Small-N design – theoretical outline

GLCb1008 Introduction to Methodology of Social Sciences

Jiří Navrátil
jiri.navratil@fss.muni.cz

Lecture outline

- Context of small-N designs
- Case study
- Comparative method
- Process tracing

Main types of research strategies

- Experiment (small N)
- Case study (small N)
- Comparative design (small N)
- Longitudinal design (small/large N)
- Cross-sectional design (large N)

Main aspects of research strategies

METHOD	(1) Form of Research Question	(2) Requires Control of Behavioral Events?	(3) Focuses on Contemporary Events?
Experiment	how, why?	yes	yes
Survey	who, what, where, how many, how much?	no	yes
Archival Analysis	who, what, where, how many, how much?	no	yes/no
History	how, why?	no	no
Case Study	how, why?	no	yes

Figure 1.1 Relevant Situations for Different Research Methods

SOURCE: COSMOS Corporation.

Main aspects of research strategies

METHOD	(1) Form of Research Question	(2) Requires Control of Behavioral Events?	(3) Focuses on Contemporary Events?
Experiment	how, why?	yes	yes
Survey	who, what, where, how many, how much?	no	yes
Archival Analysis	who, what, where, how many, how much?	no	yes/no
History	how, why?	no	no
Case Study		no	yes

Figure 1.1 Relevant Situations for Different Research Methods

SOURCE: COSMOS Corporation.

Main aspects of research strategies

METHOD	(1) Form of Research Question	(2) Requires Control of Behavioral Events?	(3) Focuses on Contemporary Events?
Experiment	how, why?	yes	yes
Survey	who, what, where, how many, how much?	no	yes
Archival Analysis	who, what, where, how many, how much?	no	yes/no
History	how, why?	no	no
Case Study	how, why?		yes

Figure 1.1 Relevant Situations for Different Research Methods

SOURCE: COSMOS Corporation.

Main aspects of research strategies

METHOD	(1) Form of Research Question	(2) Requires Control of Behavioral Events?	(3) Focuses on Contemporary Events?
Experiment	how, why?	yes	yes
Survey	who, what, where, how many, how much?	no	yes
Archival Analysis	who, what, where, how many, how much?	no	yes/no
History	how, why?	no	no
Case Study	how, why?	no	

Figure 1.1 Relevant Situations for Different Research Methods

SOURCE: COSMOS Corporation.

Case study

- Research on a contemporary phenomenon in a real-world context; the phenomenon is often not clearly delineated
- many variables are examined, and different data sources are used, often preceded by theoretical consideration of what and how to analyze
- Case: a more/less closed system in time and (social) space (individual, organization, institution, event, community ...)

Case study: sampling criteria

- unique case study (detailed analysis of the case) – e.g. homelesness in Brno
- instrumental case study (more general knowledge) – e.g. homelesness in the Czech Republic
- collective case study (multiple cases representing a phenomenon, population or circumstance - sometimes an attempt to generate theory) – e.g. homelessness in big post-socialist cities

Yin (2009, location no. 1201) lists five rationales for single cases:

1. A critical case – i.e. one that can test a particular theory.
2. An extreme or unique case – for example, a study of a rare disorder.
3. A representative case – a case that is representative, or typical, of a particular situation.
4. A revelatory case – one that reveals a phenomenon hitherto unexplored.
5. A longitudinal case – a study of changes over time.

Sampling strategies

- Maximum variation
- Homogeneous
- Critical case
- Theory based
- Confirming and disconfirming cases
- Snowball or chain
- Extreme or deviant case
- Typical case
- Politically important case
- Random purposeful
- Stratified purposeful
- Criterion
- Opportunistic
- Combination or mixed
- Convenience

Miles and Huberman (1994: 28)

Case sampling and generalization (Rohlfing 2012)

- Generalizations must always take into account the relationship between the case and the population

Selection strategy	Type of case study	Scope of generalization
Distribution based	Typical case	Similar cases
	Diverse case	All cases located between the diverse cases
	Deviant case	All other cases
Theory based	Most-likely case	All other cases
	Least-likely case	
	Failed most-likely case	
	Passed least-likely case	

