Nathaniel Woodward

(*né* Raley[1])

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Education

9/2013–8/2018	**Ph.D., Educational Psychology — University of Texas at Austin** Concentration in Learning Sciences Dissertation: "Educational Practices in Large College Courses and Their Effects on Student Outcomes" (Advisor: Andrew C. Butler)
9/2014–5/2016	**M.S., Statistics — University of Texas at Austin** Portfolio in Scientific Computation (all coursework) Report: "Learning analytics in large college courses: Facilitating retention and transfer through targeted retrieval practice"
9/2008–5/2012	**B.A., Biology — Reed College** Commendation for Academic Excellence (highest honors) Thesis; undergraduate coursework **Online Coursework & Workshops** See all online coursework and certificates

Consulting & Editorial Experience

7/2016–present	**Graduate Assistant Editor** — Journal of Applied Research in Memory & Cognition Copyediting page proofs of all manuscripts accepted for publication by JARMAC.
6/2017–9/2017	**Graduate Statistical Consultant**— *Dept. of Statistics & Data Sciences* Assisting clients with experimental design, cleaning/formating data, performing statistical analyses, troubleshooting software, and interpreting/reporting results.

Research Experience

9/2017-5/2018	**Graduate Research Assistant** — *Project 2021, UT Austin* Worked on the Research and Measurement arm of Project 2021, an educational innovation initiative at UT Austin investigating teaching effectiveness, curriculum redesign, and student pathways. (Supervisor: Dr. Huk; Dr. Wegner, Dr. Pennebaker)
6/2016–9/2016	**Graduate Research Assistant** — *College of Education, UT Austin* Developed, ran, and reported hierarchical Bayesian models estimating the item-level causal effect of Cognitive Tutor usage via principal stratification, with log data from 25,000 students in 150 schools across the country (Supervisor: Dr. Sales)
9/2013–9/2017	**Graduate Research Assistant** — *Dept. of Educational Psychology, UT Austin* Currently researching processes of feedback, error detection, and memory encoding/retrieval under Dr. Andrew Butler, Dr. Veronica Yan, and colleagues

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[1]Prior to 2018, my legal name was Nathaniel David Raley

Teaching Experience

8/2017–present	**Instructor** — *Dept. of Statistics & Data Sciences, UT Austin* SDS 302: *Data Analysis for the Health Sciences*
5/2018	**Instructor** — *UT Austin Summer Statistics Institute* Introduction to Causal Inference
5/2015–6/2018	**GRE & GMAT Tutor** — *NextStep Test Prep, Austin TX* Currently providing tutoring for graduate exam preparation on a contract basis. Scored in the 99th percentile on the GRE (official) as well as on the GMAT, LSAT, and MAT (unofficial).
8/2016 -12/2016 1/2017 - present (1/2015-5/2015)	**Teaching Assistant** (Undergraduate-Level) — *UT Austin* *Myths and Mysteries of Memory* (Prof. Andrew Butler) *Cognition, Human Learning, and Motivation* (Prof. Butler; see student evaluations) Large (30-70+ student) upper-division undergraduate courses. Held office hours and provided individual tutoring for students leading up to exams. Assisted the instructor in developing course materials. Provided detailed, individualized feedback on all student submissions (3-5 assignments per week). Attended class each day and was permitted by the instructor to design and deliver lectures of my own.
1/2016 - 5/2016 8/2015 -12/2015 8/2014 -12/2014	**Teaching Assistant** (Graduate-Level) — *UT Austin* *Instructional Psychology* (Prof. Andrew Butler) *Complex Cognitive Processes* (Prof. Andrew Butler) *Seminar in Social Psychology* (Prof. Toni Falbo) Small (∼15-20 student) graduate-level courses. Responsibilities included grading all midterm and final exam papers, meeting with students individually, and providing students with written feedback on their work in the course.
2/2014 -12/2014	**Mathematics Instructor** — *Mathnasium, Austin TX* Certified Mathnasium instructor; helped teach K-12 students a lifelong "number sense" using an individualized curriculum that emphasizes proportional thinking, part/whole relationships, and number theory. Tutored students individually on an as-needed basis for test preparation and homework help. Subject matter begins with basic arithmetic and goes up through calculus and linear algebra.
8/2016 – present	**Short Course Assistant** — *Dept. of Statistics & Data Sciences, UT Austin* Served as an aide in six software short-courses (Introduction to Stata, Introduction to R) offered through the Department of Statistics and Data Science. Handled attendance, course supplies, technology/software issues, certificates, etc.
6/2012 – 8/2013	**SAT & ACT Exam Prep Tutor** — *Huntington Learning Center, Arlington TX* Individually tutored high school students in preparation for the SAT and ACT; also tutored students in subjects ranging from 2nd grade phonics/writing, through STAAR Biology and World Geography, up to to AP Calculus, AP Physics, AP World History, and college-level mathematics.
9/2012 – 5/2013	**High School Substitute Teacher** — *Birdville & Grapevine-Colleyville ISDs* Instructed numerous classes at both the middle and high school level; held a long-term substitute positions (>2 weeks) for Engineering, Microbiology, and Pathophysiology courses at the Birdville Center for Technology and Advanced Learning.

