Qualitative comparative analysis - QCA

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This presentation will

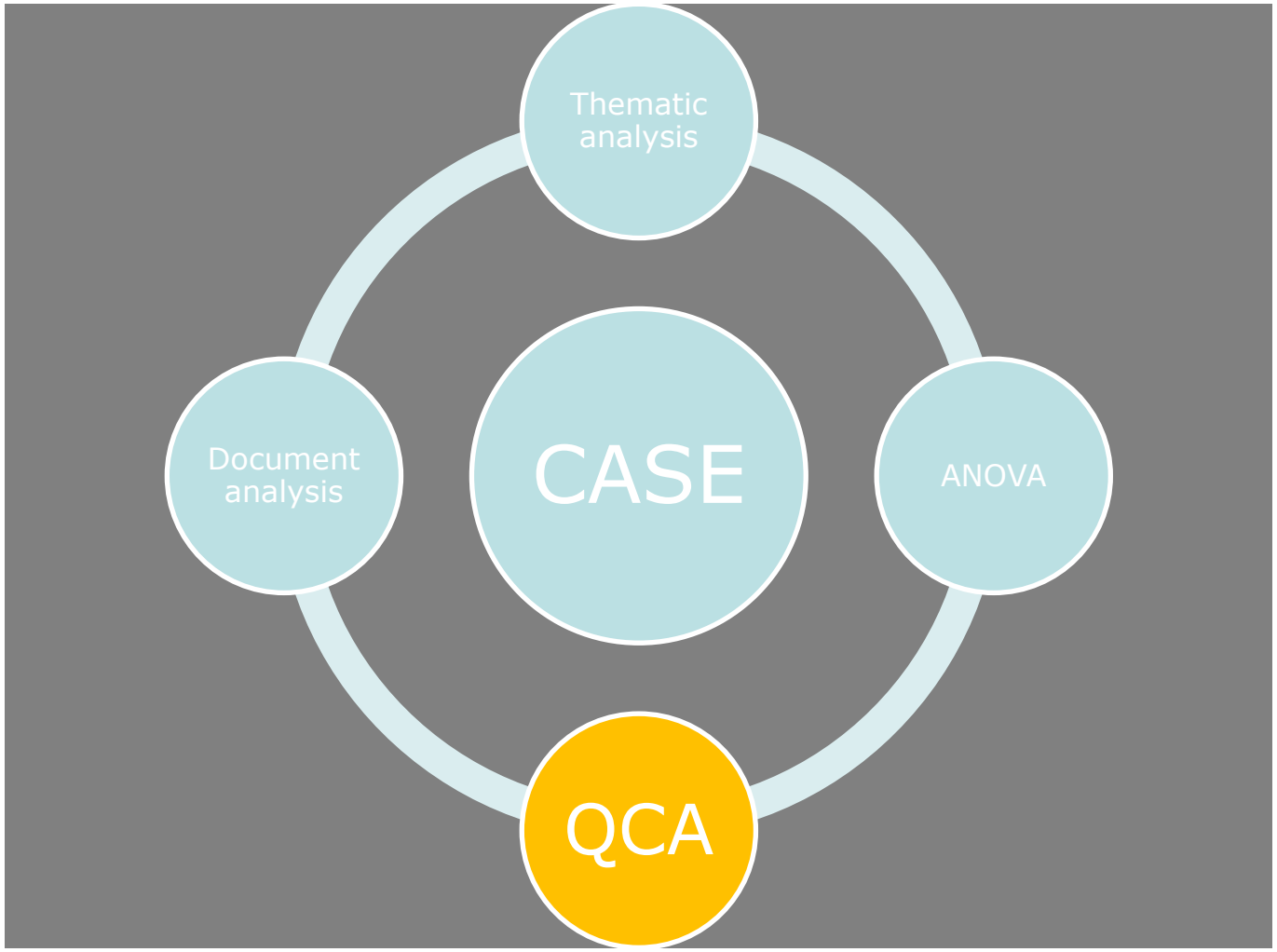
- Identify the research question
- Situate QCA
- Define QCA
- Examine the core principles of QCA
- Provide an insight to current findings
- Provide an exemplar of QCA
- Offer my thoughts on the use of QCA

Question

- How does the teaching model and duration of clinical placement, within an undergraduate nursing program, affect clinical skill acquisition and patient outcome?

Case study methodology

- Address how, what and why questions – complex settings and many variables
- Focus on cases
- Multiple data sources
- Converge findings
- Generate case report


Thematic analysis
Document analysis
CASE
ANOVA
QCA

Definition

- Vink et al (2009,p266) describe QCA as a '...family of comparative techniques that aim to explain macro-social phenomena in a parsimonious way while working with small- to medium- size data sets'

- Origins in social science research
- Looks to compare
- Method of analysis

QCA .....

