

# Laine Percell Bradshaw

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Quantitative Methodology Program  
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## Education

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### **Ph.D. in Research, Evaluation, Measurement and Statistics**

The University of Georgia, 2011

### **M.Ed. in Mathematics Education**

The University of Georgia, 2007

### **B.S. in Mathematics Education**

The University of Georgia, 2007

Graduated Summa Cum Laude

Graduated with Honors

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## Academic Positions

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### **The University of Georgia**

August 2016 – present

Associate Professor (tenure track), Department of Educational Psychology

### **The University of Georgia**

July 2012 – July 2016

Assistant Professor (tenure track), Department of Educational Psychology

### **James Madison University**

July 2011 – June 2012

Assistant Professor (tenure track), Department of Graduate Psychology

Assistant Assessment Specialist, Center for Assessment and Research Services

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## Peer-reviewed Journal Articles

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\*Indicates collaboration with a student during their graduate studies.

\*\*Indicates equal contribution from authors.

\*Madison, M., & Bradshaw, L. (In Press). Assessing Growth in a Diagnostic Classification Model Framework. *Psychometrika*.

\*Bao, Y., & Bradshaw, L. (In press). An Attribute-level Item Selection Method for DCM-CAT. *Measurement: Interdisciplinary Research and Perspectives*.

- Izsak, A., Jacobson, E., & **Bradshaw, L.** (In Press). Surveying Middle Grades Teachers' Reasoning About Fraction Arithmetic in Terms of Measured Quantities. *Journal of Research in Mathematics Education*.
- \*Madison, M., & **Bradshaw, L.** (2018). Evaluating Intervention Effects in a Diagnostic Classification Model Framework. *Journal of Educational Measurement*, 55(1), 32-51.
- Harrison, A., **Bradshaw, L.**, Naqvi, N., Campbell, J., & Paff, M. (2017). Development and Psychometric Evaluation of the Autism Stigma and Knowledge Questionnaire (ASK-Q). *Journal of Autism and Development Disorders*, 47(10), 3281-3295.
- \*Sen, S. & **Bradshaw, L.** (2017). Comparison of relative fit indices for diagnostic model selection. *Applied Psychological Measurement*, 41(6), 422-438.
- \***Bradshaw, L.** & Madison, M. (2016). Invariance Principles for General Diagnostic Models. *International Journal of Testing*, 16(2), 99-118.
- \*Liu, R., Huggins-Manley, A.C., **Bradshaw, L.** (2016). The impact of Q-matrix designs on diagnostic classification accuracy in the presence of attribute hierarchies. *Educational and Psychological Measurement*, 77(2), 420-440.
- Templin, J., **Bradshaw, L.**, & Paek, P. (2016). A comprehensive framework for integrating innovated psychometric methodology into educational research. In A. Izsák, J. Remillard, & J. Templin (Eds.), *Psychometric methods in mathematics education: Opportunities, challenges, and interdisciplinary collaborations* (pp. 97-117). Journal of Research in Mathematics Education Monograph Series No. 15. Reston, VA: National Council of Teachers of Mathematics.
- \*Madison, M., & **Bradshaw, L.** (2015). The effects of Q-matrix design on classification accuracy in the log-linear cognitive diagnosis model *Educational and Psychological Measurement*, 75 (3), 491-511.
- Bradshaw, L.**, Izsák, A., Templin, J., & Jacobson, E. (2014). Diagnosing teachers' understandings of rational number: Building a multidimensional test within the diagnostic classification model framework. *Educational Measurement: Issues and Practice*, 33(1), 2-14.
- Bradshaw, L.**, & Templin, J. (2014). Combining scaling and classification: A psychometric model for scaling ability and diagnosing misconceptions. *Psychometrika*, 79 (3), 403-425.
- \*Jurich, D., & **Bradshaw, L.** (2014). Diagnosing psychosocial research attributes: An illustration of diagnostic classification modeling. *International Journal of Testing*, 14, 49-72.

Templin, J., & **Bradshaw, L.** (2014). Hierarchical diagnostic classification models: A family of models for estimating and testing attribute hierarchies. *Psychometrika*, 79(2) 317-339.

\*\*Templin, J., & **Bradshaw, L.** (2014). The use and misuse of psychometric models. *Psychometrika*, 79(2) 347-354.

Templin, J., & **Bradshaw, L.** (2013). Measuring the reliability of diagnostic classification model examinee estimates. *Journal of Classification*, 30(2), 251-275.

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### **Book Chapters/Other Invited Publications**

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**Bradshaw, L.** (2017) Diagnostic classification modeling. In Frey, B. (Ed.), *The SAGE Encyclopedia of Educational Research, Measurement, and Evaluation*.

**Bradshaw, L.** (2017). Diagnostic classification models. In D. Bandalos (Ed.), *Measurement Theory and Application for the Social Sciences*. New York, NY: Guilford Press.

**Bradshaw, L.** (2016). Diagnostic Classification Models: A Multivariate Classification Approach for Cognitively Complex Assessment. In A. Rupp, & J. Leighton (Eds.), *Handbook of Cognition and Assessment*. Wiley-Blackwell, 297-326.

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### **Other Creative Research Products**

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\*Indicates collaboration with a graduate student.

**Bradshaw, L.**, & Hollingsworth, W. (2013). DigiTAP: A software system for digitally-capturing think-aloud protocols (Version 1.0) [Computer software]. Athens, GA: Hollingsworth Technologies, Incorporated and Metricology, LLC.

\*Madison, M., **Bradshaw, L.**, & Hollingsworth, W. (2014). Q\*Power: A web-based program for designing diagnostic assessments (Version 1.0) [Computer software]. Athens, GA. Available from <http://www.lainebradshaw.com/qpower>.