Publications & Conference Presentations

Butler, A.C., & **Woodward**, N.R. (in prep). Towards Consilience in the Use of Feedback to Promote Learning: A Review of the Literature. *Manuscript in preparation.*

Woodward, N.R. "Instructor Communication and Teaching Practices in Large College Courses"; Poster (Accepted), 2019 Psychonomic Society Annual Meeting.

Woodward, N.R., Davidson, O.A., Corliss, S.B., & Butler, A.C. Educational Practices in Large College Courses: What Really Goes On? Poster; 2018 AERA Annual Meeting, New York, NY

Butler, A.C., Black-Maier, A.C., **Raley, N.D.**, & Marsh, E.J. (2017). Retrieving and Applying Knowledge to Different Examples Promotes Transfer of Learning. Journal of Experimental Psychology: Applied, 23(4)

Raley, N.D., Sales, A., & Pane, J. *Using Principal Stratification to Assess Intervention Effectiveness at the Item Level.* 2017 NCME Annual Meeting; San Antonio, TX.

Raley, N.D. *Optimizing Retrieval Practice In Large College Courses through Factor Analysis of Frequent Quizzes.* Poster; Technology, Instruction, Cognition, & Learning SIG; 2017 AERA Annual Meeting, San Antonio, TX.

Raley, N.D., Cantor, A.D., Butler, A.C, & Marsh, E.J. Retrieval Practice and Contextual Variability Improve Transfer of Learning. Poster; 2016 Psychonomic Society Annual Meeting , Boston.

Butler, A.C. & **Raley, N.D.** A New Framework for Understanding How Feedback Promotes Learning. Poster; 2016 Psychonomic Society Annual Meeting , Boston.

Wang, L., **Raley, N.D.**, & Butler, A.C. Investigating Transfer-Appropriate Processing as a Theoretical Account for the Testing Effect. Poster; 2016 Psychonomic Society Annual Meeting, Boston.

Butler, A.C. & **Raley**, N.D. (2015) Commentary:*The Future of Medical Education: Assessing the Impact of Interventions on Long-Term Retention and Clinical Care.* Journal of Graduate Medical Education, 7(3), 483-485.

Raley, N.D., Cantor, A.D., Butler, A.C., & Marsh, E.J. (October, 2015) *Variability During Study and Retrieval Promotes Transfer of Learning* Poster; 24th Annual Armadillo Southwest Cognition Conference, Waco, TX. (*Runner-up: Best Graduate Poster*)

Raley, N.D., Jung-in, K., Hyewon, C., & Svinicki, M. (April, 2015). *Achievement Goal Orientations in Cooperative Classroom Contexts: Predicting Student Enjoyment, Community, and Group Processing.* Poster; Motivation SIG session: AERA Annual Meeting, Chicago, IL.

Raley, N.D. (March, 2014). *Group-level Achievement Goal Orientations* Presented at the Consortium for Reasearch in Teacher Education's Annual Teacher Education Symposium, Austin, TX.

Invited Talks

Woodward, N.R. (2018, February) *How Learning Works: Evidence-Based Practices from Lab and Classroom Studies.* Combined Sections (National) Meeting of the American Physical Therapy Association, New Orleans, LA.

Woodward, N.R. (2017, September) *Studying for success in college: how to make yourself better learner.* Talk presented to a University of Texas First-Year Interest Group Seminar, Austin, TX.

Projects

Summer 2016	**Online Short Course: Intro to Bayesian Statistics** — Developed my own week-long blended/flipped online course introducing applied Bayesian statistics. Wrote a full lesson plan, including video lectures/screencasts for pre-class viewing to bring all students up to the same level and to save classtime for guided practice with analysis I've also been working on a Shiny app to illustrate how Bayes rule works when observations are iterated; I plan to create several more apps like this for my course
Spring 2016	**Master's Report** "Learning Analytics in Large College Courses: Facilitating Retention and Transfer of Learning Through Targeted Retrieval Practice"
2015-present	**Memory Dynamics Lab (PI: Dr. Andrew Butler)** — Currently researching feedback effectiveness and retrieval-practice manipulations for improved retention
Fall 2015	**Statistical Consulting** — Worked with group on long-term project involving growth curve/mixed-model analysis of panel data for faculty member client; presented results
2014–2015	**NumberLand Tutoring System (c++)** — Programmed a command-line tutoring system for teaching basic arithemetic skills; models student knowledge based on variables accuracy and latency in order to address difficulties. Higher levels good for adult mental math training. Watch a video demonstration.
2013 & 2014	**Motivation Research (PI: Dr. Marilla Svinicki)**— "Achievement Goal Orientations in Cooperative Classroom Contexts: Predicting Student Enjoyment, Community, and Group Processing"
Fall 2013	**Literature Review** — "Intelligent Tutoring Systems"
8/2011 – 5/2012	**Undergraduate Thesis** "Feeding Regulation in the Maternal Mouthbrooder *Astatotilapia burtoni*"
2011	**Literature Review in Animal Physiology** "Enhancing LTP Through Actions on AMPA Receptor Initiation and CREB Consolidation"
2011	**Independent Research Project in Animal Physiology** "The Effect of Voluntary Exercise on Adiposity, Stomach Ghrelin, and GHSR1a Expression"
2010	**Literature Review & Website** — "Complex Cognition in Corvidae"

