Wanjing Anya Ma

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Education

2021 – 2026	**Ph.D., Stanford University** Learning Sciences and Technology Design Advisors: *Jason Yeatman, Nick Haber, Ben Domingue*
	Ph.D. Minor, Stanford University Computer Science
2018 – 2019	**M.S., University of Pennsylvania** Learning Sciences and Technologies Advisor: *Ryan Baker*
2016 – 2018	**B.S., New York University** Computer Science
	B.S., New York University Teaching Chemistry 7-12
2014 – 2015	**Boston University** Computer Science

Research Interests

- Psychometric: Computerized Adaptive Testing, Diagnostic Assessments, Multidimensional Latent Traits
- Natural Language Processing: Foundation Models for Assessments, Alignment
- Human-centered AI Applications: Evaluations of AI tools, Personalized Learning

Research Achievements

- Designed and deployed large-scale adaptive online applications for foundational reading skills assessment (Rapid Online Assessment of Reading), serving over 50,000 K-12 students across the U.S., Colombia, Brazil, Italy, and Canada.

- Led psychometric research, collecting longitudinal evidence on the validity and reliability of assessments, and contributed to the authorship of the technical manual.

- Integrated large language models and designed strategic human-in-the-loop systems to automate item generation and model item difficulty for educational assessments.

- Developed an open-source library, jsCAT, enabling real-time, browser-based computerized adaptive testing for broad application in behavioral research.

- Leading a collaboration with Microsoft Education to evaluate the efficiency of an AI-powered reading tool in promoting students' silent reading development.

Professional Experiences

2024	**Ida Lawrence Research Intern**, ETS Research Institute, NJ Project: Automatic Item Generation of Reading Comprehension Items Mentors: *Michael Flor, Zuowei Wang*
2019 – 2021	**Chemistry Subject Expert Teacher**, BASIS Independent Brooklyn, NY

Awards and Fellowships

2023   **Distinguished Poster Award**, International Meeting of Psychometrics Society

Stanford Interdisciplinary Graduate Fellowship, Stanford University

2019   **Best Paper Nomination**, International Conference on Computer Supported Collaborative Learning

2018   **Merit-Based Scholarship**, University of Pennsylvania

Letha Hurd Morgan Award, New York University

Honors in Science Education, New York University

Luke Hallenbeck Scholarship, New York University

2017   **John Park Graduate Student Convention Travel Award**, School Science and Mathematics

Undergraduate Student Spotlight, New York University Courant Computer Science

Publications

* indicates equal first-author contributions

Journal Articles

1. Gijbels, L., Burkhardt, A., **Ma**, **W. A.**, & Yeatman, J. D. (2024). Rapid online assessment of reading and phonological awareness (roar-pa). *Scientific Reports*, *14*(1), 10249.
🔗 https://www.nature.com/articles/s41598-024-60834-9

Conference Proceedings

1. Tan, A. W. M., Yu, S., Long, B., **Ma**, **W. A.**, Murray, T., Silverman, R. D., Yeatman, J. D., & Frank, M. C. (2024). Devbench: A multimodal developmental benchmark for language learning. *Advances in Neural Information Processing Systems*. 🔗 https://doi.org/https://arxiv.org/abs/2406.10215

2. Zelikman, E., *** Ma**, **W. A.**, * Tran, J., Yang, D., Yeatman, J., & Haber, N. (2023). Generating and evaluating tests for k-12 students with language model simulations: A case study on sentence reading efficiency. *Proceedings of the 2023 Conference on Empirical Methods in Natural Language Processing*, 2190–2205. 🔗 https://doi.org/10.18653/v1/2023.emnlp-main.135

3. Matuk, C., **Ma**, **W.**, Sharma, G., & Linn, M. (2019). The lifespan and impact of students' ideas shared during classroom science inquiry. *Proceedings of the 13th Annual International Conference for Computer Supported Collaborative Learning. Lyon: International Society for the Learning Sciences.*, 49–56.
🔗 https://par.nsf.gov/servlets/purl/10180393

4. **Ma**, **W.** (2017). A computer tool that will allow secondary science teachers to differentiate reading materials for students with varied reading abilities. *Proceedings of the 116th annual convention of the School Science and Mathematics Association*, 14–21.
🔗 https://www.ssma.org/assets/Proceedings/Proceedings2017FINALWeb.pdf#page=15

Preprints

1. Bhat, K. G., Mogan, A. D., Saavedra, A., Fuentes-Jimenez, M., Siebert, J. M., **Ma**, **W. A.**, Townley-Flores, C., Richie-Halford, A., Wilkey, E. D., & Yeatman, J. (2024). Shared and unique influences of phonological processing on reading and math. 🔗 https://doi.org/10.31219/osf.io/em3bg

