QCA In Brief
(just seven slides – hotlinks too)

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1

What is QCA?

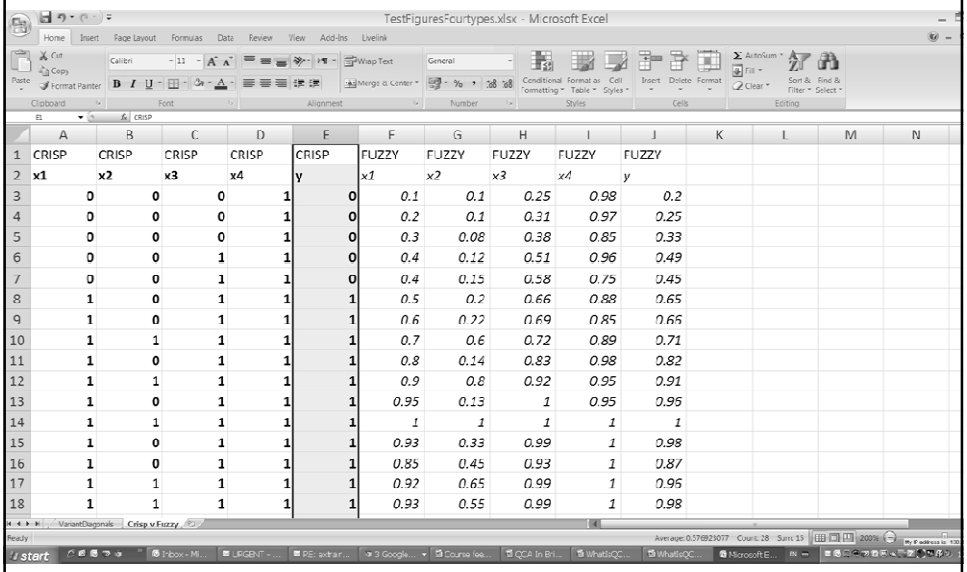
- QCA refers to several methods of case-based research.
- QCA usually involves systematically recording data from a mixed-methods project into a small or single table.
- After coding up this small table, it is analysed using the steps shown on the next page.
- A sample 'truth table' is shown, too.
- There are measures of how closely the patterns in the table conform to 2 kinds of causality. These measures are contested, do not involve 'error' or probability reasoning, and are discussed in QCA using a discourse mainly about 'subsets' and 'supersets', i.e. Venn diagrams also known as Boolean reasoning.
- An example of Boolean algebra is shown on below.

2

Steps in Typical QCA

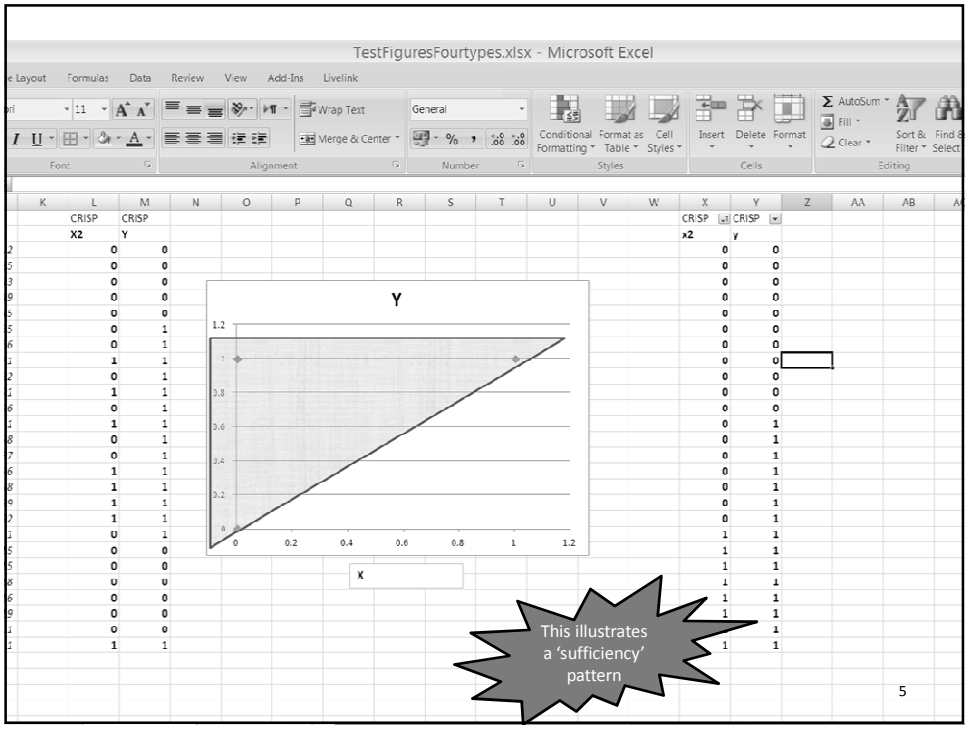
- 1. organise some data about cases into rows; a row represents a case.
- 2. create a variable for the outcome, Y
  - A) crisp: Y is a binary, 0/1. ***Y is 1*** (yes) or ***y = 0*** (no)
  - B) fuzzy: Y is a fuzzy set, {0 … 1}
- 3. sort the table by all variables or use a PC to examine *permutations that cause Y.*
- 4. produce tabular results as a table of configurations.
- 5. Each configuration has a 'consistency ratio', which is the extent to which it conforms to the claim that X causes Y, in the sense of X is sufficient for Y.
- 6. Each variable is also tested for its necessity for Y.
  - The necessity pattern is that XY and xy occur, alongside **xY.**
  - The sufficiency pattern is that XY and xy occur, alongside **Xy.**
- 7. Present the findings most easily using Boolean algebra.

