

EGAP Learning Days Agenda

EGAP LEARNING DAYS 10: EXPERIMENTAL DESIGN SESSIONS

BOGOTA, COLOMBIA
8 – 12 APRIL 2019

This five-day meeting will consist of a combination of design clinics and teach-ins on topics critical for designing impact evaluations and field experiments intended to measure the effects of policies, interventions, and programs on policy outcomes. The focus of the workshop is on experimental methods. Teach-in topics will include randomization, statistical power, and threats to the estimation of treatment effects. Throughout the week participants will work to develop their own research designs together with peers and the teaching team.

Workshop Venue: Gerencia del Campus - Universidad de los Andes Carrera 1 N° 18A 12 Bogotá

- April 8, 9, 10, and 12: Edificio (Building) LL Hemiciclo 002
- April 11: Edificio (Building) LL - Hemiciclo 001

Campus Map:

https://campusinfo.uniandes.edu.co/images/stories/campus/Recursos_fisicos/mapa_final20181.pdf

Lodging: CityU Residences, SENECA Tower, Calle 19 # 2A - 10 - Torre 2, Bogotá (about 5 min walk to university campus)

Timing: The workshop starts on Monday 8 April at 9AM and closes Friday 12 April at 5PM

Organization

The learning days are being organized by Andres Moya Rodriguez (Universidad de los Andes, AR), Jake Bowers (University of Illinois, Urbana-Champaign, JB), Natalia Garbiras Díaz (University of California, Berkeley, NGD), Tara Slough (Columbia University, TS) and Maarten Voors (EGAP and Wageningen University, MV).

Study material

- Please bring a laptop. Make sure you have [R](#) and [Rstudio](#)¹ installed. See notes below.
- We will use material developed by EGAP (<http://egap.org/list-methods-guides>)
- Additional material is drawn from
 - Dunning, Thad. 2012. *Natural experiments in the social sciences: a design-based approach*. New York: Cambridge University Press.
 - Gerber, Alan S., and Donald P. Green. 2012. *Field experiments: Design, analysis, and interpretation*. New York: W.W. Norton. Chapters 1 to 5²
 - Gertler et al: Gertler, Paul J.; Martinez, Sebastian; Premand, Patrick; Rawlings, Laura B.; Vermeersch, Christel M. J. 2011. *Impact Evaluation in Practice*. World Bank.³
 - Glennerster et al: Glennerster, Rachel; Takavarasha, Kudzai. 2013. *Running Randomized Evaluations: A Practical Guide*. Princeton.⁴
- During the workshop materials will be shared via Dropbox.

¹ Download from <http://www.rstudio.com/products/rstudio/download/>. If you already prefer using R with an editor other than RStudio, you do not need to install RStudio.

² We will distribute some pdfs of chapters from this book. The book itself is very much worth owning as a reference, as is Dunning's book.

³ Download from <https://openknowledge.worldbank.org/handle/10986/2550> License: CC BY 3.0 Unported.

⁴ Open Access ancillary materials: <http://runningres.com>

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Preparation before the workshop.

- Please prepare a brief (5 minutes) statement to introduce yourself (who you are, where you work, what are your expectations for the Learning Days) and to present your research question and general idea of your project that you will work on during the workshop. Every participant must have a project to work on throughout the week. Ideally this is a project you are implementing, or are hoping to implement and fits closely with your research interests. During the workshop we will focus mostly on experimental methods, ie where an intervention (program, project) is implemented using randomization. The workshop does not focus on non-experimental methods (ie regression models, PSM, DD, RD, etc). If you would like to discuss potential research project options with us in advance of the training, please send Maarten Voors (maarten.voors@wur.nl) us an email. We are happy to discuss!
- Make sure you have [R](#) and [Rstudio](#) installed. The file, “bogota_egap_introR.pdf” provides information on how to download R and RStudio. We ask that you download both programs prior to the workshop and familiarize yourself with the material provided in the guide. In particular, we provide lines of code in section 3.1 that you should execute to download several auxiliary files (“packages”) that we will use during Learning Days. If you have difficulty downloading R, RStudio, or the packages, please email Tara at tls2145@columbia.edu for assistance.
- To further familiarize yourself with R, have a look at a free introduction to R from the Code School, which runs entirely through your browser <https://www.codeschool.com/courses/try-r>. In addition, please complete the first lecture from the online R Programming course organized by Johns Hopkins University: (i) go to coursera.org, (ii) create an account (this is free!), (iii) sign up for R Programming at Johns Hopkins University (instructor: Roger Peng) under the "Courses" tab (iv) read the materials and watch the videos. The videos from the first week are about 2.5 hours long total.
- Complete the following pre-Learning Days assignment in R: <https://goo.gl/forms/Arxye5kJFz3bfek2>. All R code is included so it should not take long to complete.

