

Chaewon Lee

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Professional Summary

My research aims to develop and disseminate advanced statistical methods that meet the complex demands of psychological, behavioral, and neural sciences. Drawing on five core statistical frameworks—deep learning, time series modeling, dynamic network methods, structural equation modeling, and fuzzy statistics—I seek to create integrative solutions that enhance traditional methods, enable robust inference from sparse time-series data, and reconceptualize imprecision in psychological measurement as informative signal. These methodological innovations are intended to support precision psychology, including individualized mental health diagnostics, brain-behavior coupling, and adaptive interventions across clinical, cognitive, and educational domains.

Education

University of North Carolina at Chapel Hill, Chapel Hill, NC Aug 2020 – May 2026

Doctor of Philosophy in Quantitative Psychology

- Coursework: Test Theory, Multilevel Modeling, Structural Equation Modeling, Machine Learning, Factor Analysis, Intra-Individual Analysis, Computational Statistics, Computational Biology

University of Michigan, Ann Arbor, MI Aug 2018 – May 2020

Master of Science, Applied Statistics GPA: 3.97/4.0

- Coursework: Probability Theory, Statistical Inference, Regression Analysis, Financial Statistics, Machine Learning, Data Analysis in Python, Design of Experiment

Yonsei University, Seoul, Korea Sep 2012 – Feb 2017

Master of Economics GPA: 4.38/4.5

- Coursework: Econometrics, Statistics, Mathematical Statistics, Linear Algebra, Macroeconomics, Microeconomics, Game Theory, Real Analysis & Measure Theory

Yonsei University, Seoul, Korea Mar 2003 – Aug 2009

Bachelor of Science, Biology GPA: 3.61/4.5

- Coursework: Cell Biology, Genetics, Cell Physiology, Animal Histology & Physiology, Embryology, Virology, Plant Molecular Physiology, Molecular Biology, Biochemistry

Research Work

NSF IUSE Student Success Project (PI: Gates, K.M., Greene, J.A.) May 2021 – June 2022

Research assistant, UNC School of Education

- Developed an interpretable predictive analytics framework called the Sequence-based Markov Machine Learning (seqMAC) to forecast learner outcomes in online education, leveraging explainable AI to improve model transparency and interpretability

EPICS Mood and Schizophrenia Lab (PI: Deldin, P.J.)

Apr 2019 – May 2020

Graduate researcher, Department of Psychology, University of Michigan

- Analyzed event-related potentials to classify psychiatric patients and predict suicidality in individuals with bipolar disorder using supervised machine learning

PROACTIVE Data Project (PI: Manschreck, T.C.)

Oct 2019 – Mar 2020

Statistician, in collaboration with researchers at the Department of Mental Health, Harvard Commonwealth Research Center, Beth Israel Deaconess Medical Center

- Analyzed the relationship between metabolic profiles and schizophrenia treatment effectiveness (injectable Risperidone vs. SGA orals) using multilevel modeling

Publications

Published

Lee, C.* & Gates, K.M. (2025). Automated machine learning for classification and regression: A tutorial for psychologists. *Behavior Research Methods*, 57, 262. [DOI]

Lee, C.*, Luo, L., Kuhlmann, S. L., Plumley, R. D., Panter, A. T., Bernacki, M. L., Greene, J. A., & Gates, K. M. (2025). Interpretable Predictive Analytics for Online Learning: A Markov-Based Machine Learning Approach. *Journal of Learning Analytics*, 12(2), 259-278. [DOI]

Lee, C.*, Gates, K. M., Chun, J., Al Kontar, R., Kamali, M., McInnis, M. G., & Deldin, P. (2025). Suicide risk estimation in bipolar disorder using N200 and P300 event-related potentials and machine learning: A pilot study. *Journal of Affective Disorders Reports*, 20, 100875. [DOI]

Lee, C.* (2025). *flex: Fuzzy least squares estimation with explicit formula* (Version 0.1.0) [R package]. CRAN. [DOI]

Plumley, R.D., Bernacki, M.L., Greene, J.A., ..., **Lee, C.**, Panter, A.T. and Gates, K.M. (2024). Co-designing enduring learning analytics prediction and support tools in undergraduate biology courses. *British Journal of Educational Technology*, 55(5), pp.1860-1883. [DOI]

Lee, C.* (2023). *An Integrative Machine Learning Approach for Small Samples and High-Dimensional Imbalanced Data in Psychological Experiment* (Master's thesis, UNC Chapel Hill).

Accepted

Lee, C.* & Gates, K.M. (Expected on May 7, 2026). Group-iterative multiple model estimation in clinical science. *Annual Review of Clinical Psychology*.

Under review

Rodebaugh, T.L., **Lee, C.**, Gates, K.M., Frumkin, M.R., ... , & Piccirillo, J. Modeling psychological processes in Tinnitus disorder. *Clinical Psychological Science*.

Yoon, J.H.*, **Lee, C.***, Kwon, S., & Bae, Y.C. Nonlinear and chaotic dynamics in generalized fuzzy opinion model. *International Journal of Fuzzy Systems*.

Submission pending

Lee, C.* No single approach fits all: Testing two generations of structural equation modeling estimation.

Lee, C.* Modeling imprecision in psychological data: Least squares estimation with fuzzy numbers.

Lee, C.* FLEX: An R package for fuzzy numbers and fuzzy linear regression.

Teaching Experiences

University of North Carolina at Chapel Hill

PSYC 210: Statistical Principles of Psychological Research

- Instructional Assistant | May 2025 – Present; May 2022 – May 2024
- Teaching Assistant | Aug 2020 – Apr 2021
 - Awarded Departmental Undergraduate Teaching Commendation (both semesters)

Research Talks

23rd Annual Society of Multivariate Experimental Psychology (SMEP) Conference

No single approach fits all: Testing two generations of structural equation modeling estimation

Graduate Student Poster Presentation, University of Notre Dame, IN, USA (Oct 2025)

Quant Forum, UNC Chapel Hill, NC, USA

Integrative classification framework in machine learning for small samples and high-dimensional imbalanced data (Apr 2023)

Sequence analysis for classification: A hybrid Markov-machine learning approach (Apr 2022)

Predicting suicide attempt in bipolar disorder with machine learning (May 2021)

Peer-Reviewed Abstracts

Lee, C.*, Yoon, J. H., & Bae, Y. C. (2024, November). *Chaotic behaviors in opinion dynamics models influenced by external forces*. Abstract accepted at the 25th International Symposium on Advanced Intelligent Systems (ISIS), Himeji, Japan. (Presented by co-author)

Professional Experiences

Korea Investment & Securities, Seoul, Korea

Dec 2009 – Aug 2013

Junior Economist, Research Center

Dec 2010 – Aug 2013

- Published economic reports on macroeconomic and financial markets; projected key indicators such as GDP, exchange rates, and policy rates.

Junior Investment Banker, Equity Capital Market Department

Dec 2009 – Nov 2010

- Managed initial public offerings on KOSPI and KOSDAQ, including financial due diligence, accounting analysis, and listing documentation.