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# Daniel **Anderson**

Research Assistant Professor

## Curriculum Vita

I am primarily interested in data science and computational social science, broadly defined as the intersection between computer science and statistics, as applied to large-scale research in education. I am particularly interested in systematic inequalities that influence students' learning and growth over time. I am also a strong proponent of open and reproducible workflows.


Behavioral Research and Teaching
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## Education

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|---|---|
| 2011 — 2015 | Ph.D., Educational Methodology, Policy and Leadership, University of Oregon<br>*Dissertation:* Teacher and School Contributions to Student Growth |
| 2008 — 2009 | M.S. Educational Leadership, University of Oregon<br>*Terminal Project:* Educational Accountability: An Examination of Policy and Measurement Practices |
| 2003 — 2007 | B.S. Elementary Education, Utah State University |

## Brief professional history

| | |
|---|---|
| 2018 — | **Research Assistant Professor**, Behavioral Research and Teaching, University of Oregon |
| 2015 — 2018 | **Research Associate**, Behavioral Research and Teaching, University of Oregon (*on-leave during post-doc*) |
| 2016 — 2017 | **IES Post-Doctoral Research Fellow**, Center on Teaching and Learning, University of Oregon |
| 2009 — 2015 | **Research Assistant**, Behavioral Research and Teaching, University of Oregon |

## Additional training (received)

*Deep Learning with Keras and TensorFlow in R* (2020). Two-day workshop lead by Dr. Brad Boehmke

*Applied Machine Learning* (2019). Two-day workshop lead by Dr. Max Kuhn

*Summer Institute on Computational Social Science* (2018). Remote week-long workshop lead by Drs. Matthew Salganik & Chris Bail

*Master R Developer Workshop* (2017). Two-day workshop lead by Dr. Hadley Wickham

*Institute of Education Sciences: Cluster-randomized trials* (2016). Two-week long workshop lead by Drs. Larry V. Hedges & Spyros Konstantopoulos

# Teaching

*Icons link to additional content*

## Data science specialization

I have led the design, development, and teaching of a new five-course graduate-level data science specialization offered through the University of Oregon's College of Education. The following lists the sequence of courses in the specialization, as well as the year/quarter the course was most recently taught.

1. *Introduction to data science with R*. (Fall, 2018). CRN: 12074; 3 credit hours.
2. *Communicating and transforming data*. (Winter, 2019). CRN: 27553; 3 credit hours.
3. *Functional programming with R*. (Spring, 2019). CRN: 35699; 3 credit hours.
4. *Applied predictive modeling*. (Spring, 2020). CRN: [planned]; 3 credit hours.
5. *Capstone*. (Summer, 2020). CRN: [planned]; 4 credit hours.

## Additional courses taught

1. *Multiple regression in educational research*. (Fall, 2018). CRN: 17258; 3 credit hours.
2. *Survey of educational research methods*. (Summer, 2018). CRN: 40797; 3 credit hours.
3. *Exploring data with R*. (Spring/Fall, 2017). CRN: 17214/37117; 4 credit hours.

## Related experience

1. *Data processing, analysis, and visualization w/R*. (Fall/Winter/Spring, 2015/2016). Taught internally to BRT researchers credit hours.
2. *Evidence-based decision making*. (Winter, 2017). CRN: 22130 [co-taught w/Dr. Nancy Heaps]; 4 credit hours.
3. *Multiple regression in educational research [supervised teaching]*. (Fall, 2015). 4 credit hours.
4. *Public elementary school teacher*. (2007-08).

# Scholarship

*Icons link to additional content*

## Peer-Reviewed Publications

*in press* 17. **Anderson, D.**, Rowley, B., Irvin, P. S., Rosenberg, J. M., & Stegenga, S (*in press*). Evaluating content-related validity evidence using a text-based, machine learning procedure. *Educational Measurement: Issues and Practice*.

