Qualitative Comparative Analysis

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Arizona Methods Workshops
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Overview

- Day 1: Introductions and overview
  - Review of QCA resources, publications, and software
  - QCA as an investigation of invariance
  - Three analytic components of QCA: dataset calibration, necessity analysis, and sufficiency analysis
  - Three types of QCA projects: identifying causal recipes, uncovering taxonomies, understanding context
  - Discussion of research projects
- Day 2: Nuts and bolts—QCA in depth
  - Dataset calibration
  - Necessity analysis
    - Consistency and coverage measures for necessity
    - Testing for necessary conditions
  - Sufficiency analysis
    - Consistency and coverage measures for sufficiency
    - Constructing and reducing truth tables
    - Interrogating the analysis and deriving solutions
- Day 3: Workshop Projects

Primary Readings on QCA

- Ragin (2008) *Redesigning Social Inquiry*
- Ragin (1987) *The Comparative Method*
- Ragin and Rubinson (2009) “The Distinctiveness of Comparative Research”
- Ragin and Rubinson (2011) “Comparative Methods”

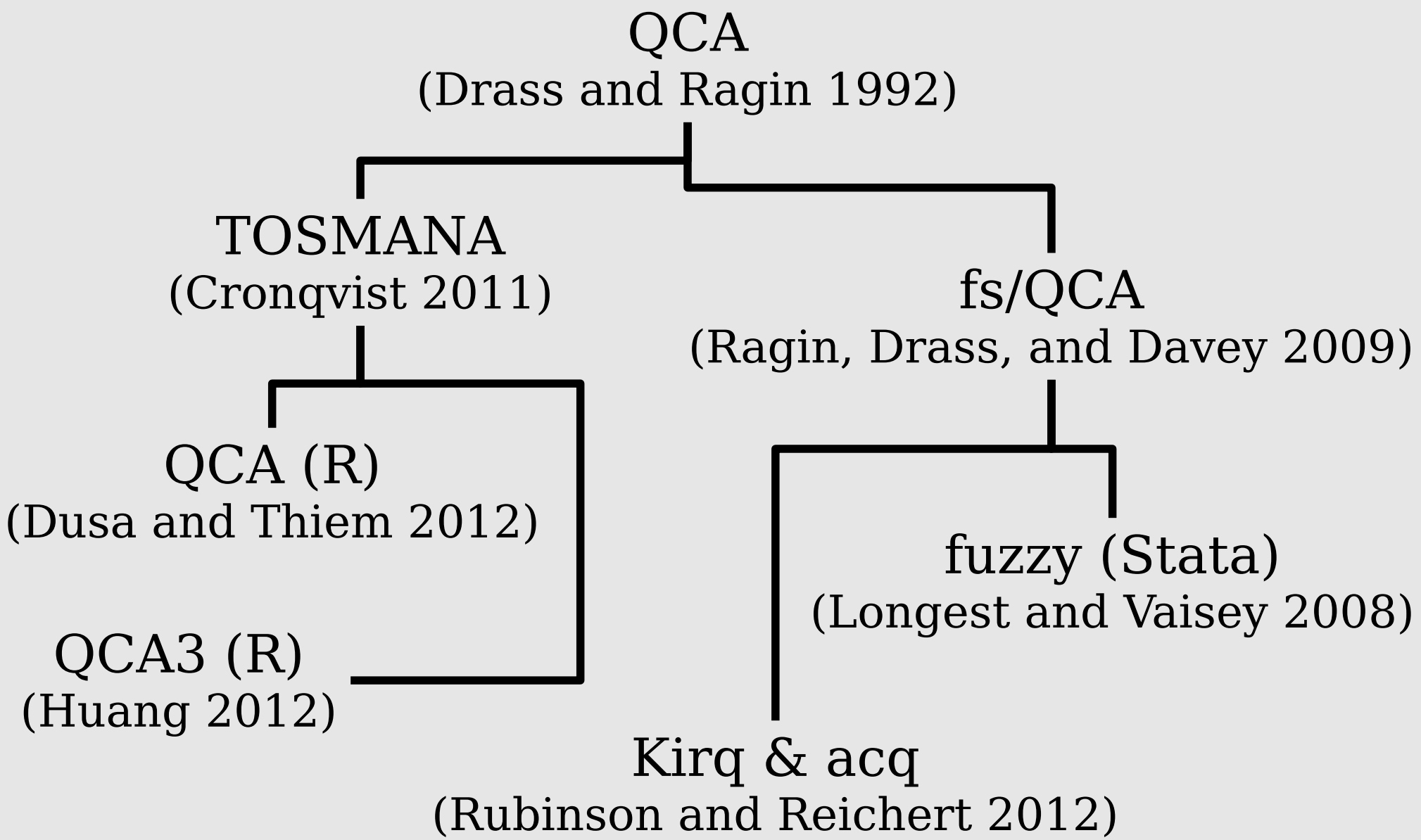
Secondary Sources

- COMPASSS web site (http://www.compasss.org)
- Goertz and Mahoney (2012) *A Tale of Two Cultures*
- Goertz (2006) *Social Science Concepts*
- Ragin (2000) *Fuzzy-Set Social Science*
- Schneider and Wagemann (2012) *Set-Theoretic Methods for the Social Sciences*
- Rihoux and Ragin (2009) *Configurational Comparative Methods*

