

Introduction to Quantitative Method

Quasi-Experiments

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November 13, 2025



3 takeaways from today's class

1. Quasi-experiments are quantitative analyses done on observational data but using a research-design approach.
2. **Randomization** remains crucial in quasi-experiments but it relies on assumptions that are harder to verify than in pure experiments.
3. To make assumptions in quasi-experiments a *deep* understanding of the institutional details of the treatment assignment is required.

Analyzing an exemplar

The 3 takeaways are exemplified in the following work which we will analyze:

Susan D. Hyde. 2007. The Observer Effect in International Politics: Evidence from a Natural Experiment. *World Politics* 60, no. 1 (October): 37–63.

<https://doi.org/10.1353/wp.0.0001>

So let us begin by introducing this work and then talk about the takeaways...

What is the research question in Hyde (2007)?

Activity: 3 minutes

Download the PDF from elearning, read it fast, and jot down the research question in *your own words*.

The 'research question' in two ways

- *At an operationalization level:* Did international monitoring of the 2003 Armenian elections reduce the incumbent's vote share?
- *At a construct level:* Does international observation aid democratization in developing countries?

Discussion question

Does the work of Hyde (2007) have *construct validity*?

What type of data is used by Hyde (2007)? I

Activity: 5 minutes

Jot down your answers for the following questions:

1. Does the data come from a randomized experiment? *Yes/No*
2. If yes, what kind of experiment?
3. If no, where does it come from?
4. What is the 'level' of the data?

What type of data is used by Hyde (2007)? II

Answers to Activity

1. Does the data come from an experiment? **No. It is just observational data on the election results.**
2. If yes, what kind of experiment? **Not applicable**
3. If no, where does it come from? **The Armenian Central Election Commission made the election data publicly available on their website.**
4. What is the 'level' of the data? **Data is available at a polling station level.**

Followup you must ask: If the work doesn't use experimental data, why are we analyzing this work in a 'Research Design' class?

Takeaway 1

Quasi-experiments are quantitative analyses done on observational data but using a research-design approach.

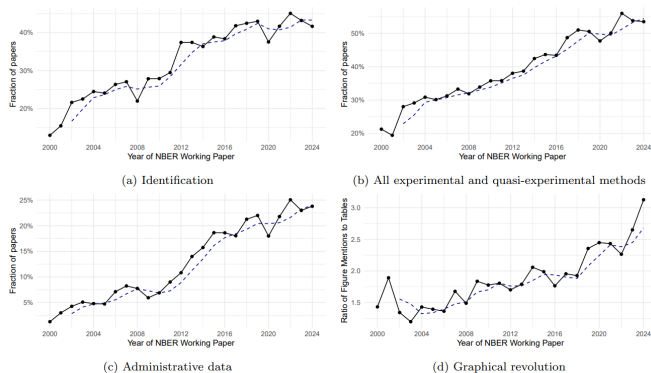
- So, even though its election data, we can turn it into a *quasi experiment* applying the research design ideas you've learned already in this class.
- But how to approach this context from a research design perspective?

A tangent before we go there...

A tangent on the credibility revolution I

Quasi-experiments are becoming a dominant methodology in economic research¹ today.

Figure: Taken from Goldsmith-Pinkham (2024)



A tangent on the credibility revolution II

- The other social sciences are following this trend too.
- This increasing tendency of researchers in the social science to favor (quasi-)experimental research-design approaches has been termed “the credibility revolution” (Angrist and Pischke 2010).
- Recall from earlier class (Week 7), “...for their methodological contributions to the analysis of causal relationships...” Joshua D. Angrist and Guido W. Imbens won the Nobel Prize in 2021 along with David Card (in labor econ).
 - [Click here for link to Noble Prize 2021 Press release](#). Notice the emphasis on “Natural experiments.”
 - *Food for thought*: But what about field experiments? Did anyone win the Noble Prize for that?

Construing a research design for Hyde (2007)

Back to the point: How *exactly* can we approach analyzing observational data from a research design perspective?

Discussion question: A thought experiment

How would you create a design to credibly answer the research question of Hyde (2007)? Answer while roleplaying as:

- an omnipotent but not an omniscient being.
- a human with enough funds to do a comprehensive census of the world.
- the author (Susan Hyde).

Lets simulate data in a spreadsheet to answer this...

As-if randomization of international observation at the polling stations

Hyde (2007) claims that international observers were assigned to polling stations in a way that amounted to there being randomization.

- Notably, “... the OSCE/ODIHR mission did **not** assign observers using a random numbers table or its equivalent...”, and yet the author argues that the assignment process amounted to “as-if” randomization.
- On the basis of this claim, the author adds to the election dataset a column indicating whether the polling station was observed or not, and considers it as the ‘treatment’ variable.

Followup you must ask: But how can the author argue in support of this claim? Is there anyway to verify her claim with the observational data?

Takeaway 2

Randomization remains crucial in quasi-experiments but it relies on assumptions that are harder to verify than in pure experiments.

- To argue for the aforementioned claim, Hyde (2007) must make empirical assumptions.
- Unlike a pure experiment where assumptions are made ex-ante, these assumptions are harder to verify since Hyde (2007) is making them ex-post.
 - Notice even in a pure experiment we *still* have to make assumptions! It is just that we can make these assumptions beforehand and hence plan the experiment so that we can test for those assumptions, and reinterpret the results in light of those tests.

Institutional details of the 2003 Armenian election monitoring

So what assumptions does Hyde (2007) make to argue in support of random assignment of the election observers?

