

Descriptive Inference

POST 8000 – Foundations of Social Science Research for Public Policy

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Goal for Today

Introduce students to basic descriptive inference.

What Makes Good Scientific Research?

1. Generates inference.
2. The research procedures are transparent/public.
3. The conclusions are “uncertain” (i.e. includes reasonable estimates of uncertainty).
4. The content is the method.

Interpretation and Inference

KKV spend much of chp. 2 contrasting “interpretation” with “inference.”

- “Interpretation” seeks accurate summaries of historical detail, placing them in historical context in which we can understand their meaning.

KKV want something more with “inference.”

- i.e. to use the facts we know to learn more about the facts we don't yet know.

A Generalized Model of Research Design

KKV build on the “model” metaphor to formalize research design. Definitions first:

- **Data collection:** a wide range of methods for gathering information, ideally connected to the question we want to answer.
- **Variable:** an empirical measurement of a characteristic, typically denoted as y .
- **Unit:** a level of analysis (e.g. individual people, countries, counties, etc.)
- **Observation:** an individual observation of y , typically denoted like y_i .

An Example from the General Social Survey (2018)

My `post8000r` package has a `gss_spending` data frame from the GSS in 2018.

- **Data collection:** a probability sample of individuals living in the U.S.
- **Variable:** (take your pick of various demographic attributes and attitudes toward spending programs)
- **Unit:** individuals living in the U.S.
- **Observation:** a numeric value (again, take your pick, type `?gss_spending` in R for more information).
 - example: `race = 1` for white people, `2` for black people, `3` for other.

```
gss_spending %>% distinct(race)
```

```
## # A tibble: 3 x 1
##   race
##   <dbl>
## 1     1
## 2     2
## 3     3
```

Summarizing Historical Detail

There are any number of ways of summarizing your variable into a *statistic*, but two principles apply:

1. The statistic should focus on the outcome the researcher wishes to describe or explain.
2. *The goal of the model is to simplify.*

Descriptive Inference

“Descriptive inference” is the process of understanding the unobserved from the observed.
Two governing principles:

1. There are *systematic* differences we can explain by reference to something fundamental/predictable.
2. There are still *nonsystematic* (or *stochastic*) differences from stuff we can't explain.

Our goal is to distinguish the former from the latter.

Discussion

1. How do we evaluate descriptive inference?
2. What can we do about stochastic/nonsystematic differences in our variable?
3. What is the difference between “realized” and “random” in our variables?
4. What can interpretative methods teach us about inference?

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