# 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, behavioral, and educational sciences.

## Education

**University of North Carolina at Chapel Hill,** Chapel Hill, NC

    **Doctor of Philosophy in Quantitative Psychology**         Aug 2020 – May 2026 (expected)

    Advisor: Kathleen M. Gates, Ph.D.

- **PhD Dissertation:** *Learning to Generalize: Adaptive and Robust Structural Equation Modeling with Meta-Learning*
- **Master's Thesis:** *An Integrative Machine Learning Approach for Small Samples and High-Dimensional Imbalanced Data in Psychological Experiment*
- 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

    **Master of Science in Applied Statistics**         Aug 2018 – May 2020  GPA: 3.97/4.0

    Advisor: Robert Keener, Ph.D.

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

**Yonsei University,** Seoul, Korea

    **Master of Economics**         Sep 2012 – Feb 2017  GPA: 4.38/4.5

    Advisor: Hakbae Lee, Ph.D.

- **Master's thesis:** *Impacts of Intellectual Property Rights on the Expansion of Korean Pharmaceutical Industry*
- Coursework: Econometrics, Statistics, Mathematical Statistics, Linear Algebra, Macroeconomics, Microeconomics, Monetary and Financial Economics, Game Theory

**Yonsei University,** Seoul, Korea

    **Bachelor of Science in Biology**         Mar 2003 – Aug 2009  GPA: 3.61/4.5

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

## Publications

### Peer-Reviewed Articles

#### 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]

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]

#### 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.

#### In Preparation

**Lee. C.*** Generalizing across studies and persons: meta-learning in psychology (PhD dissertation).

**Lee. C.*** Meta-learning for robust structural equation modeling (PhD dissertation).

### Software Program

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

## Research Experiences

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

   **Research assistant** | UNC School of Education

Role: 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

Role: 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

Role: Analyzed the relationship between metabolic profiles and schizophrenia treatment effectiveness (injectable Risperidone vs. oral second-generation antipsychotics [SGAs]) using multilevel modeling

## Teaching Experiences

**University of North Carolina at Chapel Hill**

*PSYC 210: Statistical Principles of Psychological Research*

(Undergraduate-level introductory statistics course for psychology)

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

## Research Talks

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

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

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

**Quant Forum**

Department of Psychology and Neuroscience, 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)

## Practical Training

### Functional MRI Visiting Fellowship

Athinoula A. Martinos Center for Biomedical Imaging, MA, USA            Oct 21 – 25, 2019

- Training in fMRI research: magnetic resonance physics, hemodynamic responses, statistical analysis, stimulus presentation and response recording, and the design of perceptual and cognitive experiments.

## 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 Markets Department            Dec 2009 – Nov 2010

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