

## Research Methods in Political Science II

[Graduate] School of Law, Kobe University, Fall 2016

**Dates:** Oct. 22, Nov. 5, Nov. 19, Dec. 3, and Dec. 17 (Saturdays)

**Time:** 10:40–12:10, 13:20–14:50, and 15:10–16:40

Room 162, Building II (第二学舎 162 教室)

Office Hours: During lunch (12:10–13:20)

(or by appointment)

Instructor : Yuki Yanai (矢内 勇生)

Email: [yanai@iuj.ac.jp](mailto:yanai@iuj.ac.jp)

Website: <http://yukiyanai.com>

TA: Jaehyun Song ([jaehyun.song@stu.kobe-u.ac.jp](mailto:jaehyun.song@stu.kobe-u.ac.jp))

### Overview and Class Goals

This is the second course of the sequence of research methods in political science at [Graduate] School of Law at Kobe University. In the first course, you learned how to conduct reproducible research with simple statistical models. In this course, you will learn more advanced statistical models that are essential for political science research.

### Prerequisites

Students are expected to have completed Research Methods in Political Science (RMPS) I or acquired knowledge about reproducible research and basic statistical models. Those who did not take RMPS I should read the following materials *before the first meeting* on October 22.

1. Gandrud, Christopher. 2015. *Reproducible Research with R and RStudio, Second Edition*. Boca Raton, FL: CRC Press.
2. McElreath, Richard. 2016. *Statistical Rethinking: A Bayesian Course with Examples in R and Stan*. Boca Raton, FL: CRC Press, chapters 1–5.

Students are also expected to have some experience of data analysis using R. If you would like to review how to use R, the following books help you.

- Golemund, Garret. 2014. *Hands-On Programming with R*. Sebastopol, CA: O'Reilly.
- Lander, Jared P. 2014. *R for Everyone: Advanced Analytics and Graphics*. Upper Saddle River, NJ: Addison-Wesley.
- Leek, Jeff. 2014. *The Elements of Data Analytic Style*. Leanpub.
- Peng, Roger D. 2014–2016 *R Programming for Data Science*. Leanpub.
- Peng, Roger D. 2015–2016. *Report Writing for Data Science in R*. Leanpub.

### Class Format

Class meets in a normal classroom without computers. You are encouraged to bring your own laptop to class.

### Requirements and Grading

Grades will be based on

- class participation [20% of final grade],

- homework assignments [40%], and
- final project (term paper) [40%]

Students must complete the assigned readings before each class.

### Course Website

The course materials can be found at the following URL:

<http://yukiyanai.github.io/classes/rm2/contents/>

You are expected to check the webpage on regular basis (please refresh your web browser to view the latest content).

The assignments will be posted *not* on the website but on *Slack*.

### Slack

To facilitate communication outside class, we use [Slack](#). The Slack group of this class is

<https://kobe-rmps1.slack.com/>

It is *not* *rmps2* because we continue using the Slack group we created for RMPS I. Visit [Getting Started | Slack](#) to learn the basic usage of Slack.

You are expected to post questions regarding class to *an appropriate channel* in Slack. If you do not find one, you may create a new channel.

You should not only ask questions but also answer other students' questions. Your answers do not have to be complete or perfect. If you find an answer to your own question, please post the answer to share it with your colleagues. If nobody posts an answer to a question, the instructor or TA will provide an answer or discuss the problem in the following class.

Homework assignments are also posted on Slack, so you should watch Slack activity even if you are not willing to participate in discussions.

You can join the slack team by clicking the following link:

<https://kobe-rmps1.slack.com/signup>

To sign up, you need to use an email address ending with `@stu.kobe-u.ac.jp`. If you would like to use another email address, please send me an email with the subject "Slack for Research Methods," and I will send you an invitation. You do not have to sign up again if you are already a member.

### Computing

We use R with RStudio for our data analysis projects. You can use another software when you do your homework at your own risk.

### Textbook

McElreath, Richard. 2016. *Statistical Rethinking: A Bayesian Course with Examples in R and Stan*. Boca Raton, FL: CRC Press.

### Optional Books

The following books are optional, but many of you should find them useful.

- Dobson, Annette J., and Adrian G. Barnett. 2008. *An Introduction to Generalized Linear Models*. Boca Raton, FL: CRC Press.

- Faraway, Julian J. 2016. *Extending the Linear Model with R: Generalized Linear, Mixed Effects and Nonparametric Regression Models, Second Edition*. Boca Raton, FL: CRC Press.
- Gelman, Andrew, and Jennifer Hill. 2007. *Data Analysis Using Regression and Multi-level/Hierarchical Models*. New York: Cambridge UP.
- King, Gary. 1998. *Unifying Political Methodology: The Likelihood Theory of Statistical Inference*. Ann Arbor, MI: University of Michigan Press.
- Pawitan, Yudi. 2001. *In All Likelihood: Statistical Modeling and Inference Using Likelihood*. Oxford: Oxford UP.

## Schedule

The readings with **M** (Mandatory) should be completed prior to the lecture for which they are listed. Graduate students should at least skim readings with **R** (Recommended) as well either before or after the lecture. Readings with **O** (Optional) should enrich your understanding of the topics.

