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Qualitative Comparative Analysis: a pragmatic method for evaluating intervention

A CECAN Evaluation and Policy Practice Note for policy analysts and evaluators

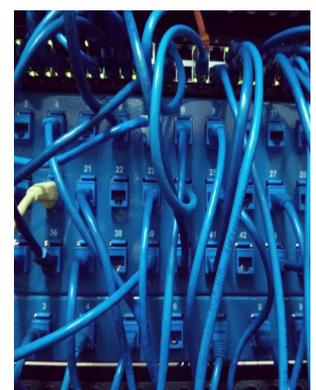


Qualitative Comparative Analysis (QCA) is a method which allows us to make systematic comparisons across cases in order to explore what causes differences between the characters of the cases. It draws on the long tradition of the comparative method in the social sciences but develops this beyond qualitative description. QCA starts from a careful qualitative consideration of each case when the number of cases is small enough for this to be done. It then moves into a quantitative mode by describing each case in relation to a set of attributes which are considered to be of significance. In evaluation work we can consider that character in terms of the outcome any intervention has been seeking to achieve. A very important feature of the QCA approach is that it allows both for complex causation – more than one attribute in combination may be what causes the outcome – and equifinality – there may be more than one causal set which can generate the same outcome. In summary QCA is a method for establishing causation on the basis of systematic comparison across a number of cases.

What are the main elements of Qualitative Comparative Analysis?

QCA works particularly well when:

- We have all the cases of interest to us. We can use QCA with sample data when we are working only with part of the set of cases of interest but in evaluations where we are looking at similar interventions in a restricted set of locations we often have complete coverage. If we have all the cases then there are no issues regarding statistical significance.
- The total number of cases (N) is not too large. We can do QCA with very large data sets but in evaluations we are usually working with a small to medium N – say 10 to 50 or so cases.



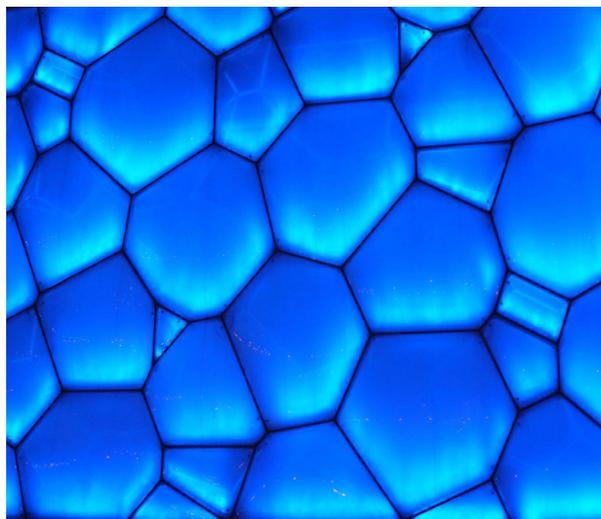
Some key terms used in QCA:

Outcome: a state of the system. For example in the study of health inequality reduction described below this could be whether the Local Strategic Partnership was reducing the gap on an indicator or not. A complex outcome would be its performance across the whole set of indicators.

Attribute: a quantitative description of something that we think might have causal powers, either taken alone or in combination with other attributes, outcome of interest. Usually we measure this as a binary category – the attribute is present or absent – but in fuzzy set QCA we can use an ordinal measure of the degree to which the attribute is present. Usually we use “fuzzy” in terms of values of 1 – totally present, 0.75 more present than not, 0.5 mid way, 0.25 not much present, and 0 not present at all.

Configuration: a set of attributes of a case which are associated or not associated with a particular outcome. The outcome can either be binary – the outcome happened or it did not, or fuzzy where we consider the degree to which the outcome happened.

Truth Table: the first level of output from QCA software. It is a table of attributes tabulated against outcomes. All possible configurations i.e. combinations of attributes, are set against outcome



What are the essential features of QCA?

As a method of evaluation QCA is:

Qualitative – we can use qualitative materials and as far as possible we should have a deep qualitative/descriptive knowledge of our cases. With large number of cases we may classify the cases into for representative types. We can use any numerical typology algorithm to do this.

Comparative – our causal account is based on systematic comparison using a refined version of the method of differences. If there are differences among similar cases in relation to an outcome, then there is assumed to be a cause for that difference. We want to identify that cause, recognizing that it may not be one thing but a complex combination of things.

Analytical – we analyse our cases, not in terms of measures on conventional external “variables” but rather in relation to attributes which can be thought of as traces of sub-systems. Attributes are things which describe the state of the system, rather than forces acting on the system from outside, which is the conventional understanding of the causal power of variables.