Recommended Readings on Case-Oriented and Comparative Research

- Rubinson and Ragin (2007) “New Methods for Comparative Research?”
- Brady and Collier (2004, 2010) *Rethinking Social Inquiry*
- George and Bennett (2005) *Case Studies and Theory Development in the Social Sciences*
- Gerring (2007) *Case Study Research*
- Mahoney and Rueschemeyer (2003) *Comparative Historical Analysis in the Social Sciences*
- Skocpol (1979) Introduction to *States and Social Revolutions*
- Gaddis (2002) *The Landscape of History*
- Franzosi (1995) *The Puzzle of Strikes*

Software


QCA
(Drass and Ragin 1992)
TOSMANA
(Cronqvist 2011)
fs/QCA
(Ragin, Drass, and Davey 2009)
QCA (R)
(Dusa and Thiem 2012)
QCA3 (R)
(Huang 2012)
fuzzy (Stata)
(Longest and Vaisey 2008)
Kirq & acq
(Rubinson and Reichert 2012)

Software

Ragin's *fs/QCA* (http://www.fsqca.com):

- always produces correct results, intermediate solutions, relatively user-friendly, described in *RSI,* cutting edge
- but: out-of-date documentation, the dreaded prime implicant chart, no tools for interrogating the analysis, cutting edge, Windows-only (next version also supports OSX)

Rubinson's *Kirq* & *acq* (http://www.grundrisse.org/qca/):

- always produces correct results, sophisticated necessity testing, supports contradictions and impossible conditions, user-friendly, cross-platform, tools for interrogating the analysis, no prime implicant chart
- but: solution complexity, can be slow with many causal conditions, no intermediate solutions or graphing (upcoming version will have both)

Software

Cronqvist's *TOSMANA*:

- visualizations; cross-platform (via Mono)
- but: no longer maintained, doesn't support fsQCA, inspired by QCA 3.0

Duşa and Thiem's *QCA* for R (also Huang's *QCA3* for R):

- cross-platform (via R)
- but: no GUI interface; inspired by TOSMANA/QCA 3.0

Longest and Vaisey's *fuzzy* module for Stata:

- cross-platform (via Stata); focus on probabilistic methods

Rubinson's Google Sheets Add-on (and forthcoming Excel package):

- functions for calculating consistency, coverage, and fuzzy-set operations
- provides the direct method of calibration
- error checking for invalid and missing data

Varieties of QCA: csQCA, fsQCA, and mvQCA

- *The Comparative Method* (1987) describes “crisp-set QCA”
- *Fuzzy-Set Social Science* (2000) describes “fuzzy-set analysis”
- *Redesigning Social Inquiry* (2008) unifies “crisp-set QCA” and “fuzzy-set QCA”
  - csQCA is a special form of fsQCA
  - *fs/QCA*, *acq/Kirq,* and R package are all based on the RSI algorithms
- What about multi-valued QCA?

What is QCA?

- QCA is a formalization of the comparative method, using Boolean algebra

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What is the comparative method?

- Many names: comparative research, comparative analysis, small-N comparison, small-N analysis, case studies, cross-case studies
- Is a technique for identifying and analyzing invariant (consistent) relationships.
- Characterized by the search for necessary and sufficient conditions.
- Is comparative research necessarily small-N?
- Is comparative research necessarily case-oriented?

Invariant Relationships

- Definition: Certain aspects of cases tend to co-occur.
  - Tenured faculty tend to have many publications
  - Religious fundamentalists tend to be politically conservative
  - “business leaders and owners of capital … are overwhelmingly Protestant” (Weber 1958:35)
  - “No bourgeois, no democracy.” (Moore 1966:418)

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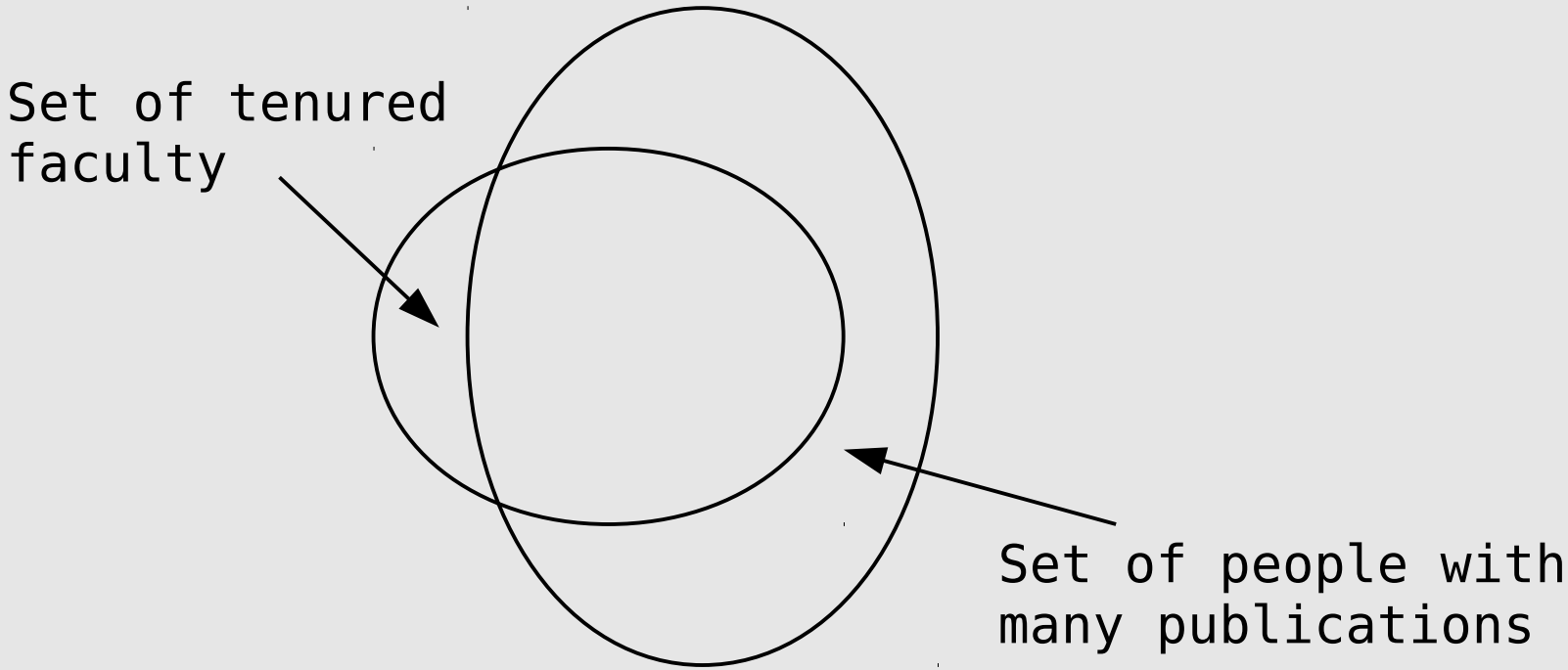

