The Demography of Kinship

EDSD Course syllabus

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European Doctoral School of Demography (EDSD)
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1 Introduction

1.1 Course description

Kinship is a fundamental property of human populations and a key form of social structure. Demographers have long been interested in the interplay between demographic change and family configuration. This has led to the development of sophisticated methodological and conceptual approaches for the study of kinship, some of which are reviewed in this course.

1.2 Goals

The course will provide a succinct and practical introduction to kinship demography. By the end of the course, students will be familiar with the current state of the sub-field and the tools to conduct independent research in this area. The main goals of the course are to:

1. present a general overview of the current state of the field of kinship demography,
2. introduce the fundamentals of the formal demography of kinship, and
3. provide hands-on experience running models of kinship in R.

1.3 Lectures and exercises

The in-person course comprises independent reading, morning lectures, and 'lab sessions' some afternoons. There are required and optional readings each day. Students are expected to attend all lectures and practical sessions.

A handout for the lab sessions can be found here: https://amandamartinsal.github.io/EDSD_kinship/. There is no exam; only a final assignment which needs to be turned in at the end of the week (see Section 2).

Schedule

- Lectures take place between 09:30-11:00 (Tuesday) and 9:00-10:30 (Wednesday & Thursday)
- Lab sessions:
  1. Tuesday, 11:15-12:30
  2. Wednesday, 10:45-12:00
  3. Thursday, 10:45-12:00 and 13:30-16:30 (Assignment)
- Office hours:
  1. Friday, 09:30-12:00 and 13:30-15:30

1.4 Hardware and software

Lab sessions will be in R ($\geq$ 4.0.2). Students are required to bring a laptop for the lab sessions. Participants should install the following packages from CRAN: `DemoKin`, `devtools`, and `tidyverse`.

1.5 Online resources and lab sessions

There are two online resources with all the information you need about the course, including lab sessions:

- A GitHub repository including the syllabus, slides, and other important materials: https://github.com/amandamartinsal/EDSD_kinship. Please make sure to download (clone) the **entire repository** into your computer!
- The website with the lab exercises: https://amandamartinsal.github.io/EDSD_kinship/.

We will update the materials constantly, so please make sure that you are working with the latest version of the data.

2 Final assignment

The assignment should be completed in groups (of three) that will be defined at the start of the course.

2.1 Description

You will use data on kinship structures to benchmark formal models of kinship. For this exercise, you will use the `DemoKin` R package to implement formal models of kinship. You should choose one country and run four different models according to the following specifications:

- One-sex model; approximate male kin using GKP factors
  - time-invariant rates
  - time-variant rates
- One-sex model; approximate male kin using the androgynous assumption
  - time-invariant rates
  - time-variant rates

Use the output of the four models to answer the following questions:

1. Plot the **expected number of living relatives by age of focal** for each specification. For extra points (i.e., this is optional), also plot the **expected number of deceased relatives by age of focal**.

2. Discuss 1-2 key insights, when would you use different specifications? Consider the specific context and the data available for the country you selected. (max 250 words)

3. Can you think of other ways of incorporating male fertility into the kinship models (beyond the options we discussed in the course)? (max 250 words)

2.2 Data

- We can obtain rates from any country in the world from United Nations 2022 Revision of the World Population Prospects. Pick any country (feel free to pick at random or pick the one you are interested in) and download the following data:

    1. Female age-specific fertility rates, 1950 - 2100
    2. Female Life Tables, 1950 - 2021
    3. Male Life Tables, 1950 - 2021

2.3 Handing in the assignment

Assignments (one per group) should be sent by email to martins@demogr.mpg.de **before midnight of Friday, May 24.** You should hand in the following files:

1. An .RMD file with all your code and answers to the exercise questions

2. A compiled .pdf of your markdown file showing all the code

3. All input data needed to replicate your code

3 Lecture Plan

3.1 Tuesday, May 21: Introduction to kinship demography

Required reading

- Alburez-Gutierrez, D., Barban, N., Caswell, H., Kolk, M., Margolis, R., Smith-Greenaway, E., Song, X., Verdery, A. M., & Zagheni, E. (2022). *Kinship, Demography, and Inequality: Review and Key Areas for Future Development* (preprint). SocArXiv. https://doi.org/10.31235/osf.io/fk7x9

3.2 Wednesday, May 22: The formal demography of kinship I

Required reading

- Caswell, H. (2019). The formal demography of kinship: A matrix formulation. *Demographic Research*, *41*, 679–712. https://doi.org/10.4054/DemRes.2019.41.24

Optional reading

- Goodman, L. A., Keyfitz, N., & Pullum, T. W. (1974). Family formation and the frequency of various kinship relationships. *Theoretical Population Biology*, *5*(1), 1–27

3.3 Thursday, May 23: Extensions of the kinship model

Required reading

- Alburez-Gutierrez, D., Williams, I., & Caswell, H. (2023). Projections of human kinship for all countries. *Proceedings of the National Academy of Sciences*, *120*(52), e2315722120. https://doi.org/10.1073/pnas.2315722120

Optional reading

- Caswell, H., & Song, X. (2021). The formal demography of kinship. III. kinship dynamics with time-varying demographic rates. *Demographic Research*, *45*, 517–546
- Caswell, H. (2022). The formal demography of kinship IV: Two-sex models and their approximations. *Demographic Research*, *47*, 359–396. https://doi.org/10.4054/DemRes.2022.47.13