# Carter Funkhouser

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#### **Education**

2022 University of Illinois at Chicago

(anticipated) Ph.D., Psychology

Dissertation Committee: Stewart Shankman (chair; Northwestern University), Eiko Fried (Leiden University), Nathan Gillespie (Virginia Commonwealth University), Heidi Klumpp (University of Illinois at Chicago), Ellen Herbener

(University of Illinois at Chicago)

Dissertation Title: A twin study testing the direction(s) of causation between

stressful life events and depression/anxiety symptoms

2018 University of Illinois at Chicago

M.A., Clinical Psychology

Thesis Advisor: Stewart Shankman, Ph.D.

Thesis Title: Social feedback valence differentially modulates the reward

positivity, P300, and late positive potential

2015 Connecticut College

B.A., Psychology (Minor: Applied Statistics) Thesis Advisor: Audrey Zakriski, Ph.D.

#### **Federal Funding**

2020–2022 National Institute of Mental Health F31MH123042 (PI: Funkhouser)

Ruth L. Kirschstein National Research Service Award

Title: Twin modeling of individual symptoms of depression and generalized

anxiety: A symptom network approach

Role: PI

Amount awarded: \$83,176

2019–2020 National Institute of Mental Health T32MH067631 (PI: Rasenick)

Title: Training in the Neuroscience of Mental Health

Role: Predoctoral Fellow Amount awarded: \$24,816

### **Publications** (\*equal contribution)

- 20. **Funkhouser, C. J.**, Correa, K. A., Letkiewicz, A. M., Cozza, E. M., Estabrook, R., & Shankman, S. A. (in press). Evaluating the criterion validity of hierarchical psychopathology dimensions across models: Familial aggregation and associations with Research Domain Criteria (RDoC) (sub)constructs. *Journal of Abnormal Psychology*. Preprint available at https://doi.org/10.31234/osf.io/xp6h4
- 19. Shenberger, E. R., **Funkhouser, C. J.**, Boley, R., Zalta, A. K., & Shankman, S. A. (2021). The impact of aversive context on early threat detection in trauma exposed individuals and associations with post-traumatic stress symptoms. *Journal of Affective Disorders Reports*, 6, 100193. https://doi.org/10.1016/j.jadr.2021.100193
- 18. Letkiewicz, A. M., **Funkhouser, C. J.**, & Shankman, S. A. (2021). Childhood maltreatment predicts poorer executive functioning beyond symptoms of internalizing psychopathology in adulthood. *Child Abuse & Neglect*, *118*, 105140. https://doi.org/10.1016/j.chiabu.2021.105140
- 17. Liu, H., **Funkhouser**, C. J., Langenecker, S. A., & Shankman, S. A. (2021). Set shifting and inhibition deficits as potential endophenotypes for depression. *Psychiatry Research*, *300*, 113931. https://doi.org/10.1016/j.psychres.2021.113931
- 16. Ashaie, S. A.\*, Hung, J.\*, **Funkhouser, C. J.**, Shankman, S. A., & Cherney, L. (2021). Depression in persons with stroke over time: A network analysis approach. *Journal of Affective Disorders Reports*, *4*, 100131. https://doi.org/10.1016/j.jadr.2021.100131
- 15. **Funkhouser, C. J.**, Kaiser, A. J. E., Alqueza, K. L., Carrillo, V. L., Hoffman, L. M. K., Nabb, C. B., Auerbach, R. P., & Shankman, S. A. (2021). Depression risk factors and affect dynamics: An experience sampling study. *Journal of Psychiatric Research*, *135*, 68–75. https://doi.org/10.1016/j.jpsychires.2021.01.007
- 14. Crane, N. A., **Funkhouser, C. J.**, Burkhouse, K. L., Klumpp, H., Phan, K. L., & Shankman, S. A. (2021). Occasional cannabis users demonstrate enhanced neural reactivity to reward: An event-related potential and time-frequency EEG study. *Addictive Behaviors*, *113*, 106669. https://doi.org/10.1016/j.addbeh.2020.106669
- 13. **Funkhouser, C. J.**, Chacko, A. A., Correa, K. A., Kaiser, A. J. E., & Shankman, S. A. (2021). Unique longitudinal relationships between symptoms of psychopathology in youth: A cross-lagged panel network analysis in the ABCD study. *Journal of Child Psychology and Psychiatry*, 62, 2, 184–194. https://doi.org/10.1111/jcpp.13256
- 12. Kaiser, A. J. E., **Funkhouser, C. J.**, Mittal, V., Walther, S., & Shankman, S. A. (2020). Test-retest & familial concordance of MDD symptoms. *Psychiatry Research*, *292*, 113313. https://doi.org/10.1016/j.psychres.2020.113313