**Bradshaw, L.** (2008) Website: <http://www.mathtasks.com>.

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### **Currently Funded External Projects**

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**Principal Investigator:** *Diagnostic Inventories of Cognition in Education* (2017-2021). Institute of Educational Sciences, Cognition and Student Learning: Goal 5 Measurement. \$1,400,000.

**Co-Principal Investigator:** *Developing Enhanced Assessment Tools for Capturing Students' Procedural Skills and Conceptual Understandings in Math* (2015-2019).

United States Department of Education, Institute of Educational Sciences: Cognition in Special Education, Measurement Goal 5 ~\$1,600,000. PI: Brian Bottge.

**Co-Principal Investigator:** *Investigating Proportional Reasoning from Two Perspectives* (2014-2017). National Science Foundation: Education and Human Resources Core: Research on Educational and Learning (REAL) Program ~\$1,333,000. PI: Andrew Izsák.

**Co-Principal Investigator:** *Assessing the Structure of Knowledge in Teaching Mathematics* (2016-2020). National Science Foundation: Discovery Research K-12 ~\$1,700,000. PI: Erik Jacobson.

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### External Grant Proposals Under Review

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None.

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### Previously Funded Grant Proposals

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**Principal Investigator:** *Engineering Diagnostic Concept Inventories* (Summer, 2015): University of Georgia College of Education Early Career Faculty Grant, \$6,000.

**Principal Investigator:** *UGA Mathematics Curriculum Team* (2015-2016). Office of STEM Education, University of Georgia ~\$1000.

**Principal Investigator:** *Developing Validity Arguments for Model-based Diagnostic Feedback* (Summer, 2014): University of Georgia College of Education \$10,000.

**Principal Investigator:** *UGA Mathematics Curriculum Team* (2014-2015). Office of STEM Education, University of Georgia ~\$1000.

**Key Personnel:** *Collaborative Research: Assessing Teachers' Pedagogical Design Capacity and Mathematics Curriculum*. Supplement to National Science Foundation: Discovery Research K-12 (DRL-0918141), \$59,000. PI: Janine Remillard and Ok-Kyeong Kim.

**Key Personnel:** *AutoMentor: Virtual Mentoring and Assessment in Computer Games for STEM Learning* (2009-2014). National Science Foundation: Division of Research on Learning in Formal and Informal Settings (DRL-0918409) \$2,080,693. PI: David Williamson Shaffer.

**Key Personnel:** *Diagnosing Teachers' Multiplicative Reasoning* (2008-2010). National Science Foundation: Discovery Research K-12 (DRK-12; DRL-0822064), \$944,163. PI: Andrew Izsák.

**Key Personnel:** Spencer Foundation, *Proportional Reasoning of Middle Grades Pre-Service Teachers* (2013-2014), \$39,992. PI: Andrew Izsák.

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## Unfunded External Grant Proposals

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**Principal Investigator:** *Diagnostic Inventories of Cognition in Education* (2016-2020). Institute of Educational Sciences, Cognition and Student Learning: Goal 5 Measurement. \$1,400,000.

**Principal Investigator:** *Development and Psychometric Evaluation of the Autism Stigma and Knowledge Questionnaire* (ASK-Q; 2016-2018). National Institutes Of Health. \$150,000.

**Co-Principal Investigator:** Developing 21<sup>st</sup> Century Assessments to Measure 21<sup>st</sup> Century Skills in Integrated STEM Setting (**2016-2020**). Institute of Educational Sciences. \$450,000. PI: Chandra Orrill.

**Co-Principal Investigator: Exploratory Foundations for 21st Century Assessments (2016-2020).** National Science Foundation. \$2,400,000. PI: Chandra Orrill.

**Co-Principal Investigator:** *Assessing the Generality and Transfer of Teachers' Knowledge* (2016-2020). National Science Foundation: Discovery Research K-12 ~\$1,400,000. PI: Erik Jacobson.

**Co-Principal Investigator:** Evolving Learning Maps: Statistical Methods to Improve Dynamic Map-Based Psychometrics (July 2015- June 2018): US DOE/IES: MMP ~\$900,000.

**Co-Principal Investigator:** Assessing the Generality and Transfer of Teachers' Knowledge (2015-2018). National Science Foundation: Discovery Research K-12 ~\$450,000. PI: Erik Jacobson.

**Principal Investigator:** Engineering Diagnostic Concept Inventories (June 2015- May 2020): National Science Foundation: CAREER Program ~\$820,850.

**Co-Principal Investigator:** *Developing Mathematics Understanding of Students with Disabilities Using Anchored Instructional Measures* (AIMs) (2014-2018). National Science Foundation: Discovery Research K-12, \$2,880,000. PI: Brian Bottge.

**Principal Investigator:** *Engineering Diagnostic Concept Inventories* (2014-2019): National Science Foundation: CAREER Program ~\$761,000.

**Co-Principal Investigator:** *Capturing Students' Procedural Skills and Conceptual Understanding in Math with Enhanced Assessment Tools* (2014-2016). United States Department of Education, Institute of Educational Sciences: Cognition in Special Education, Measurement Goal 5 ~\$1,600,000. PI: Brian Bottge.

**Co-Principal Investigator:** *Investigating Proportional Reasoning from Two Perspectives* (2014-2018). National Science Foundation: Education and Human Resources Core Program ~\$1,000,000. PI: Andrew Izsák.

**Co-Principal Investigator:** *Developing Enhanced Assessment Tools for Capturing Students' Procedural Skills and Conceptual Understanding in Math* (2013-2016). United States Department of Education, Institute of Educational Sciences: Cognition in Special Education, Measurement Goal 5 ~\$1,600,000. PI: Brian Bottge. Score: 1.99.

