COMMENT: GETTING QCA RIGHT

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In recent years, qualitative comparative analysis (QCA) has gained in popularity and has spread beyond its home base of comparative sociology and political science, fields that have traditionally been marked by a strong tradition of case-oriented analysis. With growing popularity and profile comes also greater critical attention, and thus it is not surprising and indeed welcome to have researchers unfamiliar with QCA engage with a set-theoretic approach and probe its soundness, such as the recent work of Mendel and Korjani (2013). As QCA users (along with other methodologies), we are enthusiastic about this kind of attention to QCA, a research approach that should see continued innovation going forward.

In contrast, the article by Lucas and Szatrowski (this volume, pp. 1–79; hereafter L&S), although purporting to provide a balanced critique and sound assessment of QCA, in fact provides neither. L&S argue that their use of simulated data sets shows how “QCA finds the correct causal story only 3 times across 70 different solutions” (p. 1) and that even these successes in fact reveal additional fundamental problems. In this short response, we show that their tests are often neither valid assessments nor correct analyses and that their portrayal of QCA is conceptually incorrect on core points. Indeed, when performed correctly (which is not difficult given the relatively simple data sets), QCA in fact finds the “correct causal story.”

USING SIMULATIONS TO EXAMINE QUALITATIVE COMPARATIVE ANALYSIS

We welcome the use of simulation to assess QCA as an analytic technique. Simulations can reveal properties of an analytic technique, such as its underlying assumptions, that may remain otherwise uncovered. Our reasons, however, are somewhat different from those suggested by

L&S, who argue that "because QCA purports to instantiate a deterministic epistemology, study of QCA's behavior under controlled conditions could aid efforts to adjudicate seriously contentious epistemological claims" (p. 11) The argument that QCA is deterministic has been rebutted elsewhere (e.g., Ragin and Rihoux 2004), and we will not repeat these arguments here; hence, one core foundation of L&S's demonstration is simply incorrect. This is, incidentally, one of numerous incorrect statements by L&S about QCA, which we cannot discuss here in detail.

We agree, however, with the claim that simulation data, if analyzed correctly, can provide further validation for a method. Indeed, although L&S claim that simulations are "an approach QCA analysts have rejected" (p. 3), they are not the first ones to use simulation to assess QCA, as one of the coauthors of this comment used simulations to study QCA, some of which are quite similar in design to the ones described by L&S (Marx 2010; Marx and Dusa 2011). These simulations aim to understand what results crisp-set QCA generates when used on data generated through random allocation of zeros and ones in the cells of a data matrix with a probability of .5. However, although Marx (2010) aimed to replicate in his simulation a typical QCA analysis, the approach of L&S is different in that they generate synthetic data with a known structure, more akin to the data example used by Fiss (2007), for example. We now turn to the specific simulation studies that L&S describe.

GETTING THE RESULTS OF THE SIMULATION STUDIES RIGHT

In their article, L&S use six different simulations. Study 1 is a simple simulation study using 40 cases and four causal conditions such that "$Y = 1$ if $X_1 = X_2 = 1$ or if $X_3 = X_4 = 1$" (p. 17). After conducting a crisp-set QCA on these data for the presence and the absence of the outcome Y, they argue that of the six relevant solutions, five are "incorrect." Specifically, they claim that QCA identifies "incorrect" causal recipes for the complex and intermediate solutions, while "the parsimonious solution for $Y = 1$ is wrong but for $Y = 0$ is correct" (p. 19). One out of six would be a pretty bad record indeed. However, this kind of counting is simply wrong, as the complex and intermediate solutions are not valid tests given that these are synthetic data that do not cover all possible configurations. Hence, only the parsimonious solution should be examined. Furthermore, and even more important, although we have aimed to replicate the results of L&S, we have been unable to reproduce the results they report on the basis of the data they provide. Instead, a QCA analysis finds the "correct" answer for both parsimonious solutions. Instead of one out of six solutions correctly identified, the record actually is two for two.

