*. Invited talk presented by Akira Miyake at "Bristol Workshop on Time and Short-Term Memory," Bristol, UK.
34. **Friedman, N. P.**, & Miyake, A. (March 2005). *Unity and diversity of inhibition and interference control functions: An individual differences perspective*. Invited talk presented by Akira Miyake at "The Place of Inhibitory Processes in Cognition" conference, Arlington, TX.
35. Godinez, D. A., Rhee, S. H., **Friedman, N. P.**, Young, S. E., Corley, R., DeFries, J. C., Miyake, A., & Hewitt, J. K. (June 2005). Genetic and environmental architecture and structure of the Wisconsin Card Sorting Task (WCST). *Behavior Genetics*, 35, 802-803. Poster presented by Detre Godinez at the 35th annual meeting of the Behavior Genetics Association, Hollywood, CA.
36. Miyake, A., & **Friedman, N. P.** (November 2004). *Where does the predictive power of the reading span test come from?* Talk presented by Akira Miyake at the 45th annual meeting of the Psychonomic Society, Minneapolis, MN.
37. Miyake, A., & **Friedman, N. P.** (August 2004). *Individual differences in working memory: What do working memory span tests really measure?* Talk presented by Akira Miyake at the 2nd International

Conference on Working Memory, Kyoto, Japan.

38. Miyake, A., & **Friedman, N. P.** (September 2003). *Individual differences in executive functions and complex cognitive abilities*. Talk presented by Akira Miyake at the 13th conference of the European Society for Cognitive Psychology, Granada, Spain.
39. Miyake, A., **Friedman, N. P.**, Rettinger, D. A., Shah, P., & Hegarty, M. (July 2001). *How are visuospatial working memory, executive functioning, and spatial abilities related? A latent variable analysis*. Talk presented by Akira Miyake at the 3rd International Conference on Memory (Symposium on the Role of Working Memory in Complex Cognition), Valencia, Spain.

Invited Talks

1. Friedman, N. P. (September, 2015). *Genetic influences on attentional control and working memory*. Invited talk to be presented at the "Attention and working memory: Commonalities and differences" symposium at the 19th European Society for Cognitive Psychology (ESCoP) conference, Pathos, Cyprus.
2. **Friedman, N. P.** (May, 2015). *What is (are) executive function(s)? Insights from individual differences research*. Invited talk to be presented at the "Workshop on Bilingualism and Executive Function: An Interdisciplinary Approach," New York, NY.
3. **Friedman, N. P.**, & Wright, K. P. Jr. (June, 2014). *Sleep and Cognitive Development*. Invited talk presented at the "Colorado Sleep and Circadian Research Symposia," Boulder, CO.
4. **Friedman, N. P.**, Miyake, A., Ito, T. A., Altamirano, L. J., Bartholow, B. D., & Correll, J. (June, 2011). *Individual differences in executive functions and expressions of racial biases*. Invited talk presented at the "Symposium on Implicit Racial Bias," Columbia, MO.
5. Friedman, N. P. (April, 2011). *The unity and diversity of executive functions: Genetic influences and correlates*. Invited talk to the Neuroscience Research Group at the University of Denver, Denver, CO.
6. Friedman, N. P. (March 2010). *Genetic influences on the unity and diversity of executive functions*. Invited UCLA seminar on phenomics and neurogenetics, Los Angeles, CA.
7. **Friedman, N. P.** (January 2010). *Genetic influences on the unity and diversity of executive functions*. Invited talk presented at the 2nd annual Conference on Executive Function, Boulder, CO.
8. **Friedman, N. P.**, Miyake, A., Young, S. E., Corley, R. P., Haberstick, B. C., Willcutt, E. G., DeFries, J. C., & Hewitt, J. K. (June 2009). Unity and diversity of executive functions in the longitudinal twin study. *Behavior Genetics*, 39, 652. Invited talk for the "Cognition and modularity" symposium at the 39th annual meeting of the Behavior Genetics Association, Minneapolis, MN.
9. Miyake, A., **Friedman, N. P.**, & Saito, S. (July 2003). *Individual differences in working memory span tasks: The role of attention in encoding and retrieval*. Invited talk presented at the "Variation in Working Memory" conference, Chicago, IL.