In which contexts can QCA be most usefully applied?

QCA is particularly useful:

- When we have a small to medium number of cases of interventions which are of a similar kind but applied in different contexts eg locales.
- When considering interventions “done” by actors over time. There is differential agency and the development of difference through time in terms of how actions are carried out in the different contexts. However, in conventional QCA we only can look backwards from the present state of the system, which we understand to be an outcome of those previous actions, the result of decisions taken in a previous context.



What advantages does QCA offer?

QCA is a deeply pragmatic method that looks back across cases to see how outcomes - understood as condition states for the systems - were achieved:

- It enables systematic comparison based on deep qualitative knowledge of the characteristics of each intervention in each locale, locales considered in both temporal and spatial terms.
- Comparisons become systematic because we create attributes of each system from both pre-existing quantitative descriptions and from careful review of qualitative information in order to create new attributes; ability to cope with complex causation; explicit recognition of equifinality i.e. the possibility of multiple causes, including multiple complex causes, of the same effect as an outcome / system state; ability to explore both necessary and sufficient causation including specification of necessary and sufficiency for complex causes.
- Attributes can be created relatively easily from qualitative data using the case nodes facility in **NVIVO**. Qualitative materials can be reviewed not only to establish themes but also to identify new attributes of the cases. These can be assigned to the attribute facility and exported as .dat file which is appropriate input for the QCA software.

For further information on **NVIVO**:
<http://www.qsrinternational.com/nvivo-product>

For further information on **QCA software**:
<http://www.u.arizona.edu/~cragin/fsQCA/>

What are the drawbacks of using QCA?

There are potential problems that need to be kept in mind:

- There may be problems with temporal ordering (although there are ways around this). QCA tends to be used as a cross-sectional method (i.e. looking at a case at only one point in time) but it we can use it to see what things in the past contributed to the present state of a system.
- Using binary QCA, if there are N elements of measurement for each case there are 2^N possible configurations. So there can be more possible configurations than cases. However, many configurations may not be present in the data set and this reflects the actual character of the real possibility space. In other words we have limited diversity in terms of outcomes. Not all possible outcome states exist in reality as represented by our data set.
- Reducing the amount of data can be helpful. It is possible to use a clustering technique, latent class analysis or (for continuous data) factor analysis, to reduce the number of attributes assigned to each case as a way of reducing the possible set of configurations. This is a useful way of generating a more manageable set of configurations in the Truth Table produced by the **QCA software**.

Example: Evaluation of reducing health inequalities

Spearhead Areas in England were studied in relation to their achievements in reducing health inequalities. The units were Local Strategic Partnerships and they were tasked with closing the gap in relation to a set of targets.

- Background data was collected on all 75 Spearhead areas and intensive data was collected from 45 of the areas in relation to processes engaged in to reduce health inequalities in each of the target areas.
- The data collection instrument was co-produced with actors in the health system. Comparison on the background data showed no difference between those areas for which a full response was achieved and the others.
- Not all cases in a configuration had the same outcome in relation to closing gaps, but there were clear dominant patterns which showed what processes in which localities were associated with success or failure. One of the biggest difficulties came from the poor institutional memory of the agencies - public sector institutional memory is often weak.
- Results were discussed with the actors who found them useful in guiding future work. Key findings in relation to interventions aimed at preventing premature mortality for coronary vascular disease and cancer were:
 - **Good coordination at a reasonable level was associated with better outcomes than excellent coordination.** As one practitioner commented: *enough is fine, too much stops you getting on with the job.*
 - **Champions were important. If there was an individual who championed the objective then there were better outcomes. Many champions, but not all, were clinicians.**
 - **The combination of enough but not too much coordination and champions was particularly associated with good outcomes.**
- For prevention of teenage pregnancy, in areas which had been denied access to schools, outcomes were better than in areas where such access had been obtained: i.e. contrary to the prevailing wisdom that the best way to work was through schools. Where high risk groups (looked after children, youth offenders, youth clubs on difficult to let estates) had been targeted, outcomes were better. The key point was that this pattern was established across multiple cases.
- This study is an example of a pragmatic, in the strict sense of that word, use of QCA which is an inherently pragmatic technique.

References and further information

Blackman, T., Wistow, J. & Byrne, D. (2013). Using Qualitative Comparative Analysis to understand complex policy problems. *Evaluation* 19 (2): 126.

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The Centre for the Evaluation of Complexity Across the Nexus (CECAN) is a £3m national research centre hosted by the University of Surrey, bringing together experts to address some of the greatest issues in policy making and evaluation.

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