**Key Personnel:** *Proportional Reasoning of Middle Grades Pre-Service Teachers (PRoMPT)* (2013-2015). National Science Foundation: Research and Evaluation on Education in Science and Engineering Program ~\$1,045,888. PI: Andrew Izsák, Sybilla Beckman.

**Key Personnel:** Race to the Top District Grant. United States Department of Education (2013-2016). ~\$12,454,087. District: Morgan County Charter School System.

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### Technical Reports

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**Bradshaw, L.** (2015a). *An Evaluation of Diagnostic Classification Model-based Computer Adaptive Testing Algorithm for PARCC Diagnostic Assessments in Mathematics Comprehension and Decoding*. Technical Report. Pearson Education.

**Bradshaw, L.** (2015b). *FlexMIRT Estimation Accuracy under Expected Field Test Designs for Diagnostic Classification Model-based PARCC Diagnostic Assessments*. Technical Report. Pearson Education.

**Bradshaw, L.** (2014a). *PARCC Diagnostic Assessments: Design Research for Diagnostic Classification Model-based PARCC Diagnostic Assessments in Mathematics Comprehension and Decoding*. Technical Report. Pearson Education.

**Bradshaw, L.** (2014b). *Diagnosing attributes using the Curriculum Embedded Mathematics Assessment*. Technical Report. University of Pennsylvania.

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### Presentations

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\*Indicates collaboration with a student during their graduate studies.

°Indicates invited presentation.

### **2018**

Bradshaw, L. (April, 2018). *Using classification-based psychometrics in local assessment systems for feedback and accountability*. Member of panel presentation at the annual meeting of the National Council of Measurement in Education in New York, NY.

Bradshaw, L., Famularo, L., Lee, H., & Masters, J. (April, 2018). *Designing diagnostic inventories of cognition in education*. Paper presented at the annual meeting of the American Educational Research Association in New York, NY.

Bao, Y., & Bradshaw, L. (April, 2018). *A diagnostic classification model for polytomous attributes*. Paper presented at the annual meeting of the National Council of Measurement in Education in New York, NY.

Feldberg, Z., & Bradshaw, L. (April, 2018). *Reporting results from diagnostic classification models for teachers*. Poster presented at the annual meeting of the American Educational Research Association in New York, NY.

Shen, Y., Bao, Y., Wang, S., & Bradshaw, L. (April, 2018). *Detecting Misconceptions and Estimating Ability Simultaneously: A Hybrid Computerized Adaptive Testing Framework*. Paper presented at the annual meeting of the National Council of Measurement in Education in New York, NY.

Zor, S., & Bradshaw, L. (April, 2018). *Designing field tests for multidimensional classification models*. Poster presented at the annual meeting of the National Council of Measurement in Education in New York, NY.

## **2017**

\*Feldberg, Z., & **Bradshaw, L.** (October, 2017). Technology-based diagnostic assessment systems: Interpretations and Use. Paper presented at the annual meeting of the Northeastern Educational Research Association in Trumbull, Connecticut, U.S.

\*Bao, Y., & **Bradshaw, L.** (October, 2017). A diagnostic classification model for polytomous attributes. Paper presented at the annual meeting of the Northeastern Educational Research Association in Trumbull, Connecticut, U.S.

\*Feldberg, Z., & **Bradshaw, L.** (August, 2017). Use of technology-based, diagnostic assessment tools in the classroom. Paper presented at the annual meeting of the Northeastern Educational Research Association in Trumbull, Connecticut, U.S.

\*Shen, Y., Bao, Y., Wang, S., & **Bradshaw, L.** (July, 2017). Using computerized adaptive testing to detect students' misconceptions: Exploration of item selection. Paper presented at the annual meeting of the *International Association for Computerized Adaptive Testing* in Japan.

\*Bao, Y., & **Bradshaw, L.** (April, 2017). *Item selection methods for computer adaptive testing with hierarchical diagnostic classification models*. Paper presented at the annual meeting of the National Council of Measurement in Education in San Antonio, TX.

- \***Bradshaw, L.**, Guthrie, K., & Bian, M. (April, 2017). Digital and remote collection of response process validity evidence. Paper presented at the annual meeting of the American Educational Research Association in San Antonio, TX.
- \*Madison, M., & **Bradshaw, L.** (April, 2017). *Assessing intervention effects in a diagnostic classification model framework*. Paper presented at the annual meeting of the National Council of Measurement in Education in San Antonio, TX.
- Harrison, A., Kaff, M., **Bradshaw, L.**, Naqvi, N., Campbell, J., Manji, K., . . . Paff, M. (2017). Examining Measurement Approaches to Assessing ASD Knowledge in Cross-Cultural Contexts. In *African Regional International Meeting for Autism Research (IMFAR)*. Stellenbosch, South Africa  
Regional
- Harrison, A., **Bradshaw, L.**, Naqvi, N., Paff, M., & Campbell, J. (2017). *A Proposed Solution to Psychometric Concerns with Existing ASD Knowledge Tools*. Poster session presented at the meeting of International Meeting for Autism Research  
**2016**
- Izsak, A., Beckman-Kazez, S., & **Bradshaw, L.** (November, 2016). *Diagnosing reasoning to measure growth in pre-service middle-grades teachers' facility with fraction arithmetic*. Paper presented at the annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education in Tuscon, AZ.
- \*Madison, M. & **Bradshaw, L.** (October, 2016). *An application of a longitudinal diagnostic classification model*. Paper presented at the annual meeting of the Northeastern Educational Research Association in Trumbull, Connecticut, U.S.
- \*Bao, Y., & **Bradshaw, L.** (July, 2016). *Attribute-level Item Selection Method for DCM-CAT*. Paper presented at the 2016 International Meeting of the Psychometric Society in Asheville, North Carolina, U.S.
- \*Madison, M. & **Bradshaw, L.** (July, 2016). *Assessing change over time in a general diagnostic classification model*. Paper presented at the 2016 International Meeting of the Psychometric Society in Asheville, North Carolina, U.S.
- °**Bradshaw, L.** (April, 2016). *Designing a large-scale, classification-based assessment system for diagnosing standards mastery*. Paper presented at annual meeting of the National Council on Measurement in Education in Washington, DC.
- Bradshaw, L.** & Levy, R. (April, 2016). *Interpreting examinee results from classification-based models*. Paper presented at the annual National Council on Measurement in Education conference in Washington, DC.
- \*Bao, Y., & **Bradshaw, L.** (2016). *The Impact of Model Misspecification in a DCM-CAT*. Paper presented at the annual meeting of the National Council on Measurement in Education in Washington, DC.



