Velliyoor Nott Vimal Rao

rao.vimal@gmail.com
RaoVNV.github.io

EDUCATION

PhD Educational Psychology, University of Minnesota — Expected 2023
Quantitative Methods in Education, Statistics Education — Started 2018
Advisors: Robert delMas and Andrew Zieffler

MA Educational Psychology, University of Minnesota — Expected 2023
Psychological Foundations of Education, Learning and Cognition — Started 2021
Advisors: Jeffrey K. Bye and David DeLiema

MS Statistics, George Washington University — 2013

BS Mathematics and Economics, University of Illinois — 2008
Pure Mathematics

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
Mathematical Statistician (GS-1529-9/11/12), Quality Assurance Branch — 2010 – 2014
National Processing Center, Jeffersonville, IN
Mathematical Statistician (GS-1529-7/9/11), Statistical Methods Section — 2009 – 2010

TEACHING EXPERIENCE

University of Minnesota, Minneapolis, MN
Instructor, Department of Educational Psychology
EPSY 5261 – Introductory Statistical Methods (6 terms) — 2019 – 2022
EPSY 3264 – Basic and Applied Statistics (2 terms) — 2021 – 2022
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) — 2019 – 2021

George Washington University, Washington, DC
Course Director, Department of Clinical Research and Leadership
  HSCI 2117 – Introduction to Statistics for the Health Sciences   2017 – 2020
  HSCI 3117 – Principles of Biostatistics for the Health Sciences   2017 – 2021
Instructor, Department of Clinical Research and Leadership
  HSCI 2117 – Introduction to Statistics for the Health Sciences (27 terms)   2016 – present
  HSCI 3117 – Principles of Biostatistics for the Health Sciences (2 terms)   2017 – 2022
Teaching Assistant, Department of Statistics
  STAT 6210 – Data Analysis (Spring 2012)
  STAT 3187 – Introduction to Sampling (Fall 2011)
  STAT 2112 – Business Statistics II (Spring 2011)

PUBLICATIONS

3. Running, K., Codding, R.S., Varma, S., **Rao, V.N.V.**, & Wackerle-Hollman, A. (in press). Comparing the Effects of Concepts-First and Iterative Fraction Instruction Sequences: A Randomized Control Trial. *The Elementary School Journal*.

2. DeLiema, D., Hufnagle, A.S., **Rao, V.N.V.**, Baker, J., Valerie, J., & Kim, J. (in press). Methodological considerations and innovations at the intersection of video-based research traditions. *International Journal of Research and Method in Education.* https://doi.org/10.1080/1743727X.2021.2011196

1. **Rao, V.N.V.**, Bye, J.K., & Varma, S. (2022). Categorical perception of p-values. *Topics in Cognitive Science, 14*(2), 414-425. https://doi.org/10.1111/tops.12589

PUBLICATIONS UNDER REVIEW ([‡]FORMER STUDENT)

2. Legacy, C., Zieffler, A., **Rao, V.N.V.**, & delMas, R. (in preparation). *Vampires and star-crossed lovers: Secondary teachers' reasoning about the connections between multivariate data and visualization*. Statistics Education Research Journal

1. Simpson, M.[‡], & **Rao, V.N.V.** (under review). *Association between generational trauma and progressive dementia types*. Minnesota Undergraduate Research & Academic Journal.

PUBLICATIONS IN PREPARATION ([‡]FORMER STUDENT)

6. Chen, B., Bartucz, J., Scharber, C., **Rao, V.N.V.**, & DeLiema, D. (in preparation). *Towards a framework of justice-oriented data science education*.

5. Ancel, E.E.[‡], Smith, M.L.[‡], **Rao, V.N.V.**, & Munson, B. (in preparation). *Does F3-F2 Distance predict transcriptions of preschoolers' /r/ productions?*

4. **Rao, V.N.V.**, Legacy, C., Zieffler, A., & delMas, R. (in preparation). *Building notions of tidy data*.

