

# Ruth A. Shaffer

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## PROGRAMMING & SKILLS

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- **Programming:** Expertise: R, MATLAB | Experienced: Python, SQL, PHP, HTML, CSS, JavaScript
- **Data Visualization:** Expertise: R (e.g., ggplot), Python (e.g., matplotlib, seaborn), Prism, MATLAB, Excel | Experience with: Chart.js (JavaScript)
- **Database Management:** MySQL, phpMyAdmin | **Data Collection:** MTurk, Qualtrics, neuroimaging
- **Machine Learning & Analytics:** Regression & Classification Techniques, e.g., Linear Regression (Simultaneous Analysis & Model Comparison), Mixed-Effects / Multilevel Modeling, Logistic Regression, KNN, Random Forest, AdaBoost, XGBoost, Neural Net | ANOVA, t-tests, Correlation, SDT ( $d'$ , Type I / II error), ROCs | **Big Data:** Experience: AWS EC2 instance, AWS Athena | Exposure to: Spark, EMR
- **Misc:** Expertise: Microsoft Excel, PowerPoint, Word, SPSS, Chrome DevTools, Hypothesis Testing, DOE | Experience: Agile work environment, Confluence | Music writing and production

## WORK EXPERIENCE, DATA SCIENCE & RESEARCH

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### Data Science Intern: Comcast Corporation, Reliability Analytics & Data Science Team Summer 2021

- Tuned & optimized 4 machine learning models (Random Forest, AdaBoost, XGBoost, Neural Net) using 2+ million rows of connectivity data to predict customer service truck dispatches (Scikit-learn, TensorFlow, AWS Athena, EC2). Presented findings & evaluations to company stakeholders.

### Memory and Cognition Laboratory, Washington University in St. Louis St. Louis, MO *Graduate Researcher, PhD Candidate* 2018 – Present

- Engage extensively in quantitative human memory research, both independently (end-to-end role) & cross-functionally with 8 departments, universities, nationally & internationally (Germany, Japan, Italy).
- Design & program 6 experiments for behavioral data collection (JavaScript, Python, MySQL, MTurk).
- Conduct advanced statistical quantitative analysis (R, MATLAB, SPSS) to explain and predict cognition from 180,000+ rows of human-subjects data.
- Present at national conferences to communicate key insights from data & publish 1<sup>st</sup>-author quantitative research article in scientific journal.

### Research Technician & Lab Manager / Undergraduate Research Assistant 2016 – 2018 / 2014 – 2016

- Developed pipelines in R & MATLAB to streamline data preprocessing & statistical analysis for large (100,000+ rows), complex neuroimaging & behavioral data sets.
- Built linear mixed-effects models to analyze individual differences in 3 measures of learning efficiency.
- Created dynamic visualizations of dataset for use by collaborative team (JavaScript, PHP, HTML, SQL).
- Developed tutorial & mentored graduate students in collecting data online using MySQL & jsPsych.

### Teaching Assistant: Human Learning and Memory (Psych 380) Fall 2020

- Developed & graded 3 course exams & 11 quizzes, hosted review sessions, held weekly office hours.

### Memory Laboratory, Washington University in St. Louis St. Louis, MO *Undergraduate Research Assistant (Honors Thesis, Spring 2016)* 2013 – 2015

- Quantitatively & qualitatively analyzed collective memory of WWII on Wikipedia pages in 10 languages.

## EDUCATION

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### Washington University in St. Louis – Graduate School August 2018 – Present

- Fourth Year PhD candidate, Psychological & Brain Sciences; GPA: **4.00/4.00**
- M.A., Psychological & Brain Sciences, with Thesis Conferred January 2021
- Graduate Certificate in Quantitative Data Analysis Requirements completed December 2019

### Washington University in St. Louis – Bachelor of Arts Conferred May 2016

- *Summa cum laude* with Senior Honors Thesis, Overall GPA: **3.99/4.00**
- Major: Psychological & Brain Sciences, Minor: Computer Science

## FELLOWSHIPS & AWARDS

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- National Science Foundation Graduate Research Fellow, graduate funding of **\$102,000**, conferred 2018
- McDonnell International Academy Scholar, graduate funding of **\$140,000**, conferred 2018
- Arnold J. Lien Scholar, full-tuition undergraduate merit scholarship, **\$179,600**, 2012 – 2016

## PUBLICATIONS IN PEER-REVIEWED JOURNALS

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For links to the publications below and a list of my posters and presentations: [www.ruthashaffer.com](http://www.ruthashaffer.com)

- Berg, J. J., Gilmore, A. W., **Shaffer, R. A.**, & McDermott, K. B. (2021). The stability of visual perspective and vividness during mental time travel. *Consciousness and Cognition*.
- **Shaffer, R. A.** & McDermott, K. B. (2020). A role for familiarity in supporting the testing effect over time. *Neuropsychologia*.
- Roediger III, H. L., Abel, M., Umanath, S., **Shaffer, R. A.**, Fairfield, B., Takahashi, M., & Wertsch, J. V. (2019). Competing national memories of World War II. *Proceedings of the National Academy of Sciences*.
- Gilmore, A. W., Nelson, S. M., Naaz, F., **Shaffer, R. A.**, & McDermott, K. B. (2018). BOLD activity during correct-answer feedback in cued recall predicts subsequent retrieval performance: An fMRI investigation using a partial trial design. *Cerebral Cortex*.

## MANUSCRIPTS IN PREPARATION

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- **Shaffer, R. A.** & McDermott, K. B. (in prep). The dual-process perspective and the benefits of retrieval practice in younger and older adults.

## COURSEWORK IN COMPUTER SCIENCE & DATA ANALYSIS

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### Computer Science

Computer Science I  
Seminar: Computer Science I  
Computer Science II  
Logic and Discrete Mathematics  
Data Structures and Algorithms  
Rapid Prototype Dev. and Creative Programming  
Engineering and Scientific Computing

### Relevant Data Analytics & Graduate Coursework

Applied Statistical Analysis with R  
Quantitative Methods I  
Quantitative Methods II  
Research Designs and Methods  
Hierarchical Linear Models  
Applied Longitudinal Data Analysis  
Applied Multivariate Analysis