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Monday, 8 April 2019: Getting Started

Morning: Introduction and causal inference

9-1030AM: Welcome (AR, MV, all)

- Welcome and introduction of group
- Introduction of EGAP (what is + types of projects)
- Objectives of Learning Days
- Expectations for collaboration: Ask questions (when you ask questions you are helping everyone, including the professors)! It is ok to sit or stand during lectures and discussions (just not in front of other people).
- Logistics
- **Brief** statement of research projects by participants (no formal presentation). A 3-min introduction to your research project, stressing motivation and research question, and main evaluation design plan.

1030-11AM: Coffee break

11-1PM: Lecture 1: Causal inference (JB)

- Research questions: what are X and Y ? What might it mean to say X caused Y ?
- The potential outcomes framework and the fundamental problem of causal inference
- What do experiments have to do with causality?

1PM-2PM: LUNCH

Afternoon: Research Design and Design Clinic

2-3PM: Research presentation 1: TBD (from Los Andes, El Rosario and Javeriana researchers)
These research presentations are meant to be about the process of doing research.

3-330PM: Lecture 2 Stages of research design and implementation (MV, TS, NGD)

- Introducing the *research design form*.
- Stages to DeclareDesign

3:30PM: Coffee

3:30-4PM: Design clinic: housekeeping

- Make sure you are set up with R (all)
- Hands-on session on simple statistics in R (NGD)
- Setting up DeclareDesign

4-5PM: Design clinic: your project

- Break in small groups
- Work on *research design form*
- Small Group discussions on research ideas: What are causal drivers and what are outcomes? By what “theory of change” or “causal mechanism” should the drivers influence the outcomes?

Evenings (optional): Office hours

6-730PM: Office hours

- Sign up for office hours with teaching team
- Venue: at Hotel

Resources

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- [10 strategies for figuring out if X causes Y](#)
- [10 things you need to know about causal inference](#)
- R: <http://www.r-project.org/>
- DeclareDesign
- Day 1. Key Tools for Experimental Research Design and Analysis in R

Tuesday, 9 April 2019: Identification and Randomization

Morning: Randomization strategies and Hypothesis testing

9:00–9:30 AM: Day 1 Recap, Quiz

9:30–11AM: Lecture 3: Randomization (MV, TS)

- Mechanics of replicable randomization
- Strategies for randomization: simple, clustered, factorial, intertemporal, block randomized (the idea of the power of a statistical test)
- Randomization in R (using randomizr) (TS)

11:00–11:30AM: Coffee break

11:30PM–1PM: Lecture 4: What is a hypothesis test for a randomized experiment? (JB)

- Fisher's test of the sharp null hypothesis of no effects and relationship with large sample tests.

1PM–2PM LUNCH

Afternoon: Design Workshop

2:30–3:00PM: Research presentation 2: TBD

3-4:30PM: Design clinic: assignments and design form

3:30PM: Coffee

- Hands-on session on statistics, randomization and hypothesis testing in R
- Work on research design form
 - Focus on strategy for hypothesis testing for each design
 - Focus on randomization strategies for each design

5–5:30PM: Recap

- Recap
- Quick go around: what did you find useful? What would you like to hear more about?

Evenings (optional): Office hours

6–730PM: Office hours

- Sign up for office hours with teaching team
- Venue: at Hotel

Resources

- [10 things you need to know about randomization](#)
- Day 2. Key Tools for Experimental Research Design and Analysis in R

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Wednesday, 10 April 2019: Estimation of Causal Effects and Statistical Power

Morning: Estimation and Testing of Causal Effects

9:00 AM–10:15 AM: Day 1 & 2 Recap, Quiz

10:15AM–11:00AM: Lecture 5: The Average Treatment Effect and Statistical Inference (NGD)

- ATE: Variance, standard errors, confidence intervals, sampling distributions

11:00 AM–11:30 AM BREAK

11:30AM–12:00PM Lecture 5 cont.

