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**“The Usefulness of QCA Under Realist Assumptions”**

(Bio of the author is found at the end of this article)

Qualitative comparative analysis (QCA) opens up two new forms of knowledge: firstly knowing about alternate pathways to one outcome (equifinality), and secondly perceiving nuances of necessary cause and sufficient cause. Several misunderstandings of qualitative comparative analysis (QCA) occur in the article by Lucas and Szatrowski (this volume). First there are minor problems with expressions. Then secondly, there are differences between their philosophy of science (arguments 1, 2 and 3 below) and a realist approach. Thirdly, they misinterpret what was meant by sufficient and necessary cause (arguments 4 and 5 below).

The minor problems with expressions arise in section 2.2 and section 3. At s 2.2 the authors define consistency but here they miss out two key points. Firstly they omit to say that this particular measure of consistency is a measure of sufficiency of cause, not of necessary cause.<sup>1</sup> Second, they ignore the way that *the consistency level exists for each possible configuration of characteristics*. A configuration can be shown in one row of a truth table, with  $n_1=28$ ,  $n_2=17$  within a larger sample of 155, etc. (see Byrne, 2009: 262). Using QCA's definition of 'consistency', we can discern more about the pattern of causality than one might initially expect. This learning is possible whether N overall is 155, or just 39, or thousands of cases. The essential task is to simplify and rank the list of configurations (Ragin, 2006).

At section 3, the discussion of 'determinism' is also confusing, lacking a clear statement of what is meant by determinism. What is needed is a clear ontological position. Realism offers

a clear position. Realists would say: causes are real, but each one is often obstructed or mediated by contextual factors.

Overall, partly as a result of their lack of ontological clarity, Lucas and Szatrowski understate the user-friendliness of the QCA method.

### **(1) Investigators Have Purposes and Theories**

Scholars like Rihoux and Grimm (eds., 2006) and Snow and Cress (2000) who invoke QCA are serious experts with deep knowledge of their subject. These investigators make sure their interpretations conform to the reality, and inevitably they produce situated knowledge (Smith, ed., 1998).

Lucas and Szatrowski, by suggesting that we mine datasets to find an optimal model or ‘solution’, has neglected the links people draw between funders, scholars, users, and readers of research (Flyvberg, 2001). Even given these links, any new knowledge must also still be true to reality (Byrne, 1999, 2002). There may be more than one practically adequate interpretation (Sayer, 1992). The evidence might support more than one interpretation. The idea of ‘validating the method’ (s 4 of Lucas and Szatrowski) is not consistent with realism. Each author instead needs to draw out valid **claims** after doing the research. In QCA therefore the ‘parsimonious’, intermediate and complex solutions to a simplified data table can help us to develop warranted arguments (Fisher, 1988, 2001). The ‘results’ do not simply constitute those arguments (Olsen and Morgan, 2005). QCA is an accessible, systematic, transparent medium for presenting case-study research.

In reviewing the paper, I took some results reported by Lucas and Szatrowski and made sure the fsQCA software replicated them. It did. (The software are by Ragin, et al., 2006.) The issue is interpretation.

## **(2) Epistemological Grounding of QCA -Based Findings and QCA Procedures**

Deeper issues also arise because I claim that knowledge about a particular **configuration** can be a valid contribution to sociological knowledge. Knowledge need not be about one universal model for a whole social domain. Knowledge claims are constrained by the data gathered and marshalled to support them. Knowledge is grounded by making reference to the real world. Thus the use of artificial data in s 4 is poorly constructed. It does not refute QCA because no background knowledge can be obtained: the data don't reflect reality.

## **(3) Data are Traces of the Real**

Realist scholars have asserted that epistemology is always flavoured by ontological presuppositions or assertions (Sayer, 1992). It is important for social theorists to tease out and name the different types of causal mechanisms as if they were separate, because they are different in their nature. These essential features of social causes are in turn contingent on events and structures in social history. Realism is not deterministic. Ragin's work (2006, 2008) is more like Byrne's realism. Ragin uses ontological elements similar to those listed by Sayer (1992), and his work is unlike Mahoney's approach (s 3). The trope that the QCA 'solution' offers 'recipes' does not do justice to the complexity of society. Perhaps using the word 'recipe' is unfortunate. Realists develop warranted arguments. In s 3 and 4 the paper does not do justice to the seriousness of many QCA authors' applied contributions. The randomly distributed error term found in simulation equation 1 (pg 13) shows a lack of understanding of a depth ontology. It also shows a preference for an artificially constructed

data world which is unlike the real world. Among realists this is sometimes called ‘idealism’ (meaning a focus on ideal types or ideas, not on reality).

#### **(4) Patterns That Suggest Sufficiency Deserve to be Noticed**

Equifinality (two pathways to one outcome) has been recognised in other methods. These include structural equation modelling (SEM) and interaction effects in regression. Similar to QCA, one pathway may be active in one group of cases, and another pathway in a different overlapping set of cases. There are limits to this analogy. Notably, SEM is always carried out in a random sampling context. Another key difference is how the “errors” are treated: in QCA there are no “error” terms but in SEM the model structure and its goodness of fit are absolutely central to the method. In this sense QCA is mainly about causal models.