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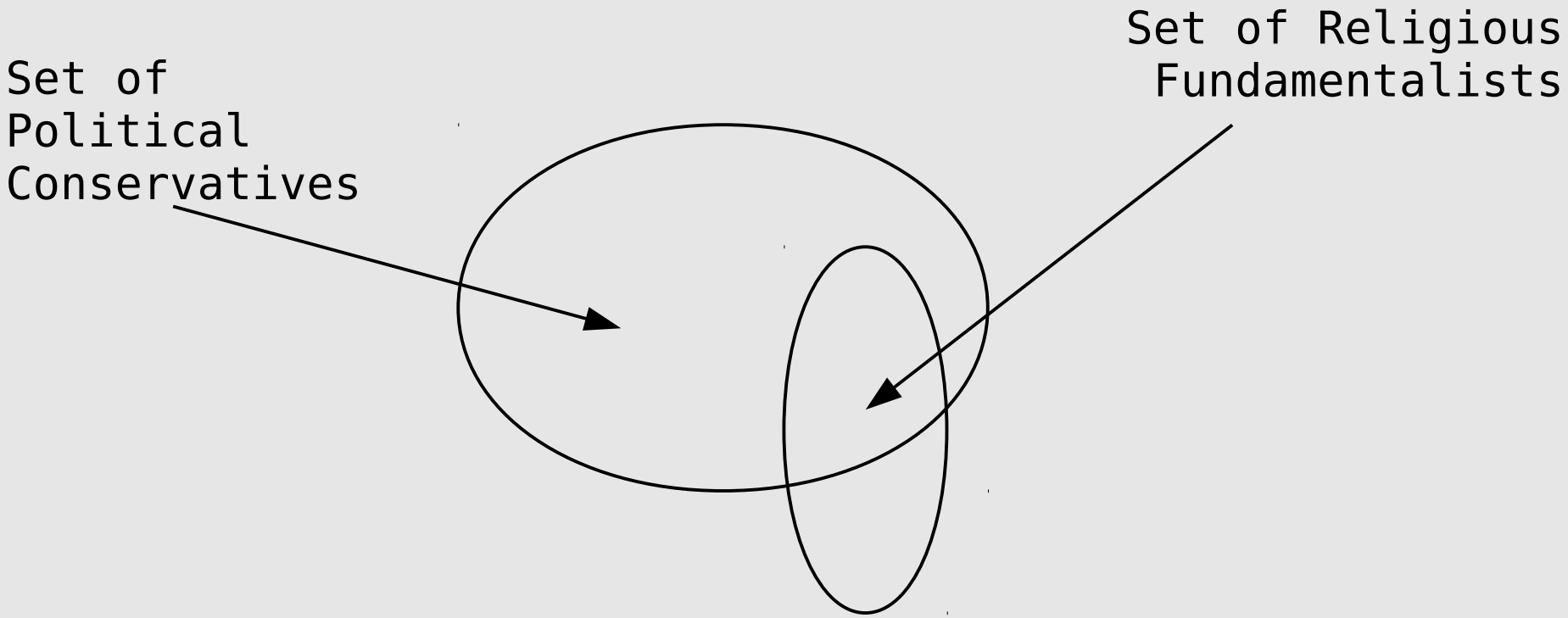

