Wesley G. Morris

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Research Summary

Ph.D. candidate in quantitative methodology working at the intersection of educational measurement and education data science. Research integrates psychometric and advanced statistical models (Item Response Theory, Many-Facet Rasch Modeling, Multilevel Modeling, Structural Equation Modeling, and Bayesian estimation) with transformer-based large language models and multimodal machine learning to build, score, and validate educational assessments and learning technologies, with particular attention to rater reliability and fairness. Dissertation develops an explanatory extension of the Many-Facet Rasch Model with Bayesian parameter estimation to explain why raters disagree when forming judgments about language. Record includes more than 20 journal articles, book chapters, and peer-reviewed proceedings; $76,389 in competitive funding, including an NSF I-Corps award; graduate-level teaching in NLP and machine learning methods; and nearly a decade of K-12 teaching experience.

Education

- **Ph.D., Cognition in Context** (Expected May 2027) | Vanderbilt University, Nashville, TN
  Dissertation focus: explanatory Many-Facet Rasch Modeling with Bayesian estimation of rater disagreement in language judgments. GPA: 3.9. Coursework in multilevel modeling, item response theory, neural networks, and transformer-based large language models.
- **M.A., Applied Linguistics and TEFL (2013)** | Georgia State University, Atlanta, GA
- **B.A., Psychology (2011)** | Charter Oak State College, New Britain, CT
  Graduated cum laude (GPA: 3.78). Member, Alpha Sigma Lambda Honor Society.

Additional Methodological Training & Certifications

- **Summer School in Social Science Methods:** *An Introduction to Bayesian Methods for the Social Sciences* | Università della Svizzera italiana (USI), Lugano, Switzerland (2026)
- **AMI Montessori Teacher Certification** | Association Montessori Internationale (2016)

Grants, Funding & Awards

- **NSF National I-Corps Grant ($50,000)** | National Science Foundation (2026). Customer discovery and commercialization of the iTELL intelligent textbook platform.
- **Chancellor's Launch Grant ($23,889)** | Owen Graduate School of Management, Vanderbilt University (2026). Launch funding for the iTELL startup.
- **NSF Mid-South Regional I-Corps Pitch Competition Award ($2,500)** | National Science Foundation (2025). iTELL customer discovery.
- **Grand Prize Winner** | NAEP Math Automated Scoring Challenge, National Center for Education Statistics (2023). LLM-based scoring of constructed-response math items.

Research Experience

- **Research Assistant** | Vanderbilt University (2022 – Present)
  Advisor: Prof. Scott Crossley (scott.crossley@vanderbilt.edu)
  - Apply psychometric and multilevel methods (Item Response Theory, explanatory Many-Facet Rasch Modeling, Bayesian estimation) to validate language assessments and to audit the reliability, sensitivity, and fairness of LLM-based scoring models.
  - Led analysis for the Feedback Competition, developing an AI tool for discourse-level essay annotation using Python and R.

    - Co-developed and served as CEO of iTELL, an intelligent textbook framework that generates interactive content from provided texts; secured $76,389 in NSF I-Corps and university funding to support its development and commercialization.
- **21st Century World Track Lead, Tools Competition** | The Learning Agency (2022 – Present)
  Directed the Schmidt Futures-funded grant competition to advance educational technologies in assessment and learning science.
    - Meg Benner, Competition Director (meg@the-learning-agency.com)
- **Graduate Research Assistant** | Georgia State University (2011 – 2013)
  Advisor: Prof. Scott Crossley.
    - Supported data analysis, transcription, and research on text quality. Performed essay rating using analytic rubrics.