\*Madison, M., & **Bradshaw, L.** (2016). *The*. Paper presented at the annual meeting of the National Council on Measurement in Education in Washington, DC.

Dhaliwal, T., Hembry, T., & **Bradshaw, L.** (2016). *Achieving the Promise of CDMs: Communicating CDM-based Assessment Results*. Paper presented at the annual National Council on Measurement in Education conference in Washington, DC.

## **2015**

\*Kang, E. K., Spangler, D. A., & Bradshaw, L. (October, 2015). Relationship between prospective primary teachers' mathematics knowledge for teaching and beliefs. In *Proceedings of the 2015 international conference on mathematics education: Vol. 2. The International Perspective on Curriculum and Evaluation of Mathematics* Vol. 2 (pp. 164-170). Seoul, Republic of Korea.

\*Bao, Y. & **Bradshaw, L.** (July, 2015). Power analysis of item-level interactions in a general diagnostic classification model framework. Paper presented at the International Meeting of the Psychometric Society in Beijing, China.

**Bradshaw, L.** (June, 2015). *PARCC diagnostic assessments for mathematics comprehension: A diagnostic classification model approach*. Paper presented at the Council of Chief State School Officers (CCSSO) 2015 National Conference on Student Assessment (NCSA) in San Diego, California.

Hembry, T., Dhaliwal, T., Koepfler, J., & **Bradshaw, L.** (2015). *Improving the effectiveness of reporting for assessments using cognitive diagnostic models based on empirical data*. Paper presented at the Council of Chief State School Officers (CCSSO) 2015 National Conference on Student Assessment (NCSA) in San Diego, California.

**Bradshaw, L.** (April, 2015). Reliability for a node-based dynamic assessment. In A. Clark (Chair) *Psychometrics in a Learning Maps Environment*. Symposium presented at the annual National Council on Measurement in Education conference in Chicago, IL.

\*Madison, M., & **Bradshaw, L.**, & Hollingsworth, W. (April, 2015). *Using Q\*Power to refine diagnostic assessment designs*. Paper presented at the annual American Educational Research Association conference in Chicago, IL.

\*Sen, S., & **Bradshaw, L.** (April, 2015). *Performance of relative fit indices: A comparison across model types*. Paper presented at the annual National Council on Measurement in Education conference in Chicago, IL.

Izsák, A., Beckmann, S., & **Bradshaw, L.** (February, 2015). *Investigating proportional relationships from two perspectives*. Poster presented at the University of Georgia College of Education Faculty and Graduate Student Research Conference in Athens, GA.

Lindstrom, J. & **Bradshaw, L.** (February, 2015). *Predicting reading success using a multilevel model*. Poster presented at the University of Georgia College of Education Faculty and Graduate Student Research Conference in Athens, GA.

Madison, M., & **Bradshaw, L.** (February, 2015). *Developing Diagnostic Formative Assessments in Graduate Statistics Courses*. Poster presented at the University of Georgia College of Education Faculty and Graduate Student Research Conference in Athens, GA.

Bao, Y., & **Bradshaw, L.** (February, 2015). *Item level specifications in a general diagnostic classification model framework*. Poster presented at the University of Georgia College of Education Faculty Research Conference in Athens, GA.

## **2014**

**Bradshaw, L.,** & Templin, J. (October, 2014). *The little model that couldn't: How the DINA model misclassifies students and hides important effects*. Paper presented at the annual meeting of the Northeastern Educational Research Association in Trumbull, CT.

**Bradshaw, L.** (July, 2014). *The added value of using model-based classification for diagnostic test feedback*. Paper presented at the meeting of the International Test Commission in San Sebastian, Spain.

°**Bradshaw, L.** (April, 2014). *A Psychometric framework for diagnosing misconceptions*. Seminar speaker for the Quantitative Methods program at Vanderbilt University in Nashville, TN.

**Bradshaw, L.** (April, 2014). *Diagnostic measurement models for item response dependencies caused by misconception effects*. Paper presented at the annual meeting of the American Educational Research Association in Philadelphia, PA.

**Bradshaw, L.,** & Koepfler, J. (April, 2014). *A caution in the quest for diagnostic test-based inferences*. Paper presented at the annual National Council on Measurement in Education conference in Philadelphia, PA.

\*Madison, M., **Bradshaw, L.,** & Hollingsworth, B. (April, 2014). *The role of Q-matrix design in diagnostic assessment*. Paper presented at the 2014 Annual Meeting of the National Council on Measurement in Education in Philadelphia, PA.