- 11. Lieberman, L., **Funkhouser, C. J.**, Gorka, S. M., Liu, H., Correa, K. A., Berenz, E. C., Phan, K. L., & Shankman, S. A. (2020). The relation between posttraumatic stress symptom severity and startle potentiation to predictable and unpredictable threat. *Journal of Nervous and Mental Disease*, 208(5), 397–402. https://doi.org/10.1097/NMD.000000000001138
- 10. **Funkhouser, C. J.**, Correa, K. A., Gorka, S. M., Nelson, B. D., Phan, K. L., & Shankman, S. A. (2020). The replicability and generalizability of internalizing symptom networks across five samples. *Journal of Abnormal Psychology*, *129*(2), 191–203. https://doi.org/10.1037/abn0000496
- 9. **Funkhouser, C. J.**, Auerbach, R. P., Kujawa, A., Morelli, S. A., Phan, K. L., & Shankman, S. A. (2020). Social feedback valence differentially modulates the reward positivity, P300, and late positive potential. *Journal of Psychophysiology*, *34*(4), 255–267. https://doi.org/10.1027/0269-8803/a000253
- 8. **Funkhouser, C. J.**, Correa, K. A., Carrillo, V. L., Klemballa, D. M., & Shankman, S. A. (2019). The time course of responding to aversiveness in females with a history of non-suicidal self-injury. *International Journal of Psychophysiology, 141*, 1–8. https://doi.org/10.1016/j.ijpsycho.2019.04.008
- 7. Stevens, E. S., Lieberman, L., **Funkhouser, C. J.**, Correa, K. A. & Shankman, S. A. (2019). Startle during threat longitudinally predicts functional impairment independent of DSM diagnoses. *Psychiatry Research*, *279*, 207–215. https://doi.org/10.1016/j.psychres.2019.02.072
- 6. Shankman, S. A., **Funkhouser, C. J.**, Klein, D. N., Davila, J., Lerner, D., & Hee, D. E. (2018). Reliability and validity of severity dimensions of psychopathology assessed using the Structured Clinical Interview for DSM-5 (SCID). *International Journal of Methods in Psychiatric Research*, 27(1), e1590. https://doi.org/10.1002/mpr.1590
- 5. Lieberman, L., Stevens, E. S., **Funkhouser, C. J.,** Weinberg. A., Sarapas, C., Huggins, A. A., & Shankman, S. A. (2017). How many blinks are necessary for a reliable startle response? A test using the NPU-threat task. *International Journal of Psychophysiology*, 114, 24–30. https://doi.org/10.1016/j.ijpsycho.2017.01.012
- 4. Lieberman, L., Gorka, S. M., **Funkhouser, C. J.**, Shankman, S. A., & Phan, K. L. (2017). Impact of posttraumatic stress symptom dimensions on psychophysiological reactivity to threat and reward. *Journal of Psychiatric Research*, *92*, 55–63. https://doi.org/10.1016/j.jpsychires.2017.04.002
- 3. **Funkhouser, C. J.**, Zakriski, A. L., & Spoltore, J. D. (2017). Evaluating peer-peer depression outreach: College students helping peers approach and respond to students in crisis. *Psi Chi Journal of Psychological Research*, *22*(1), 19–28. https://doi.org/10.24839/2325-7342.JN22.1.19

#### **Non-Peer Reviewed Publications**

- 2. Shankman, S. A., & **Funkhouser**, **C. J.** (2017). Socioeconomic Status. In A. E. Wenzel (Ed.), *The SAGE Encyclopedia of Abnormal and Clinical Psychology* (pp. 3254-3255). Thousand Oaks, CA: SAGE Publications.
- 1. **Funkhouser, C. J.**, & Siegel-Wallace, S. (2015). Perceptions and prevalence of nonmedical stimulant use among college students. *Connecticut College Psychology Journal*.