2. He-Yueya, J., **Ma**, **W. A.**, Gandhi, K., Domingue, B. W., Brunskill, E., & Goodman, N. D. (2024). Psychometric alignment: Capturing human knowledge distributions via language models.
🔗 https://arxiv.org/abs/2407.15645

3. **Ma**, **W. A.**, Richie-Halford, A., Burkhardt, A., Kanopka, K., Chou, C., Domingue, B., & Yeatman, J. D. (2023a). Roar-cat: Rapid online assessment of reading ability with computerized adaptive testing. *PsyArXiv*. 🔗 https://osf.io/preprints/psyarxiv/7tpx2

4. Tran, J. E., * Yeatman, J., * Burkhardt, A., **Ma**, **W. A.**, Mitchell, J., Yablonski, M., Gijbels, L., Townley-Flores, C., & Richie-Halford, A. (2023). Development and validation of a rapid online sentence reading efficiency assessment. 🔗 https://osf.io/preprints/osf/u3mjz

Open Software

1. **Ma**, **W. A.**, Yeatman, J. D., & Richie-Halford, A. (2023). Jscat: Computer adaptive testing in javascript [Open-source software]. 🔗 https://github.com/yeatmanlab/jsCAT

Presentations

Invited Talks

1. Zelikman, E., * **Ma**, **W. A.**, * Tran, J., Yang, D., Yeatman, J., & Haber, N. Generating and evaluating tests for k-12 students with language model simulations: A case study on sentence reading efficiency. In: HAI: AI+Education Summit: AI in the Service of Teaching Learning. 2024.

Conference Presentations

1. Long, B., **Ma**, **W. A.**, Silverman, R., Yeatman, J., & Frank, M. C. Developmental changes in the precision of visual concept knowledge. In: Vision Science Society. 2024.

2. Tran, J. E., **Ma**, **W. A.**, Burkhardt, A., T., M., Wentzlof, K., Ungashe, A., Fuentes-Jimenez, M., Stone, H., Mitchell, J., Yablonski, M., Gijbels, L., Richie-Halford, A., Townley-Flores, C., & Yeatman, J. D. Improving the efficiency of silent reading measure through timing analyses and automatic ai test generation. In: NCME Special Conference on Classroom Assessment. 2024.

3. **Ma**, **W. A.**, Burkhardt, A. K., & Yeatman, J. D. Exploring parameter invariance for adaptively assessing reading among students with learning differences. In: Annual Meeting of the National Council on Measurement in Education. 2023.

4. **Ma**, **W. A.**, Richie-Halford, A., Burkhardt, A., Kanopka, K., Chou, C., Domingue, B., & Yeatman, J. D. Roar-cat: Rapid online assessment of reading ability with computerized adaptive testing. In: International Meeting of the Psychometric Society. 2023.

5. Tran, J. E., **Ma**, **W. A.**, Gijbels, L., Townley-Flores, C., Siebert, J., Tran, J. E., Murray, T., Fuentes-Jimenez, M., Ramamurthy, M., Richie-Halford, A., & Yeatman, J. D. Rapid online assessment of reading (roar): A platform for developmental cognitive neuroscience research at an unprecedented scale. In: Flux Congress. 2023.

6. Kirch, S. A., Sabouri, P., Zhang, M., & **Ma**, **W.** Theory-based design of tools for analyzing learning in educational environments. In: National Association for Research in Science Teaching Annual International Conference. 2019.

7. **Ma**, **W.**, Kirch, S. A., Sabouri, P., & Zhang, M. Understanding students' dialogic learning experience in an emergent transformative science classroom. In: National Association for Researching Science Teaching Annual International Conference. 2019.

Graduate Teaching Experiences

Stanford University

2024   **EDUC 252**: Introduction to Psychometrics
Teaching Assistant

Professional Activities

Certificates

2018 – 2023   Chemistry Initial Certificate 7–12 with 5–6 Extension, New York State Education Department

Professional Memberships

2023 – · · · ·   Associations for Computational Linguistics (ACL)

2022 – · · · ·   National Council on Measurement in Education (NCME)

2023 – · · · ·   Psychometric Society (IMPS)

Service to Field

Reviewer   National Council on Measurement in Education 2023

National Council on Measurement in Education 2024

NeurIPS 2024 Workshop Large Foundation Models for Educational Assessment

Programming Skills

Python, R, SQL, JavaScript, HTML, Java, C, and TypeScript