L&S then add an additional noncausal factor Z_1 to examine whether QCA is able to eliminate such a noncausal factor and still produce the correct recipe. They again report that only one out of six solutions is correct, with the same pattern as before, whereby only the parsimonious solution for $Y = 0$ is correct. L&S unfortunately do not provide their noncausal component in their appendix, and thus we cannot exactly replicate this analysis. However, we created our own simulation data, which are reported in the Appendix to this comment. The random, noncausal condition Z_1 is correlated at –.041, –.123, –.064, .240, and .042 with X_1 to X_4 and Y, respectively. Our subsequent analysis, including the noncausal factor Z_1, finds that QCA correctly eliminates this factor in both parsimonious solutions (i.e., the two relevant ones). Again, the correct record is two out of two. In sum, L&S's subsequent statement that "in Study 1, 10 of 12 QCA solutions were incorrect" (p. 27) is simply not accurate. The correct record with our simulation data is actually four out of four.

In Study 3, under the heading "Ideal Data, Yet Qualitative Comparative Analysis Fails?" (pp. 39–41) L&S up the ante by returning to the same data and suggest that overdetermination may be a problem for QCA. They delete three overdetermined cases and repeat the first analysis of their Study 1. They again find that the complex and intermediate solutions are "wrong," even though they are actually not relevant given the simulation data, whereas the two parsimonious solutions are correct. They then use the apparent contrast between "irrelevant" and "correct" solutions to argue that QCA has an "implicit 'no overdetermination' assumption" (p. 41). However, because in fact QCA gets situations in which overdetermination is present (Study 1) and in which it is absent (Study 3) "correct," this argument is again not supported. The findings show quite the opposite: that QCA does work with overdetermined outcomes and that the simulation of L&S, when done correctly, in fact makes that argument for Ragin.

CONCLUSIONS

In this short comment, we cannot examine all the studies detailed by L&S, and we have therefore focused on some of their foundational tests. What we have examined from their piece demonstrates that, if properly used and if based on a technically correct understanding of QCA, simulations confirm QCA's strength and analytical usefulness. Unfortunately, not only do L&S present QCA's underpinnings incorrectly, but their use of simulations in connection with QCA is also flawed and does not offer an informed and balanced contribution to the debate around QCA. In addition, we regret their aggressive and negative writing style.

To be clear, we welcome informed and candid engagement with QCA. It will make the approach stronger and better. Much of this will come from a closer engagement between QCA and conventional large-*n* analysis using correlations, and we have indeed called for this kind of engagement, as we believe it may allow "insights from large-N QCA to become more robust through comparison across methods and more precise in assessing the magnitude of relationships" (Fiss, Sharapov, and Cronqvist 2013:195). It is obviously important to further promote standards of good practice in QCA, as done, for instance, by Schneider and Wagemann (2012) and by Rihoux and Ragin (2009). Doing so will help a growing community of users provide stronger insights, because, as noted by Jon Elster (2009), "Data analysis is not a science, nor—as is sometimes asserted an art, but a *craft*" (p. 16). QCA is no different: to do it well requires not mechanical application of formal rules but both good practice and the "wisdom" that comes with continued use.

APPENDIX

Simulated Data for Study 1 Replication with Noncausal Factor

ID	X_1	X_2	X_3	X_4	Z_1	Y
1	1	1	1	0	0	1
2	0	0	1	1	1	1
3	0	1	1	0	0	0
4	0	0	1	0	1	0
5	1	1	1	1	0	1

(continued)

APPENDIX (continued)

ID	X_1	X_2	X_3	X_4	Z_1	Y
6	0	0	1	0	0	0
7	0	0	0	1	1	0
8	1	1	0	1	0	1
9	1	1	1	0	0	1
10	1	0	0	0	0	0
11	1	0	1	0	1	0
12	1	1	1	0	1	1
13	0	1	1	0	1	0
14	0	0	1	0	1	0
15	0	1	1	0	1	0
16	0	0	0	1	1	0
17	1	1	0	0	1	1
18	0	1	0	0	0	0
19	0	0	0	0	1	0
20	1	1	1	1	1	1
21	1	0	1	1	1	1
22	0	0	1	0	0	0
23	0	1	1	1	0	1
24	1	0	1	1	1	1
25	0	1	0	0	1	0
26	0	0	1	0	0	0
27	0	1	1	0	1	0
28	1	1	0	1	1	1
29	0	1	1	0	0	0
30	1	1	1	0	0	1
31	1	0	0	0	1	0
32	0	1	1	0	0	0
33	1	0	1	0	1	0
34	1	0	0	0	1	0
35	1	0	0	0	0	0
36	0	1	0	0	1	0
37	0	1	1	1	1	1
38	1	0	0	0	0	0
39	1	1	1	1	1	1
40	0	1	1	1	1	1

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