2019 16. Kovensky, R., **Anderson, D.**, and Leve, L (2019). Early adversity and sexual risk in adolescence: externalizing behaviors as a mediator. *Journal of Child & Adolescent Trauma*. doi: 10.1007/s4065

15. **Anderson, D.** (2019). Exploring teacher and school variance in students' within-year reading and mathematics growth. *School Effectiveness and School Improvement*. *30*, 510-530. doi: 10.1080/09243453.2019.1618349

14. Shanley, L., Clarke, B., **Anderson, D.**, Turtura, J., Doabler, C., Kurtz-Nelson, E., & Fien, H (2019). Exploring the utility of assessing early mathematics intervention response via embedded assessment. *School Psychology*. doi: 10.1037/spq0000326

13. Nese, J. F. T., Farley, D., & **Anderson, D.** (2019). Educator-reported instructional characteristics of grade 1 reading interventions within a CBM assessment system. *Learning Disabilities: Research and Practice*. doi: 10.1111/ldrp.12191

12. Tindal, G., and **Anderson, D.** (2019). Changes in status and performance over time for students with specific learning disabilities. *Learning Disabilities Quarterly*. *42*, 3-16. doi: 10.1188/0731948718806660

2018 11. Rosenberg, J, Beymer, P. N., **Anderson, D.**, van Lissa, C.J., and Schmidt, J. A (2018). tidyLPA: An R package to easily carry out latent profile analysis (LPA) using open-source or commercial software. *Journal of Open Source Software*. *3*(30), 978. 10.21105/joss.00978

10. Fien, H., **Anderson, D.**, Nelson, N. J., Kennedy, P., Baker, S. K., & Stoolmiller, M (2018). Examining the impact and school-level predictors of impact variability of an 8th grade reading intervention on at-risk students' reading achievement. *Learning Disabilities Research & Practice*. *33*, 37-50. doi: 10.1111/ldrp.12161

2017 9. **Anderson, D.**, Kahn, J, and Tindal, G (2017). Exploring the robustness of a unidimensional item response theory model with empirically multidimensional data. *Applied Measurement in Education*. *30*, 163-177. doi: 10.1080/08957347.2017.1316277

8. Park, B. J., **Anderson, D.**, Tindal, G., & Alonzo, J (2017). A validity argument for a mathematics curriculum-based measure: Implications for response to intervention decision-making. *Journal of Educational Administration and Policy*. *2*, 5-18. 10.22553/keas/2017.2.1.5

2016 7. Farley, D., **Anderson, D.**, Irvin, P. S., & Tindal, G (2016). Modeling reading growth in Grades 3-5 with an alternate assessment. *Remedial and Special Education*. *38*, 195-206. doi: 10.1177/0741932516678661

6. Saven, J. L., **Anderson, D.**, Nese, J. F. T., Farley, D., & Tindal, G (2016). Patterns of statewide test participation for students with significant cognitive disabilities. *The Journal of Special Education*. *49*, 209-220. doi: 10.1177/0022466915582213

2015 5. **Anderson, D.**, Farley, D., & Tindal, G (2015). Test design considerations for students with significant cognitive disabilities. *The Journal of Special Education*. *49*, 3-15. doi: 10.1177/0022466913491834

4. **Anderson, D.**, Irvin, P. S., Alonzo, J., & Tindal, G (2015). Gauging item alignment through online systems while controlling for rater effects. *Educational Measurement: Issues and Practice*. *34*, 22-33. doi: 10.1111/emip.12038

2013 3. Patarapichayatham, C., **Anderson, D.**, and Kamata, A (2013). Middle school transition: An application of latent transition analysis (LTA) on easyCBM benchmark mathematics data. *The International Journal of Educational Administration and Development*. *4*, 745-756.

2012 2. Nese, J. F. T., Biancarosa, G., **Anderson, D.**, Lai, C.-F., Alonzo, J., and Tindal, G (2012). Within-year oral reading fluency with CBM: A comparison of models. *Reading and Writing*. *25*, 887-915. doi: 10.1007/s11145-011-9304-0

2011 1. **Anderson, D.**, Lai, C., Alonzo, J. and Tindal, G (2011). Examining a grade-level math CBM designed for persistently low-performing students. *Educational Assessment*. *16*, 15-34. doi: 10.1080/10627197.2011.551084

## Book chapters

2. Rosenberg, J. M., Lawson, M. A., **Anderson, D.**, Rutherford, T., & Jones, R. S (*forthcoming*). Making data science "count": Data science and Learning, Design, and Technology research. In E. Romero-Hall (Ed.). *Research Methods in Learning Design & Technology* Routledge: New York, NY