- Is Case oriented
- Provides a way to dialogue between case and theory
- Generalises beyond the cases at hand *
- Has a particular language
- Is a method for considering qualitative and quantitative data (at the same time!)

* = moderate generalisation

Functions of QCA

- Summarize data
- Overview basic assumptions of the data
- Test hypotheses and theories
  - A theory of maths
- Develop new theoretical arguments

» Schneider & Wagemann (2010)

Principles

- Set theory – Venn diagrams that depict (compare) relationships
- Conditions of interest NOT variables
- Dichotomy
- Boolean algebra
- Parsimony – Occam's Razor
- Multiple conjectural causation

Set theory – Venn diagrams

- Set theory provides a formal language for comparing conditions
- Is reproducible
- ? More so than other qualitative approaches
- Venn diagram locates the cases visually – comparing even a few cases with few conditions will create many, many combinations

Conditions of interest NOT variables

- Conditions not variables
  - Variables associated with statistical methods
  - Complex causality
  - Necessary condition – must always be present for an outcome to occur
  - Sufficient condition – is always present for a particular outcome but other conditions may also lead to the same outcome

Dichotomy

- csQCA – crisp set QCA
- mvQCA – multi value QCA
- fsQCA – fuzzy set QCA
- MSDO/MDSO

Boolean algebra

- Form of algebra
- Conventions
  - [1] positive, on, white, new
  - [0] negative, off, black, old
  - [-] present or absent
  - AND [*]
  - OR [+]
- Provides a language for minimisation
- R*B*I + R*B*i $\rightarrow$ O
- R*B $\rightarrow$ O

Parsimony

Everything should be made as simple as possible, but not simpler.

Albert Einstein

In QCA speak – ‘a short (parsimonious) explanation of a certain phenomena of interest while still providing a appropriate allowance for causal complexity’

Berg Schlosser et al (2009)

Equifinality

Multiple conjectural causation

1. most often a combination of causally relevant conditions that generate the outcome
2. different combinations of outcomes may produce the same outcome
3. an outcome may result from the presence of a condition but may also occur when it is absent i.e. another condition also leads to the same outcome