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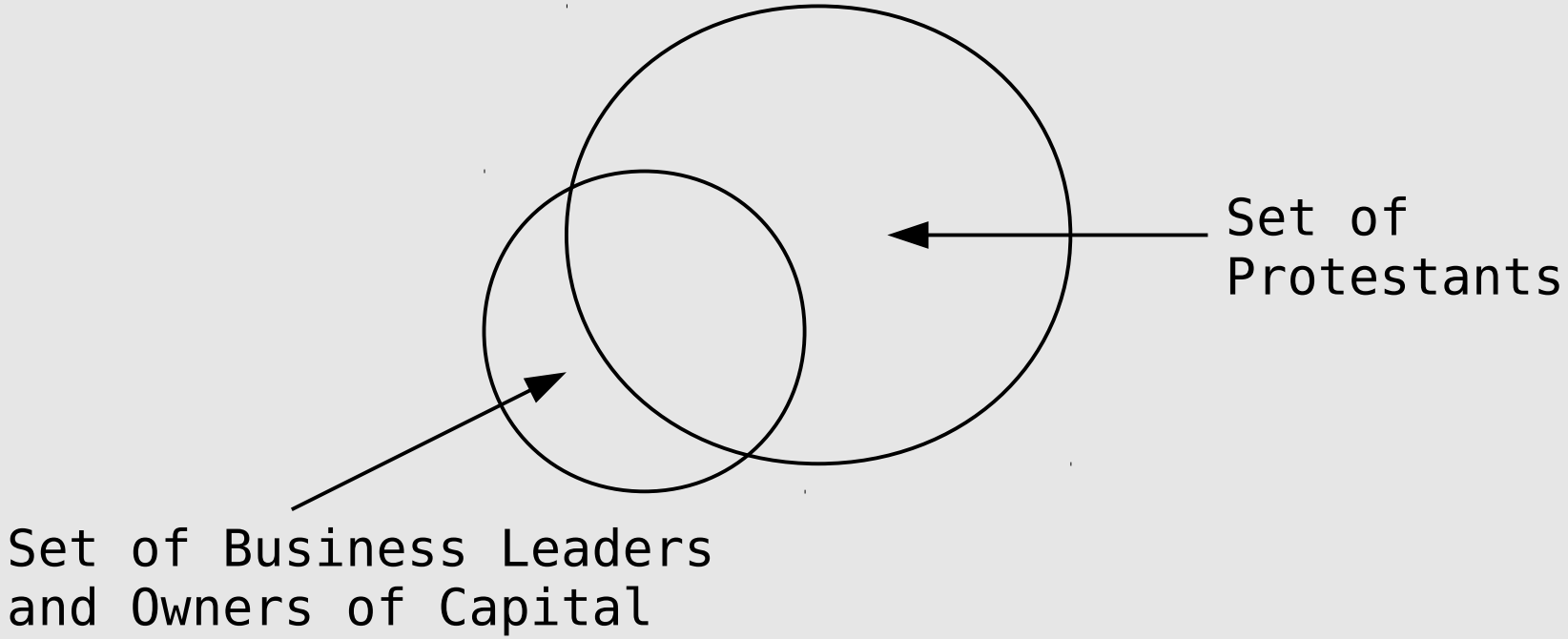

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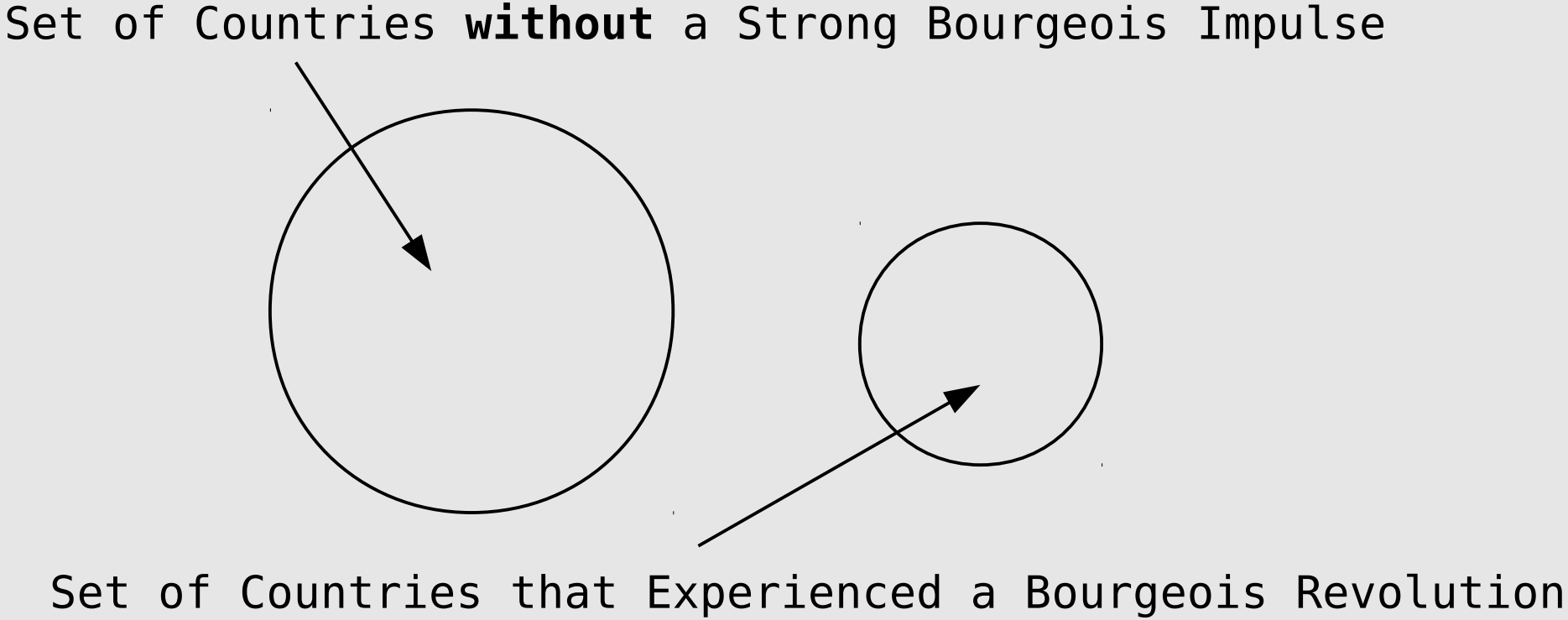