Relationship to theory (Blaikie)

Types of case studies:

- *configurative-idiographic* - understanding
- *disciplined-comparative* – theory application
- *heuristic* – theory seeking
- *plausibility probes* – theory development
- *crucial-case* – theory testing

Comparative method

- Functional equivalent of the experiment
- Study of contrasting cases using identical methods
- Method of controlling for the effect of variables in research with a small number of cases (by selecting cases we transform variables into constants, thus controlling for the effect of alternative variables)
- It is a cross-sectional design for small N
- e.g. Durkheim analysis of suicide: official statistics (large N) across countries (small N)

Mill's method of difference and agreement

Effect

Potential causes

Accident	Drunk Driving	Car Entering from Right-Hand Side	Driver Speeding	Runs a Red Light
	Difference			
Yes (**driver j**)	Yes	Yes	No	Yes
No (**driver k**)	Yes	No	No	Yes
	Agreement			
Yes (**driver l**)	Yes	Yes	No	Yes
Yes (**driver m**)	Yes	No	Yes	Yes

Mill's Methods of Difference and Agreement: Lieberson's Example

Case-oriented strategy in comparative settings (Ragin)

- Combination of causal analysis, interpretative analysis and concept formation
- Designed to uncover patterns of invariance and constant association, using cross-tabulation of cause(s) and effect and accounting for deviant cases; no probabilistic relationships!
- If only one case deviates – explanation is doubted
- Cases are considered as whole entities, not as collection as variables (e.g. Weber´s analysis of protestant ethics)
- Stimulation of dialogue between ideas and evidence

Process tracing

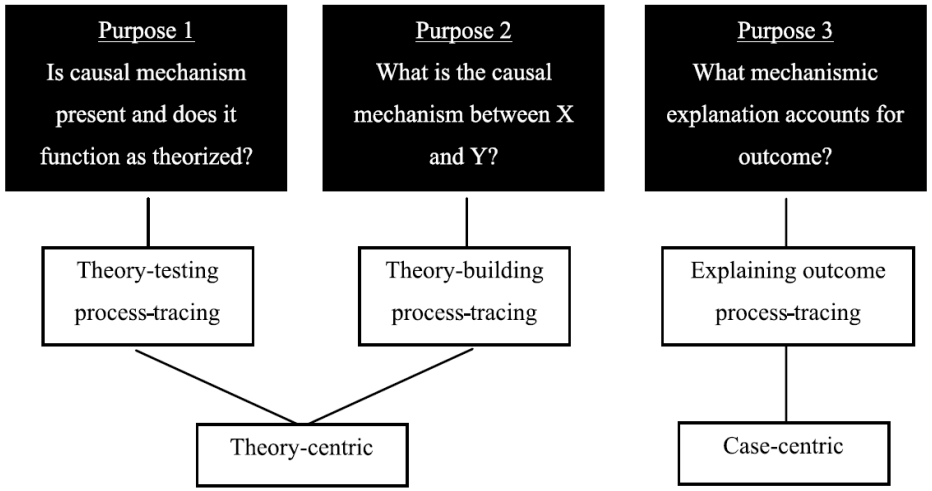
- Beyond correlations between independent variables (Xs) and outcomes (Ys)
- Aiming to unpack the causal relationship between them and trace causal mechanisms
- A causal mechanism -"a complex system, which produces an outcome by the interaction of a number of parts"
- Single case research design
- E.g. analysis of how particular social protest emerges

How?