\*Jang, Y., **Bradshaw, L.,** Oliver, J. S., Hodges, G. W., Cohen, A., Rogers, W., ..., Robertson, T. (April, 2014). *Diagnosing students' mastery of concepts in biology: An examination of mastery states before and after instruction based on 3-D animations*. Paper presented at the business meeting of the Cognition and Assessment Special Interest Group at the annual meeting of the American Educational Research Association in Philadelphia, PA.

- \*Jurich, D., **Bradshaw, L.**, & DeMars, C. (April, 2014). *Limited information methods to assess overall fit of diagnostic classification models*. Paper presented at the annual National Council on Measurement in Education conference in Philadelphia, PA.
- Wang, C., **Bradshaw, L.**, & Koepfler, J. (April, 2014). *An integrated approach towards the development of cognitive diagnostic assessment*. Paper presented at the annual National Council on Measurement in Education conference in Philadelphia, PA.
- \*Arican, M., Karadavut, T., Bradshaw, L., Izsak, A. (April, 2014). *Diagnosing teachers' understandings of rational number: Exploring the effects of interpreting drawn figures*. Poster presented at the annual College of Education Faculty/Student Research conference in Athens, GA.
- \*Bao, Y., Xing, X., & Bradshaw, L. (April, 2014). Diagnosing career indecision types for adolescents using a diagnostic classification model. Poster presented at the annual College of Education Faculty/Student Research conference in Athens, GA.
- \*Jang, Y., Bradshaw, L., Oliver, J. S., Hodges, G. W., Cohen, A., Rogers, W., ..., Robertson, T. (April, 2014). Diagnosing students' mastery of concepts in biology: An examination of mastery states before and after instruction based on 3-D animations. Poster presented at the annual College of Education Faculty/Student Research conference in Athens, GA.
- \*Madison, M., & Bradshaw, L. (April, 2014). The effects of Q-matrix design on classification accuracy in the LCDM. Poster presented at the annual College of Education Faculty/Student Research conference in Athens, GA.

### **2013**

- °**Bradshaw, L.** (December, 2013). *Building a multidimensional test within the diagnostic classification model framework*. Seminar speaker for the Measurement and Statistics program at the Florida State University in Tampa, FL.
- \*Madison, M., & **Bradshaw, L.** (October, 2013). The Effects of Q-Matrix Design on Classification Accuracy in the LCDM. Paper presented at the annual Northeastern Educational Research Association conference in Rocky Hill, CT.
- °**Bradshaw, L.** (April, 2013). *A psychometric model for scaling individuals and diagnosing misconceptions*. Dissertation presented at American Educational Research Association Special Interest Group for Cognition and Assessment business meeting in San Francisco, CA.
- \*Kopp, J., **Bradshaw, L.**, Young, M. J., & Lau, A. (April, 2013). *A method for vertically-scaling diagnostic classification models*. Paper presented at the annual National Council on Measurement in Education conference in San Francisco, CA.

°**Bradshaw, L.** (February, 2013). *Building a multidimensional test within the diagnostic classification model framework*. Seminar speaker for Quantitative Methods program at the Georgia Institute for Technology in Atlanta, GA.

°**Bradshaw, L.** (January, 2013). Diagnostic classification models: A practical measurement paradigm for multidimensional constructs. In J. Rojewski (Chair) *Innovative Research Methods*. Panel session conducted at the University of Georgia College of Education Faculty Research Conference in Athens, GA.

## **2012**

\*Jurich, D., & **Bradshaw, L.** (2012, October). *Modeling testlet effects within a diagnostic classification framework*. Paper presented at the annual Northeastern Educational Research Association conference in Rocky Hill, CT.

**Bradshaw, L.,** & Templin, J. (2012, April). *A two parameter asymptote IRT model for binary data*. Paper presented at the annual National Council on Measurement in Education conference in Vancouver, BC Canada.

**Bradshaw, L.,** Templin, J., & Izsák, A. (2012, April). A diagnostic assessment of teachers' understandings of rational number. In A. Izsák (Chair), *Harnessing psychometric models to develop next generation, research-based assessments of rational number knowledge*. Symposium conducted at the annual American Educational Research Association conference in Vancouver, BC Canada.

## **2011**

**Bradshaw, L.** (2011, June). Psychometric tools for analyses of wrong answers in multiple choice tests. In E. Taleporos, (Chair) *Analyses of wrong answers in multiple choice tests*. Symposium conducted at the Council of Chief State School Officers' National Conference on Student Assessment in Orlando, FL.

**Bradshaw, L.,** & Templin, J. (2011, April). *A nominal response model for scaling ability and diagnosing misconceptions*. Paper presented at the annual National Council on Measurement in Education conference in New Orleans, LA.

Templin, J., & **Bradshaw, L.** (2011, April). *A hypothesis test for attribute hierarchies in diagnostic classification models*. Paper presented at the annual National Council on Measurement in Education conference in New Orleans, LA.

°**Bradshaw, L.** (2011, March). *A psychometric model for scaling ability and diagnosing misconceptions using multiple choice tests*. Research presented for University of Georgia's Statistics Department colloquium series in Athens, GA.

## **2010**

**Bradshaw, L.,** & Templin, J. (2010, July). *Combining scaling and classification: A model for scaling ability and diagnosing misconceptions with nominal response item types*. Paper presented at the annual International Meeting of the Psychometric Society in Athens, GA.

Izsák, A., Lobato, J., Druken, B., Orrill, C., Jacobson, E., & **Bradshaw, L.** (2010, July). *Applying cognitive diagnosis models to measure middle grades teachers' multiplicative reasoning*. Paper presented at the annual International Meeting of the Psychometric Society in Athens, GA.

