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Set-Theoretic Methods in Democratization Research: An Evaluation of Their Uses and Contributions

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Set-theoretic Methods in Democratization Research: An Evaluation of Their Uses and Contributions

Abstract

Set-theoretic methods in the form of explanatory typologies have for long figured prominently in democratization research, especially in comparative historical analysis. In the 1990s, QCA entered this research field but a tally shows that the number of democratization studies using this method has so far been low and that there is little evidence of any takeoff. We review a series of landmark studies that use explanatory typologies and sixteen studies that use QCA to see how they fare on three criteria: alignment between hypotheses and methods, the strength of causal claims, and the employment of robustness tests. The review shows that most of the QCA applications devote too little attention to formulating set-theoretic propositions and to carrying out robustness tests. Moreover, many scholars are too quick to interpret their findings as causal relationships, especially in light of the modest use of within-case evidence. Finally, it is striking that virtually none of these analyses have influenced the literature in the way some of the studies combining simple explanatory typologies with within-case analysis have. Against this backdrop, we discuss the potential of QCA for democratization research.

Key words: Set-theoretic methods, QCA, Typologies, Democratization, Within-case analysis, Evaluation

Introduction

Charles Ragin's¹ introduction of qualitative comparative analysis (henceforth QCA) into political science and sociology made quite a splash, the repercussions of which have hit democratization research along with other areas of research.² However, simpler versions of set-theoretic methods, in the form of Mill's methods of difference and agreement and explanatory typologies, were quite common in democratization research long before Ragin's development of QCA, and they have continued to be used within the field after.³

Tellingly, in his original illustration of QCA, Charles Ragin⁴ used Stein Rokkan's conceptual map of Europe, the aim of which is to account for patterns of democratic survival and breakdown in the interwar period, to illustrate the logic and purchase of set theory. Rokkan's configurational line of research can be traced back to Max Weber, who designed a "typological" approach to comparative historical analysis based on set theory. The aim of this

¹ *The Comparative Method*.

² Rihoux et al., "From Niche to Mainstream Method?"; Marx, Rihoux, and Ragin, "The Origins, Development and Applications of Qualitative Comparative Analysis."

³ See Coppedge, *Democratization and Research Method*: Chapter 5; Mahoney, "Knowledge Accumulation"; "Strategies of Causal Assessment"; Møller, *State Formation*. We can also note that the set-theoretic reasoning has been extremely influential *conceptually* in democratization studies. The *genus per differentiam*-principle underlying Sartori's ("Concept Misinformation") so-called ladder of abstraction is based on set-theoretic logic (see also Collier and Mahon, "Conceptual 'Stretching' Revisited"). The proliferation of attempts to categorize different types of democracies and different types of autocracies therefore draws on set theory, albeit for descriptive purposes only (e.g., Møller and Skaaning, "Explanatory Typologies"). Set theory has also been applied in attempts to measure democracy, for instance by using the "weakest link/minimum" aggregation rule proposed by Goertz (*Social Science Concepts*).

⁴ *The Comparative Method*: 125-134.

approach was to identify individually necessary and jointly sufficient conditions for the rise of Western modernity, including – though Weber mostly treats this as an aside – democracy.⁵

This Weberian version of typological analysis is explicitly based on nesting within-case analysis into the cross-case typological comparisons. Lange⁶ goes as far as to make this “mixed method” approach the defining characteristic of comparative historical analysis more generally. This type of inquiry thus combines a historical perspective with cross-case comparisons on the one hand and in-depth case studies of empirical processes on the other. Set-theoretic methods enable this combination, which is advantageous in democratization research where we study national-level phenomena that require actor-level underpinnings to be convincingly explained.

Set-theoretic methods thus have an impressive pedigree in democratization research. However, the use of these methods by students of democracy has not been reviewed in a systematic and comprehensive fashion.⁷ The aim of this article is to do so. Our point of departure is that the proof of the usefulness of set-theoretic methods is to be found in good and influential applications. We first present the common core features of these methods and outline their specific characteristics, including a short discussion of their relative advantages and disadvantages. We then review the use of explanatory typologies and QCA in democratization studies to identify patterns in the use of set-theoretic methods in democratization research. We emphasize some of the most influential and interesting

⁵ See Møller, *State Formation*: Chapter 4.