1. Tindal, G., and **Anderson, D.** (2011). Validity evidence for making decisions about accommodated and modified large-scale tests. In Elliot, S. N., Kettler, R. J., Beddow, P. A., & Kurz, A. (Eds.). *Accessible tests of student achievement: Issues, innovations, and applications* (pp. 183-200). New York, NY: Springer

## National & International Conference Presentations

2019 29. **Anderson, D.**, Rowley, B., Stegenga, S., Irvin, P. S., and Rosenberg, J. M (April, 2019). *Evaluating content-related validity evidence using text modeling*. Paper presented at the annual meeting of the National Council on Measurement in Education, Toronto, ON.

2018 28. **Anderson, D.**, and Tindal, G (October, 2018). *Changes in status and performance for students with learning disabilities*. Poster presented at the annual meeting of the Council for Learning Disabilities, Portland, OR.

27. **Anderson, D.**, and Stevens, J. J (April, 2018). *Exploring and visualizing school achievement and school effects*. Paper presented at the annual meeting of the National Council on Measurement in Education, New York, NY.

26. Stegenga, S., **Anderson, D.**, Munger, K., and Wennerstrom, E. K (March, 2018). *Big Data… and Babies!? A Mixed Methods Systematic Scoping Review of Strenghts, Challenges, and Implications of Big Data Use in Early Intervention and Eartly Childhood*. Poster presented at the Conference on Research Innovations in Early Intervention, San Diego, CA.

2017

25. **Anderson, D.**, Stevens, J. J., and Nese, J. F. T (April, 2017). *Visualizing Achievement Gaps Across the Full Distribution*. Paper presented at the annual meeting of the National Council on Measurement in Education, San Antonio, TX.

24. Stevens, J. J., **Anderson, D.**, Nese, J. F. T., and Tindal, G (April, 2017). *Using Effect Size Measures to Estimate and Report Achievement Gaps*. Paper presented at the annual meeting of the National Council on Measurement in Education, San Antonio, TX.

23. Pilger, M., Fien, H., Nelson, N. J., **Anderson, D.** and Otterstedt, J (February, 2017). *Self-Regulation and Math Achievement: Potential Mitigating Benefits of Instructional Gaming*. Paper presented at the annual meeting of the National Association of School Psychologists, Washington, DC.

22. Nese, J. F. T., **Anderson, D.**, and Farley, D (February, 2017). *What Does Reading Intervention Look Like?*. Poster presented at the Pacific Coast Research Conference, Coronado, CA.

2016

21. **Anderson, D.**, and Stevens, J. J (December, 2016). *Visualizing Achievement Gaps Across the Full Scale*. Poster presented at the Principal Investigators Meeting, Institute of Education Sciences, Washington, DC.

20. **Anderson, D.** (May, 2016). *Exploring the Latino-White Achievement Gap Across Disability Classifications Over Time*. Poster presented at the Education and Inequality in 21st Century America conference at Stanford University, Palo Alto, CA.

19. **Anderson, D.**, and Stevens, J. J (April, 2016). *Cohort and content variability in value-added model school effects*. Paper presented at the annual meeting of the National Council on Measurement in Education, Washington, DC.

2015

18. **Anderson, D.**, and Stevens, J. J (April, 2015). *Exploring the impact of cohort variability on teacher effects*. Paper presented at the annual meeting of the National Council on Measurement in Education, Chicago, IL.

17. **Anderson, D.** (April, 2015). *Within-year variance in mathematics growth between students, teachers, and schools*. Poster presented at the annual meeting of the American Educational Research Association, Chicago, IL.

16. **Anderson, D.**, Irvin, P. S., Nese, J. F. T, Alonzo, J., Tindal, G (April, 2015). *National middle school mathematics within-year growth norms*. Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL.

15. **Anderson, D.**, Kahn, J. D., Alonzo, J, and Tindal, G (April, 2015). *Exploring the item factor structure of a CCSS-aligned middle school mathematics CBM*. Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL.

14. Farley, D., **Anderson, D.**, Irvin, P. S., Saven, J. L., and Tindal G (April, 2015). *Modeling reading growth for alternate assessments based on alternate achievement standards (AA-AAS)*. Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL.

