VelliyoorNott Vimal Rao

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RESEARCH INTERESTS

My research applies theories and methods from the cognitive and learning sciences to investigate learning and doing statistics, and critically examines statistics education research methodology.

EDUCATION

PhD Educational Psychology
Quantitative Methods in Education
Statistics Education
University of Minnesota Twin Cities
Advisors: Robert delMas, Andrew Zieffler
Expected 2023

MA Educational Psychology
Psychological Foundations of Education
Learning and Cognition
University of Minnesota Twin Cities
Advisors: David DeLiema, Jeffrey K. Bye
Expected 2022

MS Statistics
George Washington University
2013

BS Mathematics and Economics
Pure Mathematics
University of Illinois Urbana-Champaign
2008

POSITIONS

Health Resources and Services Administration
Division of Policy and Data, HIV/AIDS Bureau, Rockville, MD
Chief (GS-1530-14), Data Management and Analysis Branch — 2015 – 2016
Health Statistician (GS-1530-13), Data Management Branch — 2014 – 2015

US Census Bureau
Decennial Statistical Studies Division, Suitland, MD — 2010 – 2014
Mathematical Statistician (GS-1529-9/11/12), Quality Assurance Branch
National Processing Center, Jeffersonville, IN — 2009 – 2010
Mathematical Statistician (GS-1529-7/9/11), Statistical Methods Section

TEACHING EXPERIENCE

University of Minnesota, Minneapolis, MN
Instructor, Department of Educational Psychology
EPSY 5261 – Introductory Statistical Methods (4 terms) — 2019 – present
Co-Instructor, Division of Biostatistics
PUBH 6451 – Biostatistics II (Spring 2020)
Teaching Assistant, Department of Educational Psychology
EPSY 3264 – Basic and Applied Statistics (Spring 2021)
EPSY 8264 – Advanced Multiple Regression Analysis (Fall 2020)
EPSY 5261 – Introductory Statistical Methods (3 terms)

George Washington University, Washington, DC
Course Director, Department of Clinical Research and Leadership
HSCI 2117 – Introduction to Statistics for the Health Sciences   2017 – 2020
Instructor, Department of Clinical Research and Leadership
HSCI 2117 – Introduction to Statistics for the Health Sciences (23 terms)   2016 – present
HSCI 3117 – Principles of Biostatistics for the Health Sciences (Fall 2017)
Teaching Assistant, Department of Statistics   2011 – 2012
STAT 6210 – Data Analysis (Spring 2012)
STAT 3187 – Introduction to Sampling (Fall 2011)
STAT 2112 – Business Statistics II (Spring 2011)

CONFERENCE PROCEEDINGS

3. **Rao, V.N.V.**, Legacy, C., Brown, J.M., Zieffler, A., & delMas, R. (in press). Data-to-graphs and back: Secondary teachers' reasoning about aesthetic mappings in data visualization. In *Proceedings of the 12th Annual Satellite Conference of the International Association for Statistical Education*, (pp. TBD).

2. Marupudi, V., Harsch, R.M., **Rao, V.N.V.**, Bye, J.K., Park, J., & Varma, S. (2021). The role of clustering in the efficient solution of small Traveling Salesperson Problems. In T. Fitch, C. Lamm, H. Leder, & K. Tessmar (Eds.), *Proceedings of the 43rd Annual Conference of the Cognitive Science Society* (pp. 1865-1871).

1. **Rao, V.N.V.**, Bye, J.K., & Varma, S. (2021). Categorical perception of p-values. In T. Fitch, C. Lamm, H. Leder, & K. Tessmar (Eds.), *Proceedings of the 43rd Annual Conference of the Cognitive Science Society* (pp. 168-173).

PUBLICATIONS UNDER REVIEW

2. DeLiema, D., Hufnagle, A.S., **Rao, V.N.V.**, Baker, J., Valerie, J., & Kim, J. (under review). *Methodological considerations and innovations at the intersection of video-based research traditions.* International Journal of Research and Method in Education.

1. Running, K., Codding, R.S., Varma, S., **Rao, V.N.V.**, & Wackerle-Hollman, A. (under review). *Comparing the Effects of Concepts-First and Iterative Fraction Instruction Sequences: A Randomized Control Trial.* Journal of Experimental Psychology.

PUBLICATIONS IN PREPARATION

4. **Rao, V.N.V.**, Legacy, C., Brown, J.M., Zieffler, A., & delMas, R. (in preparation). *Data-to-graphs and back: Secondary teachers' reasoning about aesthetic mappings in data visualization*.

3. Varma, S., Marupudi, V., Harsch, R., **Rao, V.N.V.**, Park, J., & Bye, J.K. (in preparation). *The consistency of human clustering and solutions to the Traveling Salesperson Problem*.