Nixon, C., Acar, S., **Bradshaw, L.**, Bramlett, A., Chen, Y., Jimenez, A., Lee, S., Raczynski, K., Sen, S., & Kim, S.-H. (2010, July). *Analyses of items with multiple choices*. Paper presented at the annual International Meeting of the Psychometric Society in Athens, GA.

**Bradshaw, L.**, & Cohen, A. (2010, May). Accuracy of multidimensional item response model parameters estimated under small sample sizes. In A. Izsák (Chair), *Using cognitive attributes to develop mathematics assessments, opportunities, and challenges*. Symposium conducted at the annual American Educational Research Association conference in Denver, CO.

**Bradshaw, L.**, Lin, J., Young, M., & Lee, K. (2010, May). *An examination of linguistic modifications on a large scale test*. Paper presented at the annual American Educational Research Association conference in Denver, CO.

Izsák, A., Lobato, J., Orrill, C., Jacobson, E., & **Bradshaw, L.** (2010, May). Identifying attributes and developing items to assess middle grades teachers' multiplicative reasoning. In A. Izsák (Chair), *Using cognitive attributes to develop mathematics assessments, opportunities, and challenges*. Symposium conducted at the annual American Educational Research Association conference in Denver, CO.

Izsák, A., Lobato, J., Orrill, C. H., Jacobson, E., & **Bradshaw, L.** (2010, April). *Designing attribute-based items to assess middle grades teachers' multiplicative reasoning*. Paper presented at the National Council of Teachers of Mathematics Research Pre-session, San Diego, CA.

**Bradshaw, L.**, & Wang, A. (2010, April). *A multilevel growth modeling approach to examining the spread of bacteria*. Poster presented at the University of Georgia College of Education Graduate Student Research Conference in Athens, GA.

Samuelson, K., **Bradshaw, L.**, Bramlett, A., & Jimenez, A. (2010, February). *Translating research into practice*. Paper presented at the Eastern Educational Research Association conference in Savannah, GA.

## **2009**

**Bradshaw, L.** (2009, October). *Item and test construction*. Training session presented at the annual South Carolina Council of Teachers of Mathematics conference in Columbia, SC.

Tomlinson, J., & **Bradshaw, L.** (2009, October). *Transforming ideas into tasks for class*. Training session presented at the annual South Carolina Council of Teachers of Mathematics conference in Columbia, SC.

**Bradshaw, L.** (2009, October). *Item and test construction*. Training session presented at the annual Georgia Council of Teachers of Mathematics conference in Eatonton, GA.

Palmour, J., **Bradshaw, L.**, Franklin, C., Presley, D. & Olive, J. (2009, October). *Developing effective assessment items for the GPS*. Presentation given at the annual Georgia Council of Teachers of Mathematics conference in Eatonton, GA.

Cohen, A., Templin, J., & **Bradshaw, L.** (2009, April) *Beyond unidimensionality: Measuring all of achievement*. Paper presented at the annual National Council on Measurement in Education conference in San Diego, CA.

**Bradshaw, L.**, & Choi, Y.-J. (2009, April). *Examining regional differences on the Rosenberg Self-Esteem Scale using confirmatory factor analysis*. Poster presented at the University of Georgia College of Education Centennial Graduate Student Research Conference in Athens, GA.

**Bradshaw, L.** (2009, February). *Best practices of item and test construction*. Training session presented at the annual Georgia Perimeter College Mathematics Conference in Clarkston, GA.

#### **2008**

**Bradshaw, L.**, & Samuelsen, K. (2008, October). *Test success!* Training session presented at the annual Georgia Council of Teachers of Mathematics conference in Eatonton, GA.

Tomlinson, J., & **Bradshaw, L.** (2008, October). *Transforming ideas into tasks for class*. Training session presented at the annual Georgia Council of Teachers of Mathematics conference in Eatonton, GA.

Samuelsen, K., & **Bradshaw, L.** (2008, March). *The credibility interval method for the detection of DIF within a Bayesian framework*. Paper presented at the annual National Council on Measurement in Education conference in New York, NY.

#### **2007**

**Bradshaw, L.** (2007, October). *Implementing the Georgia Performance Standards for mathematics*. Presentation given for University of Georgia Mathematics Education Student Association colloquium in Athens, GA.

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## Teaching Experiences

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<sup>o</sup>Indicates invited workshop or training session.

\*Indicates collaboration with a student.

### Graduate-level Courses

Quantitative Methodology Program, The University of Georgia

*Quantitative Methodology Special Topics Seminar (EPSY 8990)*

*Categorical Data Analysis (ERSH 8360)*

*Diagnostic Measurement (ERSH 8140)*

*Analysis of Variance (ERSH 8310)*

Assessment and Measurement Program, James Madison University

*Categorical Data Analysis (PSYC 850)*

*Diagnostic Classification Modeling (PSYC 850)*

Research, Evaluation, Measurement & Statistics Program, University of Georgia

*Analysis of Variance (ERSH 8310), Teaching Assistant*

### Undergraduate Courses

The University of Georgia

*Freshman Year Odyssey Seminar (FYOS 1001)*

### High School Courses

North Oconee High School

*Algebra I, Student Teaching*

*Algebra III, Student Teaching*

### Professional Development Training Sessions/Workshops

**Bradshaw, L., & Madison, M.** (April, 2018). *Diagnostic Classification Models: Fundamentals*. Half day training session to be presented at the annual meeting of the National Council on Measurement in Education in New York, NY.

**Madison, M., & Bradshaw, L.** (April, 2018). *Diagnostic Classification Models: Advanced Applications*. Half day training session to be presented at the annual meeting of the National Council on Measurement in Education in New York, NY.

