

Stephen Rhodes

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EDUCATION & TRAINING

Postdoctoral Research Fellow (2019–present)
Rotman Research Institute, Baycrest
Advisors: Dr Bradley Buchsbaum and Dr Lynn Hasher.

Postdoctoral Research Fellow (2016–2019)
University of Missouri
Working on the ESRC funded project, Working Memory Across the Adult Life-Span: An Adversarial Collaboration. Advisors: Dr Moshe Naveh-Benjamin and Dr Nelson Cowan.

PhD Psychology (2012–2016)
University of Edinburgh
Title: “Healthy Ageing and Binding Features in Working Memory: Measurement Issues and Potential Boundary Conditions”. Advisors: Dr Robert Logie, Dr Mario Parra and Dr Nelson Cowan.

MSc Human Cognitive Neuropsychology (2011–2012)
University of Edinburgh
Thesis title: “Ageing and Feature Binding in Visual Working Memory: The Role of Presentation Time”.
Advisor: Dr Robert Logie.

BSc Psychology (2008–2011)
University of Leeds
Awarded First Class Honours. Project title: “Auditory Short-Term Memory for Timbre: The Roles of Temporal Distinctiveness and Similarity Based Interference”. Advisor: Dr Denis McKeown.

AWARDS

- 2020 Soupcoff Family Research Grant, Rotman Research Institute (CAD\$4500)
- University of Edinburgh, School of Philosophy, Psychology, and Language Sciences (PPLS) Gray Publication Prize for article in *The Quarterly Journal of Experimental Psychology*
- Psychonomic Society International Graduate Accommodation Award for 2016 International Meeting of the Psychonomic Society in Granada, Spain
- Guarantors of Brain Travel Grant for attendance of the 2015 meeting of the Psychonomic Society in Chicago, Illinois
- Experimental Psychology Society Grindley Grant for attendance of the 2014 Cognitive Aging Conference in Atlanta, Georgia
- Highly commended dissertation award for master’s thesis from the School of Philosophy, Psychology and Language Sciences, University of Edinburgh (Sep 2012)

- Lifelong Health and Well-being (LHW) 2012 Young Scientist Poster Award (First prize) for poster presented at the LHW research showcase, University of Edinburgh. Posters were judged by delegates from the MRC, BBSRC, and ESRC
- Centre for Cognitive Ageing and Cognitive Epidemiology 1 + 3 Scholarship for master's and Ph.D. (£70,000/ \$90,000)

PUBLICATIONS

1. **Rhodes, S.**, Doherty, J. M., Jaroslawska, A., Forsberg, A., Belletier, C., Naveh-Benjamin, M., Cowan, N., Barrouillet, P., Camos, V., & Logie, R. H. (*in press*). Exploring the influence of temporal factors on age differences in working memory dual task costs. *Psychology & Aging*.
2. Jaroslawska, A. J., **Rhodes, S.**, Belletier, C., Doherty, J. M., Cowan, N., Naveh-Benjamin, M., Barrouillet, P., Camos, V., & Logie, R. H. (*in press*). What Affects the Magnitude of Age-Related Dual-Task Costs in Working Memory? The Role of Stimulus Domain and Access to Semantic Representations. *The Quarterly Journal of Experimental Psychology*.
3. **Rhodes, S.**, *[†]Abbene, E., *[†]Meierhofer, A. M., & Naveh-Benjamin, M. (*in press*). Age Differences in the Precision of Memory at Short and Long Delays. *Psychology & Aging*.
4. Haaf, J. M., **Rhodes, S.**, Naveh-Benjamin, M., *Sun, T., Snyder, H. K., & Rouder, J. N. (*in press*). Revisiting the Remember-Know Task: A Replication of Gardiner and Java (1990). *Memory & Cognition*.
5. Cowan, N., Belletier, C., Doherty, J. M., Jaroslawska, A. J., **Rhodes, S.**, Forsberg, A., Naveh-Benjamin, M., Barrouillet, P., Camos, V., & Logie, R. H. (2020). How do scientific views change? Notes from an extended adversarial collaboration. *Perspectives on Psychological Science*, 15(4), 1011-1025.
6. Morey, C., **Rhodes, S.**, & Cowan, N. (2020). Co-existing, Contradictory Working Memory Models are Ready for Progressive Refinement: Reply to Logie. *Cortex*, 123, 200–202.
7. [†]**Rhodes, S.**, [†]Greene, N. R., & Naveh-Benjamin, M. (2019). Age-Related Differences in Recall and Recognition: A Meta Analysis. *Psychonomic Bulletin & Review*, 26(5), 1529–1547.
8. [†]Jaroslawska, A. J., & [†]**Rhodes, S.** (2019). Adult Age Differences in the Effects of Processing on Storage in Working Memory: A Meta-Analysis. *Psychology & Aging*, 34(4), 512–530.
9. **Rhodes, S.** & Cowan, N. (2019). Flexible Representations in Visual Working Memory and Interactions with Long-Term Learning: Commentary on the Special Issue. *British Journal of Psychology*, 110(2), 449–460.
10. **Rhodes, S.**, Jaroslawska, A. J., Doherty, J. M., Belletier, C., Barrouillet, P., Camos, V., Cowan, N., Naveh-Benjamin, M., & Logie, R. H. (2019). Storage and Processing in Working Memory: Assessing Dual Task Performance and Task Prioritization Across the Adult Lifespan. *Journal of Experimental Psychology: General*, 148(7), 1204–1227.
11. Morey, C., **Rhodes, S.** & Cowan, N. (2019). Sensory-Motor Integration and Brain Lesions: Progress Toward Explaining Domain-Specific Phenomena Within Domain-General Working Memory. *Cortex*, 112, 149–161.
12. Doherty, J. M., Belletier, C., **Rhodes, S.**, Jaroslawska, A., Camos, V., Barrouillet, P., Cowan, N., Naveh-Benjamin, M., & Logie, R. H. (2019). Dual-Task Costs in Working Memory: An Adversarial Collaboration. *Journal of Experimental Psychology: Learning, Memory, & Cognition*, 45(9), 1529–1551.
13. **Rhodes, S.**, Cowan, N., Parra, M. A., & Logie, R. H. (2019). Interaction Effects on Common Measures of Sensitivity: Choice of Measure, Type I Error and Power. *Behavior Research Methods*, 51(5), 2209–2227.
14. **Rhodes, S.** & Cowan, N. (2018). Attention in Working Memory: Attention is Needed but it Years to be Free. *Annals of the New York Academy of Sciences*, 1424(1), 52–63.