3. **Rao, V.N.V.**, Bye, J.K., & Varma, S (in preparation). *The psychological reality of the learned "p < 0.05" barrier.*

2. Marupudi, V., Harsch, R.M., **Rao, V.N.V.**, Park, J., Bye, J.K., & Varma, S. (in preparation). *The role of clustering in humans' Traveling Salesperson Problem solutions.*

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

CONFERENCE PROCEEDINGS

5. **Rao, V.N.V.**, Bye, J.K., & Varma, S. (in press). Graduate students' effect size categorical boundaries. In S. Peters & L. Zapata (Eds.), *Proceedings of the 11th International Conference on Teaching Statistics* (pp. TBD).

4. Marupudi, V., Harsch, R.M., Park, J., Bye, J.K., **Rao, V.N.V.**, & Varma, S. (in press). Use of clustering in human solutions of the traveling salesperson problem. In J. Culbertson, A. Perfors, H. Rabagliati, & V. Ramenzoni (Eds.), *Proceedings of the 44th Annual Conference of the Cognitive Science Society* (pp. 424-430).

3. **Rao, V.N.V.**, Legacy, C., Brown, J.M., Zieffler, A., & delMas, R. (2021). Data-to-graphs and back: Secondary teachers' reasoning about aesthetic mappings in data visualization. In R. Helenius & E. Falck (Eds.), *Statistics Education in the Era of Data Science: Proceedings of the Satellite Conference of the International Association for Statistical Education*. https://iase-web.org/Conference_Proceedings.php.

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). https://escholarship.org/uc/item/5q76r06x.

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). https://escholarship.org/uc/item/7hw3s1rs.

CONFERENCE PRESENTATIONS (‡FORMER MENTEE)

12. **Rao, V.N.V.**, Bye, J.K., & Varma, S. (2022, September). *Graduate students' effect size categorical boundaries* [Paper Presentation]. The Eleventh International Conference on Teaching Statistics (ICOTS), Rosario, Argentina.

11. Marupudi, V., Harsch, R.M., Park, J., Bye, J.K., **Rao, V.N.V.**, & Varma, S. (2022, July). *Use of clustering in human solutions of the traveling salesperson problem* [Paper Presentation]. Annual Meeting of the Cognitive Science Society, Toronto, Canada.

10. **Rao, V.N.V.**, Bailey, N., Bartucz, J., & Chávez, C. (2022, May). *Social Justice is more than just using critical contexts: A panel on embedding social justice into curricula* [Breakout Session]. Electronic Conference on Teaching Statistics.

9. Legacy, C., Zieffler, A., delMas, R., & **Rao, V.N.V.** (2022, January). *Data to graphs and back: Secondary teachers' reasoning about the aesthetic mappings that link data and visualizations* [Paper Presentation]. 12th International Research Forum on Statistical Reasoning, Thinking, and Literacy (SRTL-12), online.

8. Torrey-White, K.[‡], Gary, L., Bergson, A., Flynn, J., Driehorst, M., Siekman, R., Prekker, F., Slusher, T., Maynard, K., Paetox, G., **Rao, V.N.V.**, Hendrickx, L., & Bjorklund, A. (2021, November). *A Quality Improvement Project Using Simulation to Improve Nursing Confidence and Skills and Promote Teamwork During High Acuity, Low Occurrence Clinical Events in the Pediatric Intensive Care Unit* [Quick Shot Presentation]. Annual Meeting of the Pediatric Trauma Society, Baltimore, MD.

7. 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.

6. **Rao, V.N.V.**, Bye, J.K., & Varma, S. (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. 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.

4. **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.

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.

25. **Rao, V.N.V.,** Bye, J.K., & Varma, S. (2022, August). *Categorical boundaries in graduate students' judgment of effect sizes* [Poster Presentation]. Annual Meeting of the American Psychological Association, Minneapolis, Minnesota.

