

# Tzu-Yao Lin

M.S. IN PSYCHOLOGY, NATIONAL TAIWAN UNIVERSITY

3F., No. 213-1, Wuling St., Anle Dist., Keelung City 204007, Taiwan (R.O.C.)

+886-989878512 | r08227112@ntu.edu.tw | Cognitive Psychometrics Lab | xup6y3ul6

*I'm a committed, communicative, and team-oriented psychology graduate student who has a strong interest in Bayesian statistics and computational modeling of decision-making processes. I'm good at data analysis and programming. I'm always eager for new knowledge and willing to share what I have learned.*

## Current Research

### Incorporating the threshold theory into the cultural consensus theory for ordinal categorical data: A simulation study

Advisor: Prof. Yung-Fong Hsu

Cultural consensus theory (CCT), developed by Batchelder and colleagues in the mid-1980s, is a cognitively driven methodology to assess informants' consensus in which the culturally correct answers are unknown to researchers in prior. The primary goal of CCT is to uncover the cultural knowledge, preference, or beliefs shared by members of a group. One of the CCT models, called the General Condorcet Model (GCM), deals with binary (e.g., true/false) response data which were collected from a group of informants who share the same cultural knowledge. I incorporated the GCM with the Luce-Krantz threshold theory to account for ordinal categorical data (including Likert-type questionnaires) in which informants can express different confidence levels when answering the items/questions. I applied the hierarchical Bayesian modeling approach and the Markov chain Monte Carlo sampling method to simulated data to evaluate the recovery of the parameters in the model.

## Education

### National Taiwan University (NTU)

M.S. in Psychology [Overall GPA: 4.02/4.30]

Taipei, Taiwan

September 2019–Present

### National Taiwan University

B.S. in Psychology (major) and in Forestry and Resources Conservation (minor) [Overall GPA: 4.12/4.30]

Taipei, Taiwan

September 2014–June 2019

## Awards

### The 3rd Outstanding Poster Award

The 8th Annual Academic Conference on Psychology at NTU

November 2020

### Professor Fa-Yu Cheng Memorial Scholarship

Department of Psychology, National Taiwan University

2019

- The top prize of undergraduate psychology students for outstanding academic performance at the academic year 2018-2019

### Dean's Award

College of Science, National Taiwan University

2019

- The top 10% of the class graduating for outstanding scholastic achievement at the academic year 2018-2019

### Academic Excellence Award

Department of Psychology, National Taiwan University

Spring 2017

- Awarded to students ranking top 5% in the department in the semester

### Academic Excellence Award

Department of Forest and Resources Conservation, National Taiwan University

Spring 2015

- Awarded to students ranking top 5% in the department in the semester

## Conference Presentation

Lin, T.-Y. & Hsu, Y.-F. (2020) *Incorporating threshold theory into the cultural consensus theory for ordinal categorical data: A simulation study*

Taipei, Taiwan

The 8th Annual Academic Conference on Psychology at NTU

- Received the 3rd Outstanding Poster Award
- Poster: [https://xup6y3ul6.github.io/GCLKmodel\\_poster/poster.pdf](https://xup6y3ul6.github.io/GCLKmodel_poster/poster.pdf)

## Research Experience

### Neural correlates of emotion as an arbitrator to reconcile the conflicts within dual-process in the context of decision making under risk

Prof. Yung-Fong Hsu

Research Assistant

March 2021–Present

- We studied how the mechanism of people's dual-processing (heuristic and analytical) conflict when making a risky decision. The purpose of this study is to explore the role of emotion in the conflict of dual-processing decision-making. I helped design the experiment of creating a 'Mixed Prospect Binary Lottery' to simulate a risky scenario and estimate every subject's utility functions. Besides the behavioral experiments, we will conduct state-of-the-art neuroimaging, PET-fMRI and MRS-fMRI, in the future and examine the effects of neurotransmitter and BOLD signals under a risky situation.