### **Submitted Manuscripts** (\*equal contribution)

**Funkhouser, C. J.**, Ashaie, S. A., Gameroff, M. J., Talati, A., Posner, J., Weissman, M. M., & Shankman, S. A. (under review). Prospectively predicting adult depression from adolescent peer dysfunction: A sibling comparison study.

**Funkhouser, C. J.**, Katz, A. C., Meissel, E. E., Stevens, E. S., Weinberg, A., Nabb, C. B., & Shankman, S. A. (under review). Associations between repetitive negative thinking and habituation of aversive responding within and between sessions.

Correa, K. A., Carrillo, V. L., Shenberger, E. R., **Funkhouser, C. J.**, & Shankman, S. A. (under review). Ethnic differences in behavioral and physiological indicators of sensitivity to threat.

### **Manuscripts in Preparation**

**Funkhouser, C. J.**, Ashaie, S. A., Cherney, L., & Shankman, S. A. (in preparation). Longitudinal within- and between-person associations between post-stroke depression symptom dimensions.

Stevens, L. S., **Funkhouser**, **C. J.**, & Shankman, S. A. (in preparation). Inhibition predicts the course of internalizing symptoms: The moderating role of familial risk.

#### **Honors and Awards**

2017-present	Graduate Student Travel Awards
	Department of Psychology, University of Illinois at Chicago
2020	Keys Award for Early Outstanding Research Achievement (\$500 departmental award)
2015	Jane W. Torrey Award for the Psychological Study of Social Issues (\$200
	departmental award for undergraduate thesis)
2015	Magna Cum Laude
2015	Graduated with Distinction
2014–2015	Student in the Psychology Department Honors Program, Connecticut College
2014	New England Small College Athletic Conference (NESCAC) Student Athlete
	Award (varsity rowing)

2013 Psi Chi

2011–2015 Dean's High Honors, Connecticut College

#### **Invited Addresses**

- 8. "A Network Approach to Conceptualizing and Modeling Psychopathology." *Columbia University* (2020), New York, NY.
- 7. "Studying the Causes and Classification of Psychopathology." *University of Illinois at Chicago* (2019), guest lecture, Chicago, IL.
- 6. "Measurement of Psychopathology." *University of Illinois at Chicago* (2019), guest lecture, Chicago, IL.
- 5. "Using machine learning to understand processes involved in internalizing psychopathology." *Northwestern University Department of Psychiatry* (2018), invited colloquia, Chicago, IL.
- 4. "Reliability and Validity in Psychopathology Assessment." *University of Illinois at Chicago* (2018), guest lecture, Chicago, IL.
- 3. "Research Domain Criteria." *University of Illinois at Chicago* (2018), guest lecture, Chicago, IL.
- 2. "Evaluating peer-peer depression outreach: College students helping peers approach and respond to students in crisis." *New England Psychological Association* (2016), Worcester, MA.
- 1. "An outcome evaluation of a peer-based suicide prevention program for college students." *Connecticut College Psychology Department Conference* (2015), New London, CT.

### **Conference Poster Presentations**

- 24. **Funkhouser, C. J.**, Gillespie, N. A., Aggen, S. H., & Shankman, S. A. (September, 2021). *A twin study testing the direction(s) of causation between stressful life events and internalizing symptom dimensions*. Poster presented at the 34<sup>th</sup> annual meeting of the Society for Research in Psychopathology, Virtual Meeting.
- 23. Nabb, C. B., **Funkhouser**, C. J., & Shankman, S. A. (September, 2021). *Maladaptive personality traits as potential endophenotypes for smoking*. Poster presented at the 34<sup>th</sup> annual meeting of the Society for Research in Psychopathology, Virtual Meeting.