Publications

Peer-Reviewed Journal Articles

1. **Morris, W.**, Tian, Y., Holmes, L., Choi, J. S., & Crossley, S. A. (in press). *Validating LexTALE for Native English Speakers using Item Response Theory.* Studies in Language Assessment.
2. Crossley, S., Holmes, L., & **Morris, W.** (2026). Assessing the reliability and validity of large language models in automatic essay scoring. *Assessing Writing*, 69, 101082.
3. Holmes, L., **Morris, W.**, Crossley, S., & Choi, J. S. (2026). Assessing Fairness in Finetuned Scoring Models with Demographically Restricted Training Data. *Assessing Writing*, 68, 101032. https://doi.org/10.1016/j.asw.2026.101032
4. Holmes, L., **Morris, W.**, Choi, J. S., & Crossley, S. A. (2026). Word Predictability as a Measure of Second Language Proficiency. *Language Learning*, 76(1). https://doi.org/10.1111/lang.12650
5. **Morris, W.**, Holmes, L., Choi, J. S., & Crossley, S. (2025). Distinguishing Effective Writing Styles in the PERSUADE Corpus. *Journal of Writing Research*, 16(3). https://doi.org/10.17239/jowr-2025.16.03.05
6. **Morris, W.**, Holmes, L., Choi, J. S., & Crossley, S. (2024). Automated Scoring of Constructed Response Items in Math Assessment Using Large Language Models. *International Journal of Artificial Intelligence in Education*, 34(4), 1551-1582. https://doi.org/10.1007/s40593-023-00379-8
7. **Morris, W.**, Crossley, S., Holmes, L., Ou, C., Dascalu, M., & McNamara, D. (2024). Formative Feedback on Student-Authored Summaries in Intelligent Textbooks Using Large Language Models. *International Journal of Artificial Intelligence in Education*, 34(3), 1276-1310. https://doi.org/10.1007/s40593-023-00361-4
8. Holmes, L., Crossley, S., **Morris, W.**, & Sikka, H. (2023). PILLO: An Open-Source System for Personally Identifiable Information Labeling and Obfuscation. *Information and Learning Science*, 124(9/10), 285-305. https://doi.org/10.1108/ILS-03-2023-0023
9. Crossley, S. A., Tian, Y., Baffour, P., Franklin, A., Kim, Y., **Morris, W.,** Benner, B., Picou, A., & Boser, U. (2023). Measuring Second Language Proficiency Using the English Language Learner Insight, Proficiency and Skills Evaluation (ELLIPSE) Corpus. *International Journal of Learner Corpus Research*, 9(2), 248-271. https://doi.org/10.1075/ijlcr.22013.cro

Book Chapters

1. Crossley, S. A., Choi, J. S., Holmes, L., **Morris, W.**, Rus, V., & Lintean, M. (2026). The Use of Large Language Models in an Intelligent Text Framework. In A. M. Sinatra, V. Rus, A. C. Graesser, & P. M. Lawton (Eds.), *Design Recommendations for Intelligent Tutoring Systems: Volume 12 - Generative Artificial Intelligence* (pp. 119–134). Orlando, FL: US Army Combat Capabilities Development Command - Soldier Center. ISBN 978-0-9977258-7-2.