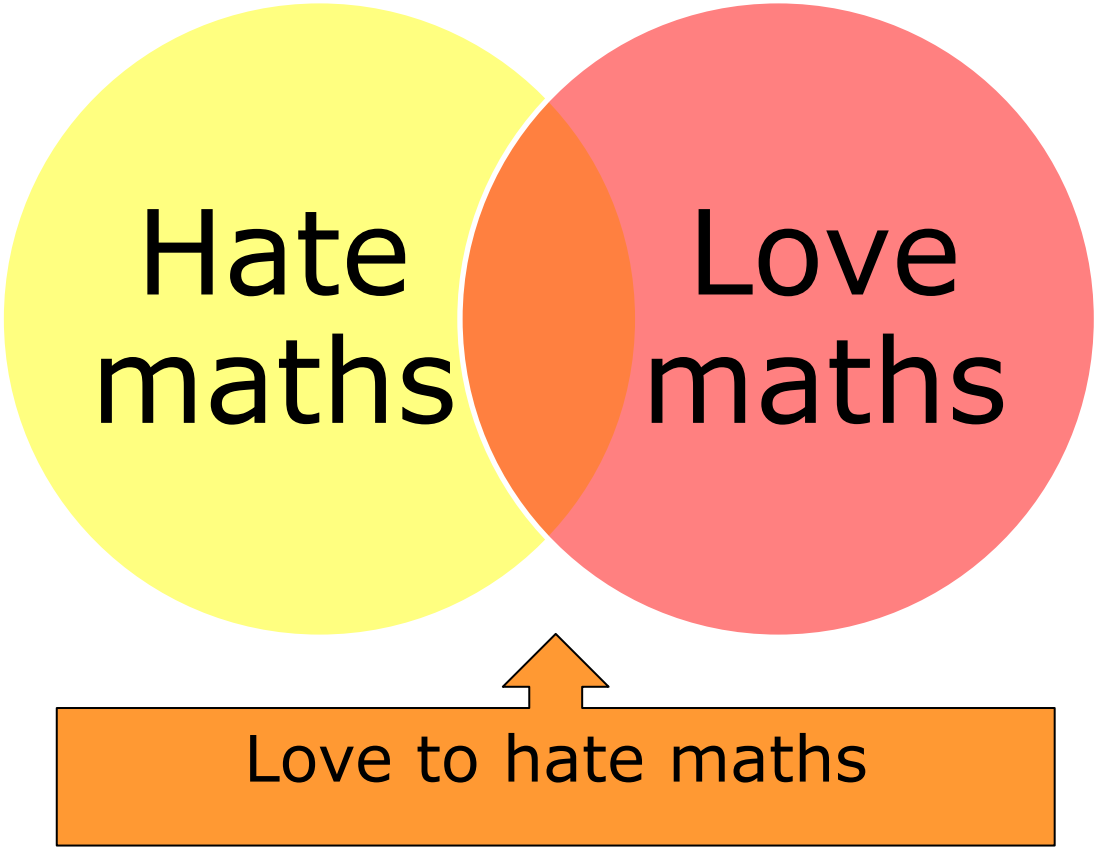
Selecting conditions

- Have a theoretical orientation
- Accommodates inductive and deductive reasoning
- Require transparency
- Qualitative conditions need to be allocated a numerical value (i.e. they lend themselves to dichotomy)
- Need to be defensible

A theory of maths

- Theoretical proposition – those who like maths are more likely to be competent in solving maths problems.
- We are going to ‘compare’ the lecturing staff from the School of Nursing

Set theory - Venn diagrams



Conditions

- I enjoy / do not enjoy solving maths problems
- LIKE
- I had a good / bad maths teacher at school
- TEAC
- I did / did not do maths homework
- HOME
- My parents encouraged / did not encourage me in maths
- PARE
- The answer to the following question is
- OUTC

Dichotomy

[1]

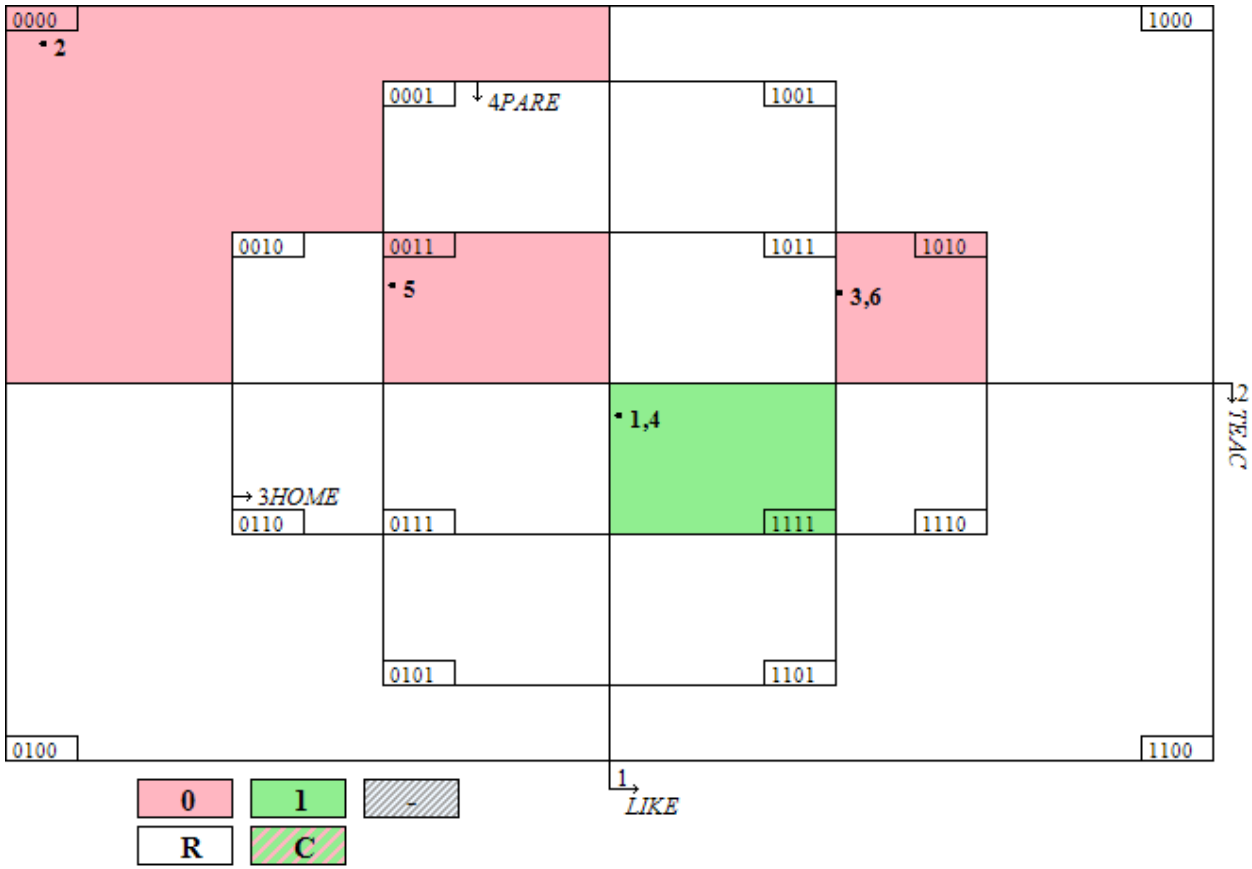
- Like maths
- Good teacher
- Did homework
- Parents encouraged
- >75%