15. **Rhodes, S.**, Cowan, N., Hardman, K. O., & Logie, R. H. (2018). Informed Guessing in Change Detection. *Journal of Experimental Psychology: Learning, Memory, & Cognition*, *44*(7), 1023–1035.
16. Michalska da Rocha, B., **Rhodes, S.**, Vasilopoulou, E., & Hutton, P. (2018). Loneliness in Psychosis: A Meta-analytical Review. *Schizophrenia Bulletin*, *44*(1), 114–125.
17. **Rhodes, S.**, Parra, M. A., Cowan, N., & Logie, R. H. (2017). Healthy Aging and Visual Working Memory: The Effect of Mixing Feature and Conjunction Changes. *Psychology & Aging*, *32*(4), 354–366.
18. Smith, K., Ricaud, B., Shahid, N., **Rhodes, S.**, Starr, J. M., Ibáñez, A., Parra, M. A., Escudero, J., & Vandergheynst, P. (2017). Locating Temporal Functional Dynamics of Visual Short-Term Memory Binding using Graph Modular Dirichlet Energy. *Scientific Reports*, *7*, 42013.
19. Brown, L. A., Niven, E. H., Logie, R. H., **Rhodes, S.**, & Allen, R. J. (2017). Visual Feature Binding in Younger and Older Adults: Encoding and Suffix Interference Effects. *Memory*, *25*(2), 261–275.
20. **Rhodes, S.**, Parra, M. A., & Logie, R. H. (2016). Ageing and Feature Binding in Visual Working Memory: The Role of Presentation Time. *The Quarterly Journal of Experimental Psychology*, *69*(4), 654–668.
21. **Rhodes, S.**, & Parra, M. A. (2016). *Executive Functioning*. Encyclopedia of Geropsychology, Springer.

† = equal contribution; * = undergraduate student; pdfs at: <http://stephenrho.github.io/CV.html>

MANUSCRIPTS IN PROGRESS

1. **Rhodes, S.**, Cowan, N., Parra, M. A., & Logie, R. H. (*revise and resubmit*). Binding in Short-Term Visual Memory: Reassessing Whole Display Interference. Pre-print: <https://psyarxiv.com/rng4a/>
2. †Greene, N. R. & †**Rhodes, S.** (*under review*). A Tutorial on Cognitive Modeling for Cognitive Aging Research. Pre-print: <https://psyarxiv.com/qsnea/>

SELECTED PRESENTATIONS & POSTERS

Rhodes, S. (2019, Sep). Age Differences in the Precision of Memory Over the Short- and Long-Term. Invited talk presented at the Case Western Reserve University, Psychological Sciences Fall Colloquium, Cleveland, Ohio.