- within- case inferences about the presence/absence of causal mechanisms vs. cross- case inferences about causal relationships
- Vs. congruence method: based on the value of the independent variable (X), researchers test whether the prediction about the outcome that should follow from the theory is congruent with what is found in the case, investigated either temporally or other across aspects of the outcome(s) (e.g. higher crime rate in economically deprived localities)
- Congruence investigates correlations between X and Y, whereas process-tracing investigates the workings of the mechanism(s) that contribute to producing an outcome (e.g. how exactly is economic deprivation linked to crime?)
- Process- tracing case studies are usually presented as a stepwise test of each part of a causal mechanism, especially in the theory- testing variant (e.g. economic downturn, perception of this downturn, conflict between social norms and achievable goals, social ties, social norms reassessment, illegal activity)

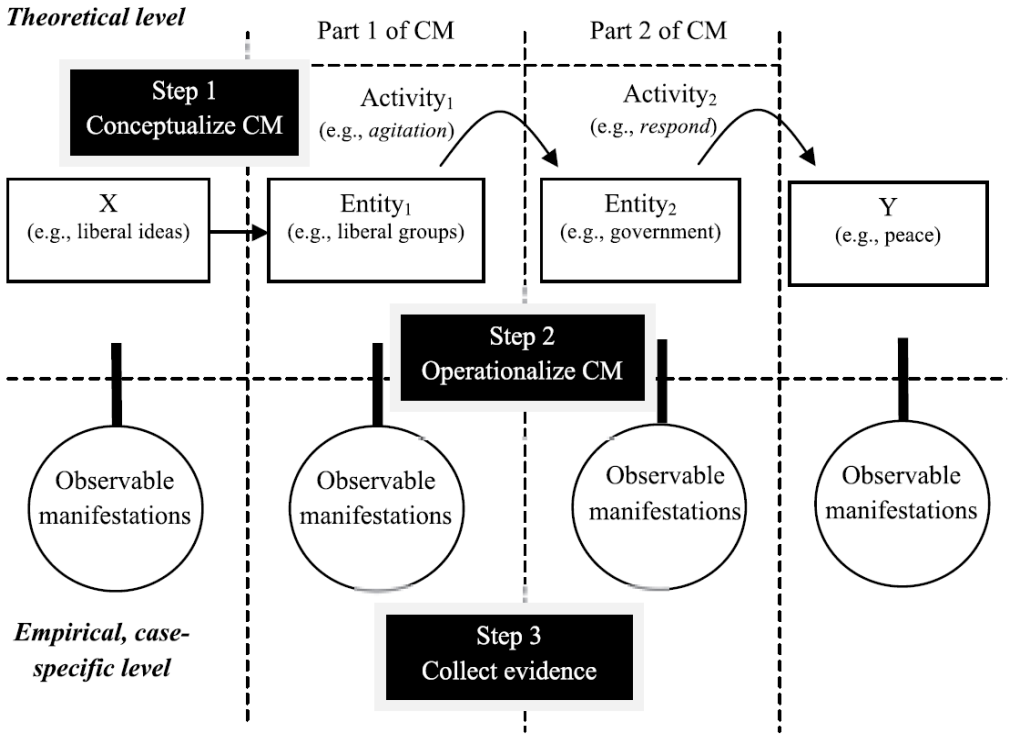
Variants of proces tracing

- theory- testing: deduces a theory from the existing literature and then tests whether evidence shows that each part of a hypothesized causal mechanism is present in a given case (theory-centric)
- theory- building- inferring that a more general causal mechanism exists from the facts of a particular case (theory-centric)
- explaining- outcome – come out with a minimally sufficient explanation of a puzzling outcome in a specific historical case (case-centric)



Theory-testing

- causal mechanism is hypothesized to be present in a population of cases of a phenomenon, the researcher selects a single case where both X and Y are present, and the context allows the mechanism to operate, the goal is to evaluate whether evidence shows that the hypothesized causal mechanism linking X and Y was present and that it functioned as theorized



"democratic peace theory" - democracies are hesitant to engage in armed conflict with other identified democracies:

- democracies are in general more peaceful in their international relations);
- democracies do not go to war with other democracies
- more democratic states in the international system makes the international system more peaceful

Theory-building

- building a theory about a causal mechanism between X and Y that can be generalized to a population of a given phenomenon, starting from a situation where we are in the dark regarding the mechanism