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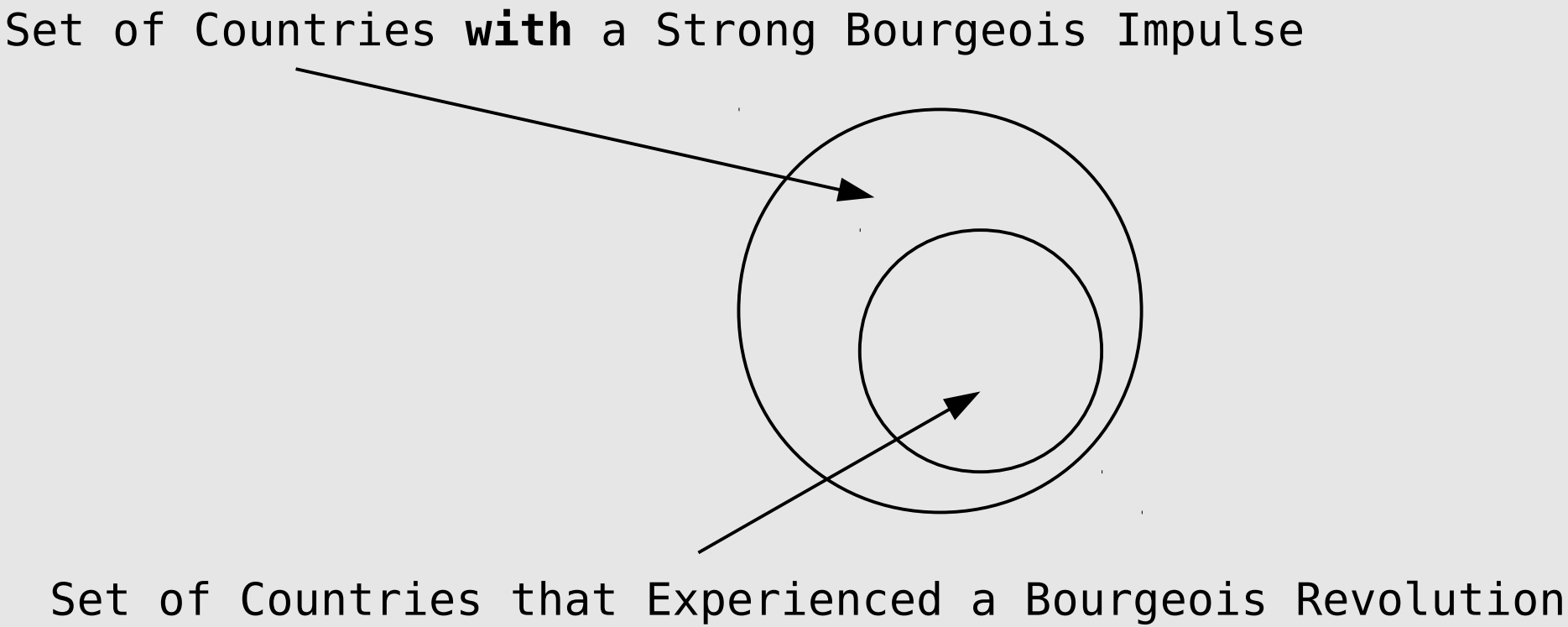

