

## Emily M. Sanford

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### CURRENT POSITION

University of California, Berkeley, CA 2022-present  
Postdoctoral Fellow, Psychology  
PI: Steven T. Piantadosi, PhD

### EDUCATION

Johns Hopkins University, Baltimore, MD 2022  
PhD in Psychological & Brain Sciences  
Advisor: Justin Halberda, PhD  
Dissertation: *Exploring the limits of approximate number perception*

Johns Hopkins University, Baltimore, MD 2019  
MA in Psychological & Brain Sciences  
Advisor: Justin Halberda, PhD

Macalester College, St. Paul, MN 2017  
B.A. in Psychology with Honors, Summa Cum Laude  
Minors in Mathematics and Classical Languages  
Honor's Thesis: *Timmy's in the Well: Empathy and Prosocial Helping in Dogs*

### PUBLICATIONS

- Sanford, E. M., Topaz, C., & Halberda, J. (2024). Modeling magnitude discrimination: Effects of internal precision and attentional weighting of feature dimensions. *Cognitive Science*, 48, e13409. <https://doi.org/10.1111/cogs.13409>
- Sanford, E. M. & Halberda, J. (2024). Non-numerical features fail to predict numerical performance in real-world stimuli. *Cognitive Development*, 69, 101415. <https://doi.org/10.1016/j.cogdev.2023.101415>
- Sanford, E. M. & Halberda, J. (2023). A shared intuitive (mis)understanding of psychophysical law leads both novices and educated students to believe in a Just Noticeable Difference (JND). *Open Mind*, 7, 785-801. [https://doi.org/10.1162/opmi\\_a\\_00108](https://doi.org/10.1162/opmi_a_00108)
- Sanford, E.M. & Halberda, J. (2023). Successful discrimination of tiny numerical differences. *Journal of Numerical Cognition*, 9, 196-205. <https://doi.org/10.5964/jnc.10699>. Featured in [Scientific American](#).
- Maa, H., Bu, X., Sanford, E., Zeng, T., & Halberda, J. (2021). Approximate number sense in students with severe hearing loss: A modality-neutral cognitive ability. *Frontiers in Human Neuroscience – Cognitive Neuroscience*, 15, 688144. <https://doi.org/10.3389/fnhum.2021.688144>
- Sanford, E. M., Burt, E. R., & Meyers-Manor, J. (2018). Timmy's in the well: Empathy and prosocial helping in dogs. *Learning & Behavior*, 46, 374-386. <https://doi.org/10.3758/s13420-018-0332-3>. Featured in [The New York Times](#), [Time Magazine](#), and [NBC News](#).

## MANUSCRIPTS UNDER REVIEW/IN PREPARATION

- Varma, S., Sanford, E. M., Shaffer, O., Marupudi, V., & Lea, R. B. (Under review). Recruitment of magnitude representations to process graded words.
- Piantadosi, S.T., Muller, D.C.Y., Rule, J.S., Kaushik, K., Gorenstein, M., Leib, E.R., & Sanford, E.M. (Under review). How cognitive science (probably) figured out concepts.
- Sanford, E. M., & Piantadosi, S. (In prep). Approximate number representations are built from perceptual samples.
- Sanford, E. M., & Piantadosi, S. (In prep). A novel effect of eccentricity on approximate number perception.

## PRESENTATIONS

- Sanford, E. M., & Piantadosi, S. (2023). A novel effect of visual eccentricity on number estimation. Talk presented at the Psychonomics Society Annual Meeting, November 16-19.
- Sanford, E.M. & Piantadosi, S. (2023). Sampling in Approximate Number Perception. Poster presented at the Cognitive Science Society Conference, July 26-29.
- Sanford, E.M., & Halberda, J. (2022). There is no such thing as a “Just Noticeable” Difference. Poster presented at the Vision Science Society Annual Meeting (VSS), May 13-18.
- Halberda, J., Myers, C., Sanford, E.M., & Firestone, C. (2022). Visual guessing is anti-Bayesian. Poster presented at the Vision Science Society Annual Meeting (VSS), May 13-18.
- Sanford, E., & Halberda, J. (2021). What is a number? Evidence against the hypothesis that continuous visual features serve as the foundation for our numerical thoughts, both perceptually and developmentally. Poster presented at the Society for Philosophy and Psychology Annual Conference (SPP), June 28-July 2.
- Sanford, E., & Halberda, J. (2021). The Channel Between Perception and Cognition Is Perfect: The JND Does Not Exist. Poster presented at the Vision Science Society Annual Meeting (V-VSS), May 21-26.
- Sanford, E. & Halberda, J. (2020). That just doesn’t add up: Continuous features fail to determine the number of items, and number behavior, in visual scenes. Talk presented at the Vision Science Society Annual Meeting (V-VSS), June 19-24.
- Sanford, E. & Halberda, J. (2020). Our concept of approximate number cannot be inferred from continuous dimensions such as density, area, and convex hull. Talk presented at the Annual Interdisciplinary Conference (AIC), Feb 7-10.
- Sanford, E. M., Shaffer, O., Lea, R. B., & Varma, S. (2019). Numbers and words: Magnitude effects for the comparison of graded adjectives. Poster presented at the the Psychonomics Society Annual Meeting, November 14-17.
- Sanford, E. M., Shaffer, O., Acierno, J., Harmon, E., & Lea, R. B. (2019). Meaning on the Fence: Do Idioms Activate Figurative and Literal Meanings Equally? Poster presented at the Society for Text and Discourse, July 9-11.
- Sanford, E. M., & Halberda, J. (2019). The innateness of visual number: A case study using children’s counting books. Poster presented at Mathematical Cognition and Learning Society, Ottawa, CA, June 16-18.
- Sanford, E. M., & Halberda, J. (2019). The innateness of visual number: A case study using children’s counting books. Poster presented at the Vision Sciences Society Annual Meeting, May 17-22.
- Sanford, E. M., Harmon, E., Acierno, J., Spanos, N., Shaffer, O., & Lea, R.B. (2018). When You Kick the Bucket, Do You Pick Up the Pail? Poster presented at the Psychonomic Society Annual Meeting, November 15-18.