[0]

- Do not like
- Bad teacher
- Did not do homework
- Parents did not encourage
- <75%

Data:

CASE	LIKE	TEAC	HOME	PARE	OUTC
1,4	1	1	1	1	1
2	0	0	0	0	0
3,6	1	0	1	0	0
5	0	0	1	1	0


0000
• 2
1000
0001
4PARE
1001
0010
0011
1011
1010
• 5
• 3,6
• 1,4
2
TEAC
3HOME
0110
0111
1111
1110
0101
1101
0100
1100
1
LIKE
0
1
-
R
C

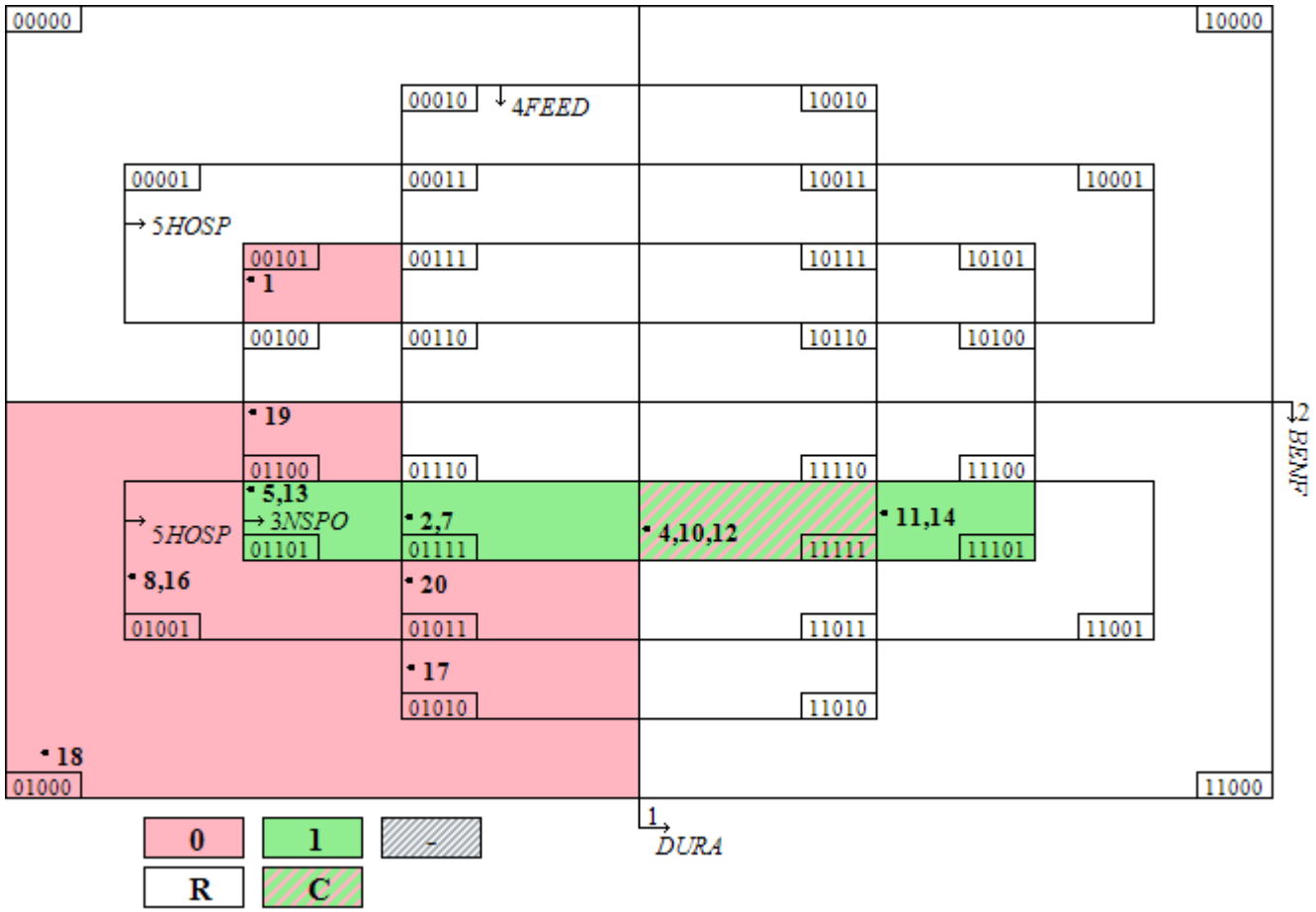
TOSMANA 1.3.2

Study conditions

- Duration – of placement
- Preparation – for the work setting
- Benefit – of attending clinical placement
- Lectures – describing falls, pressure area and pneumonia
- Feedback – perception by students
- Hospital – did students have a placement in the hospital of employ?
- Clinical experiences – of patients with falls, pressure area and pneumonia
- Outcomes - care / interventions for falls, pressure area and pneumonia

Truth table

CASE	DURA	BENF	NSPO	FEED	HOSP	OUTC
1	0	0	1	0	1	0
2,7	0	1	1	1	1	1
4,10,12	1	1	1	1	1	C
5,13	0	1	1	0	1	1
8,16	0	1	0	0	1	0
11,14	1	1	1	0	1	1
17	0	1	0	1	0	0
18	0	1	0	0	0	0
19	0	1	1	0	0	0
20	0	1	0	1	1	0



TOSMANA 1.3.2 Version – Visualiser - Venn diagram

And the findings.....

- Are considered within the case study context
- QCA provides a piece of the puzzle!

QCA is not ……..

- Directed to proving with statistical certainty a phenomenon
- Aligned to any permanent causality
- Always neat – contradictory configurations need to be resolved
- Straightforward especially minimisation

However QCA……..

- Encourages the consideration of complexity and causality
- Demands engagement of the researcher and the data
- May encourage important theoretical developments
- Is a timely addition to the research of difficult questions in education and nursing

Critique

- QCA will be ‘awkward’ for qualitative or quantitative purists
- ‘the skill and indeed the risk, in identifying the most suitable form of QCA analysis is in the researcher’s capacity to argue for the identification of the initial set of conditions’

My experience of QCA

- New language
- Little description of use outside of social science
- Software is ‘clunky’