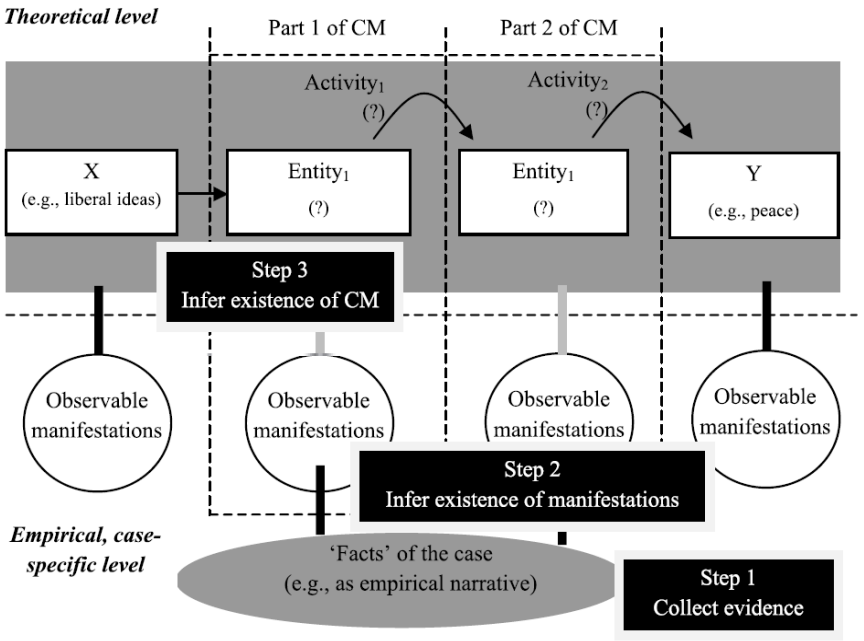


Fig. 2.3. Theory-building process-tracing. (Bold lines = direct inferences; shaded lines = indirect (secondary) inferences; shaded area = what is being traced.)

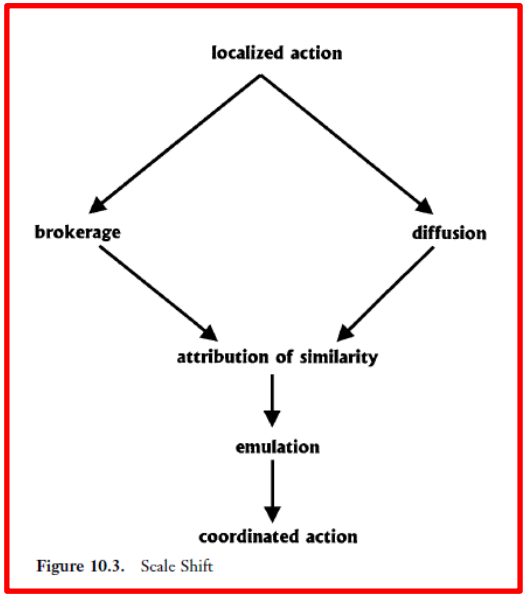
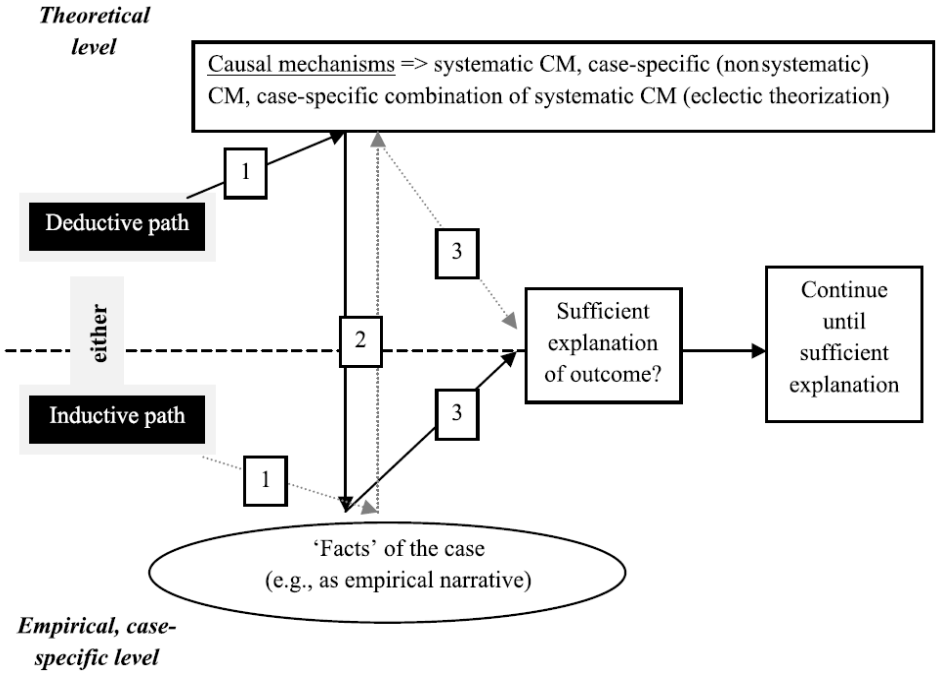
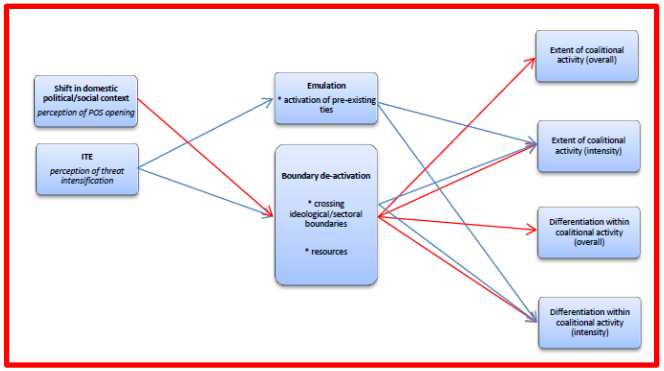