2. **Rao, V.N.V.**, Bye, J.K., Varma, S (in preparation). *Mental representation of probabilities as p-values.*

1. **Rao, V.N.V.**, Hurtado, I. L., Riegelman, A., delMas, R.C. (in preparation). *A review of research uses of the Comprehensive Assessment of Outcomes in Statistics*. Retrieved from osf.io/yf3zh.

PRESENTATIONS

8. Society for the Teaching of Psychology's Presidential Task Force on Statistical Literacy, Reasoning, and Thinking*. (2021, August). *STP's Statistical Literacy, Reasoning, and Thinking Presidential Task Force's recommendations and resources for integrating psychological statistics across the undergraduate curriculum* [Symposium]. Annual Meeting of the American Psychological Association, San Diego, California.
   *16 scholars (chairs, followed by alphabetical order): Hartnett, J. (chair), Freeman, E. (co-chair), Neufeld, G. (co-chair), Aguilera, S.E., Geodert, K., Karazsia, B., Naufel, K., Peters, J., **Rao, V.N.V.**, Reusser, A.Y., Sathy, V., Shaw, R., Soicher, R., Smith, T., Ullman, J., & Woodward, A.

7. The Link Tank* (2021, July). *The promise of video-based research methods in psychology* [Oral presentation]. The 36th Annual Psychology Postgraduate Affairs Group Conference, online.
   *6 scholars (alphabetical order): Baker, J., DeLiema, D., Hufnagle, A., Kim, J., **Rao, V.N.V.**, & Valerie, J.

6. **Rao, V.N.V.** (2021, July). *More than just a name: The psychological effects of 'Statistical Significance'* [Oral presentation]. The 36th Annual Psychology Postgraduate Affairs Group Conference, online.

5. **Rao, V.N.V.**, Bye, J.K., & Varma, S. (2021, July). *Categorical perception of p-values* [Paper presentation]. Annual Meeting of the Cognitive Science Society, Vienna, Austria.

4. **Rao, V.N.V.** (2021, June). *Simulation-based inference with R for ANOVA design experiments* [Workshop]. Psychology Postgraduate Affairs Group Data Simulation Summer School, online.

3. **Rao, V.N.V.**, Bye, J.K., & Varma, S. (2021, April). *The psychological reality of the learned "p < 0.05" barrier* [Paper presentation]. Annual Meeting of the American Educational Research Association, virtual.

2. **Rao, V.N.V.** (2020, November). *A Null Hypothesis Story* [Lightning Talk]. Fifth Annual Learning Sciences Graduate Student Conference, Madison, Wisconsin.

1. **Rao, V.N.V.** (2019, September). *Towards a framework for context selection in statistics instruction* [Oral presentation]. Fourth Annual Learning Sciences Graduate Student Conference, Evanston, Illinois.

POSTERS

16. **Rao, V.N.V.**, Legacy, C., Brown, J.M., Zieffler, A., & delMas, R. (2021, August). *Data-to-graphs and back: Secondary teachers' reasoning about aesthetic mappings in data visualization* [Poster presentation]. 12th Annual Satellite Conference of the International Association for Statistical Education, online.

15. The Link Tank*. (2021, August). *Teaching statistics students psychology: Using podcasts to integrate context and content* [Poster presentation]. Annual Meeting of the American Psychological Association, San Diego, California.
*4 scholars (alphabetical order): Koenen, R., **Rao, V.N.V.**, Rubin, N., & Sullivan, M.

14. McNamara, A., Beckman, M., Legacy, C., Zieffler, A., delMas, R.C., & **Rao, V.N.V.** (2021, August). *Integrating computation in statistics: Instructional decisions for Teaching R* [Speed presentation]. Joint Statistical Meetings, Seattle, Washington.

13. Marupudi, V., Harsch, R.M., **Rao, V.N.V.**, Bye, J.K., Park, J., & Varma, S. (2021, July). *The role of clustering in the efficient solution of small Traveling Salesperson Problems* [Poster presentation]. Annual Meeting of the Cognitive Science Society, Vienna, Austria.

12. **Rao, V.N.V**., Legacy, C.A., & Zieffler, A.S. (2021, June). *Students' perspectives on entering a data science career after experiential learning with local community organizations* [Poster presentation]. United States Conference on Teaching Statistics, online.

11. McNamara, A., Zieffler, A., Beckman, M., Legacy, C., Basner, E.B., delMas, R., & **Rao, V.N.V**. (2021, June). C*omputing in the statistics curriulum: Lessons learned from the educational sciences* [Poster presentation]. United States Conference on Teaching Statistics, online.

10. Running, K., Codding, R.S., **Rao, V.N.V.**, Goodridge, A., Kromminga, K.R., Will, K., Sullivan, M., & Varma, S. (2021, February). *Determining effective fraction instruction sequences* [Poster presentation]. Annual Meeting of the National Association of School Psychologists, Salt Lake City, Utah.

