

Preregistration, Preanalysis, and Reanalysis at OES

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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.



Office of Evaluation Sciences



Plan

- OES
- Perspective on Preregistration, Preamalysis
 - 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

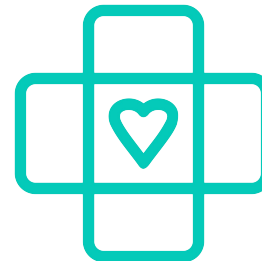
Achieved **\$8M+** in
cost savings and
revenue in less than 15
months



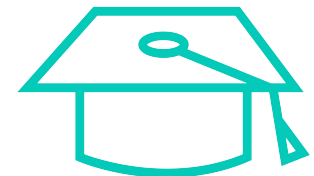
Enrolled more than
20,000 active duty
servicemembers into
retirement savings plans



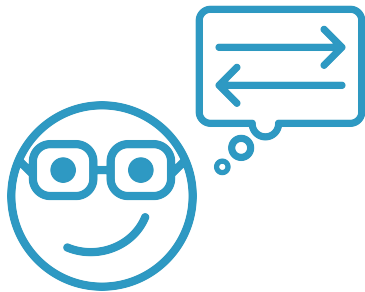
Informed more than
half a million
Americans about
the benefits of getting
vaccinated



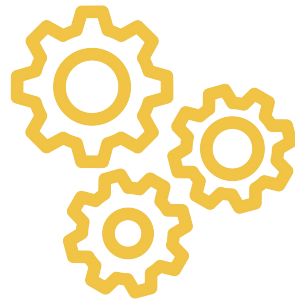
Showed text message
reminders could
increase college
enrollment
by 6%



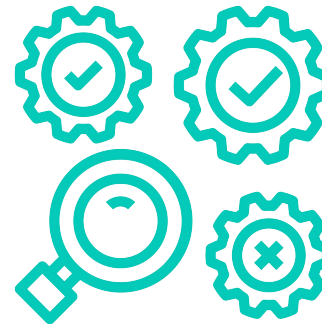
What do we mean “test”?



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, Preamalysis

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



The screenshot shows a GitHub repository page for 'gsa-oes / office-of-evaluation-sciences'. The navigation bar includes 'Code', 'Issues 3', 'Pull requests 9', 'Projects 0', 'Wiki', and 'Security'. Below the navigation bar, the path 'History for office-of-evaluation-sciences / assets / analysis / 1809-analysis-plan.pdf' is displayed. A vertical timeline on the left indicates 'Commits on May 23, 2019'. A commit entry shows 'Add files via upload' by user 'oesmiked' committed on May 23. At the bottom right, there are 'Newer' and 'Older' buttons.

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, Preamalysis

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.
- Preamalysis 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

The OES Standard Statistical Operating Procedure

Overview

Purposes of this document

Nature and limitations of this docu...

Help us improve our work!

About this document

1 Statistical and causal inference for ...

2 Basics of Experimental Design and...

3 Design-Based Principles of Statisti...

4 Randomization and Design

5 Analysis Choices

6 Procedures when we have missing...

7 Observational Studies (Policy Eval...

8 Power Analysis

9 Other Topics

10 Working with data

OES Standard Operating Procedures for The Design and Statistical Analysis of Experiments.

Jake Bowers, Ryan Moore, Lula Chen, Paul Testa, Nate Higgins

September 10, 2019

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.¹ 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

<https://oes.gsa.gov>

<https://oes.gsa.gov/work>

<https://oes.gsa.gov/methods>