Peer-Reviewed Conference Proceedings & Workshop Papers

1. **Morris, W.**, Holmes, L., & Crossley, S. (in press). Psychometric Analysis of LLM Differential Sensitivity to Word Predictability Using Explanatory MFRM. In *Proceedings of the Sixteenth International Conference on Learning Analytics & Knowledge* (LAK '26), Bergen, Norway, April 27-30, 2026.
2. Holmes, L., Choi, J. S., Crossley, S. A., & **Morris, W. G.** (in press). Assessing the reliability and construct representation of LLM-based language proficiency scores. In *Proceedings of the Artificial Intelligence in Measurement and Education Conference (AIME-Con)*. National Council on Measurement in Education.
3. Shen, S., Wise, A. F., **Morris, W**., Holmes, L., Hinze, S. R., & Crossley, S. (2026, April). The Effects of AI Feedback on College Students' Reading and Writing Performance in an Intelligent Text Framework. In *Proceedings of the LAK26: 16th International Learning Analytics and Knowledge Conference* (pp. 876-882).
4. Reddig, J., Smith Jr, G. R., Siyahrood, S. A., **Morris, W. G.**, Bae, Y., Crutcher, K., ... & MacLellan, C. J. (2026, June). Guidelines for Designing AI Technologies to Support Adult Learning. In *Proceedings of the 2026 Designing Interactive Systems Conference* (pp. 2474-2496).
5. **Morris, W.**, Vitale, J., & Arvelo, I. (2025). Using Whisper Embeddings for Audio-Only Latent Token Classification of Classroom Management Practices. In *Proceedings of the Artificial Intelligence in Measurement and Education Conference* (AIME '25), Pittsburgh, USA, October 27-29, 2025.
6. Crossley, S., Choi, J. S., **Morris, W.**, Holmes, L., & Joyner, D. (2025). AI Enhanced Intelligent Texts and Learning Gains. In *Proceedings of the Sixth Workshop on Intelligent Textbooks* (iTextbooks '25), Palermo, Italy, July 26, 2025.
7. **Morris, W.**, Holmes, L., Choi, J. S., & Crossley, S. (2025). Uncovering Differential Sensitivity Toward Linguistic Features of Cohesion in Large Language Models. In *Proceedings of the Twenty-Sixth International Conference on Artificial Intelligence in Education* (AIED '25), Palermo, Italy, July 22-26, 2025.
8. Crossley, S., **Morris, W.**, Choi, J. S., & Holmes, L. (2025). Exploratory Assessment of Learning in an Intelligent Text Framework: iTELL RCT. In *Proceedings of the 18th International Conference on Educational Data Mining* (EDM '25), Palermo, Italy, July 20–23, 2025.
9. **Morris, W.**, Choi, J. S., Holmes, L., & Gupta, V. (2024). Automatic Question Generation and Constructed Response Scoring in Intelligent Texts. In *Proceedings of the 17th International Conference on Educational Data Mining* (EDM '24), Atlanta, Georgia, July 14–17, 2024.
10. Crossley, S., Tian, Y., Choi, J. S., Holmes, L., & **Morris, W.** (2024). Plagiarism Detection Using Keystroke Logs. In *Proceedings of the 17th International Conference on Educational Data Mining* (EDM '24), Atlanta, Georgia, July 14–17, 2024 (pp. 476–483).
11. Crossley, S., Choi, J. S., **Morris, W.**, Holmes, L., & Gupta, V. (2024). Using Intelligent Texts in a Computer Science Classroom: Findings from an iTELL Deployment. In *Proceedings of the Educational Data Mining in Computer Science Education Workshop* (CSEDM '24), Atlanta, Georgia, USA, July 14, 2024.
12. Choi, J. S., **Morris, W.**, Holmes, L., & Crossley, S. (2024). Focus Time and Writing Performance in an Intelligent Textbook. In *Selected Papers of the Educational Data Mining in Writing and Literacy Instruction Workshop*, Atlanta, Georgia, USA, July 14, 2024.
13. Kim, M., Kim, J., Bae, Y., **Morris, W.**, Holmes, L., & Crossley, S. (2024). How AI Evaluates Learner Comprehension: A Comparison of Knowledge-Based and Large Language Model (LLM)-Based AI Approaches. Submitted to the *18th International Conference of the Learning Sciences* (ICLS 2024), Buffalo, New York: International Society of the Learning Sciences.
14. Coscia, A., Holmes, L., **Morris, W.**, Choi, J., Crossley, S., & Endert, A. (2024). iScore: Visual Analytics for Interpreting How Language Models Automatically Score Summaries. In *Proceedings of the 29th ACM Conference on Intelligent User Interfaces* (IUI '24), Greenville, SC, USA, March 18–21, 2024. https://doi.org/10.1145/3640543.3645150
15. **Morris, W.**, Crossley, S., Holmes, L., Ou, C., McNamara, D., & Dascalu, M. (2023). Using Transformer Language Models to Provide Formative Feedback in Intelligent Textbooks. In *Proceedings of the Twenty-Fourth International Conference on Artificial Intelligence in Education* (AIED '23), Tokyo, Japan, July 3–6, 2023.

16. Holmes, L., Crossley, S., **Morris, W.**, Sikka, H., & Trumbore, A. (2023). Deidentifying Student Writing with Rules and Transformers. In *Proceedings of the Twenty-Fourth International Conference on Artificial Intelligence in Education* (AIED '23), Tokyo, Japan, July 3-6, 2023.
17. **Morris, W.**, Crossley, S. A., Langdon, H., & Trumbore, A. (2023). Using Transformer Language Models to Validate Peer-Assigned Essay Scores in Massive Open Online Courses (MOOCs). In *Proceedings of the Thirteenth International Conference on Learning Analytics & Knowledge* (LAK '23), Arlington, Texas, March 13-17, 2023.

Teaching Interests

Quantitative research methods and statistics (introductory through advanced); multilevel modeling; item response theory and Rasch measurement; structural equation modeling; Bayesian data analysis; education data science, machine learning, and natural language processing with Python and R.

