

I am a computational social scientist with a background in sociology, economics, statistics, and computer science. I leverage and develop quantitative methods to analyze family and network dynamics as drivers of social inequality. Methodologically, I specialize in the modeling of complex dependencies in observational data (e.g., multilevel, spatial, and network embeddedness).

## AREAS OF INTEREST

Social Networks, Social Inequality, Family Demography, Quantitative Methods (esp. inference with multilevel, spatial, network, and textual data)

## EDUCATION AND EMPLOYMENT

- 2022 Organization for Economic Cooperation and Development (OECD), France  
**Data Science Consultant**  
Created a web application using R Shiny and Plotly to monitor country differences in exposure to climate-related hazards. <https://oecd-main.shinyapps.io/climate-actions-and-policies/>
- 2017 – present Cornell University, United States  
**Ph.D. Sociology and Computer Science (minor)**  
Committee: Michael Macy (Cornell Information Science), Filiz Garip (Princeton Sociology), Eleonora Patacchini (Cornell Economics), Felix Elwert (UW-Madison Statistics), Lillian Lee (Cornell Computer Science)
- 2014 – 2017 University of Utrecht, The Netherlands  
**M.Sc. Methods and Statistics for the Behavioral, Biomedical, and Social Sciences**  
GPA: 3.97, graduated in the top five percent of my class  
**M.Sc. Sociology and Social Research**  
GPA: 4.00, valedictorian
- 2010 – 2014 University of Mannheim, Germany  
**B.A. Sociology and Economics (minor)**  
GPA: 3.90, graduated in the top five percent of my class
- 2009 – 2010 Stuttgart Media University, Germany  
**B.Sc. Computer Science**  
Without degree, shift of study

## PUBLICATIONS

An, W., Beauville, R., & Rosche, B. (2022). Causal Network Analysis. *Annual Review of Sociology*, 48.

\* The authors are listed alphabetically and contributed equally to the article

## WORK IN PROGRESS

Rosche, B. (2023). Socioeconomic segregation in adolescent friendship networks. Determinants of ties within and between socioeconomic boundaries.

The paper is part of an NSF-funded project studying the drivers and consequences of friendship dynamics that bridge socioeconomic boundaries for long-term success of disadvantaged youth. It won the 2023 Robin M. Williams Jr. Best Paper Award in the Cornell Department of Sociology.

Rosche, B. (2022). Treatment effects on within-group and between-group inequality. A causal decomposition approach.

This paper introduces a novel approach to analyzing how treatment variables affect both changes in within- and between-group inequality and decomposing these changes into compositional and behavioral effects. In preparation for submission.

Rosche, B. (2020). A multilevel model for coalition governments: Uncovering dependencies within and across governments due to parties.

This paper introduces a novel statistical technique to account for the complex multilevel structure of coalition government data. It won the 2020 Robert McGinnis Best Paper Award in the Cornell Department of Sociology. In preparation for submission.

## SOFTWARE

R library: **ineqx**. Developed R library that implements Rosche (2022). <https://benrosche.github.io/ineqx/>

R library: **rmm**. Developed R library that implements Rosche (2020). <https://benrosche.github.io/rmm/>

## PROGRAMMING LANGUAGES AND COMPUTING

- Highly proficient in **R** (10 years; I work daily with tidyverse, ggplot, and Shiny), **Stata** (10 years; incl. Mata), **BUGS/JAGS/Stan** (3 years), **Python** (2 years; worked with NumPy, SciPy, Pandas, Scikit-Learn).
- Experience with **large datasets** (esp. network data) and **parallel computing** (esp. in R).
- Other programming skills: PHP, MySQL, (X)HTML, CSS, JavaScript, jQuery and various CMS, UNIX tools

## STATISTICS

Supervised and unsupervised machine learning, generalized linear model, multilevel analysis, panel analysis, survival analysis, structural equation modeling, measurement / latent variable modeling, survey and sampling design, modern causal inference (matching techniques, instrumental variable analysis, regression discontinuity, potential outcome model), decomposition techniques, Bayesian statistics, imputation techniques, statistical computing and simulation, social network analysis (network formation models, network effect models)

## GRANTS, FELLOWSHIPS, AND AWARDS

2023	Robin M. Williams Jr. Best Paper Award in the Cornell Department of Sociology (Paper: Socioeconomic segregation in adolescent friendship networks)
2021	Grant from the <b>National Science Foundation</b> for the project “Cross-SES friendship in US high schools and socioeconomic success of disadvantaged youth” (\$240,000) Role: Principal Investigator (co-PIs: Michael Macy, Eleonora Patacchini)
2020	Robert B. McGinnis Best Methods Paper Award in the Cornell Department of Sociology (Paper: A multilevel model for coalition governments)
2018, 2023	Cornell Sage Fellowship (\$70,000)
2012-2017	Fellowship from <b>Studienstiftung des Deutschen Volkes</b> (German National Merit Foundation) (\$75,000)

## RESEARCH AND TEACHING EXPERIENCE

2019-2022	<b>Research Assistant</b> of Prof. Kelly Musick (Cornell Demography)
2019	<b>Teaching Assistant</b> for <i>Controversies about Social Inequality</i> (Cornell, undergraduate level)
2015-2016	<b>Research Assistant</b> of Prof. Joop Hox and Prof. Edith de Leeuw (Utrecht Methods and Statistics) <b>Teaching Assistant</b> for <i>Introduction to Statistics</i> (Utrecht, undergraduate level)
2011-2014	<b>Research Assistant</b> of Prof. Frank Kalter and Prof. Clemens Kroneberg (Mannheim Sociology) <b>Teaching Assistant</b> for <i>Introduction to Sociology</i> (Mannheim, undergraduate level)

## SERVICE AND VOLUNTEERING

Since 2023	Big Brothers Big Sisters: Big brother of a 10-year-old boy, weekly meetings
2021, 2022	Reviewer for the <i>Sociological Methods and Research</i>
Since 2020	President of Cornell Graduate Student Improvisational Theater Club
2018-2020	President of the Recreational Squash Club at Cornell
2019	Reviewer for the <i>American Journal of Sociology</i>
2018-2019	Organized the Cornell Sociology Graduate Student Training Seminar
2010-2014	Big Brothers Big Sisters: Big brother of a 10-year-old boy, weekly meetings over 4 years

## CONFERENCE PARTICIPATIONS

Population of America Association Conference (2018, 2021, 2022, 2023), American Sociological Association Conference (2020, 2023), International Network for Social Network Analysis Conference (2018, 2021, 2023), Network Science Society Conference (2021, 2023), International Network of Analytical Sociology conference (2022, 2023), RC28 Conference on Social Stratification (2022, 2023), American Political Science Association Conference (2019), International Multilevel Conference (2017), International Conference on Survey Nonresponse (2016)

## LANGUAGES

English (fluent), German (native), Dutch (fluent), Spanish (basic)

## PERSONAL INTERESTS

In my free time, I like to run, surf, and play racket sports. Between 2018 and 2020, I was president of the *Cornell Recreational Squash Club*, where I organized weekly training sessions and tournaments for a group of 60 students and faculty. In 2020, I founded the *Cornell Graduate Student Improvisational Theater Club*, where I lead weekly sessions on improvisational theater for a group of 20 graduate students.

## REFERENCES

Prof. Dr. Michael Macy  
Distinguished Professor of Arts and Sciences  
Cornell University  
[mwm14@cornell.edu](mailto:mwm14@cornell.edu)

Prof. Dr. Filiz Garip  
Professor of Sociology and Public Affairs  
Princeton University  
[fgarip@princeton.edu](mailto:fgarip@princeton.edu)

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