- 22. Crane, N. A., **Funkhouser, C. J.**, Burkhouse, K. L., Klumpp, H., Phan, K. L., & Shankman, S. A. (December, 2020). *Cannabis users demonstrate enhanced neural reactivity to reward: An event-related potential and time-frequency EEG study.* Poster presented at the 59<sup>th</sup> annual meeting of the American College of Neuropsychopharmacology, Virtual Meeting.
- 21. **Funkhouser, C. J.**, Kaiser, A. J. E., Carrillo, V. L., Hoffman, L., Alqueza, K. L., Auerbach, R. P., & Shankman, S. A. (May, 2020). *Depression risk factors and affective dynamics: An experience sampling study*. Poster presented at the 32<sup>nd</sup> annual meeting of the Association for Psychological Science, Virtual Meeting.
- 20. **Funkhouser, C. J.**, Chacko, A. C., Correa, K. A., & Shankman, S. A. (September, 2019). *Unique longitudinal associations between symptoms of psychopathology in youth: A cross-lagged panel network analysis in the ABCD study*. Poster presented at the 33<sup>rd</sup> annual meeting of the Society for Research in Psychopathology, Buffalo, NY.
- 19. Kaiser, A., Correa, K. A., **Funkhouser, C. J.**, Shenberger, E. R., & Shankman, S. A. (September, 2019). *The association between frontal EEG asymmetry during reward anticipation and familial risk for specific depressive symptoms*. Poster presented at the 33<sup>rd</sup> annual meeting of the Society for Research in Psychopathology, Buffalo, NY.
- 18. Shenberger, E. R., Kaiser, A. J. E., Correa, K. A, **Funkhouser, C. J.**, & Shankman, S. A. (September, 2019). *Exploring the relationship between maladaptive personality traits, sibling relationship quality, and depression severity: An actor-partner interdependence model*. Poster presented at the 33<sup>rd</sup> annual meeting of the Society for Research in Psychopathology, Buffalo, NY.
- 17. Correa, K. A., **Funkhouser, C. J.**, Carrillo, V. L., Kaiser, A., & Shankman, S. A. (September, 2019). *Racial and ethnic differences in treatment seeking individuals*. Poster presented at the 33<sup>rd</sup> annual meeting of the Society for Research in Psychopathology, Buffalo, NY.
- 16. Shenberger, E. R., **Funkhouser, C. J.**, Meissel, E. E. E., & Shankman, S. A. (May, 2019). *Do the four PTSD symptom clusters have differential associations with attentional biases to threat?* Poster presented at the 74<sup>th</sup> annual meeting of the Society of Biological Psychiatry, Chicago, IL.
- 15. Klemballa, D. M., Correa, K. A., **Funkhouser, C. J.**, & Shankman, S. A. (March, 2019). *Associations between contextual threat and respiratory sinus arrhythmia*. Poster presented at the 39<sup>th</sup> annual meeting of the Anxiety and Depression Association of America, Chicago, IL.

- 14. Chacko, A. C., **Funkhouser, C. J.**, Maki, P., & Shankman, S. A. (April, 2019). *The moderating effect of sex on startle response to threat in those with and without Social Anxiety Disorder*. Poster presented at the University of Illinois at Chicago Impact and Research Day, Chicago, IL.
- 13. **Funkhouser, C. J.**, Gorka, S. M., Nelson, B. D., Phan, K. L., & Shankman, S. A. (March, 2019). *The replicability and generalizability of internalizing symptom networks across five samples*. Poster presented at the 39<sup>th</sup> annual meeting of the Anxiety and Depression Association of America, Chicago, IL.
- 12. Kaiser, A., **Funkhouser, C. J.**, & Shankman, S. A. (March, 2019). *The test-retest reliability and familialness of aggregated vs. unaggregated depression symptoms*. Poster presented at the 39<sup>th</sup> annual meeting of the Anxiety and Depression Association of America, Chicago, IL.
- 11. **Funkhouser, C. J.**, Leow, A., Kinney, K. L., Correa, K. A., & Shankman, S. A. (September, 2018). *Toward a data-driven nosology of internalizing psychopathology: Identifying and validating clusters of negative valence constructs using machine learning.* Poster presented at the 32<sup>nd</sup> annual meeting of the Society for Research in Psychopathology, Indianapolis, IN.
- 10. Correa, K. A., Stevens, E. S., **Funkhouser, C. J.**, & Shankman, S. A. (September, 2018). *A longitudinal study examining the incremental predictive validity of intolerance of uncertainty*. Poster presented at the 32<sup>nd</sup> annual meeting of the Society for Research in Psychopathology, Indianapolis, IN.
- 9. Klemballa, D. M., **Funkhouser, C. J.**, & Shankman, S. A. (September, 2018). *Respiratory sinus arrhythmia as a familial vulnerability factor for internalizing and externalizing psychopathology*. Poster presented at the 32<sup>nd</sup> annual meeting of the Society for Research in Psychopathology, Indianapolis, IN.
- 8. Nannini, S. R., **Funkhouser, C. J.**, Meissel, E. E., & Shankman, S. A. (April, 2018). *Borderline Personality Disorder and the PID-5 predicting current suicidality*. Poster presented at the 90<sup>th</sup> annual meeting of the Midwestern Psychological Association, Chicago, IL.
- 7. **Funkhouser, C. J.**, Carrillo, V. L., Correa, K. A., & Shankman, S. A. (October, 2017). *Physiological habituation to aversiveness and non-suicidal self-injury: A test of acquired capability for suicide*. Poster presented at the 57<sup>th</sup> annual meeting of the Society for Psychophysiological Research, Vienna, Austria.
- 6. **Funkhouser, C. J.**, Meissel, E. E., Kujawa, A., & Shankman, S. A. (April, 2017). *The association between negative cognitive style and neural reactivity to social acceptance vs. rejection*. Poster presented at the 37<sup>th</sup> annual meeting of the Anxiety and Depression Association of America, San Francisco, CA.

