

Velliyoornott Vimal Rao

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[@RaoVNV](#)

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

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|--|---|------------------|
| 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

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|---|-------------|
| 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

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| 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

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| 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) | |

Commented [VR1]: 4th time was spring 2021. 5th and 6th time will be fall 2021

Commented [VR2]: 3rd time is summer 2021

George Washington University, Washington, DC

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| 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) | |

Commented [VR3]: 23rd time is Summer 2021A

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., Coddling, 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). *Computing in the statistics curriculum: Lessons learned from the educational sciences* [[Poster presentation](#)]. United States Conference on Teaching Statistics, online.
10. Running, K., Coddling, 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., & Coddling, 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 sparkezone.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

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| 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

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| 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 |