### The cultural consensus theory extends with the threshold theory: A study of ordinal categorical data analysis

Prof. Yung-Fong Hsu

Research Assistant

August 2019–July 2020

- We incorporated the Luce-Krantz threshold theory into cultural consensus theory to deal with ordinal categorical data. I axiomatized our new model and used Markov chain Monte Carlo sampling for Bayesian inference.

### From mind reading to mind sharing: A study on neural correlates of cognitive and affective "Theory of Mind" and their applications to salesforce enhancement

Prof. Heng-Chiang Huang

Research Assistant

January 2018–Present

- Under the supervision of Ph.D. candidate Jonathan Tong, we tried to measure the subject's ability of cognitive and affective theory of mind. According to our experiment paradigm, we also probed into the topographic representation of numerosity on the brain.

### Coalition without trust: The intra-brain connectivity and inter-brain synchronization of herd behaviors in an economic bubble game

Prof. Yu-Ping Chen

Research Assistant

January 2018–Present

- Under the supervision of Ph.D. candidate Jonathan Tong, I attended data collection and analyzed behavior and fMRI data. The breakthrough in this project was that we connected two MRIs and collected both subject's BOLD signals simultaneously.

### Research of positive and negative memorable tourism experience

Prof. Chia-Pin Yu

Learning Assistant

September 2016–January 2017

- Assisted in data collection and qualitative interviews about the memorable tourism experience.

### Characteristics of the evapotranspiration of a Japanese cedar forest in Xitou in Taiwan

Researcher Sophie Laplace

Research Assistant

February 2015–January 2016

- Assisted in collecting the evapotranspiration data of tree sap flow in the Xitou experimental forest.

## Teaching Assistant

Fall 2021 PSY7001: **Experimental Design**

Fall 2020 PSY7001: **Experimental Design**

Spring 2020 PSY1004: **Statistics in Psychology and Education II**

4.33/5.00

Fall 2019 PSY1003: **Statistics in Psychology and Education I**

4.40/5.00

## Graduate Level Statistics or Modeling Courses

Spring 2021 MATH7610: **Multivariate Statistical Analysis**

A+

Fall 2020 PSY7277: **Neural and Behavioral Modeling**

A+

Fall 2020 MATH7606: **Regression Analysis**

A

Spring 2020 MATH7604: **Advanced Statistical Inference II**

A-

Fall 2019 MATH7603: **Advanced Statistical Inference I**

B-

Fall 2019 PSY7001: **Experimental Design**

A+

Fall 2019 CSIE2120: **Linear Algebra**

A+

Spring 2019 PSY5033: **Applied Linear Regression**

A+

Fall 2018 EPM5074: **Applied Bayesian Statistical Analysis**

A

## Trainings

### Statistical Teaching Assistant Training Course

Taipei, Taiwan

Statistics Education Center, National Taiwan University

2020

## Functional Magnetic Resonance Imaging Training Course I

Imaging Center for Integrated Body, Mind and Culture Research, College of Science, National Taiwan University

Taipei, Taiwan

January 2019

## Magnetoencephalography Training Course I

Imaging Center for Integrated Body, Mind and Culture Research, College of Science, National Taiwan University

Taipei, Taiwan

January 2019

## Skills

---

### Analytical

Statistical modeling, Computational modeling, Bayesian statistics, Neuroimage analysis (fMRI and MEG)

### Programming

R (Tidyverse, R Markdown, and Shiny), JAGS, Stan, Python (PyTorch), MATLAB (SPM12 and Brainstorm), SAS, Linux

### Tools

Git, GitHub,  $\text{\LaTeX}$

## Extracurricular Activities

---

### The 9th Taiwan National Fire Dance Competition 🔥

Leader and Choreographer

2017

- Group champion 🏆

### National Taiwan University Fire Dance Club

Vice President

2016-2017

### The 11th Presentation of National Taiwan University Fire Dance Club

Coordinator and Choreographer

2016

### The 10th Presentation of National Taiwan University Fire Dance Club

Vice Coordinator and Choreographer

2016

### Forest Summer Camp

Lecturer and Team Leader

2015, 2016

### Forest Orientation Camp

Vice Coordinator

2015

### National Taiwan University Student Association

Member of the Election and Recalling Execution Commission

2014-2015