3



	A	B	C	D	E	F	G	H	I	J
1	CRISP	CRISP	CRISP	CRISP	CRISP	FUZZY	FUZZY	FUZZY	FUZZY	FUZZY
2	x1	x2	x3	x4	y	x1	x2	x3	x4	y
3	0	0	0	1	0	0.1	0.1	0.25	0.98	0.2
4	0	0	0	1	0	0.2	0.1	0.31	0.97	0.25
5	0	0	0	1	0	0.3	0.08	0.38	0.85	0.33
6	0	0	1	1	0	0.4	0.12	0.51	0.96	0.49
7	0	0	1	1	0	0.4	0.15	0.58	0.75	0.45
8	1	0	1	1	1	0.5	0.2	0.66	0.88	0.65
9	1	0	1	1	1	0.6	0.22	0.69	0.85	0.65
10	1	1	1	1	1	0.7	0.6	0.72	0.89	0.71
11	1	0	1	1	1	0.8	0.14	0.83	0.98	0.82
12	1	1	1	1	1	0.9	0.8	0.92	0.95	0.91
13	1	0	1	1	1	0.95	0.13	1	0.95	0.95
14	1	1	1	1	1	1	1	1	1	1
15	1	0	1	1	1	0.93	0.33	0.99	1	0.98
16	1	0	1	1	1	0.85	0.45	0.93	1	0.87
17	1	1	1	1	1	0.92	0.65	0.99	1	0.95
18	1	1	1	1	1	0.93	0.55	0.99	1	0.98

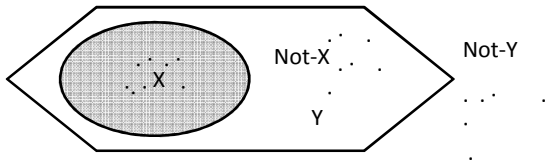
4



A Truth Table

	X	Y	N	
	0	0	11	
	0	1	7	
	1	0	0	
	1	1	8	

A Venn Diagram Showing Sufficiency of X for Y



Illustrations of Boolean Algebra

- X → Y (X causes Y) -… ambiguous whether X is necessary, or sufficient, for Y.
- We use this algebra to show sufficiency.

- Ab + CD → Y shows:
- {A and not B OR C and D }are two sufficient pathways for Y.
  - In one study, for 172 schools, SCHOOL PERFORMANCE WAS HIGH IF:
  - NotSociallyDeprivedArea&Catholic OR LotofSEN&SelectiveAdmissions
  - aB or CD = Y describes sufficient causality
- (See Byrne, et al., chapter in Byrne and Ragin, eds. 2009)

7

Conclusions – a Few Contrasts (Both Schools Can Test Hypotheses)

QCA

- Considers measurement to be a qualitative description of the case, i.e. a representation of the true character of a case
- Considers causality to exist across small groups of cases, which have similar features, known as **configurations**
- Considers **sufficient cause** to exist in multiple pathways, whereas necessary cause is not the same thing

Statistics

- Considers each case as a unit unto itself
- Considers measurement to contain measurement error
- Considers Y to be a probabilistically varying outcome
- Considers causality to exist at the **universal** level (ie. across the whole population)
- Considers mainly linear causality, implying that X is both necessary & sufficient for Y

8

QUERIES? – Write to wendy.olsen@ Manchester.ac.uk

References

Textbooks and Overviews

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Web Sites

- www.compasss.org
- Subscribe to this list for occasional nuggets of wisdom: https://www.jiscmail.ac.uk/cgi-bin/webadmin?A0=QUAL-COMPARE
- Sample data sets from:
  - www.ruralvisits.org/qca

9