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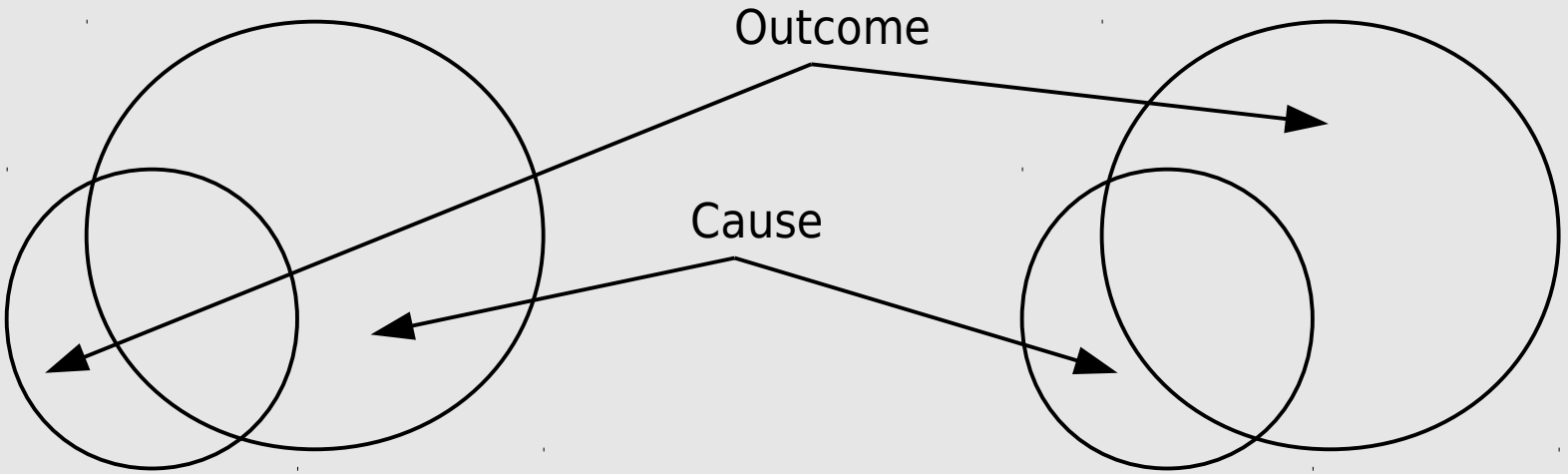
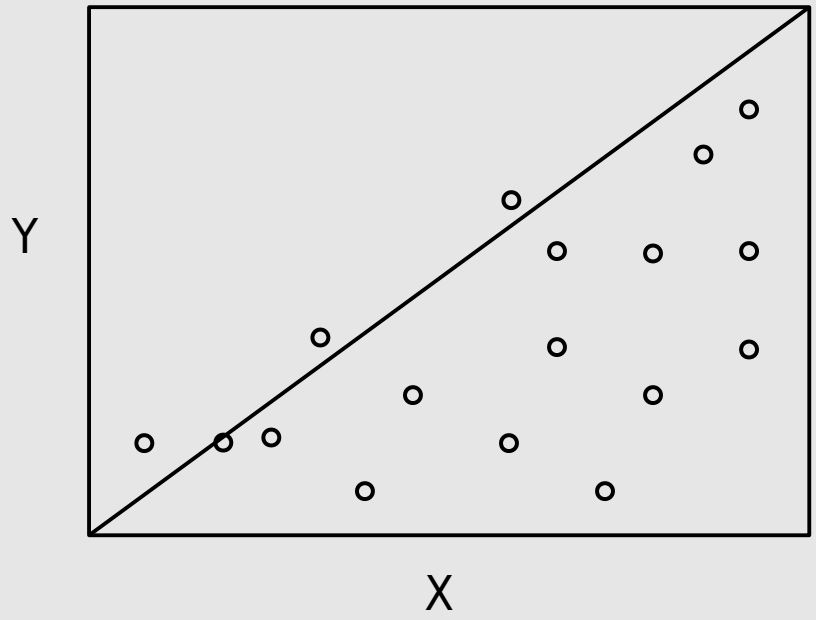
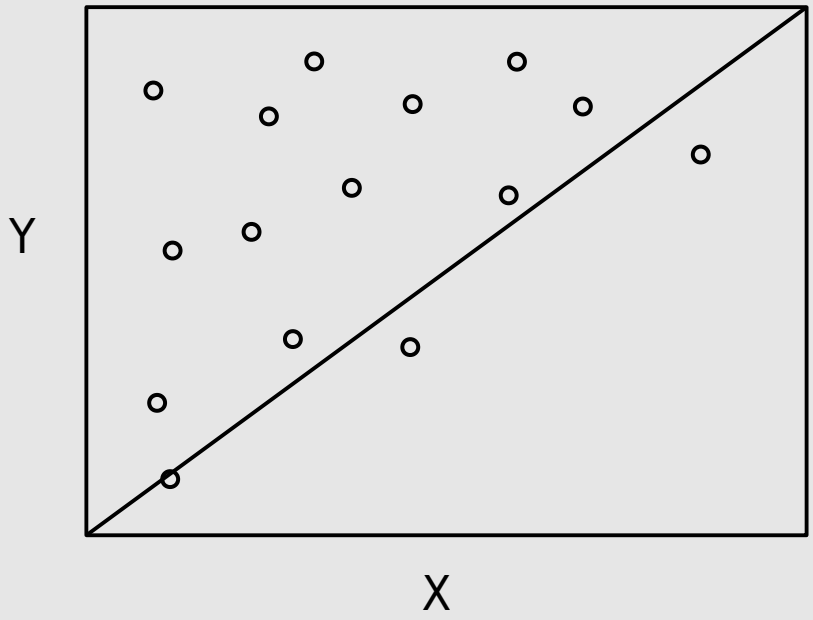




Subset relationship consistent with *necessity* (X≥Y)



Subset relationship consistent with *sufficiency* (Y≥X)

Invariant Relationships

- Definition: Certain aspects of cases tend to co-occur.
  - Does not imply determinism (or stochasticism)
  - Is not vulnerable to a single disconfirming case
  - Is fundamentally set-theoretic
  - Parallels how we typically formulate social theory:
    - The modern world system is a capitalist world-economy characterized by a core/periphery division of labor that prioritizes the endless accumulation of capital.
    - During unsettled periods, people actively use culture to learn new ways of being.

Software Demonstration
Example: Brown and Boswell (1995)

Distinguishing Features of QCA

- Assumption of invariance
- Assumption of causal complexity
  - Identification of necessary and sufficient conditions
  - There can be multiple paths to the same outcome
- No degrees-of-freedom restrictions
  - Appropriate for small-, medium-, and large-N analysis
- Encourages retroductive analysis (moving back and forth between theory and data)
  - Uses a malleable analytic frame
  - Must identify, measure, and scale (calibrate) your causal conditions and outcome
  - Dataset must include both positive and negative outcomes
  - Identifying and resolving contradictions is key