**Bradshaw, L., & Madison, M.** (April, 2017). *Diagnostic Measurement: Theory, Methods and Applications*. Full day training session to be presented at the annual meeting of the National Council on Measurement in Education in San Antonio, TX.

**Bradshaw, L.** (April, 2015). *An Introduction to Diagnostic Classification Modeling*. Full day training session presented at the annual meeting of the National Council on Measurement in Education in Chicago, IL.

**Bradshaw, L., & Templin, J.**, (April, 2014). *Diagnostic Measurement: Theory, Methods and Applications*. Full day training session presented at the annual meeting of the National Council on Measurement in Education in Philadelphia, PA.

°**Bradshaw, L.** (March, 2014). *An Introduction to Diagnostic Measurement*. Presented for Pearson Education in Iowa City, IA.

°**Bradshaw, L.** (January, 2014). *An Overview of Diagnostic Measurement*. A web-based training session presented for Pearson Education.

Templin, J., & **Bradshaw, L.** (April, 2013). *Diagnostic Measurement: Theory, Methods and Applications*. Full day training session presented at the annual meeting of the National Council on Measurement in Education in San Francisco, CA.

\***Bradshaw, L., & Jurich, D.** (October, 2012). *An Introduction to Diagnostic Measurement*. Half day workshop presented at the annual meeting of the Northeastern Educational Research Association in Rocky Hill, CT.

**Bradshaw, L., & Templin, J.**, (April, 2012). *Diagnostic Measurement: Theory, Methods and Applications*. Full day training session presented at the annual meeting of the National Council on Measurement in Education in Vancouver, BC Canada.

°**Bradshaw, L.** (February, 2012). *Diagnostic Classification Modeling. Diagnostic Classification Modeling*. Invited workshop presented for The College Board in NY, NY.

Templin, J., & **Bradshaw, L.** (April, 2011). *Diagnostic Measurement: Theory, Methods and Applications*. Workshop presented at the annual meeting of the American Educational Research Association in New Orleans, LA.

Templin, J., & **Bradshaw, L.** (May, 2010). *Diagnostic Measurement*. May 2010. Teaching assistant for workshop presented for University of Georgia Institute for Interdisciplinary Research in Education in Athens, GA.

### **High School-level Courses**

*Student Teacher, Algebra I*, Spring 2007  
North Oconee High School

*Student Teacher, Algebra III*, Spring 2007  
North Oconee High School



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**Mentorship**

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**PhD Major Professor***Completed*

Matthew Madison, Quantitative Methodology, UGA

*In Progress*

Yu Bao, Quantitative Methodology, UGA

Meina Bian, Quantitative Methodology, UGA

Zack Feldberg, Quantitative Methodology, UGA

Jiajun Xue, Quantitative Methodology, UGA

Kang Xu, Quantitative Methodology, UGA

Selay Zor, Quantitative Methodology, UGA

**PhD Co-Major Professor***Completed*

Eun Kang, Mathematics Education, UGA, 2014

**PhD Dissertation Committee Member***Completed*

Shawn Fowler, Applied Cognition and Development, UGA, 2018

Alex Lyford, Statistics, UGA, 2017

Tugba Karadavut, Quantitative Methodology, UGA Committee Member, 2016

Kristina Collins, Ph.D., Gifted Education, UGA, Committee Member, 2015

Daniel Jurich, Assessment and Measurement, James Madison University, 2014

Christy Brown, Research, Evaluation, Measurement & Statistics, UGA, 2013

*In Progress*

Kellie Templeman, Applied Cognition and Development, UGA

**MA Major Professor***Completed*

Selay Zor, Quantitative Methodology, UGA, 2018

Stephen Imperiale-Hagerman, M.Ed., Quantitative Methodology, UGA, 2013

*In-progress*

Madeline Schellman, Quantitative Methodology, UGA

**MA Thesis Committee Member***Completed*

Yawei Shen, Quantitative Methodology, UGA Committee Member, 2016

Christopher Runyon, MA, Psychological Sciences, JMU, 2012

**MEd Major Professor***Completed*

Sue Hyeon Paek, Quantitative Methodology, UGA, 2017

Jia Liang, Quantitative Methodology, UGA, 2014

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**Honors and Awards**

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**Carl Glickman Faculty Fellow Award, 2018**

Awarded by the University of Georgia College of Education: Research/Outreach

**Jason Millman Promising Measurement Scholar Award, 2015**

Awarded by the National Council of Measurement in Education

**Ocie T. Dekle Excellence in Teaching Award, 2015**

Awarded by The University of Georgia College of Education

**Sarah H. Moss Fellowship, 2013-2014**

Awarded by The University of Georgia Center for Teaching and Learning for an amount of \$10,000. Assignment to the University of Nottingham, Nottingham, England

**Outstanding Dissertation Award, 2013**

Awarded by the American Educational Research Association (AERA) Cognition and Assessment Special Interest Group

**Joseph R. Hooten Award for Excellence in Mathematics Education, 2007**

Awarded by Mathematics Education Department at the University of Georgia

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**Leadership Positions and Service Activities**

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**Organization Leadership***National Council on Measurement in Education*

- (i) Bradley Hanson Award Committee (2014 –2016)
- (ii) Faculty Advisor, Graduate Student Issues Committee (2013 – 2015)
- (iii) Newsletter Advisory Board Member (2012 – 2016)
- (iv) Review Panelist for Annual Conference (2014, 2015)

*American Educational Research Association*

- (i) Chair, Cognition and Assessment Special Interest Group (2015 – 2018)
- (ii) Vice-chair, Cognition and Assessment Special Interest Group (2012 – 2015)
- (iii) Conference Program Co-Chair, Division D: Quantitative Methods and Statistical Theory (2013, 2014)