12:00 – 1:00PM: Lecture 6: Power (TS)

- Power: What it is, relation to sample size, dispersion, standard methods, simulations

1PM – 2PM LUNCH

Afternoon: Research presentation and Design Workshop

2:00–3PM: Research Presentations 3 TBD

3:00–4:45PM: Design clinic

- Hands-on session on power in R
- Feedback and questions
- Figuring out the power for each study
- Work on research design

4:30–5PM: Recap

- Recap
- Quick go around: what did you find useful? What would you like to hear more about?

Evening: Group outing/group dinner

Resources

- [10 things you should know about the local average treatment effect](#)
- [10 things you need to know about spillovers in experimental analysis](#)
- <https://egap.shinyapps.io/spillover-app/>
- Day 3. Key Tools for Experimental Research Design and Analysis in R

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Thursday, 11 April 2019: Threats to Causal Inference

Morning Threats to Inference

9:00–9:45AM: Recap day 1-3, Quiz, Reflections & Suggestions of topics for Friday afternoon

9:45AM–12AM: Lecture 7: Threats to Inference (MV, all)

- Reading and presenting results
- Endogenous subgroups
- Partial compliance: LATE and ITT
- Spillovers & Attrition

12–1PM: Group work

- Feedback and questions
- Work on research design

1PM–2PM LUNCH

Afternoon: Design Workshop

2:30–3PM: Research Presentations 4 Andres Moya Rodriguez

3-4:30PM: Design clinic

- Feedback and questions
- Work on your project with DeclareDesign
- Revise research designs
- Prepare Presentations

4:30–5PM: Recap

- Recap
- Quick go around: what did you find useful? What would you like to hear more about?

Evenings (optional): Office hours

6–730PM: Office hours

- Sign up for office hours with teaching team
- Venue: at Hotel

Resources

- [10 things you need to know about statistical power](#)
- [10 things you need to know about covariate adjustment](#)
- [10 things you need to know about multiple comparisons](#)
- https://egap.shinyapps.io/Power_Calculator/
- DeclareDesign Guide

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Friday, 12 April 2019: Design presentations and Remaining Topics

Morning: Design Presentations

9-10AM: Individual run-through of presentations

10AM–1PM: Design presentations (two rooms)

- Each participant's does a 10-min presentation with 5-minutes discussion
- Addressing sampling, randomization approach, power, cluster randomized trials, potential threats

1–2PM: LUNCH

Afternoon: Other Topics

2–4PM: Other topics

Based on demand we will discuss on one or more of the following themes.

1. IRB/Ethics
2. Partnerships
3. Measurement strategies
4. Workflow
5. Transparency in research

4–5 PM: Feedback and Next Steps

- How will we all continue to communicate and support each other after today?

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Workshop Participants:

- Alexander Buritica Casanova - Universidad de los Andes
- Anghella Rosero - Universidad de los Andes
- Antonio Campos Flores - MineduLAB
- Bilver Adrian Astorquiza Bustos - Universidad EAFIT
- Juan Bogliaccini - Universidad Icesi
- Juan Albarracin Dierolf - Universidad Católica del Uruguay
- Juan Pablo Micozzi - ITAM
- Laura Schiavon - Federal University of Juiz de Fora
- Lina María Restrepo Plaza - Universidad del Valle
- Lorena Moreno - National Statistics Office of Ecuador
- Lucia Tiscornia - CIDE Mexico City
- Margarita Gómez - Center for Research and Teaching in Economics
- María Laffaire - CIPPEC
- Marly Tatiana Celis Galvez - National Planning Department
- Monica Pachon - Universidad de los Andes
- Santiago Izquierdo Tort - Centro de Energía y Recursos Naturales (CIERN), Instituto Tecnológico Autónomo de México (ITAM)
- Soraya Roman - Universidad Privada Boliviana