24. Marupudi, V., Harsch, R. M., Park, J., **Rao, V. N. V.**, Bye, J. K. & Varma, S. (2022, June). *Human use of clustering to solve traveling salesperson problems* [Poster Presentation]. Annual Conference of the Mathematical Cognition and Learning Society, Antwerp, Belgium.

23. **Rao, V.N.V.,** Bye, J.K., & Varma, S. (2022, May). *Graduate students in the psychological sciences perceive at categorical boundary when processing p-values across the .05 boundary* [Poster Presentation]. Annual Meeting of the American Psychological Society, Chicago, Illinois.

22. Simpson, M.‡, & **Rao, V.N.V.** (2022, April). *Association between Generational Trauma and Progressive Dementia Types* [Poster Presentation]. University of Minnesota Center for Cognitive Sciences Spring Research Day, Minneapolis, Minnesota.

21. **Rao, V.N.V.,** Bye, J.K., & Varma, S. (2022, April). *Graduate students in the psychological sciences perceive at categorical boundary when processing p-values across the .05 boundary* [Poster Presentation]. University of Minnesota Center for Cognitive Sciences Spring Research Day, Minneapolis, Minnesota.

20. Ancel, E.E.‡, Smith, M.L.‡, **Rao, V.N.V.**, & Munson, B. (2022, April). *Does F3-F2 Distance predict transcriptions of preschoolers' /r/ productions?* [Poster Presentation]. University of Minnesota Center for Cognitive Sciences Spring Research Day, Minneapolis, Minnesota.

19. **Rao, V.N.V.,** Bye, J.K., & Varma, S. (2022, February). *Graduate students' effect size category boundaries* [Poster Presentation]. University of Minnesota Department of Educational Psychology Graduate Student Research Day, Minneapolis, Minnesota.

18. **Rao, V.N.V.** (2022, February). *The logic of statistical tests: A historical analysis* [Poster Presentation]. University of Minnesota Department of Educational Psychology Graduate Student Research Day, Minneapolis, Minnesota.

17. Ancel, E.E.‡, Smith, M.L.‡, **Rao, V.N.V.**, & Munson, B. (2021, November). *Does F3-F2 Distance predict transcriptions of preschoolers' /r/ productions?* [Poster Presentation]. 181st Meeting of the Acoustical Society of America, Seattle, Washington. https://doi.org/10.1121/10.0007949

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. https://iase-web.org/conference/satellite21/

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.** & Chávez, 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.

INVITED TALKS, WORKSHOPS, AND PANELS

8. **Rao, V.N.V.** & Carpenter, Z. (2022, October). *Openness and Uncertainty: A forum on the psychology of science* [Forum proposed]. Seventh Annual Learning Sciences Graduate Student Conference, Bloomington, Indiana.

7. **Rao, V.N.V.** (2022, September). *The Psychology of Statistics* [Invited Talk]. Stochastic Modeling and Computational Statistics, Pennsylvania State University, State College, Pennsylvania. Sponsored by Dr. Matthew Beckman and Dr. Stephen Berg.

6. **Rao, V.N.V.** (2022, September). *Graduate Students' Thinking in Statistical Tests: Implications for Practice and Pedagogy* [Invited Talk]. Department of Psychology, Gannon University, Erie, Pennsylvania. Sponsored by Dr. Jessica Hartnett.

5. **Rao, V.N.V.** (2022, August). *Using Drawings to Facilitate Statistical Modelling and Testing* [Skill Building Session]. Annual Meeting of the American Psychological Association, Minneapolis, Minnesota. (session cancelled)

4. **Rao, V.N.V.** (2022, May). *Thinking about thinking: A preliminary analysis of the use of eye tracking in the study of statistical thinking* [Invited Talk]. Teaching and Learning Lab, University of California Los Angeles, Los Angeles, California. Sponsored by Dr. Jim Stigler.