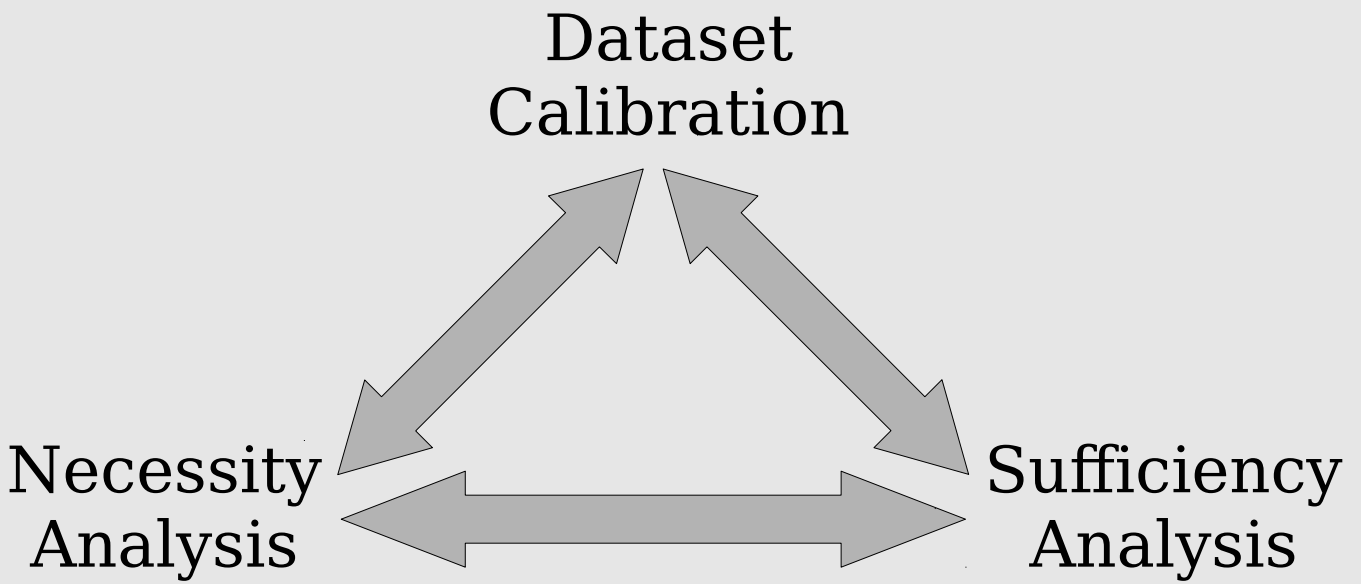
Historical Affinity with Case-Oriented, Small-N Research

- Holistic approach of comparativists encourages "structured, focused comparisons."
- Small number of countries enables in-depth analysis and helps cases to remain in the foreground

But:

- Small-N statistical analysis is possible (e.g., Esping-Andersen)
- Large-N comparative research is possible (e.g., Ragin and Fiss; Franzosi and Rubinson)
- Small-N ≠ Case-Oriented; Large-N ≠ Variable-Oriented

Three Analytic Components of QCA



Boolean Algebra

- UPPERCASE for the presence of a condition
- lowercase or ~ for the absence of a condition
- Negation

  ~A = 1 – A

  a = 1 – A
- Logical and (Boolean multiplication/Set intersection)

  A•b = Ab = min(A,b)
- Logical or (Boolean addition/Set union)

  A+b = max(A,b)

Dataset Calibration

- The process of constructing fuzzy-sets
- May be crisp or fuzzy
- Is about defining set memberships
  - degree of membership in the set of rich people (vs annual income)
  - degree of membership in the set of core countries (vs GDP/capita)
- Importance of negation and asymmetry
  - degree of membership in the set of *not* rich people
  - degree of membership in the set of *not* core countries

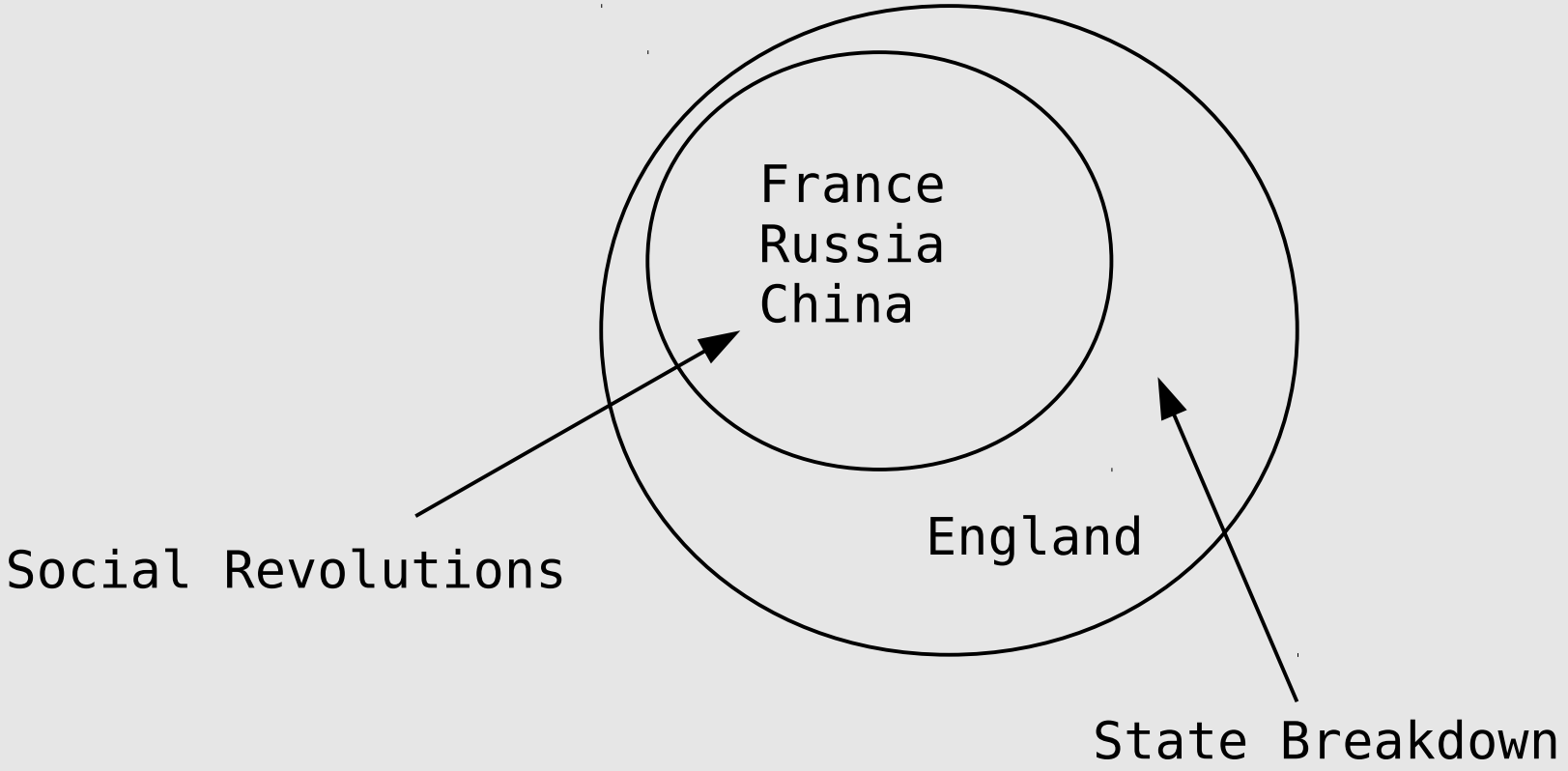
Analysis of Necessary and Sufficient Conditions