9. **Rao, V.N.V.**, Running, K., & Codding, R.S. (2021, February). *Choosing a statistical model amidst ceiling and floor effects* [Poster presentation]. Annual Meeting of the National Association of School Psychologists, Salt Lake City, Utah.

8. **Rao, V.N.V.** (2020, September). *Investigating multidimensionality in the Comprehensive Assessment of Outcomes in Statistics* [Poster presentation]. Annual Meeting of the National Council of Measurement in Education, San Francisco, California.

7. Marupudi, V., **Rao, V.N.V.**, Park, J., Harsch, R., Bye, J.K., & Varma, S. (2020, July). *Clustering as a precursor to efficient and near-optimal solution of small instances of the Traveling Salesperson Problem (TSP)* [Poster presentation]. Annual Meeting of the Cognitive Science Society, Toronto, Canada.

6. **Rao, V.N.V.**, Bye, J.K., & Varma, S. (2020, June). *Mental representation of p-values: Does a categorical perception effect exist?* [Poster presentation]. University of Minnesota Center for Cognitive Sciences Spring Research Day, Minneapolis, Minnesota.

5. Marupudi, V., **Rao, V.N.V.**, Park, J., Harsch, R., Bye, J.K., & Varma, S. (2020, June). *Clustering as a core mathematical ability for solving graph-theoretic problems such as the Traveling Salesperson Problem (TSP)* [Poster presentation]. Annual Conference of the Mathematical Cognition and Learning Society, Dublin, Ireland. (Conference cancelled)

4. **Rao, V.N.V.** & Chavez, C. (2020, February). *On the Utilization of the Comprehensive Assessment of Outcomes in Statistics* [Poster presentation]. University of Minnesota Department of Educational Psychology Graduate Student Research Day, Minneapolis, Minnesota.

3. Marupudi, V., **Rao, V.N.V.**, Park, J., Harsch, R., Bye, J.K., & Varma, S. (2020, February). *The consistency of human clustering* [Poster presentation]. University of Minnesota Department of Educational Psychology Graduate Student Research Day, Minneapolis, Minnesota.

2. The Link Tank*. (2020, February). *A cognitive behavioural therapy lesson design for statistics anxiety* [Poster presentation]. University of Minnesota Department of Educational Psychology Graduate Student Research Day, Minneapolis, Minnesota.
   *5 scholars (alphabetical order): Baker, J., DeLiema, D, Loiselle, T., **Rao, V.N.V.**, & Yang, W.

1. **Rao, V.N.V.** (2019, May). *Utilizing distributed practice assignments to develop students' statistical literacy in an online class* [Poster presentation]. United States Conference on Teaching Statistics, State College, Pennsylvania.

OTHER PUBLICATIONS AND MANUSCRIPTS

4. **Rao, V.N.V.** (2021, April). From happy hour to co-author: How I found an academic home. *SPARK*. Available at sparkezine.com.

3. **Rao, V.N.V.** (2021). *Students' understanding and reasoning of simulation-based significance testing.* Unpublished preliminary oral exam paper, University of Minnesota, Minneapolis.

2. **Rao, V.N.V.** (2020). *Interpretations and uses of the Comprehensive Assessment of Outcomes in Statistics.* Unpublished preliminary written exam paper, University of Minnesota, Minneapolis.

1. **Rao, V.N.V.** (2019). *Investigating multidimensionality in student responses to the Comprehensive Assessment of Outcomes in Statistics.* Unpublished pre-dissertation paper, University of Minnesota, Minneapolis.

HONORS AND AWARDS

Disciplinary Diversity & Integration Award in Cognitive Science	2021
Quantitative Methods in Education Graduate Student Leadership Award	2019
College of Education and Human Development Graduate Student Fellowship	2018
Russell W Burris Memorial Fellowship in Educational Psychology	2018
Outstanding Group Performance in Data Dissemination	2015
Outstanding Group Performance in Communications Innovations	2015
Data Request Process Improvement	2015
Customer Service Process Improvement	2014
Excellence in Quantitative Analysis	2014
Excellence in Innovative Analyses	2011
Data Quality Process Improvement	2010
Census2010 Operations Management	2010

SERVICE

Technology Innovations in Statistics Education, reviewer	2021
Society for the Teaching of Psychology Presidential Task Force on Statistical Literacy, Reasoning, and Thinking	2021
AP Statistics Exam Reader	2020
American Educational Research Association, Annual Conference reviewer	2020 – 2021
The Link Tank (UMN), founder	2019 – present
QME Brown Bag, student founder and organizer	2018 – 2021
Council of Graduate Students, Educational Psychology student representative	2018 – 2019
American Society for Testing and Materials, subcommittee E11.10 & E11.30	2011 – 2013
Pi Mu Epsilon Illinois Alpha Chapter, Chapter President	2007 – 2008
Pi Mu Epsilon Illinois Alpha Chapter, Chapter Vice President	2006 – 2007