- Each team of observers was given a list of polling stations to observe throughout election day. They only visited the listed stations, and had no agency over this.
- The lists were made merely to monitor the sprawl of Armenia and to avoid rework without any consideration of demographic characteristics of the region. At any rate, these demographic variables were unavailable to the observers. Even if they did have it, support for the incumbent was not correlated to any particular demographic.
- There was no preannouncement on which stations would be observed. Deployment plans were confidential.
- Observers can spend the time to notice the fraud if any.

Plausibility of the randomization claim in Hyde (2007) I

Ideally, one assesses *plausibility* of randomization by checking balance of characteristics across treated and control group. But here...

TABLE 2
ROUND 1 OBSERVER COVERAGE BY REGION

<i>Region</i>	<i>Total Polling Stations</i>	<i>Percent Monitored</i>	<i>Average Voters per Polling Station</i>	<i>Voters/Total Monitored Polling Stations</i>
Aragatsotn	133	27.82	701	2520
Ararat	137	53.28	1355	2543
Armavir	153	38.56	1319	3420
Gegharkunik	148	32.43	1140	3515
Kotayk	132	43.18	1429	3309
Lori	226	33.63	1059	3148
Shirak	273	25.64	907	3537
Syunik	54	37.04	859	2319
Tavush	80	28.75	1152	4007
Vayots Dzor	40	37.50	1017	2712
Yerevan	388	69.59	1751	2516

Plausibility of the randomization claim in Hyde (2007) II

TABLE 3
ROUND 2 MONITORING VS. BACKGROUND COVARIATES

	<i>DV: Voter Turnout Round 1 Coefficient (S.E.)</i>	<i>DV: Demirchian Vote Share Round 1 Coefficient (S.E.)</i>	<i>D.V. Demirchian Vote Share Round 1 Coefficient (Robust S.E.)^a</i>
Round 2 Monitored	0.018 (0.010)	0.002 (0.007)	0.002 (0.021)
Constant	0.637** (0.006)	0.276** (0.004)	0.276** (0.018)
N	1763	1763	1763
F	(1, 1761) = 2.96	(1,1761) = 0.10	F(1, 10) = 0.01
Prob > F	0.0853	0.7471	0.9179

* significant at 5%; ** significant at 1%

^aRobust standard errors are clustered by region.

Where did the assumptions come from?

Develop a deep appreciation for the gravity of the following sentence of Hyde (2007):

"I learned from conversations with staff and participants in the OSCE observation mission to Armenia that the method used to assign observers to polling stations was functionally equivalent random assignment."

- The empirical assumptions made by Hyde (2007) did *not* originate in data or political/economic theory.
- It originated from deliberate *legwork* by the author to understand the minor institutional details of the particular treatment variable of interest (i.e.) how the election observation process worked *on the ground* in Armenia in 2003.

Takeaway 3

To make assumptions in quasi-experiments a deep understanding of the institutional details of the treatment assignment is required.

- The legwork required to understand institutional details can take many forms: Talking with relevant stakeholders (like Hyde), understanding bureaucratic minutiae (common in public policy work), a deep knowledge of historical events (common in economic history work), and so on.
 - Examples of this are endless: See Cabral, Geruso, and Mahoney (2018) and Azoulay et al. (2019) for use of bureaucratic minutiae; See Lampe and Moser (2010) and Moser (2012) for use of historical events.
- Further optional reading on this point: Freedman (1991)

Interpreting the results

TABLE 1
DIFFERENCE OF MEANS TESTS COMPARING “TREATMENT” AND
“CONTROL” GROUPS^a

<i>Average Incumbent Vote Share among Polling Stations That Were...</i>		<i>Average Incumbent Vote Share among Polling Stations That Were...</i>	<i>Difference</i>
1. Not observed in R1 54.2% (R1 vote share)	vs.	Observed in R1 48.3% (R1 vote share)	5.9% t(1762)=5.92 P> t =0.00
2. Not observed in R2 69.3% (R2 vote share)	vs.	Observed in R2 67.3% (R2 vote share)	2.0% t(1761)=2.47 P> t =0.014
3. Never observed 70.7% (R2 vote share)	vs.	Observed in both R1 and R2 66.2% (R2 vote share)	4.5% t(1116)=4.48 P> t =0.00
4. Never observed 62.8% (Average of R1 and R2 vote share)	vs.	Observed in both R1 and R2 57% (Average of R1 and R2 vote share)	5.8% t(1116)=5.36 P> t =0.00
5. Never observed 62.7% (Average of R1 and R2 vote share)	vs.	Observed in one or both rounds 58.1% (Average of R1 and R2 vote share)	4.6% t(1761)=5.65 P> t =0.00
6. Never observed 70.7% (R2 vote share)	vs.	Observed only in R1 66.3% (R2 vote share)	4.4% t(1138)=4.40 P> t =0.00
7. Never observed 70.7% (R2 vote share)	vs.	Observed only in R2 68.7% (R2 vote share)	2.0% t(1013)=1.73 P> t =0.084
8. Observed only in R2 68.7% (R2 vote share)	vs.	Observed in both R1 and R2 66.2% (R2 vote share)	2.5% t(621)=1.93 P> t =0.054
9. Observed in both R1 and R2 66.3% (R2 vote share)	vs.	Observed only in R1 66.2% (R2 vote share)	.11% t(746)=0.094 P> t =0.93
10. Observed only in R1 68.7% (R2 vote share)	vs.	Observed only in R2 66.3% (R2 vote share)	2.4% t(643)=1.83 P> t =0.067

^a Reported results reflect two-sample t-tests with equal variances.

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