*The University of Georgia Graduate Researchers in Educational Psychology & Instructional Technology*

- (i) Vice President, Executive Committee (2010 – 2011)
- (ii) Member-at-Large, Executive Committee (2009 – 2010)
- (iii) Program Representative, Executive Committee (2007 – 2009)

*The University of Georgia Mathematics Education Student Association*

Undergraduate Representative (2006 – 2007)

### **Editorial Leadership**

#### *Editorial Board Member*

Educational Assessment  
Journal of Classification  
Journal of Educational Measurement

#### *Peer Reviewer for Journals*

Applied Psychological Measurement  
British Journal of Mathematical and Statistical Psychology  
Educational Measurement: Issues and Practice  
International Journal of Testing  
Journal of Research in Mathematics Education  
Journal of Statistics Education  
Multivariate Behavioral Research  
Psychometrika

#### *Peer Reviewer for Conferences and Organizations*

American Educational Research Association Conference  
*Division D and Cognition and Assessment SIG*  
National Council of Measurement in Education Conference  
Northeastern Educational Research Association

### **University Committee Member**

#### The University of Georgia College of Education

Member, Search Committee: Assistant Professor, Gifted Education (2019)  
Faculty Senate (2016-2018)  
Member, Search Committee: Dean of College of Education (2018)  
Member, Search Committee: Assistant Professor, Mathematics Education (2018)  
Promotion and Tenure Committee (2017)  
Junior Faculty Mentoring Committees (2016-Present; 2017-Present)  
Chair, Search Committee: Assistant Professor, Quantitative Methodology (2017)  
Chair, Search Committee: Assistant Professor, Quantitative Methodology (2016)  
Member, Planning Committee, Faculty/ Student Research Conference (2015)  
Member, Planning Committee, Graduate Student Research Conference (2013, 2014)  
Member, Curriculum Committee (2013-2015)  
Member, Search Committee: Full Professor, Research, Evaluation, Measurement, and Statistics (2013)  
Member, Search Committee: Assistant Professor, Research, Evaluation, Measurement, and Statistics (2011)  
Member, Conference Organization Committee: 75th International Meeting of the Psychometric Society at the University of Georgia in Athens, Georgia. (2010)

#### James Madison University

Member, Tech One Task Force Committee (2011 – 2012)  
Member, Search Committee: Assistant Professor of Assessment & Measurement/Assessment Specialist (2012)

**Technical Advisory Committee Member**

Utah state (2018-present)  
Educational Records Bureau (2014 – Present)  
Curriculum Associates (2015 – 2016)

**Consulting**

Chief Psychometric Consultant, PARCC Diagnostic Assessment Project (2013-2016)

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**Other Past Professional Experiences**

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**Assessment Specialist, Center for Assessment and Research Services, James Madison University**

Assessment specialists coordinate with faculty and other university stakeholders to provide internal assessment of programs at the university. Responsibilities include facilitating the specification of program learning objectives, designing and creating assessments, analyzing results of assessment data, conducting relevant research regarding the results, and reporting findings in written and oral formats to stakeholders.

General Education Program, Science and Mathematics Cluster (2011 – 2012)  
Study Abroad Program (2011 – 2012)  
International Students Program (2011 – 2012)

**Graduate Research Assistant, NSF funded *Diagnosing Teacher's Multiplicative Reasoning* (DTMR) project (NSF DRK-12; DRL-0822064)**

2010 – 2011, Athens, GA: work includes designing and implementing simulation studies and empirical data analyses for a newly developed nominal response diagnostic classification model (DCM), as well as reviewing items with respect to cognitive interview data for the creation of a final form of an assessment to diagnose teachers' abilities to reason multiplicatively.

2009 – 2010, Athens, GA: designed and implemented simulation studies to investigate properties of small sample estimation and reliability for various diagnostic classification models.

2008 – 2009, Athens, GA: authored mathematics items to measure middle grades teachers' mathematical reasoning and analyzed cognitive interviews to assess effectiveness of items.

**Pearson Education, 2009, San Antonio, TX**

*Pearson Psychometric Fellowship*: conducted research on the effectiveness of linguistically modified items on a large scale assessment and participated in usual psychometric tasks completed by large-scale testing company.

**Georgia Center for Assessment, 2007 – 2008, Athens, GA**

*Graduate Assistantship*: developed DCM framework for writing mathematics items to measure 4<sup>th</sup> and 8<sup>th</sup> grade students' mathematics reasoning and conducted interviews with students to develop items.

**Georgia Department of Education, 2008 – 2009, Atlanta, GA**

*Math III and IV Instructional Framework Committee:* individual work included writing the tasks and supportive materials for a complete unit in Math III as well as editing other committee members' tasks for Math III and IV.

**Cassandra Drennon and Associates, 2008, Athens, GA**

*Consultant:* work included the construction of a Likert-type scale that assessed middle grades children's perceptions of mental illnesses.

**Georgia Department of Education, 2007, Atlanta, GA**

*Intern for the Director of the State Mathematics Curriculum:* work included helping prepare training sessions about implementing Math I for high school teachers and then compiling the data from teachers' feedback about the training to be included in a report to the State Board of Education.

*Eighth Grade Instructional Framework Committee:* work included task writing for curriculum Frameworks.

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**Statistical Software Skills**

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Fortran, Mplus, R, SAS, SPSS

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**Professional Affiliations**

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American Educational Research Association, 2007 - present

Georgia Council of Teachers of Mathematics

National Council on Measurement in Education, 2007 - present

National Numeracy Network

Northeastern Educational Research Association, 2012 – present

Psychometric Society