In QCA the left- and right-hand side deviations away from the diagonal line in the X-Y space mean entirely different things. The upper left triangle reflects ‘sufficient cause of X for Y’ and the lower right triangle reflects the X factor being a ‘necessary cause of Y’. If X is necessary, it can usually not also be sufficient since they are converses.

Suppose one began by testing the interaction  $X1 * X2$ . Suppose X1 and X2 were crisp, and Y was a fuzzy set. ( $X1X2$  is a configuration. \* means ‘and’ here.) For sufficiency,  $X1 * X2$ ’s effect could be discerned by counting the relative prevalence of three possible situations:

Cases with X1 and X2,	and Y1 high
Cases with X1 and X2 absent	and Y1 low
Cases with X1 and X2 absent	and Y1 high (nevertheless).

Y1 may also have been caused by something other than X1 and X2 combined. Figure 1 illustrates.

Figure 1: Four Patterns and their Interpretation in Qualitative Comparative Analysis

<table border="1" style="margin: auto;"> <tr> <td style="padding: 5px;"><math>Y \downarrow X \rightarrow</math></td> <td style="padding: 5px;">No</td> <td style="padding: 5px;">Yes</td> </tr> <tr> <td style="padding: 5px;">High</td> <td style="padding: 5px;"></td> <td style="padding: 5px; background-color: #cccccc;">::</td> </tr> <tr> <td style="padding: 5px;">Low</td> <td style="padding: 5px; background-color: #cccccc;">::</td> <td style="padding: 5px;"></td> </tr> </table> <p style="text-align: center;">X is necessary and sufficient for Y</p>	$Y \downarrow X \rightarrow$	No	Yes	High		::	Low	::																					
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In Evidence Pattern 1, each time a case appears in the bottom right cell, it contradicts the hypothesis that X is sufficient for Y. Using a mixture of crisp and fuzzy set memberships we have empirically discerned sufficient configurations using data on slum dwellers in Chennai (Olsen, et al., 2010; Harriss-White, et al., 2013).

### (5) Mechanisms That Operate as Necessary Causes Operate Independently of Each Other and in Tandem

A wholly different evidence pattern is where the data instead support the claim that  $X_1 * X_2$  is **necessary** for Y (Ragin, 2008, 2009). Finding necessity within a configuration that is sufficient<sup>ii</sup> is different from finding necessity overall. This distinction did not get highlighted in the paper by Lucas and Szatrowski. Their Table 4 should be clearly labelled as ‘sufficiency consistency’, and their addition of a “non-causal” factor should be noted as artificial. If a real factor had raised all the levels of consistency (for sufficiency), we would then explore what

aspect of it bore this causal mechanism. We would explore its nature and then develop a better theory that integrated this causal mechanism.

## **(6) Conclusions**

Based on the preceding arguments, this critique of QCA does not seem well founded. The authors created an artificial dataset by a data-generating process that mimicked random error (their Eq. 1) rather than mimicking a mix of ‘necessary’, ‘sufficient’ and INUS relations. They have ignored a key fact about asymmetry in the data. Variation in one direction supports the claim of necessity, but variation in the other direction supports the converse claim of sufficiency. The attempt to rebut QCA needs to assume the strongest possible underlying presuppositions for QCA (Fisher, 2001). The best foundation is to assume complexity of the underlying social relations. These data and the ‘solutions’ (tables 4-6) do not reflect in a naturalistic way any underlying social relations. As a result of ignoring complexity and the role of theory, the rebuttals are unconvincing. Replication studies can attempt to refute someone’s findings, but they need to make reference to the real world, not to purely numerical patterns.

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## Biography of the Author

Wendy Olsen works at the University of Manchester. She teaches development studies, sociology, development economics, applied statistics, and research methods. Her recent book *Data Collection: Key Trends and Methods in Social Research* (Sage, 2012) summarises a variety of methods ranging from interviews and realist enquiry to statistical analysis, questionnaire surveys, and QCA. Her research interests include gender and British labour markets; economic and social aspects of labour markets in South Asia; moral economy of child labour; gender pay gaps; and research methods. Her specialist areas include the regulation of informal labour markets; feminist analyses of labour relations; labour supply; and mixed methods. Her other publications include *Rural Indian Social Relations* (Oxford, 1996); *The Politics of Money*, with F. Hutchinson and M. Mellor (Pluto, 2002); and *Realist Methodology* (edited 4 volumes of reprints, Sage, 2010). In Chapter 1 of Vol. 1 of the latter she reviews a critical realist approach to mixing methods. This approach synthesises methods, notes the overlap of ontology with epistemological issues, and avoids the classic Qual-Quant ‘schism’. She is currently working on fuzzy set causal analysis, causes of gender pay gaps, institutional change, people’s habitus in India and Bangladesh, and moral reasoning strategies.

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<sup>i</sup> If a variable representing a necessary cause (overall) is left in the model, it can reduce the consistency level of the other variables within various configurations. It should be removed as noted by Ragin (2008), Rihoux and Ragin (2009), and Ragin et al. (2006) manual.

<sup>ii</sup> This is a situation known as an INUS condition. There, X is necessary within a sufficient condition, but X is not in itself sufficient for Y.