# Runhan (Brad) Yang

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## Research & Data Science Profile

PhD researcher specializing in quantitative behavioral science, with deep experience in Bayesian hierarchical modeling, computational simulations, and experimental design. Proven ability to translate complex research questions into rigorous statistical models and data-driven insights.

## Education

**University of Illinois Urbana-Champaign** — Champaign, IL
*PhD in Psychology (Cognitive and Quantitative Track)* — *2022 - 2027 (expected)*
*MS in Psychological Science* — *2020 - 2022*
*BS in Psychology & BA in Economics* — *2016 - 2019*

## Skills

**Data Science & Statistics**
Bayesian hierarchical modeling (brms, Stan), Generalized linear models & model comparison
Simulation-based power analysis, Model comparison & cross-validation, Experimental design & causal inference

**Computational Modeling**
Signal Detection Theory, Drift-Diffusion Model, Item Response Theory
Parameter estimation (evolutionary algorithm, grid search)

**Programming & Tools**
Advanced: R (tidyverse, brms, rstan), Matlab
Intermediate: JavaScript, Python

## Research Experience

**Doctoral Researcher in Cognitive Science** — May 2022 - present
*University of Illinois Urbana-Champaign, Human Memory and Cognition Lab* — *Champaign, IL*

- Led 10+ end-to-end behavioral and psychophysical studies, translating theoretical questions into deployable experiments using MATLAB, JavaScript, and Python
- Developed and evaluated 5+ computational models using Bayesian and frequentist approaches to estimate latent cognitive and metacognitive processes
- Designed large-scale simulations to validate model behavior, assess parameter identifiability, and conduct simulation-based power analyses for nonlinear models
- Applied evolutionary algorithms and cross-validation to optimize model fitting and prevent overfitting
- Analyzed eye-tracking and pupillometry data to model vigilance, attention dynamics, and decision uncertainty
- Mentored junior researchers and coordinated research teams (10+ assistants per semester), ensuring reproducible workflows and project efficiency

## Applied Research Experience

**User Experience Research Intern** — Jan 2021 - May 2022
*Synchrony Financial, the UX group* — *Champaign, IL*

- Designed and analyzed A/B tests and usability experiments to evaluate user decision-making in financial products
- Synthesized quantitative metrics and qualitative findings to inform product design decisions under real business constraints
- Assessed readability, information structure, and decision friction in redesigned web interfaces, producing actionable recommendations
- Identified behavioral bottlenecks in purchase and enrollment flows and proposed data-driven improvements

  Methods: A/B testing, surveys, usability testing, Think-Aloud, 5-second tests

## Publications

[6] **Yang**, R., & Benjamin, A. S. (2025). Metacognitive control of workflow enhances stimulus discriminability and reduces signal uncertainty. *Journal of Experimental Psychology: Learning, Memory, & Cognition.*

[5] **Yang**, R., Patel, T. N., Fairbairn, C. E., & Benjamin, A. S. (2025). The effect of alcohol on extended vigilance and on the benefits of rest breaks. *Attention, Perception, & Psychophysics*, 1-12.

[4] Benjamin, A. S., **Yang**, R., & Unal, B. (2025). Changes in recent practices in research and publishing: A view from the Journal of Experimental Psychology: Learning, Memory, and Cognition. *Journal of Experimental Psychology: Learning, Memory, & Cognition.*

[3] Patel, T. N., **Yang**, R., Steyvers, M., & Benjamin, A. S. (2024). The metacognition of vigilance: Using self-scheduled breaks to improve sustained attention. *Journal of Experimental Psychology: Applied.* https://doi.org/10.1037/xap0000518

[2] **Yang**, R., Whitlock, J., & Benjamin, A. S. (in prep). Model of eye movements during forced-choice recognition.

[1] **Yang**, R., Zhang, B., & Benjamin, A. S. (in prep). Self-selection of test items improves test reliability by reducing item variability in the presence of item x person interaction effects

## Presentations

[3] **Yang**, R., & Benjamin, A. S. (2025, November 20) *Can we monitor attention? Metacognitive harnessing of attentional fluctuations* [Oral presentation]. International Association of Metacognition 12th Biennial Meeting, Denver, Colorado, United States.

[2] **Yang**, R., Whitlock, J., & Benjamin, A. S. (2024, November 21-24) *Model of eye movements during forced-choice recognition* [Poster presentation]. Psychonomic Society 65th Annual Meeting, New York City, New York, United States.

[1] **Yang**, R., & Benjamin, A. S. (2023, November 16-19) *Self-pacing in attention-demanding search task enhances stimulus discriminability and reduces uncertainty* [Poster presentation]. Psychonomic Society 64th Annual Meeting, San Francisco, California, United States. *__Graduate Conference Award received (15 out of 1000)__