- Contradictory configurations to be resolved
- Will be valuable to final case report

Thank you

References

- Berg-Schlosser D, De Meur G, Rihoux B, Ragin C (2009) Qualitatative Comparative Analysis (QCA) as an approach.In Rihoux B, Ragin, C (Eds) *Configurational Comparative Methods: Qualitative Comparative Analysis and Related Techniques* SAGE Thousand Oaks.
- Grofman B, Schneider C (2009) An introduction to crisp set QCA, with a comparison to binary logistic regression *Political Research Quarterly* 62, 4, 662-672.
- Ragin C (1987) *The Comparative Method: Moving beyond qualitative and quantitative strategies* University of California Press, Berkeley.
- Ragin C (1999) Using qualitative comparative analysis to study causal complexity *Health Services Research* 34,5,1225-1239.
- Rihoux B (2006) Qualitative comparative analysis (QCA) and related systematic comparative methods: Recent advances and remaining challenges for social science research *International Sociology* 21, 5, 679-706.

- Rihoux B, De Meur G (2009) Crisp-set Qualitative Comparative Analysis (csQCA) In Rihoux B, Ragin, C (Eds) *Configurational Comparative Methods: Qualitative Comparative Analysis and Related Techniques* SAGE, Thousand Oaks.
- Rihoux B, Ragin, C (Eds) (2009) *Configurational Comparative Methods: Qualitative Comparative Analysis and Related Techniques* Applied Social Research Methods Series, SAGE, Thousand Oaks.
- Schneider C, Wagemann C (2010) Standards of good practice in qualitative comparative analysis (QCA) and fuzzy-sets *Comparative Sociology* 9,3, 397-418.
- Skaaning S E (2011) Assessing the robustness of crisp-set and fuzzy-set QCA results *Sociological Methods and Research* 40, 2, 391-408.
- Vink M, van Vliet O (2009) Not quite crisp, not yet fuzzy? assessing the potentials and pitfalls of multi-value QCA *Field Methods* 21, 3, 265-289.
- Wagemann C, Schneider C (2010) Qualitative comparative analysis (QCA) and fuzzy-sets: Agenda for a research approach and a data analysis technique *Comparative Sociology* 9, 3, 376-396.