Skills

	Experimental Design, Academic Tutoring, Test Preparation, Statistics, Applied Math, Cognitive Psychology, Psychometrics, , Linux (Debian, Red Hat), LaTeX, Version control (Git), Web services (HTML/CSS, SQL, AWS), Adobe Creative Suite
	Statistical Software: R, JAGS/Stan, SAS, SPSS, JMP, Matlab/GNU Octave, Stata **Programming Languages:** Python, C(++), Fortran 95/2003, Lisp (Scheme)

Test Scores

Graduate Record Examination (GRE): 337/340
- Verbal Reasoning: 170/170 (99th %ile — *760-800 old scale*)
- Quantitative Reasoning: 167/170 (94th %ile — *800 old scale*)

Workshops, Online Coursework, & Certifications

12/2015	Bayesian Data Analysis Workshop (Prof. John Kruschke)
8/2015	Scalable Machine Learning (UC BerkeleyX)
	Cluster computing using Apache Spark with an emphasis on large-scale machine learning.
6/2014	Machine Learning (Coursera) — Stanford University (Prof. Andrew Ng)
	10-week course covering logistic regression, support vector machines, kernels, neural networks, clustering, dimensionality reduction, recommender systems, deep learning, bias/variance theory.
6/2014	Linear Algebra (edX: ID Verified) — UT Austin (Prof. Robert van de Geijn)
	16-week course covering all standard topics in linear algebra
2/2014	Computing for Data Analysis (Coursera) — Johns Hopkins (Prof. Roger Peng)
	4-week course in R programming: cleaning data, writing functions, graphics, packages, debugging

Volunteer Experience

5/2016 – 6/2016 5/2015 – 6/2015 5/2017 – 6/2017	**Instructor's Assistant** — *UT Summer Statistics Institute (SSI), Austin TX* For 3 years, served as an aide to Dr. Mahometa in the Introduction to Regression week-long course offered through the Summer Statistics Institute at UT. Handled attendance, course supplies, technology/software issues, and certificates
5/2017	**Competition Proctor/Grader** — *MATHCOUNTS, Austin TX* Assissted with proctoring and grading duties during the 2017 Texas State Competition of MATHCOUNTS, a nationwide program that promotes math excellence for 6th, 7th and 8th grade students
9/2012 – 7/2013	**Web Developer and Technology Liason** — *First Book, Tarrant County* Maintained a website for the Tarrant County advisory board of First Book, a non-profit organization devoted to promoting literacy in underpriviledged schools
1/2012 – 5/2012	**Exhibit Guide: "The Wonder of Learning"** — *Portland Children's Museum* Provided information and assistance to museum guests as they explored the exhibit; explained the finer points of the Reggio Emilia approach to early-childhood education

Professional Affiliations

- American Educational Research Association (AERA); Div C - Learning and Instruction
- National Council on Measurement in Education (NCME)
- Society for Applied Research in Memory and Cognition (SARMAC)
- Psychonomic Society

Professional References

- Dr. Andrew C. Butler. Associate Professor of Psychological & Brain Sciences, WUSTL. (andrew.butler@wustl.edu; 314-935-8954)
- Dr. Michael Mahometa. Lead Consultant: Statistics & Data Science, UT Austin. (michael.mahometa@austin.utexas.edu; 512-471-4542)
- Dr. Yeronica Yan. Assistant Professor of Educational Psychology, UT Austin. (veronicayan@austin.utexas.edu)

Representative Graduate Coursework (2013–2017)

Psychology/Education Courses	*Statistics & Computing Courses*
Psychology of Learning	*Experimental Design & Statistical Inference*
Current Topics in Learning & Instruction	*Regression Analysis*
Psychometrics: Theory & Methods	*Bayesian Statistical Methods*
Seminar in Social Psychology	*Mathematical Statistics I & II*
Motivation & Emotion	*Survey of Multivariate Methods*
Complex Cognitive Processes	*Introduction to Scientific Programming*
Research Design/Methods for Ed. Psych	*Scientific and Technical Computing*
Instructional Psychology	*Calculus III (Multivariable)*
College Teaching Methodology (398T)	*Causal Inference*
Lit. & Research Synthesis	*Numerical Analysis: Linear Algebra*
Applied Psychometrics	*Item Response Theory*
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Undergraduate Coursework:

Animal Behavior (Renn), Behavioral Neuroscience (Currie), Comparative Cognition (Hackenberg), Developmental Psychology (Henderlong-Corpus), Animal Physiology (Arch), Probability & Statistics (Jones), Calculus I & II (Roberts), Intro to Analysis (Perkinson), Genetics (Russell), Population Ecology & Evolution (Kaplan), Greco-Roman Humanities, Early Modern Europe, Chinese I & II (Gibas), . . .