Qualitative Comparative Analysis

NERUPI network
Evaluating & Researching University Participation Interventions

Description:	Qualitative Comparative Analysis (QCA) is a process of comparing the configurations of different cases in order to identify the components that result in specific outcomes. Findings are based on seeking logical combinations of causes and effects, identified through pair-wise comparisons of all the cases. The programme theory underpinning the evaluation would inform the choice of causes and conditions to be included in the analysis.
Type of evidence:	OfS Type 2 (empirical).
Strengths:	A QCA evaluation can be used where there are only a small number of cases (as few as ten). This can be useful in evaluations of small-scale interventions. The minimum number would depend on the number of conditions being investigated, since ideally there would be enough cases to represent all combinations of conditions. However, a large amount of information is needed on each case. QCA analysis can identify the combinations of conditions which generate the outcome, and is therefore good for unpicking complex programmes involving several interventions (i.e., several causal pathways). It also identifies the conditions under which the outcome occurs. Moreover, the analysis can highlight conditions which are a block to achieving the desired outcome. It is considered a rigorous approach that can be the basis of making policy recommendations about the replicability of activities and their transferability (although this may be limited to thinking about the specific conditions in the cases under investigation). QCA could potentially identify features or aspects which other types of statistical analysis might miss because they were not in the model.
Weaknesses:	QCA relies on having sufficient information about the cases, so a potential weakness is due to data availability which would limit the possible number of conditions included in a study. Where there are only a small number of cases the number of configurations might not be very diverse, or the selection of cases could bias the findings. The analysis reduces complex conditions to binary conditions, and detailed knowledge of the conditions is needed in the first place to justify the creation of the variables and how they are coded. The coding relies on making meaningful distinctions, including ones that practitioners or policy makers can work with. There could be a trade-off between simplifying the results and including the highest level of detailed information.
Mixed Methods:	QCA can be used to add qualitative insights into other types of evaluation – for example, it could complement quantitative data analysis in order to unpick the theoretical basis for the results.
Expertise:	High.
Requirements:	QCA would only work if there is the opportunity to collect a large amount of information on the cases under investigation, as in a number of in-depth case studies. The technique requires the features and conditions captured in the cases to be coded numerically – so there needs to be a clear definition of each variable and the threshold to be used when coding. The dataset also needs to include robust evidence on the outcome of the activity being studied. The technique is rather specialist and needs an existing QCA expert, or someone who can undertake training in QCA. Specialist software is needed to underpin the coding and mapping of the cases (a google search showed that there are several free software packages that could be used).
Ethical considerations:	Ethical considerations would need to be addressed when collecting data on the cases in order to avoid potential risks to the individuals involved. Data could be collected through different tools and methods so these would need to be specified from the outset and the ethical issues associated with these addressed before the data collection starts.

Working planning:

QCA is an iterative process, working with the data collected on the cases and translating each case into a set of defined conditions based on a series of appropriate variables – plus at least one outcome indicator. Firstly, the evaluator would code the conditions and outcome for each case using dichotomous variables (Yes/No, Male/Female, Target/Not target etc), or, in the case of fuzzy sets, classified on a scale from 0 to 1 measuring the degree of membership in the set. This data is then set out in tabular form using specialist QCA software.

The data is synthesised by means of a 'truth table' which defines how the conditions relate to the outcome (cases are shown in rows, conditions are listed in columns in binary form, with the final column listing the outcome in each case). There are five possible situations: configurations of variables where there was an outcome; configurations where there was no outcome; configurations where there was an intermediate outcome; configurations where the outcome was present in some cases but not others (i.e., contradictory outcome); and configurations which were not observed in practice (but which could theoretically generate the outcome).

The purpose of the analysis is to find out which conditions are necessary or sufficient for the outcome to be observed. The evaluator would go back and consider the contradictory outcomes (i.e., where the same conditions sometimes led to an outcome but sometimes did not) in order to identify any additional factors that could explain the contradiction, or to retest based on moving the threshold or redefining the condition to resolve the contradiction.

The software undertakes a data minimisation process in order to identify the shortest configuration which explains the outcome. Those variables signifying conditions that do not affect the outcome are removed at this stage.

The combinations of causes and effects are identified through making pair-wise comparisons. For necessary conditions (i.e., something that must happen for an effect to occur), the outcome will be a subset of the cause. For sufficient conditions (i.e., something that needs to be present before something else can occur), the cause will be a subset of the outcome.

Analysis:

The software can then tell the evaluator the 'coverage' or extent to which each of the remaining configuration of conditions explains the outcome (for example, the percentage of cases they explain). It also gives a measure of 'consistency' or extent to which the configuration is always associated with the outcome. In this way the QCA process results in identification of the simplest set of conditions that accounts for the outcome.

Reporting:

The analysis results in various 'casual recipes' relating to the conditions which lead to an outcome for certain cases. The results could be expressed as statements such as: "Condition A and condition B or a combination of condition C and condition D will lead to outcome X". The point of the evaluation is usually to test the existing theory, so the findings should be evaluated to see whether they support the theory or offer a new theory to explain what happened.

Useful links:

www.fsqca.com

Patrick A. Mello (2021) Qualitative Comparative Analysis: An Introduction to Research Design and Application, Georgetown University Press.