Rhodes, S. (2019, May). Comparing Competing Accounts of Storage and Processing in Working Memory. Presented at the Toronto Area Memory Group (TAMeG) meeting. York University, Toronto.

Rhodes, S., *Abbene, E., & Naveh-Benjamin, M. (2018, Nov). Age differences in memory precision across different study-test delays. Poster presented at the annual meeting of the Psychonomic Society, New Orleans, Louisiana.

Rhodes, S. (2018, May). Storage and Processing in Working Memory Across the Adult Lifespan. Presented at the Show-Me conference on Cognition. Washington University in St Louis, Missouri.

*Abbene, E., **Rhodes, S.**, & Naveh-Benjamin, M. (2018, May). Memory Precision in Younger and Older Adults Over Varying Delays Between Study and Test. Poster presented at the Cognitive Aging Conference, Atlanta, Georgia.

*Hussain, N., **Rhodes, S.**, & Naveh-Benjamin, M. (2018, May). The Effects of Aging and Verbal Overshadowing on Eyewitness Identification. Poster presented at the Cognitive Aging Conference, Atlanta, Georgia.

*Ledbetter, T., **Rhodes, S.**, & Naveh-Benjamin, M. (2018, May). Effects of Stereotype Threat on Older Adults' Associative Memory: The Role of Sensitivity and Criterion. Poster presented at the Cognitive Aging Conference, Atlanta, Georgia.

Rhodes, S., Jaroslawska, A. J., Doherty, J. M., Belletier, C., Naveh-Benjamin, M., Cowan, N., Camos, V., Barrouillet, P., & Logie, R. H. (2017, Nov). *Simultaneous Storage and Processing Across the Adult Lifespan*. Poster presented at the annual meeting of the Psychonomic Society, Vancouver, Canada.

Rhodes, S., Parra, M. A., Cowan, N., & Logie, R. H. (2016, Nov). *Interaction Effects in Detection and Recognition: Choice of Sensitivity Measure and Type I Error Rate*. Poster presented at the annual meeting of the Psychonomic Society, Boston, Massachusetts.

Rhodes, S. (2016, Sep). *Age and Binding Features in Working Memory: The Effect of Mixing Feature and Conjunction Changes*. Presented at the Cognition and Neuroscience Colloquium, University of Missouri.

Rhodes, S., Cowan, N., Hardman, K. O., & Logie, R. H. (2016, Jun). *Informed Guessing in Change Detection*. Presented at the Working Memory Discussion Group Meeting, Parcevall Hall, UK.

Rhodes, S., Parra, M. A., Cowan, N., & Logie, R. H. (2015, Nov). *Visual Working Memory and Change Detection: Reassessing Whole Display Interference*. Poster presented at the annual meeting of the Psychonomic Society, Chicago, Illinois.

Rhodes, S., Parra, M. A., Cowan, N., & Logie, R. H. (2014, Nov). *The Effect of Age on Visual Working Memory for Features and Conjunctions*. Poster presented at the annual meeting of the Psychonomic Society, Long Beach, California.

Rhodes, S., Parra, M. A., Cowan, N., & Logie, R. H. (2014, Sep). *Does Healthy Ageing Affect the Ability to Bind Features in Visual Working Memory?* Presented at the Seventh European Working Memory Symposium, Edinburgh.

Rhodes, S., Crowther, J., & Parra, M. A. (2014, Mar). *Behavioural and Electrophysiological Correlates of Visual Working Memory During Change Detection Tasks*. Presented at the Human Cognitive Neuroscience research seminar, University of Edinburgh.

TEACHING EXPERIENCE

Workshop on Bayesian Data Analysis

(Oct 2019 & Feb 2020)

Workshop Organizer

A workshop introducing attendees to Bayesian data analysis, the R package `brms`, and the Stan probabilistic programming language. Materials available at: <https://github.com/stephenrho/bayes-workshop>. This workshop was first given at the Rotman Research Institute, Toronto, and then at the School of Applied Social Sciences at Case Western Reserve University, Cleveland.

Workshop on Modeling Cognitive Processes in R

(Aug 2018)

University of Missouri – Workshop Co-organizer

Two-day workshop covering cognitive modeling in R, with a focus on signal detection theory and multinomial processing tree models (with Julia Haaf). Graduate students from University of Missouri and Washington University in St Louis attended. Materials available at: <https://tiny.cc/mocpr>

Psych 3020 (Research Methods)

(Jun 2018)

University of Missouri – Guest Lecture

Gave a guest lecture on “Experimental Investigations into Memory & Aging.”

Psych 2110 (Learning Memory & Cognition)

(Nov 2017)

University of Missouri – Guest Lecture

Gave a guest lecture on “Development and Aging Effects on Learning and Memory.”