- 5. **Funkhouser**, **C. J.**, Lieberman, L., & Shankman, S. A. (September, 2016). *The association between neural responses to errors and family history of OCD*. Poster presented at the 30th annual meeting of the Society for Research in Psychopathology, Baltimore, MD.
- 4. Liu, H., **Funkhouser**, C. J., Sarapas, C., & Shankman, S. A. (September, 2016). *Reliability of two measures of attention to emotional stimuli*. Poster presented at the 30th annual meeting of the Society for Research in Psychopathology, Baltimore, MD.
- 3. Meissel, E. E. E., **Funkhouser, C. J.**, Liu, H., & Shankman, S. A. (September, 2016). *Investigating the reliability of different measures from the dot-probe task and using personal and family history of social anxiety disorder as validators*. Poster presented at the 30th annual meeting of the Society for Research in Psychopathology, Baltimore, MD.
- 2. Jabbar, S., & **Funkhouser**, **C. J.** (April, 2016). *The relationship between birth order and risk-taking*. Poster presented at the UIC GPPA Medicine Capstone Forum, Chicago, IL.
- 1. **Funkhouser, C. J.**, Liu, H., Hee, D., & Shankman, S. A. (October, 2015). *Does reward learning predict changes in depression?: A preliminary study.* Poster presented at the 29<sup>th</sup> annual meeting of the Society for Research in Psychopathology, New Orleans, LA.

### **Editorial Experience**

Ad Hoc Reviewer

- European Psychiatry
- International Journal of Methods in Psychiatric Research
- International Journal of Psychophysiology
- Journal of Abnormal Psychology (with advisor)
- Clinical Psychological Science (with advisor)
- Psychotherapy (with advisor)

#### **Research Experience**

#### 2017-present Northwestern Emotion and Risk Lab

Northwestern University/University of Illinois at Chicago Supervisor: Stewart Shankman, Ph.D.

- <u>Projects</u>: NIMH-funded study (R01 MH118741) characterizing psychomotor disturbance in current and remitted depression; NIMH-funded studies (R01 MH119771, R21 MH112330) identifying social processes associated with depression risk
- <u>Duties</u>: mentor junior graduate students and undergraduates; supervise physiological data collection and processing; clean and organize ambulatory assessment data; analyze data in R and SPSS

# 2015–2017 Chicago Lab of Emotion and Physiology

University of Illinois at Chicago Supervisor: Stewart Shankman, Ph.D.

- <u>Project</u>: NIMH-funded study (R01 MH098093) examining reduced reward anticipation and heightened sensitivity to potential threat as potential familial risk factors for depression and anxiety, respectively
- <u>Duties</u>: conducted clinical interviews (Structured Clinical Interview for DSM-5 and Longitudinal Interval Follow-up Evaluation); collected psychophysiological data (electroencephalography [EEG], electromyography [EMG]); administered neuropsychological assessments and behavioral tasks; processed psychophysiological data, recruited and screened participants; supervised undergraduate theses; trained and supervised undergraduate research assistants

### 2014–2015 Senior Honor's Thesis Study

Connecticut College

Supervisor: Audrey Zakriski, Ph.D.