⁶ *Comparative-Historical Methods*.

⁷ Rihoux, Rezsöházy, and Bol, “Qualitative Comparative Analysis (QCA) in Public Policy Analysis”, and Emmenegger, Kvist, and Skaaning, “Making the Most of Configurational Comparative Analysis”, review the use of QCA in public policy studies and welfare state studies, respectively. In “From Prospect to Practice”, Mello evaluates 24 fsQCA applications in sociology, comparative politics, and international relations.

applications of both methods and carry out an exhaustive review of QCA studies in democratization research.⁸

The identified studies are matched against three criteria: Whether the methods are used to examine propositions formulated in set-theoretic terms, whether they are cautious about interpreting their findings in causal terms, and whether they carry out robustness tests. On this basis, we discuss the methodological challenges related to set-theoretic methods in the further progress of knowledge accumulation in the field, and we briefly reflect on the methodological take-home points for future research.

Core features, principles, and types of set-theoretic methods

There are three common core features of set-theoretic methods: “first, they work with membership scores of cases in sets; second, they perceive relations between social phenomena as set relations; third, these set relations are interpreted in terms of sufficiency and necessity.”⁹

Many today automatically identify set-theoretic methods as QCA. However, it is more correct to say that QCA is based on set theory. So are a number of other methods such as John Stuart Mill’s¹⁰ classical methods of difference (most-similar-systems design) and agreement (most-different-systems design), explanatory typologies,¹¹ and Coincidence Analysis (CNA)

⁸ Mahoney (“Knowledge Accumulation”; Strategies of Causal Assessment”), Coppedge (*Democratization and Research Methods*: Chapter 5), and Møller (*State Formation*) have reviewed democratization research undertaken within the framework of comparative historical analysis, many of which take the form of explanatory typologies. For this reason, our discussion places most emphasis on the studies using QCA.

⁹ Schneider and Wagemann, *Set-Theoretic Methods*: 3.

¹⁰ Mill, *A System of Logic*.

¹¹ George and Bennett, *Case Studies and Theory Development*: Chapter 11; Elman, “Explanatory Typologies.”

recently developed by Baumgartner.¹² Moreover, QCA – whether we are speaking of crisp-set QCA (csQCA), multi-value QCA (mvQCA), or fuzzy-set QCA (fsQCA) – is based on a particular version of set theory.¹³

There thus exists a wide repertoire of different methods, which share the core set-theoretic features outlined above. Since small-N comparisons are covered in the article by Bogaards on case studies in this issue, we concentrate on the two other set-theoretic methods that figure prominently in democratization research, namely explanatory typologies and QCA.

An explanatory typology or typological theory is a theoretical set of propositions about the ways a certain set of cases cluster in a specified property space.¹⁴ These propositions are stated in set-theoretic terms. Explanatory typologies often operate with several different outcomes but the number of conditions is normally relatively low as the typologies easily become too complex to handle for researchers. To illustrate, a dichotomous operationalization of four dimensions produces 16 (2^4) types; a dichotomous of seven dimensions 128 (2^7) types. For the same reason, outcomes and conditions are normally ordered in categorical terms of presence or absence. But explanatory typologies can in principle introduce more fine-grained distinctions; for instance, by making ordinal distinctions on the outcome or even on explanatory conditions.

Hypotheses are assessed across cases by ordering the cases or observations in the property space. However, at the same time, explanatory typologies can be perceived as a nested strategy of inquiry. The theoretical propositions are normally subjected to some kind of

¹² Baumgartner, “Detecting Causal Chains in Small-N Data.”

¹³ Thiem, “Unifying Configurational Comparative Methods.”

¹⁴ Elman, “Explanatory Typologies”; George and Bennett, *Case Studies and Theory Development*: 235; Møller and Skaaning, “Explanatory Typologies as a Nested Strategy of Inquiry.”

within-case analysis in addition to the cross-case analysis in the property space.¹⁵ In fact, it is the combination of cross-case comparisons and within-case analysis which has traditionally provided the analytical leverage of explanatory typologies, especially in the research field of comparative historical analysis¹⁶; see also the contribution to this issue on mixed methods by Aahmed.