2013

13. **Anderson, D.**, Irvin, P. S., Alonzo, J., & Tindal, G (April, 2013). *Modeling rater effects in a formative mathematics alignment study*. Paper presented at the annual meeting of the National Council on Measurement in Education, San Francisco, CA.

12. Irvin, P. S., **Anderson, D.**, Saven, J., Alonzo, J. and Tindal, G (April, 2013). *Within-year growth in math: Implications for progress-monitoring using RTI*. Paper presented at the annual meeting of the American Educational Research Association, San Francisco, CA.

11. Saven, J., **Anderson, D.**, Nese, J. F. T., Alonzo, J., and Tindal, G (April, 2013). *Teacher decision making and within-year growth in math*. Paper presented at the annual meeting of the American Educational Research Association, San Francisco, CA.

10. Patarapichayatham, C., Nese, J. F. T., & **Anderson, D.** (April, 2013). *Within-year grade 2 math growth: Using a 2PL second-order item response theory growth model*. Paper presented at the annual meeting of the National Council on Measurement in Education, San Francisco, CA.

9. **Anderson, D.**, Alonzo, J., and Tindal, G (February, 2013). *Best practices in oral reading fluency administration*. Paper presented at the annual meeting of the National Association of School Psychologists, Seattle, WA.

8. Patarapichayatham, C., **Anderson, D.**, & Kamata, A (February, 2013). *Middle School Transition: An Application of Latent Transition Analysis (LTA) on easyCBM® Benchmark Mathematics Data*. Paper presented at the Conference on Educational Reform,SiemReap, Cambodia.

2012

7. **Anderson, D.** (June, 2012). *An analysis of growth in alternate assessments*. Paper presented at the annual meeting of the Council of Chief State School Officers (CCSSO), National Conference on Student Assessment, Minneapolis, MN.

6. Alonzo, J., Park, B.J., Lai, C.F., **Anderson, D.**, and Irvin, P. S (February, 2012). *The appropriateness of different types of CBM measures for first- and second-grade students receiving literacy instruction in Spanish*. Poster presented at the Pacific Coast Research Conference, Coronado, CA.

2011

5. Park, B. J., **Anderson, D.**, Alonzo, J., and Tindal, G (April, 2011). *Use of Student Growth to Predict State Assessment Performance*. Paper presented at the annual meeting of the American Educational Research Association, New Orleans, LA.

4. Park, B. J., **Anderson, D.**, Nese, J. F. T., Alonzo, J., and Tindal, G (April, 2011). *The Classification Accuracy of Mathematics Screening Measures*. Poster presented at the annual meeting of the American Educational Research Association, New Orleans, LA.

2010

3. Nese, J. F. T., **Anderson, D.**, and Tindal, G (May, 2010). *The invariance of the easyCBM® mathematics measures across educational setting, language, and ethnic groups*. Paper presented at the annual meeting of the National Council of Measurement in Education, Denver, CO.

2. **Anderson, D.**, Park, B. J., and Tindal, G (May, 2010). *An examination of the easyCBM® benchmark tests and the Oregon statewide tests in grades 6-8 mathematics*. Paper presented at the annual meeting of the American Educational Research Association, Denver, CO.

1. **Anderson, D.** (May, 2010). *Accountability plans and the growth model pilot program: An examination of state policy effects on the percentage of schools making adequate yearly progress*. Poster presented at the annual meeting of the American Educational Research Association, Denver, CO.

## Regional conferences

4. **Anderson, D.** (September, 2018). *My research and the COE*. Presentation at the Joint Meeting of the University of Oregon's Data Science Initiative and Oregon Health and Science University.

3. **Anderson, D.** (June, 2018). *Contribute to open source with pretty slides*. Presentation at the annual Cascadia R Conference.

2. **Anderson, D.** (April, 2018). *Developing your first R package: A case study with esvis*. Presentation at the Eugene R Users Group Meetup.

1. **Anderson, D.** (June, 2017). *esvis: An R package for effect size visualizations*. Presentation at the annual Cascadia R Conference.

## Technical reports (selected)

I am a co-author on over sixty technical reports. Below is a sample of 10 that are among the most cited.