3. **Rao, V.N.V.**, Bye, J.K., & Varma, S. (2021, October). *Statistical Significance and the Categorization of p-values* [Invited Talk]. Percepts and Concepts Lab, Indiana University, Bloomington, Indiana. Sponsored by Dr. Robert Goldstone.

2. **Rao, V.N.V.**, Bye, J.K., & Varma, S. (2021, October). *Statistical Significance and the Categorization of p-values* [Invited Talk]. Psychological Foundations of Education Research Talks, University of Minnesota, Minneapolis, Minnesota. Sponsored by Dr. Martin Van Boekel.

1. **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.

OTHER PUBLICATIONS AND MANUSCRIPTS

6. **Rao, V.N.V.** (2022). *Graduate students' thinking in statistical tests: A multi-modal multiple descriptive case study.* Unpublished dissertation prospectus, University of Minnesota, Minneapolis.

5. Neufeld, G., Estrada Aguilera, S., Goedert, K., Peters, J., **Rao, V.N.V.**, Sathy, V., Smith, T., & Hartnett, J. (2022). *Statistical Literacy, Reasoning, and Thinking: Guidelines 2.0 – Presidential Task Force Subcommittee on Introductory Psychology Statistical Literacy.* Society for the Teaching of Psychology. http://teachpsych.org/page-1863179

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

Quantitative Methods in Education Graduate Student Teaching Award ($100)	2022
UMN Thank-a-Teacher Program, recipient of 12 letters	2020 – 2022
Best Presentation, 36th Annual PsyPAG Conference	2021
Disciplinary Diversity & Integration Award in Cognitive Science ($1000)	2021
Quantitative Methods in Education Graduate Student Leadership Award ($100)	2019
CEHD Graduate Student Fellowship ($25000)	2018
Russell W Burris Memorial Fellowship in Educational Psychology ($5000)	2018
Outstanding Group Performance in Data Dissemination, HRSA	2015
Outstanding Group Performance in Communications Innovations, HRSA	2015
Data Request Process Improvement, HRSA ($1000)	2015
Customer Service Process Improvement, HRSA ($1000)	2014
Excellence in Quantitative Analysis, HRSA ($1000)	2014
Excellence in Innovative Analyses, US Census Bureau ($1000)	2011
Data Quality Process Improvement, US Census Bureau ($500)	2010
Census2010 Operations Management, US Census Bureau ($500)	2010

OTHER RESEARCH EXPERIENCE

University of Minnesota, Minneapolis, MN
Research Assistant, Department of Curriculum and Instruction
  DataX (NSF #2101413)   2022
Research Assistant, Department of Educational Psychology
  The Data Science WAV (NSF #1923700)   2020

SERVICE TO THE FIELD

Researchers of Statistics Education (RoSE), deputy director   2022 – present
Journal of Statistics and Data Science Education, reviewer   2021 – present
Statistics Education Research Journal, reviewer   2021 – present
Technology Innovations in Statistics Education, reviewer   2021 – present
Statistics Education – Engagement and Development for Students, founder 2021 – present
American Educational Research Association, annual conference reviewer   2021
Society for the Teaching of Psychology, Presidential Task Force on Statistical 2021
Literacy, Reasoning, and Thinking, task force member
AP Statistics Exam, reader   2020
CAUSE Undergraduate Statistics PROject Competition, judge   2020 – present
Washington Statistical Society, poster competition judge   2014
American Society for Testing and Materials, subcommittee E11.10 & E11.30 2011 – 2013

SERVICE TO THE COMMUNITY

The Link Tank (UMN), founder   2019 – present
   Council of Graduate Students (COGS) Community Building Grant ($300)   2022
   Council of Graduate Students (COGS) Community Building Grant ($120)   2020
QME Brown Bag, founder   2018 – 2021
Council of Graduate Students, Educational Psychology student representative 2018 – 2019
Pi Mu Epsilon Illinois Alpha Chapter, chapter president   2007 – 2008
Pi Mu Epsilon Illinois Alpha Chapter, chapter vice president   2006 – 2007