The logic of explanatory typologies can be used as a reference point for describing QCA.¹⁷ QCA differs from the typological approach in one core respect: Like statistical methods, it subjugates data to mathematical operations. However, in contrast to the conventional statistical methods based on linear algebra, QCA, including the minimization algorithm, is based on Boolean algebra (or its multi-value or fuzzy extensions), that is, on the algebra of logic and set-theoretic relationships that also underlies the typological approach. This means that associations are understood as asymmetrical subset relationships¹⁸ that can be expressed in terms of necessity and/or sufficiency between individual sets or conjunctions of sets.

CsQCA is based on binary distinctions between the presence (1) or absence (0) of particular conditions or the outcome. MvQCA and fsQCA have been introduced as a response to the widespread criticism that valuable information is lost when dichotomizing conditions. MvQCA allows for multiple categories within conditions, while fsQCA allows for partial (fuzzy) membership values in particular sets. Similar to csQCA, the values 1 and 0 in fuzzy

¹⁵ See George and Bennett, *Case Studies and Theory Development*: Chapter 11.

¹⁶ Lange, *Comparative-Historical Methods*; Møller and Skaaning, “Explanatory Typologies as a Nested Strategy of Inquiry.”

¹⁷ For elaborate introductions to QCA, see Ragin, *The Comparative Method*; Rihoux and Ragin, *Configurational Comparative Methods*, and Schneider and Wagemann, *Set-theoretic Methods*.

¹⁸ Users can relax the requirements of perfect subset relationships by allowing for less than perfect consistency levels.

sets are qualitative assignments (fully in and fully out, respectively), whereas values between 0 and 1 designate degrees of membership. The value of 0.5 represents the cross-over point between being more in and being more out of the particular set. This cross-over point is also based on a qualitative decision; indeed, it is the most important qualitative decision when using fuzzy sets because it establishes the difference in kind.

The reduction of complexity in QCA rests on the minimization rule: “If two Boolean expressions differ in only one causal condition yet produce the same outcome, then the causal condition that distinguishes the two expressions can be considered irrelevant and can be removed to create simpler, combined expressions.”¹⁹ This procedure is repeated until no further reduction is achievable based on the so-called Quine-McCluskey algorithm. Assumptions about logical remainders, i.e., configurations of set memberships that are not represented by empirical cases, can (but need not) be used to reduce complexity along these lines.

Finally, an important difference between the typological approach and QCA is that QCA operates with only one (present or absent) outcome at the time.²⁰ Other than that, QCA can be seen as a more sophisticated version of explanatory typologies, which retains a broad view of social phenomena but resorts to a particular minimization algorithm.²¹ QCA therefore makes it easier to include more cases into the analysis and to explore the impact of different assumptions about unobserved configurations in the property space.

¹⁹ Ragin, *The Comparative Method*: 93.

²⁰ If multiple outcomes in an explanatory typology are ordinally ordered, one might translate them into a fuzzy-set outcome.

²¹ Elman, “Explanatory Typologies”: fn. 15; Schneider and Rohlfing, “Combining QCA and Process-tracing”: fn. 4; Møller and Skaaning, “Explanatory Typologies as a Nested Strategy of Inquiry”: fn. 1.

Recent use of QCA in large-N research have prompted a discussion about whether in-depth case knowledge and analysis (sometimes referred to as case-orientation) is a defining feature of QCA, and whether QCA combined with within-case analysis is better thought of as a multi-method approach.²² One way of understanding this is by distinguishing between QCA as an approach and QCA as a technique. Within-case analysis is not a defining feature of QCA as a technique since the logic of inference is merely based on difference-making (variation) at the cross-case level. This also means that there is no upper limit to how many cases the technique can process. As an approach, QCA can be either condition-oriented or case-oriented. Depending on the perspective, users of QCA can do a variety of things to support internal and external validity and contribute to the building and appraisal of theories.²³

Prominent advocates of QCA have repeatedly underlined that paying attention to the cases is required to get bang for the buck with QCA. In the original description of QCA, Ragin's idea was thus that the cases rather than the cross-case patterns should be the center of the analysis.²⁴ Likewise, in Schneider and Wagemann's influential textbook on QCA, the method is construed as one that pays more attention to the cases than quantitative studies.²⁵ Our take on this is that QCA has most potential as a case-oriented approach. This goes *a fortiori* in the case of democratization research where within-case evidence is needed to buttress cross-case configurations if explanations are to be convincing.