- Necessity analysis is underdeveloped in the literature; QCA development—and applications—have focused on sufficiency analysis
- but: *Kirq* and *acq* have sophisticated necessity testing
- Sufficiency analysis emphasizes causal complexity (a.k.a., multiple conjunctural causation, “recipes,” equifinality, or INUS conditions)

Necessary Conditions

Causal condition must (almost always) be present for outcome to occur.

Outcome is a subset of Cause



Sufficient Conditions

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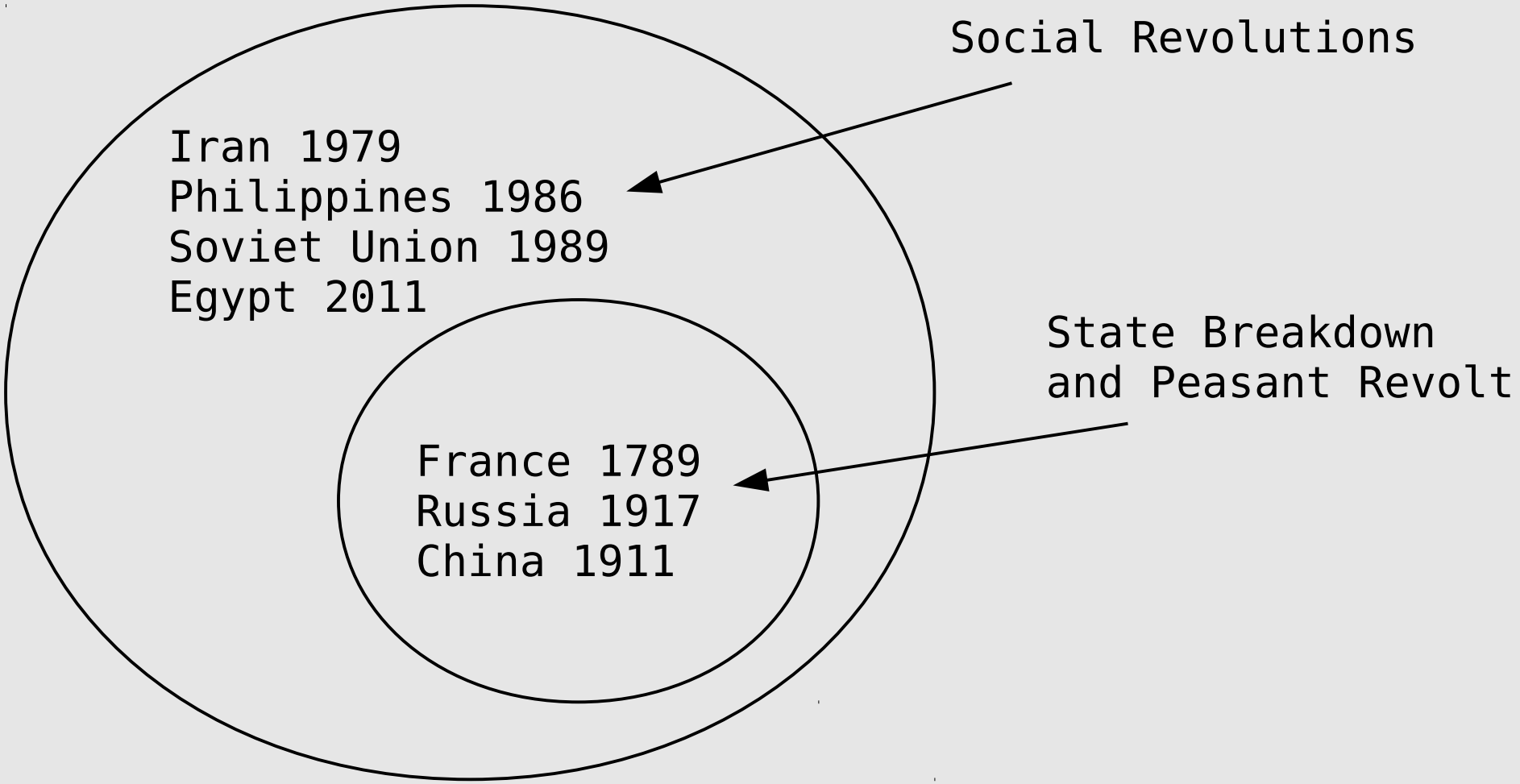

Three Types of Comparative/QCA Projects

- Uncovering causal recipes
  - The most popular use of QCA, and how we typically describe the method's goal
- Identifying taxonomies and types
  - Based on truth table analysis
  - Often engaged in “along the way” but can be its own end
- Analyzing context
  - What are the conditions under which phenomena do, or do not, occur?