- <u>Project</u>: self-designed study to evaluate the effects of a suicide prevention program on college students' responses to and desired social distance from at-risk peers, self-stigma and perceived stigma associated with psychological help-seeking, and knowledge of depression and suicide
- <u>Duties</u>: obtained IRB approval; recruited participants; collected data by implementing the suicide prevention program; analyzed data; wrote up results

### 2014 Positive Emotion & Psychopathology Lab

Yale University

Supervisors: June Gruber, Ph.D. and John Purcell, B.S., B.A.

- <u>Project</u>: study examining affective and neuroendocrine processes related to reward sensitivity in unipolar and bipolar depression
- <u>Duties</u>: Processed psychophysiological data, performed literature reviews

### **Clinical Experience**

### 2017–2020 Office of Applied Psychological Services

Department of Psychology, University of Illinois at Chicago

- Provided empirically-supported psychotherapy for depressive disorders, anxiety disorders, anger, and interpersonal difficulties in a community outpatient clinic
- Conducted diagnostic intake assessments and wrote intake reports
- Mentored junior students completing diagnostic intakes
- Administered neuropsychological assessments and interpreted, documented, and communicated the results of assessments to clients, supervisors, and colleagues

#### 2019 Women's Mental Health Research Program

Department of Psychiatry, University of Illinois at Chicago

 Worked as a paid Graduate Research Assistant supervising graduate students learning to administer the Structured Clinical Interview for DSM (SCID)

### 2015–2018 Chicago Lab of Emotion and Physiology

Department of Psychology, University of Illinois at Chicago

• Conducted SCIDs and Longitudinal Interval Follow-Up (LIFE) interviews with adults with various psychopathologies

#### 2014–2015 Sound Community Services

New London, CT

- Worked as a Rehabilitation Specialist at a behavioral health program for adults with severe and persistent mental illness
- Developed and led new group programs
- Taught educational and social skills through psychosocial interventions
- Collaborated on the planning and implementation of social and recreational activities

### **Teaching Experience**

Fall 2018, **PSCH 333 Laboratory in Clinical Psychology** 

Spring 2019, *Teaching Assistant* 

Fall 2019 Department of Psychology

University of Illinois at Chicago

- Gave guest lectures on the etiology, classification, and measurement of psychopathology
- Provided feedback and grading on students' papers and oral presentations
- Held weekly office hours

Spring 2015 **STA 107 Introduction to Statistics** 

Teaching Assistant

Department of Mathematics and Statistics

Connecticut College

• Graded homework assignments and exams

Fall 2014 **STA 207 Advanced Regression Techniques** 

Teaching Assistant

Department of Mathematics and Statistics

Connecticut College

• Graded homework assignments and exams

### **Undergraduate Senior Thesis Advisees**

2015-2016 Saadiya Jabbar

Title: The relationship between birth order and risk-taking

Subsequent position: Medical student, University of Illinois at Chicago

2017-2018 Sierra Nannini

Title: Borderline personality disorder and the PID-5 as risk factors for suicide

Subsequent position: Research assistant, University of Pittsburgh

2018-2019 Anjali Chacko

Title: The moderating effect of sex on startle response to threat in those with

and without social anxiety disorder

Subsequent position: Medical student, Eastern Virginia Medical School

#### Service

**Diversifying Curriculum Task Force** 2021–present

Department of Psychology, University of Illinois at Chicago

• Learn and disseminate best practices for diversifying curricula

2021–present Project SHORT (Students for Higher-Ed Opportunities and

Representation in Training)

Mentor an underrepresented student through the clinical psychology

PhD application process

2021-present Society for Research in Psychopathology, Publications Committee

Student Contributor

2020–present Psychology Undergraduate Research Readiness (PURR) Program

Department of Psychology, University of Illinois at Chicago

Mentor underrepresented undergraduates on career planning and graduate school applications

# 2020–2021 Psychology Doctoral Mentor Match Program

 Mentored an underrepresented student through the clinical psychology PhD application process (student received 3 admissions offers and will be attending their top choice program)

## **Professional Memberships**

Society for a Science of Clinical Psychology Society for Research in Psychopathology Anxiety and Depression Association of America Society for Psychophysiological Research Association for Behavioral and Cognitive Therapies

#### References

Stewart Shankman, Northwestern University Randy Auerbach, Columbia University Stephanie Gorka, Ohio State University K. Luan Phan, Ohio State University