Preregistration, Preanalysis, and Reanalysis at OES

ACF/OPRE Methods Meeting
October 24, 2019

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Remarks delivered in this presentation represent the views of the presenter and not the official perspective of the General Services Administration or the U.S. Government.
Plan

● OES
● Perspective on Preregistration, Preanalysis
  ○ Easy to get started
● How OES uses Preregistration
  ○ Register Project Analysis Plans
  ○ Analysis
  ○ Reanalysis
● SSOP: Preregistering Methods
Office of Evaluation Sciences (OES)
What is the Office of Evaluation Sciences (OES)?

- Interdisciplinary team of experts in Federal government, housed at GSA
- Translate evidence-based insights into concrete recommendations to improve government
- Test these recommendations

Achieved $8\text{M}+ \text{ in cost savings} \text{ and revenue in less than 15 months} \\
Enrolled more than 20,000 active duty servicemembers into retirement savings plans \\
Informed more than half a million Americans about the benefits of getting vaccinated \\
Showed text message reminders could increase college enrollment by 6\%
What do we mean “test”? 

Translate evidence-based insights into concrete recommendations 

Embed tests using randomized evaluations 

Analyze results using existing administrative data 

Ensure our work meets evaluation best practice
OES Perspectives on Preregistration, Preanalysis
Two Goals of Preregistration

**Inform** scientific, policymaking community of study

**Strengthen** study itself
Inform Community about Study

Preregister Every Project

- Commit to describing that the project existed
- Commit to learning from pos./neg./null results
- Fight the file drawer problem
- We/others can make informed decisions

Project lead responsible for preregistration
Inform Community about Study

Must-Have Preregistration

- Describe intervention, policy change
- Describe outcomes
- Date stamp
- Read-only

Get started -- Type these, 1 page, post internally!
(Improve/develop over years. See OES 2015.)
Inform Community about Study

Analysis Plan
Project Name: Increasing School Attendance in Seattle
Project Code: 1809
Date Finalized: May 22, 2019

Overview
This project consists of three distinct interventions targeting two (overlapping) populations of interest – students who are Seattle Housing Authority (SHA) residents and Seattle Public Schools (SPS) students with poor records of prior attendance – and two time periods – the fall and spring semesters in the 2018-2019 academic year.

Fall Interventions
1. SHA Fall Letter versus Postcard: SHA students were randomly assigned to get a postcard or a letter describing the importance of good attendance for the first 20 days of the school year.
Inform Community about Study

Outcome Variables to Be Analyzed:

Using data from Seattle Public Schools (SPS) and Seattle Housing Authority (SHA), we will analyze school attendance patterns. Specifically, we will examine both the number of days missed and the percentage of days missed.
Inform Community about Study

Nice-to-Have Preregistration: External Facing

- oes.gsa.gov
- GitHub
Strengthen Study

Nice-to-Have Preanalysis Plans

- Which variables to analyze, transform to outcomes
- How to analyze them
- How to deal w/ missing data
- What hypotheses tested, what models to test them
- What standard errors to estimate
- How to check for covariate balance
- How to adjust for imbalance
- Which exploratory analysis (subgrps, persistence, ...)
- (More detail on confirmatory than exploratory)
Goals of Registered Preanalysis Plan

● Commit to analyses of agency interest
● Commit to report certain analyses. Prevent
  ○ Fishing
  ○ $p$-hacking
  ○ HARKing
  ○ *Ex post* “obviously right way!”
● Overall, more credible, higher-quality policy and analysis
How OES Uses Preregistration, Preanalysis
OES Project Process

Phase 1: Project Exploration
  GATE: Project Initiation

Phase 2: Design
  GATE: Design Review & Randomization Code Review

Phase 3: Ready for Field

Phase 4: Field
  GATE: Analysis Plan Commitment

Phase 5: Initial Analysis
  GATE: Analysis Review

Phase 6: Prepare for Reanalysis
  GATE: Reanalysis

Phase 7: Prepare Publication Package
  GATE: Pre-Publication Review

Phase 8: Publication
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Reanalysis

Who

- OES team member not part of project
- Intentionally not aware of analysis results
Reanalysis

Ingredients

● Preanalysis plan, design docs, note on deviations from expected data formats
● Design and outcome data, as for primary analysis
● Codebooks
● Hand-off conversation with Lead Analyst
Reanalysis

Goals

● Promote adherence to preanalysis plan
● Report what we committed to
● Promote robust discussion, documentation of deviations (different data structure, ...)
● Replicate analytic choices that weren’t specified one way or the other in the plan
● Ensure that code is error-free (because mistakes happen!)
● (Not a scavenger hunt...)


Example: Preregistration Aids Reanalysis
Preregistration Anchors Analysis

● Admin health data arrives in different form
● Challenge: calculate eligible for intervention
  ○ Date field means different things
  ○ Several relevant date fields
  ○ Unexpected flags overriding dates
  ○ Etc.
● Preanalysis records exact def’n of outcomes
● As define eligibles, easy to think group size “sounds right” based on expectations.
Preregistration Commits to Reporting, Best Methods

Prespecified methods critical to interp findings!

- Common default, ignoring design:
  (small $p$-value)
- Preregistered method, better represents true implementation:
  (larger, valid SE’s, $p$-value)

(Still OK to report explorations; just label them.)
Preregistering Default Methods: SSOP
Overview

This document explains how our team, the Office of Evaluation Sciences in the General Services Administration (the OES), tends to do statistical analysis and it also explains why we do what we do. The research integrity process of the OES is already documented the OES Methods Web Page. For example, on that page we provide templates for our research design and analysis pre-registration process. Here, we get into the nitty gritty of our statistical work.
SSOP

Contents:
● Our default methods
● Our rationale and demonstrations
● Code to implement the methods
● Written for OES internal use

Plans:
● Publicly available, but updating content
● More public release FY 2020
● Future?: code package to distribute methods
Resources Available on Our Website
Resources Available on the OES Website

● Additional detail on our methods and motivations
● Templates for project gate documents, including
  ○ Project Design Document
  ○ Analysis Plan
  ○ Record of Analysis
  ○ Record of Reanalysis
● OES Evaluation Policy

oes.gsa.gov