

KOLE NORBERG, Ph.D.

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PROFILE

Cognitive and data scientist with 10+ years of experience designing studies, measuring cognition and behavior, and converting complex research data into validated analyses, predictive models, visualizations, and scientific reports. Advanced R practitioner with Python, SQL, and Databricks experience; recognized for identifying data-integrity problems, developing reproducible pipelines, and communicating complex findings clearly. Independently leads external research engagements from requirements gathering and analysis planning through data governance, statistical execution, quality review, interpretation, and presentation.

SELECTED HIGHLIGHTS

- **Data quality & validation.** Discovered unanticipated behavioral pathways and data anomalies that violated assumptions built into multiple analyses; corrected the affected findings, collaborated with engineering teams to repair instrumentation errors, and authored an internal data-science course to establish shared cleaning and validation protocols across the analyst team.
- **Cognitive & behavioral measurement.** Measured attention and learning using eye tracking (EyeLink), and built measures of harder-to-observe constructs — engagement, metacognition, reading strategy — from behavioral data, across both controlled experiments and large real-world datasets ([Journal of Experimental Psychology](#), [Dissertation](#), [Learning @ Scale](#)).
- **Predictive & ML modeling.** Built and validated predictive models of user outcomes, including a supervised text-feature model now used to evaluate and rewrite LLM content, and a random-forest analysis extracting navigation strategies from high-dimensional behavioral logs ([Educational Data Mining](#), [Learning and Individual Differences](#)).
- **Translation & scientific communication.** Owned research end-to-end across six grants — turning stakeholder needs into analysis plans, statistical output, and reports — and presented results to product, engineering, design, and executive audiences.

EXPERIENCE

Senior Learning Engineer | Carnegie Learning, Pittsburgh, PA

03/2024 – Present

Learning Engineer | Carnegie Learning

03/2023 – 03/2024

- Led external research engagements from requirements gathering through delivery, translating scientific questions into study designs, preregistered analysis plans, data specifications, reproducible statistical output, technical reports, executive summaries, and publication-ready tables and figures while managing IRB review, data-use agreements, de-identification, and secure handling of sensitive participant data.
- Conducted quantitative and qualitative analyses of cognitive and learning outcomes at scale, including hierarchical regression, path analysis, machine learning, and Bayesian inference on large behavioral-log datasets integrated with surveys, usability interviews, demographics, and assessment scores.
- Independently validated calculations and system-generated metrics against raw source data, investigated discrepancies, and worked with technical teams to correct data-processing and instrumentation issues.
- Evaluated a real-time dashboard that surfaced student state to teachers, integrating survey and behavioral-log data to determine how the tool was used under real-world conditions at scale ([Learning @ Scale](#)).
- Automated a data pipeline for text processing, transformation, and encoding, reducing time to production by more than 75% ([International Journal of AI in Education](#)).

Postdoctoral Researcher | Resilient Cognitive Solutions, Pittsburgh, PA

03/2022 – 12/2022

- Developed a cognitive-communications model identifying behavioral and contextual risk factors for miscommunication between humans and automated systems.
- Led a cross-functional team in designing a video game as an experimental research instrument, translating research requirements into measurable behaviors, study procedures, and system features.
- Analyzed and coded Federal Aviation Administration communication transcripts to investigate patterns associated with human-machine and operational miscommunication.
- Authored a cross-disciplinary review synthesizing psychology and computer-science research into evidence-based recommendations for the Air Force Research Laboratory.

Graduate Student Researcher | University of Pittsburgh (LRDC), Pittsburgh, PA

08/2017 – 05/2022

- Led seven projects through the full research cycle: theory, design, execution, data cleaning, analysis, inference, and dissemination.
- Designed and analyzed cognitive experiments measuring moment-to-moment attention and comprehension during reading using EyeLink eye tracking, identifying when and how readers integrated on-screen information ([Journal of Experimental Psychology](#)).
- Applied random forests to high-dimensional, low-observation behavioral-log data that were poorly suited to conventional inference, extracting interpretable navigation strategies (Outstanding Student Paper; [Learning and Individual Differences](#)).
- Communicated statistical methods and findings to technical and nontechnical audiences through graduate instruction and invited lectures on Bayesian inference, R, and data visualization.

Research Assistant | City University of New York (Kacirik Lab)

08/2015 – 08/2017

- Behavioral studies of language processing and embodied cognition; work presented at the Psychonomic Society Annual Meeting.

METHODS & TOOLS

- **Statistics & machine learning:** randomized experiments and A/B tests, quasi-experimental designs, hierarchical linear and logistic regression, Bayesian inference, path analysis, supervised machine learning (incl. random forests), predictive modeling.
- **Programming & data:** R (advanced), Python, SQL, Databricks, GitHub; pipeline automation, data cleaning, curation, and validation.
- **Scientific reporting & visualization:** analysis plans, statistical output and QC, data visualization, executive summaries, peer-reviewed writing, and presenting to technical and executive audiences.
- **Cognitive & behavioral measurement:** cognition, attention, and engagement; eye tracking (EyeLink); reading-time and comprehension measurement; large-scale behavioral-log analysis.
- **Survey & mixed methods:** scale design and adaptation, response-bias tradeoffs, sensitivity analysis; protocol and behavioral-strategy coding, think-aloud and interview analysis.

EDUCATION & AWARDS

Ph.D., Cognitive Psychology | University of Pittsburgh

- Minor in Quantitative Methods; Certificate in Neuroscience, Center for the Neural Basis of Cognition.
- Ruth Myers Research Excellence Award for Dissertation; Outstanding Student Paper Award (2019).

M.S., Cognitive Psychology | University of Pittsburgh

M.F.A., Creative Writing | Florida Atlantic University

B.A., Psychology | Indiana University, Bloomington