Figure 10.3. Scale Shift

Explaining outcome

- the aim is to craft a sufficient explanation of the outcome, instead of studying mechanisms that cause war (Y), the analysis would focus on explaining a particular outcome such as war in Ukraine





Overview

	Theory-Testing	Theory-Building	Explaining-Outcome
Purpose of analysis—research situation	*Situation one* Correlation has been found between X and Y, but is there evidence that there exists a causal mechanism linking X and Y?	*Situation two* Build a plausible causal mechanism linking X:Y based on evidence in case	*Situation three* Explain particularly puzzling historical outcome by building minimally sufficient explanation in case study
Ambitions of study	Theory-centric	Theory-centric	Case-centric
Understanding of causal mechanisms	Systematic (generalizable within context)	Systematic (generalizable within context)	Systematic, nonsystematic (case-specific) mechanisms and case-specific conglomerates
What are we actually tracing?	Single, generalizable mechanism	Single, generalizable mechanism	Case-specific, composite mechanism that explains the case
Types of inferences made	(1) Parts of causal mechanism present/absent (2) Causal mechanism is present/absent in case	Observable manifestations reflect underlying mechanism	Minimal sufficiency of explanation

References

Bryman, Alan. 2012. *Social Research Methods*. Oxford: Oxford University Press.

Blaikie, Norman. 2000. *Designing social research: the logic of anticipation*. Cambridge: Polity Press.

Biemer, Paul P., Robert M. Groves, Lars E. Lyberg, Nancy A. Mathiowetz and Seymour Sudman (eds.). 1991. *Measurement Errors in Surveys*. New York: John Wiley & Sons.

De Vaus, David A. 1996. *Surveys in Social Research*. London: University College London Press Limited.

Dillman, Don A. 2007. *Mail and Internet Surveys. The Tailored Design Method.* New York: John Wiley & Sons.

Fowler, Floyd J. 1995. *Improving Survey Questions: Design and Evaluation*. Thousand Oaks: Sage Publications.

Groves, Robert M., Floyd J. Fowler, Mick P. Couper, James M. Lepkowski, Eleanor Singer and Roger Tourangeau. 2004. *Survey Methodology*. New York: John Wiley & Sons.