- Sanford, E. M., & Halberda, J. (2018). Estimating number from dot displays relies on a visual sense of number, not on size or spacing. Poster presented at the Vision Sciences Society Annual Meeting, May 18-23.
- Sanford, E. M., Burt, E., & Meyers-Manor, J. (2017). Timmy's in the well: Empathy and prosocial helping in dogs. Poster presented at the Conference on Comparative Cognition (CO3), April 19-22.
- Sanford, E. M., & Meyers-Manor, J. (2016). Rats do not show the bystander effect. Poster presented at the Conference on Comparative Cognition (CO3), April 13-16.

## TEACHING EXPERIENCE

### Credentials

JHU Summer Teaching Institute (Group Facilitator)	Summer 2022
JHU Teaching Academy (Certificate)	Spring 2022

### Johns Hopkins University

"Measuring the Mind" (Dean's Teaching Fellowship Course)	Spring 2022
Instructor	
"Introduction to Psychophysics"	Interession 2021
Instructor	
"Introduction to Cognitive Psychology"	Spring 2021
TA with Dr. Jonathan Flombaum	
"Advanced Statistical Methods"	Fall 2019
TA with Dr. Jeff Bowen	
"Design and Analysis for Experimental Psychology"	Spring 2019
TA with Dr. Jeff Bowen	
"Positive Psychology"	Fall 2018
TA with Dr. Justin Halberda	

### Macalester College

"Principles of Learning and Behavior"	Spring 2017
TA with Dr. Julia Meyers-Manor	
"Applied Multivariable Calculus I"	Fall 2014
TA with Dr. Chad Topaz	

## SERVICE

Co-Lead Organizer for PBS Early Career Colloquium	Summer 2021-Spring 2022
Outreach Working Group of PBS Equity Committee	Spring 2020-Spring 2022
Cohort representative on PBS Graduate Steering Committee	Fall 2017-Spring 2022
PBS Colloquium Committee	Summer 2019-Spring 2020
Invited Speaker at Rutgers Cognition and Learning Center lab meeting	Fall 2020
Invited Speaker at PBS Undergraduate Steering Committee Research Panel	Fall 2019
Invited Speaker at Macalester College Psychology Career Panel	Spring 2023, Fall 2019

## HONORS AND AWARDS

Robert S. Waldrop Award for Outstanding Scholarship and Leadership (JHU)	2022
Walter L. Clark Service Award (JHU)	2022
Vision Sciences Society NEI Travel Grant	2022
Summer Dissertation Completion Award (JHU)	2022

Dean's Teaching Fellowship (JHU)	2021
Walter L. Clark Teaching Award (JHU)	2021
National Science Foundation Graduate Research Fellowship (NSF GRFP)	2017
Psi Chi Honor Society	2017
Parchem Research Fellowship (Macalester College)	2015
Dean's List (Macalester College)	2013-2017
DeWitt Wallace Distinguished Scholarship (Macalester College)	2013
National Merit Scholar	2012

## **MENTEES**

Hannah Corr (2023-present)	Phylicia Cooper (2021)
Mikaela Harnoy (2023-present)	Eloise West (2019)
Justine Krieger (2023-present)	Wenxuan Guo (2019)
Serin Lee (2023-present)	Nauman Hussain (2019)
Madeleine Lloyd (2023-present)	Peter Liu (2019)
Camille Redmond (2019-2022)	Brooke Stanicki (2018)