Univariate and Multivariate Statistics Using R

(Sep 2014 – Sep 2015)

University of Edinburgh – Teaching Assistant

Two semester long courses introducing MSc students to data analysis in the R programming language (PSYL11053 & PSYL11054). This role involved assisting with practical sessions covering the use of different statistical models, including multi-level/ hierarchical models, as well as marking exam reports and code.

Working Memory Tutorials

(Sep 2014 – Sep 2015)

University of Edinburgh – Teaching Assistant

Assisted with tutorials for the graduate level working memory course taught by Dr. Candice Morey (PSYL11079). Led in-depth discussion of themes from lectures with groups of masters students.

Experiment Design Workshops

(Sep 2013 – Sep 2015)

University of Edinburgh – Workshop Organizer

Two 3-hour workshops covering the use of the OpenSesame software package and Python for building behavioural experiments. Offered to final year undergraduate and MSc students.

Psychology 2 (Research Methods)

(Sep 2013 – Sep 2014)

University of Edinburgh – Teaching Assistant

Led tutorials on methodology and statistics with groups of undergraduate students. Also assisted with practical sessions covering the use of SPSS and graded student research reports (PSYL08002).

UNDERGRADUATE RESEARCH MENTORING

2018–2019

- Ashley Meierhofer - *Memory for Precise Object Locations in Younger and Older Adults: Separating Effects of Study-Test Delay and Interference* (co-mentor with Dr Moshe Naveh-Benjamin)
- Mark Stewart Kaiser - *Value Based Memory and Divided Attention* (with Dr Moshe Naveh-Benjamin)

2017–2018

- Najeebah Hussain - *Aging, Eyewitness Memory, and Verbal Overshadowing* (with Dr Moshe Naveh-Benjamin) (Najeebah won the Psi Chi Regional Research Award for her poster at the 2018 meeting of the Midwestern Psychological Association)
- Emily Abbene - *Memory Precision in Younger and Older Adults Over Varying Delays* (with Dr Moshe Naveh-Benjamin)
- Tremaine Ledbetter - *Effects of Stereotype Threat on Older Adults' Associative Memory: The Role of Sensitivity and Criterion* (with Dr Moshe Naveh-Benjamin)
- Tony Sun - *Recollective Experience in Recognition: Replication of Gardiner and Java (1990)* (with Dr Jeff Rouder and Julia Haaf)

OTHER PROFESSIONAL ACTIVITIES

Ad-Hoc Reviewing

- *Aging, Neuropsychology, & Cognition*
- *Canadian Journal of Experimental Psychology*
- *Annals of the New York Academy of Sciences*
- *Cognition*
- *Attention Perception & Psychophysics*
- *Cognitive Psychology*

- *Cognitive, Affective, & Behavioral Neuroscience*
- *Developmental Psychology*
- *Frontiers in Aging Neuroscience*
- *Journal of Cognitive Psychology*
- *Journal of Experimental Psychology: General*
- *Journal of Experimental Psychology: Learning, Memory, & Cognition*
- *Memory*
- *Memory & Cognition*
- *Personality & Individual Differences*
- *Psychological Bulletin*
- *Psychology & Aging*
- *Visual Cognition*

Public Outreach

- neuroBRITE Mentor – working with high school (grade 10 and 11) students on a research project using the Muse™ EEG headband. Part of the Baycrest-Rotman Innovation & Technology Education in Cognitive Neuroscience initiative (*Jan 2019 – Mar 2020*)
- As a research ambassador for the journal *Cortex* I wrote summaries of in press articles for the general public or press. These summaries are available here: <https://medium.com/@STMDigest>
- Started and produced a newsletter for research volunteers (*Jan 2013 – Sep 2015*)
- Demonstrator – Edinburgh International Science Festival (*Apr 2013 & 2014*)
- Public talk – National Library of Scotland (with Mark Horne and Dr Sergio Della Sala) (*Apr 2014*)
- Public talk – University of the Third Age (U3A) Haddington, Scotland (*Feb 2014*)
- Demonstrator – Medical Research Council centenary celebration event (*Jun 2013*)

Professional Development

- University of Missouri Preparing Future Faculty Program (*2017–2018*)
- Centre for Cognitive Ageing and Cognitive Epidemiology workshop on public engagement (*Jun 2016*)

TECHNICAL SKILLS

- Generalized linear mixed-effects models
- Multinomial Processing Tree models
- Signal Detection Theory
- R for data analysis & simulation
- Hierarchical Bayesian modeling with JAGS and Stan
- Python and PsychoPy for experimental design and data collection
- L^AT_EX and knitr for document preparation

(Last updated 20th Oct, 2020)