10. **Anderson, D.**, Alonzo, J., Tindal, G., Farley, D., Irvin, P. S., Lai, C. F., Saven, J. L., Wray, K. A (2014). *Technical Manual: easyCBM* (Technical Report No. 1408). Eugene, OR: Behavioral Research and Teaching, University of Oregon.

9. **Anderson, D.** (2013). *Hierarchical Linear Modeling (HLM): An Introduction to Key Concepts Within Cross-Sectional and Growth Modeling Frameworks* (Technical Report No. 1308). Eugene, OR: Behavioral Research and Teaching, University of Oregon.

8. **Anderson, D.**, Irvin, P. S., Patarapichayatham, C., Alonzo, J., & Tindal, G (2012). *The development and scaling of the easyCBM CCSS middle school mathematics measures* (Technical Report No. 1207). Eugene, OR: Behavioral Research and Teaching, University of Oregon.

7. **Anderson, D.**, Park, B. J., Lai, C. F., Alonzo, J., & Tindal, G (2012). *An examination of test-retest, alternate form reliability, and generalizability theory study of the easyCBM reading assessments: Grade 1* (Technical Report No. 1216). Eugene, OR: Behavioral Research and Teaching, University of Oregon.

6. Lai, C.F., Nese, J.F.T., Jamgochian, E.M., Kamata, A., **Anderson, D.**, Park, B.J., Alonzo, J., & Tindal, G (2010). *Technical adequacy of the easyCBM primary-level reading measures (Grades K-1), 2009-2010 version* (Technical Report No. 1003). Eugene, OR: Behavioral Research and Teaching, University of Oregon.

5. Sáez, L., Park, B. J., Nese, J. F. T., Jamgochian, E. M., Lai, C. F., **Anderson, D.**, Kamata, A., Alonzo, J., & Tindal, G. (2010) (2010). *Technical Adequacy of the easyCBM Reading Measures (Grades 3-7), 2009-2010 Version* (Technical Report No. 1005). Eugene, OR: Behavioral Research and Teaching, University of Oregon.

4. Nese, J. F. T., Lai, C. F., **Anderson, D.**, Park, B. J., Tindal, G., & Alonzo, J (2010). *The alignment of easyCBM math measures to curriculum standards* (Technical Report No. 1002). Eugene, OR: Behavioral Research and Teaching, University of Oregon.

3. Nese, J. F. T., Lai, C. F., **Anderson, D.**, Jamgochian, E. M., Kamata, A., Sáez. L., Park, B. J., Alonzo, J., & Tindal, G (2010). *Technical adequacy of the easyCBM mathematics measures: Grades 3-8, 2009-2010 version* (Technical Report No. 1007). Eugene, OR: Behavioral Research and Teaching, University of Oregon.

2. **Anderson, D.**, Lai, C. F., Nese, J. F. T., Park, B. J., Sáez. L., Jamgochian, E. M., Alonzo, J., & Tindal, G (2010). *Technical adequacy of the easyCBM primary-level mathematics measures (grades K-2), 2009-2010 version* (Technical Report No. 1006). Eugene, OR: Behavioral Research and Teaching, University of Oregon.

1. Jamgochian, E. M., Park, B. J., Nese, J. F. T., Lai, C. F., Sáez. L., **Anderson, D.**, Alonzo, J., & Tindal, G (2010). *Technical adequacy of the easyCBM grade 2 reading measures* (Technical Report No. 1004). Eugene, OR: Behavioral Research and Teaching, University of Oregon.

# External Funding Activity

*Icons link to additional content*

## Under review

1. Community, opportunity, and disparity in educational systems: Project CODES. July 2020 to June 2024. Proposed budget: $1,399,808. **Role:** Principal Investigator. FTE: 0.30.

2. Digital assessments of writing using multiple metrics to reflect improvement for students with disabilities. September 2020 to August 2024. Proposed budget: $1,399,163. **Role:** Principal Investigator. FTE: 0.35.

## Current projects

1. Community health and school readiness: Closing the gap. February 2020 to January 2021. Total budget: $48,903.17. **Role:** Principal Investigator. FTE: 0.00.
2. Evaluation of return to school programs for traumatic brain injury. September 2019 to August 2023. Total budget: $2,189,469. **Role:** Statistical analyst/advisor. PI: Ann Glang. FTE: 0.10.
3. Oregon Extended Assessment. September 2019 to August 2020. Total budget: $628,012. **Role:** Statistical analyst/psychometrician. PI: Gerald Tindal. FTE: 0.24.