Teaching

Advisory and Supervisory Responsibilities:

Predoctoral Mentoring:

Chelsie Benca, Behavior Genetics	2010 – present
Daniel Gustavson, Cognitive	2013 – present
--mentor for IBG certificate; primary mentor Akira Miyake	
Lee Altamirano, Cognitive	2013 – present
--co-mentor with Yuko Munakata	
Alexander Hatoum, Behavior Genetics	2014 – present
Harry Smolker, Cognitive	2014 – present
--mentor for IBG certificate; primary mentor Marie Banich	

Predoctoral Committees:

Jeff Frazer, U. of Victoria		Dissertation, 2/12
Joanna Vandever, U. of CO	Comp. exam, 11/11;	Dissertation, 4/14
Ashley Smith, U. of CO		Dissertation, 5/14
Dan Johnson, U. of CO		Dissertation, 5/14
Lee Altamirano, U. of CO	Comp. exam, 4/13;	Dissertation
Kerri Woodward, U. of CO	Development committee 2013-present	
Geoffrey Kerr, U. of CO		Dissertation
Daniel Gustavson, U. of CO		Dissertation
Helena Yardley, U. of CO	Comp. exam 3/15	

Undergraduate Committees:

Amelia Weller, U. of CO	Honor's thesis, 4/15
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Courses:

Primary Teaching:

Undergraduate:

Introduction to Behavioral Genetics	Spring 2014, Fall 2014
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Graduate:

Structural Equation Modeling	Spring 2015
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Guest Teaching:

Discussion leader for Responsible Conduct of Research	9/23/2013
Guest lecture for Intro to Behavioral Genetics (Rhee)	4/22/2014

Teaching Assistant:

Statistics	Spring 1998 & Spring 1997
History of Psychology	Fall 1997
Perception	Summer 1997
Cognitive Psychology	Fall 1996

Professional Activities

Professional Memberships:

- *Behavior Genetics Association*
- *Association for Psychological Science*

Editorial Service:

Journal Editorial Boards:

- *Developmental Science* (2014–present)

Guest Action Editor:

- *Journal of Experimental Psychology: General* (2014)

Ad Hoc Journal Reviews:

- *Annals of Behavioral Medicine* (2014)
- *Applied and Preventive Psychology* (2007)
- *Behavior Genetics* (2009)
- *Brain and Cognition* (2015)
- *Cognitive and Behavioral Neurology* (2009)
- *Cognition and Emotion* (2005)
- *Cortex* (2014)
- *Developmental Science* (2007, 2008 [2], 2009, 2010, 2011, 2014 [2])
- *Journal of Adolescence* (2014)
- *Journal of Child Psychology and Psychiatry* (2006)
- *Journal of Experimental Child Psychology* (2014)
- *Journal of Experimental Psychology: General* (1999, 2002, 2003, 2004 [2], 2005, 2009, 2014, 2015)
- *Journal of Experimental Psychology: Learning, Memory, and Cognition* (2007, 2008, 2009 [2], 2013, 2015)
- *Journal of Memory and Language* (2008)
- *Memory* (2000, 2006, 2009)
- *Memory and Cognition* (2010, 2011)
- *Mind, Brain, and Education* (2009)
- *Neuropsychologia* (2013 [2], 2014 [2])
- *Neuropsychology* (2006)
- *Proceedings of the National Academy of Sciences (PNAS)* (2011)
- *Psychological Assessment* (2011)
- *Psychological Bulletin* (2003)
- *Psychological Science* (2005, 2008, 2012, 2013, 2015)
- *Psychonomic Bulletin & Review* (2009)
- *Quarterly Journal of Experimental Psychology* (2006, 2008, 2009)
- *Science* (2012 [2])
- *Sleep* (2013)

Ad Hoc Grant Reviews:

- Louisiana Experimental Program to Stimulate Competitive Research (EPSCoR) (2008)
- National Science Foundation (2009)

Departmental Service

Department of Psychology and Neuroscience:

- Human Research Committee (2013 – present)
- Undergraduate Research Day Committee (2014 – present)

Institute for Behavioral Genetics:

- Training Program Committee (2013 – present)