*This schedule is subject to change.*

### Day 1: Linear Regression (Oct. 22)

- Review linear regression
- Overfitting and information criteria
- Models with interactions

**M** McElreath, chapters 6–7.

**M** Brambor, Thomas, William Roberts Clark, and Matt Golder. 2006. “[Understanding Interaction Models: Improving Empirical Analyses.](#)” *Political Analysis* 14(1): 63–82.

**R** Gelman and Hill, chapters 3–4.

**R** Cook, R. Dennis, and Sanford Weisberg. 1999. *Applied Regression Including Computing and Graphics*. New York: Wiley, chapters 6–7, 10, 12–20.

**O** Kam, Cindy D., and Robert J. Franzese, Jr. 2007. *Modeling and Interpreting Interactive Hypotheses in Regression Analysis*. Ann Arbor: University of Michigan Press.

**O** Fox, John. 1997. *Applied Regression Analysis, Linear Models, and Related Methods*. Thousand Oaks: SAGE Publication.

### Day 2. Generalized Linear Models (Nov. 5)

- MCMC
- Entropy
- Generalized Linear Models (GLM)
- Binomial models: logit and probit

**M** McElreath, chapters 8, 9, and 10 (pp.291–311).

**M** King, chapters 3–4.

**M** Gilens, Martin. 2005. “[Inequality and Democratic Responsiveness.](#)” *Public Opinion Quarterly* 69(5): 778–796.

**M** Bartels, Larry M. 2000. “[Partisanship and Voting Behavior, 1952–1996.](#)” *American Journal of Political Science* 44(1): 35–50.

- R Achen, Christopher H. 2005. “[Let’s Put Garbage-Can Regressions and Garbage-Can Probits Where They Belong.](#)” *Conflict Management and Peace Science* 22(4): 327–339.
- R Gelman and Hill, chapters 5–6.
- O Bickel, Peter J., and Kjell A. Doksum. 2015. *Mathematical Statistics: Basic Ideas and Selected Topics. Volume I, Second Edition*, chapters 1–2.
- O Bickel, Peter J., and Kjell A. Doksum. 2016. *Mathematical Statistics: Basic Ideas and Selected Topics. Volume II*, chapter 10.
- O Gill, Jeff. 2001. *Generalized Linear Models: A Unified Approach*. Thousand Oaks, CA: Sage.

### Day 3. Count Data (Nov. 19)

- Poisson models
  - Other count models
  - Overdispersion and underdispersion
  - Zero-inflation
- M McElreath, chapters 10 (pp.311–330)
- M King, chapter 5.
- M Calvo, Ernesto, and Maria Victoria Murillo. 2013. “[When Parties Meet Voters: Assessing Political Linkages Through Partisan Networks and Distributive Expectations in Argentina and Chile.](#)” *Comparative Political Studies* 46(7): 851–882.
- M Chenoweth, Erica. 2010. “[Democratic Competition and Terrorist Activity.](#)” *Journal of Politics* 72(1): 16–30.
- R Gelman and Hill, chapter 6.
- O Cameron, A. Colin, and Pravin K. Trivedi. 1998. *Regression Analysis of Count Data*. New York: Cambridge UP.
- O Hilbe, Joseph M. 2014. *Modeling Count Data*. New York: Cambridge UP.

### Day 4. Categorical Data (Dec. 3)

- Ordered categorical models
  - Multinomial categorical models
- M McElreath, chapter 11.
- M Hosmer, David W., Stanley Lemeshow, and Rodney X. Sturdivant. 2013. *Applied Logistic Regression, Third Edition*. Hoboken, NJ: Wiley, “[Ch. 8 Logistic Regression Models for Multinomial and Ordinal Outcomes.](#)”
- M Knack, Stephen. 2004. “[Does Foreign Aid Promote Democracy?](#)” *International Studies Quarterly* 48(1): 251–266.
- M Dow, Jay K., and James W. Endersby. 2004. “[Multinomial Probit and Multinomial Logit: A Comparison of Choice Models for Voting Research.](#)” *Electoral Studies* 23(1): 107–122.
- R Bagozzi, Benjamin E., Daniel W Hill Jr., Will H. Moore, and Bumba Mukherjee. 2014. “[Modeling Two Types of Peace: The Zero-inflated Ordered Probit \(ZiOP\) Model in Conflict Research.](#)” *Journal of Conflict Resolution* 59(4): 728–752.

O Borooah, Vani K. *Logit and Probit: Ordered and Multinomial Models*. Thousand Oaks, CA: Sage.

**Day 5. Multilevel Models** (Dec. 17)

- Multilevel models

M McElreath, chapters 12–13.

M Gelman and Hill, chapters 11–13.

R Duch, Raymond M., and Randy Stevenson. 2005. “[Context and the Economic Vote: A Multilevel Analysis](#).” *Political Analysis* 13(4): 387–409.

R Jusko, Karen Long, and W. Phillips Shively. 2005. “[Applying a Two-Step Strategy to the Analysis of Cross-National Public Opinion Data](#).” *Political Analysis* 13(4): 327–344.

R Western, Bruce. 1998. “[Causal Heterogeneity in Comparative Research: A Bayesian Hierarchical Modeling Approach](#).” *American Journal of Political Science* 42(4): 1233–1259.

O Goldstein, Harvey. 2011. *Multilevel Statistical Models, 4th Edition*. London: Wiley.

O Snijders, Tom, and Roel Bosker. 2011. *Multilevel Analysis: An Introduction to Basic and Advanced Multilevel Modeling, 2nd Edition*. London: Sage.