## Completed projects

1. Developing middle school mathematics progress monitoring measures. June 2010 to June 2014. Total budget: $1,631,403. **Role:** Project Manager. PI: Gerald Tindal. FTE: 0.51 to 0.61 across project years.
2. National research and development center on assessment and accountability. July 2011 to June 2018. Total budget: $11,677,134. **Role:** Research Associate. PI: Gerald Tindal. FTE: 0.10 to 0.47 across project years.
3. Reliability and validity evidence for progress meaures in reading. June 2010 to May 2014. Total budget: $1,596,638. **Role:** Research Assistant. PI: Gerald Tindal. FTE: 0.28 to 0.45 across project years.

# Software development

*Icons link to additional content*

I am active in the R community and have developed a number of packages. My GitHub repositories for R rank in the top 30 (of 8,590) nationally and top 100 (of 72,387) worldwide. Below is a summary of packages I have authored and contributed to, as well as a few interactive data applications.

## Author


6. Barrett, T. S., & **Anderson, D.** (2019). biosketchr: Rmarkdown for biosketches. R package version 0.1.4.
5. **Anderson, D.**, Heiss, A., & Rosenberg, J. M (2019). equatiomatic: Convert R models to LaTeX equations. R package version 0.0.0.9000.
4. **Anderson, D.** (2018). slidex: Convert microsoft PowerPoint slides to markdown/HTML slides. R package version 0.0.0.9000.
3. **Anderson, D.** (2018). esvis: Visualization and estimation of effect sizes. R package version 0.2.0.
2. **Anderson, D.** (2016). sundry: A sundry of convenience functions. R package version 0.0.0.9000.

1. **Anderson, D.** (2015). r2Winsteps: A package for interfacing between R and the Rasch modeling software Winsteps. R package version 0.0.0.9000.

## Contributor

2. Xie, Y (2018). xaringan: Presentation ninja. R package version 0.6.3.
1. Rosenberg, J. M (2018). tidyLPA: Easily carry out latent profile analysis. R package version 0.1.3.

## Web applications

2. **Anderson, D.** (2019). Geographical variance in achievement gaps.
1. **Anderson, D.** (2019). Early learning alliance.

# Professional Service

## Working Committees

3. *Core Member (two-year appointment): Social Systems Data Science Network*. (2019-current). University of Oregon.
2. *Faculty Advisory Committee: Research Advanced Computing Services*. (2018-current). University of Oregon.
1. *Panel Member, Next Generation Assessment Review for Accessibility for Students with Disabilities*. (August, 2015). Sponsored by HumRRO and the Thomas B. Fordham Institute.

## Doctoral committees

I have served on the following doctoral committee.

1. Sondra Stegenga. (2018-2019). Dissertation title: *Maximizing pilot phase measures to inform quality improvement: Using a sequential mixed methods design with interrupted time series to examine feasibility, uptake, and drivers of an evidence based practice in part c/early intervention systems*. University of Oregon.

## Workshops delivered

2. *Developing transparent and reproducible research with R*. (April, 2019). Training provided at the Annual meeting of the American Educational Research Association, Toronto, ON.
1. *A taste of R: Mini-course on R (4 sessions, two hours each)*. (Winter, 2017). Training provided for University of Oregon faculty in the College of Education.

## Ad hoc reviewer

I have served as a peer reviewer for the following journals:

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| Educational Researcher | Reading Research Quarterly |
| American Educational Research Journal | Journal of Special Education |
| Educational Measurement: Issues and Practice | Remedial and Special Education |
| Applied Psychological Measurement | Open Education Studies |
| Educational Assessment | Studies in Educational Evaluation |
| | Language Testing |

# Awards

2. Outstanding reviewer: *Educational Researcher*. (2017).
1. Terminal project of distinction. (2009). Awarded for outstanding Master's degree Terminal Project.

# Professional Affiliations

3. American Educational Research Association
2. National Council of Measurement in Education
1. Data Visualization Society