Teaching Experience

- **Teaching Assistant, Graduate NLP Course** | Vanderbilt University (2023 – Present)
  Prof. Scott Crossley (scott.crossley@vanderbilt.edu)
    - Lead lecture sessions and design curriculum on tokenization, embeddings, transformer architectures, and LLM fine-tuning.
    - Mentor students on implementing and debugging Python-based NLP projects (SpaCy, Hugging Face).
- **Grammar & Writing Instructor** | CMCH Middle School (2020 – 2022)
  Developed and delivered a functional grammar curriculum to improve students' analytical writing across genres.
    - Elaine Padron, Academic Director (epadron@chayamushka.org)
- **Upper Primary Teacher** | International Montessori School of Hong Kong (2015 – 2020)
  Led a Montessori classroom and delivered professional development courses on English grammar instruction.
    - Adam Broomfield, Principal (adam.broomfield@ims.edu.hk)
- **Head of English** | Montessori School of Beijing (2013 – 2015)
  Coordinated the English department, developed a Communicative Language Teaching curriculum for ages 6-12, and created a reading instruction program. Trained teachers as a certified "How Language Works" tutor.
    - Shahir Shahidian, Lead Teacher (shahirhahidian@msb.edu.cn)

Professional Service

- **Reviewer:** *Computers and Education: Artificial Intelligence*, *International Journal of Artificial Intelligence in Education*, *Behavior Research Methods*, *Journal of Second Language Writing*.

Technical Skills

- **Statistics & Psychometrics:** Multilevel Modeling, Item Response Theory, Many-Facet Rasch Measurement, Structural Equation Modeling, Bayesian Estimation, Inter-Rater Reliability Analysis.
- **Machine Learning & NLP:** Transformers, LLMs, Recurrent Neural Networks, Multimodal Models, Sequence Classification, Hugging Face, SpaCy.
- **Programming & Tools:** Python (PyTorch, data analysis/visualization libraries), R, JavaScript (Express.js, NextJS).

Selected Conference Presentations

- **Primary Presenter**
    - **Morris, W.** , Holmes, L., & Crossley, S. (2026, December). *From static text to active learning: Using AI in CTE* [Conference presentation]. Association for Career and Technical Education (ACTE) CareerTech VISION 2026, New Orleans, LA, United States. (Accepted)
    - **Morris, W.** , Holmes, L., & Crossley, S. (2026, September). *AI tutoring that moves the needle on certification pass rates* [Poster presentation]. Association for Career and Technical Education (ACTE) National Postsecondary CTE Summit, Arlington, VA, United States.

- **Morris, W.**, Holmes, L., & Crossley, S. (2026, July). *Explanatory many-facet Rasch measurement as a psychometric approach to LLM interpretability in student discourse* [Paper presentation]. Annual Meeting of the Society for Text and Discourse, Charlotte, NC, United States.
- **Morris, W.**, Holmes, L., & Crossley, S. (2026, April 27). *Psychometric analysis of LLM differential sensitivity to word predictability using explanatory MFRM* [Paper presentation]. LLM Psychometrics Workshop at the 16th International Learning Analytics and Knowledge Conference (LAK26), Bergen, Norway.
- **Morris, W.**, Vitale, J., & Arvelo, I. (2025, October). *Using Whisper embeddings for audio-only latent token classification of classroom management practices* [Paper presentation]. Artificial Intelligence in Measurement and Education Conference (AIME-Con), National Council on Measurement in Education, Pittsburgh, PA, United States.
- **Morris, W.**, Holmes, L., Choi, J. S., & Crossley, S. (2025, July). *Uncovering differential sensitivity toward linguistic features of cohesion in large language models* [Paper presentation]. 26th International Conference on Artificial Intelligence in Education (AIED 2025), Palermo, Italy.
- **Morris, W.**, & Zepeda, C. D. (2025, April). *Capturing students' metacognitive study strategies using NLP: Creating pathways for research and practice* [Symposium presentation]. Annual Meeting of the American Educational Research Association, Denver, CO, United States.
- **Morris, W.**, Chen, H., Holmes, L., Choi, J. S., & Crossley, S. (2025, February). *Using synthetic data to improve the performance of automated summary scoring* [Paper presentation]. Winter Text and Discourse Conference, Boulder, CO, United States.
- **Morris, W.**, Choi, J. S., Holmes, L., & Gupta, V. (2024, July). *Automatic question generation and constructed response scoring in intelligent texts* [Poster presentation]. 17th International Conference on Educational Data Mining (EDM 2024), Atlanta, GA, United States.
- **Morris, W.**, Crossley, S., Holmes, L., Ou, C., McNamara, D., & Dascalu, M. (2023, July). *Using transformer language models to provide formative feedback in intelligent textbooks* [Paper presentation]. 24th International Conference on Artificial Intelligence in Education (AIED 2023), Tokyo, Japan.
- **Morris, W.**, & Holmes, L. (2023, March). *Word probability predictions using LLM* [Paper presentation]. American Association for Applied Linguistics (AAAL) Annual Conference, Portland, OR, United States.

