

# Velliyoor Nott Vimal Rao

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[RaoVNV.github.io](https://github.com/RaoVNV)

## EDUCATION

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<b>PhD</b> Educational Psychology, University of Minnesota Quantitative Methods in Education, Statistics Education Advisors: Robert delMas and Andrew Zieffler	Expected 2023 Started 2018
<b>MA</b> Educational Psychology, University of Minnesota Psychological Foundations of Education, Learning and Cognition Advisors: David DeLiema and Jeffrey Bye	Expected 2023 Started 2021
<b>MS</b> Statistics, George Washington University	2013
<b>BS</b> Mathematics and Economics, University of Illinois Pure Mathematics	2008

## POSITIONS

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### 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

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### University of Minnesota, Minneapolis, MN

Instructor, Department of Educational Psychology	
EPSY 5261 – Introductory Statistical Methods (5 terms)	2019 – present
EPSY 3264 – Basic and Applied Statistics (2 terms)	
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 (25 terms) 2016 – present

HSCI 3117 – Principles of Biostatistics for the Health Sciences (2 terms)

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)

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**PUBLICATIONS**

2. DeLiema, D., Hufnagle, A.S., **Rao, V.N.V.**, Baker, J., Valerie, J., & Kim, J. (2021). 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 (2021). Categorical perception of p-values. *Topics in Cognitive Science*. <https://doi.org/10.1111/tops.12589>

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**PUBLICATIONS UNDER REVIEW** (<sup>‡</sup>FORMER STUDENT OR MENTEE)

2. Marupudi, V., Harsch, R. M., Park, J., **Rao, V. N. V.**, Bye, J. K., & Varma, S. (under review). Use of clustering in human solutions of the traveling salesperson problem. *Proceedings of the 44th Annual Cognitive Science Society Conference*.
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*. The Elementary School Journal.

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**PUBLICATIONS IN PREPARATION**

5. **Rao, V.N.V.**, Legacy, C., Beckman, M.D., McNamara, A., Zieffler, A., & delMas, R. (in preparation). *Using Computation in Statistics Classrooms: Reflections and Recommendations through the Lens of Educational Psychology*.
4. Legacy, C., **Rao, V.N.V.**, Zieffler, A., & delMas, R. (in preparation). *Data-to-graphs and back: Secondary teachers' reasoning about aesthetic mappings in data visualization*.
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.**, Bye, J.K., Park, J., & Varma, S. (in preparation). *The role of clustering in humans' Traveling Salesperson Problem solutions*.
1. **Rao, V.N.V.**, Hurtado, I. L., Riegelman, A., delMas, R., & Lisinker, R. (in preparation). *A review of research uses of the Comprehensive Assessment of Outcomes in Statistics*. Retrieved from [osf.io/yf3zh](https://osf.io/yf3zh).

#### CONFERENCE PROCEEDINGS

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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). <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 (<sup>‡</sup>FORMER STUDENT OR MENTEE)

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10. **Rao, V.N.V.**, Bye, J.K., & Varma, S. (2022, September). *Graduate students' effect size categorical boundaries* [Paper Presentation Proposed]. The Eleventh International Conference on Teaching Statistics (ICOTS), Rosario, Argentina.
9. **Rao, V.N.V.**, Bailey, N., Chávez, C., & Bartucz, J. (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.
8. Torrey-White, K.<sup>‡</sup>, 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 36<sup>th</sup> 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 36<sup>th</sup> 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.

#### CONFERENCE POSTERS (†FORMER STUDENT OR MENTEE)

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22. **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.
21. 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.
20. **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 Proposed]. Annual Meeting of the American Psychological Society, Chicago, Illinois.
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.<sup>‡</sup>, Smith, M.L.<sup>‡</sup>, **Rao, V.N.V.**, & Munson, B. (2021, November). *Does F3-F2 Distance predict transcriptions of preschoolers' /r/ productions?* [Poster Presentation]. 181<sup>st</sup> Meeting of the Acoustical Society of America, Seattle, Washington.
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](#)]. 12<sup>th</sup> 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.** & 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 AND WORKSHOPS

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4. **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.
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

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4. **Rao, V.N.V.** (2021, April). From happy hour to co-author: How I found an academic home. *SPARK*. Available at [sparkezone.com](http://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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Best Presentation, 36th Annual PsyPAG Conference	2021
Disciplinary Diversity & Integration Award in Cognitive Science (\$1000)	<a href="#">2021</a>
Quantitative Methods in Education Graduate Student Leadership Award (\$100)	<a href="#">2019</a>
CEHD Graduate Student Fellowship (\$25000)	<a href="#">2018</a>
Russell W Burris Memorial Fellowship in Educational Psychology (\$5000)	<a href="#">2018</a>
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

## SERVICE TO THE FIELD

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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
American Educational Research Association, Annual Conference reviewer	<a href="#">2021</a>
Society for the Teaching of Psychology, Presidential Task Force on Statistical Literacy, Reasoning, and Thinking, task force member	<a href="#">2021</a>
AP Statistics Exam, reader	2020
CAUSE Undergraduate Statistics PROject Competition, judge	<a href="#">2020</a> – present
American Society for Testing and Materials, subcommittee E11.10 & E11.30	2011 – 2013

## **SERVICE TO THE COMMUNITY**

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Journal of Emerging Investigators, associate editor and reviewer	2021 – present
The Link Tank (UMN), founder	<a href="#">2019 – present</a>
QME Brown Bag, student founder and organizer	2018 – 2021
Council of Graduate Students, Educational Psychology student representative	2018 – 2019
Washington Statistical Society, poster competition judge	<a href="#">2014</a>
Pi Mu Epsilon Illinois Alpha Chapter, chapter president	<a href="#">2007</a> – 2008
Pi Mu Epsilon Illinois Alpha Chapter, chapter vice president	2006 – 2007