- **Co-Author**
  - Holmes, L., Choi, J. S., Crossley, S. A., & **Morris, W.** (2026, October). *Assessing the reliability and construct representation of LLM-based language proficiency scores* [Paper presentation]. Artificial Intelligence in Measurement and Education Conference (AIME-Con), National Council on Measurement in Education, Pittsburgh, PA, United States. (Accepted)
  - Shen, S., Wise, A. F., **Morris, W.**, Holmes, L., Hinze, S. R., & Crossley, S. (2026, April). *The effects of AI feedback on college students' reading and writing performance in an intelligent text framework* [Paper presentation]. 16th International Learning Analytics and Knowledge Conference (LAK26), Bergen, Norway.
  - Reddig, J., Smith, G. R., Jr., Siyahrood, S. A., **Morris, W.**, Bae, Y., Crutcher, K., … MacLellan, C. J. (2026, June). *Guidelines for designing AI technologies to support adult learning* [Paper presentation]. ACM Designing Interactive Systems Conference (DIS '26), Singapore.
  - Crossley, S., Choi, J. S., **Morris, W.**, Holmes, L., & Joyner, D. (2025, July). *AI enhanced intelligent texts and learning gains* [Paper presentation]. Sixth Workshop on Intelligent Textbooks (iTextbooks 2025), Palermo, Italy.
  - Crossley, S., **Morris, W.**, Choi, J. S., & Holmes, L. (2025, July). *Exploratory assessment of learning in an intelligent text framework: iTELL RCT* [Paper presentation]. 18th International Conference on Educational Data Mining (EDM 2025), Palermo, Italy.
  - Crossley, S., Tian, Y., Choi, J. S., Holmes, L., & **Morris, W.** (2024, July). *Plagiarism detection using keystroke logs* [Paper presentation]. 17th International Conference on Educational Data Mining (EDM 2024), Atlanta, GA, United States.

- Crossley, S., Choi, J. S., **Morris, W.**, Holmes, L., & Gupta, V. (2024, July). *Using intelligent texts in a computer science classroom: Findings from an iTELL deployment* [Paper presentation]. Educational Data Mining in Computer Science Education Workshop (CSEDM 2024), Atlanta, GA, United States.
- Choi, J. S., **Morris, W.**, Holmes, L., & Crossley, S. (2024, July). *Focus time and writing performance in an intelligent textbook* [Paper presentation]. Educational Data Mining in Writing and Literacy Instruction Workshop, Atlanta, GA, United States.
- Kim, M., Kim, J., Bae, Y., **Morris, W.**, Holmes, L., & Crossley, S. (2024, June). *How AI evaluates learner comprehension: A comparison of knowledge-based and large language model (LLM)-based AI approaches* [Paper presentation]. 18th International Conference of the Learning Sciences (ICLS 2024), Buffalo, NY, United States.
- Coscia, A., Holmes, L., **Morris, W.**, Choi, J., Crossley, S., & Endert, A. (2024, March). *iScore: Visual analytics for interpreting how language models automatically score summaries* [Paper presentation]. 29th ACM Conference on Intelligent User Interfaces (IUI '24), Greenville, SC, United States.
- Holmes, L., Crossley, S., **Morris, W.**, Sikka, H., & Trumbore, A. (2023, July). *Deidentifying student writing with rules and transformers* [Paper presentation]. 24th International Conference on Artificial Intelligence in Education (AIED 2023), Tokyo, Japan.