Set-theoretic methods have the following strengths: They allow scholars to identify complex patterns of necessity and sufficiency; they allow the researcher to devote attention to

²² See Aus, "Conjunctural Causation"; Rihoux, "Qualitative Comparative Analysis."

²³ See Thomann and Maggetti, "Designing Research with Qualitative Comparative Analysis."

²⁴ Ragin, *The Comparative Method*.

²⁵ Schneider and Wagemann, *Set-Theoretic Methods*.

the individual cases while retaining a broad focus; they can be easily replicated; and they offer a way of being transparent and conscious about assumptions that concern unobserved variation.²⁶ Their weaknesses include the following: Set-theoretic methods are generally not well suited for handling time in a sophisticated way;²⁷ the procedures for dealing with measurement error are crude and insufficient;²⁸ and they provide little in the way of distinguishing between logical and causal relationships, including systematic assessment of the risk that the identified patterns are the result of chance.²⁹

Finally, set-theoretic methods only lend themselves to assess a particular kind of relationships, namely set-theoretic relationships. This is what Braumoeller and Goertz emphasize when they note that scholars need to be more aware of the inseparability of particular kinds of propositions and the methods appropriate for assessing them.³⁰ Set-theoretic methods are based on the notion of subset associations stated as necessary and/or sufficient relationships. The point here is that one should not use these methods to examine expectations that are stated in correlational terms. If the arguments take this form, other methods have a competitive edge in empirical applications. Moreover, due to the inability to distinguish logical from causal relationships, one should not make strong claims about

²⁶ Collier, LaPorte and Seawright, “Putting Typologies to Work”; Elman, “Explanatory Typologies”; Rihoux and Ragin, *Configurational Comparative Methods*; Schneider and Wagemann, *Set-Theoretic Methods*.

²⁷ Some attempts to develop time-sensitive uses do exist (e.g., Caren and Panofsky, “TQCA”; Garcia-Castro and Ariño, “A General Approach”) but they have not gained broad acceptance and use.

²⁸ See Maggetti and Levi-Faur (“Dealing with Errors in QCA”) for different ways to deal with measurement error in QCA.

²⁹ See, e.g., Braumoeller, “Guarding against False Positives”; Hug, “Qualitative Comparative Analysis”; Liebersson, “Comments on the Use and Utility of QCA”; Munck, *Assessing Set-Theoretic Comparative Methods*; Paine, “Set-Theoretic Comparative Methods.”

³⁰ Braumoeller and Goertz, “The Methodology of Necessary Conditions: 847.

causality based on set-theoretic methods. At least, one should not do so unless within-case analysis is successfully used to confirm the existence of the mechanisms on which the cross-case configurations are based.

We use these considerations to formulate a set of criteria³¹ for evaluating empirical applications of set-theoretic methods in democratization research. These concern alignment between theoretical propositions and method, causal claims, and robustness tests, respectively. These are of course not the only criteria of good practice that one might envisage.³² However, they are important if set-theoretic methods are to fulfill their potential. Empirical applications have to deal convincingly with these ‘non-technical’ issues to achieve broader recognition in democratization research.

Alignment between theoretical propositions and method. This criterion concerns whether or not the set-theoretic method is used to assess expectations explicitly stated in set-theoretic terms. Ragin³³ and other advocates of QCA³⁴ have time and again emphasized that QCA is based on configurational thinking, and that the method is designed to capture relationships of set-theoretic nature that can be expressed in terms of necessity and sufficiency, whether with respect to individual conditions or in the form of one or more conjunctural connections. This also applies to explanatory typologies, which rest on similar set-theoretic features.

³¹ Cf. Schneider and Wagemann, *Set-Theoretic Methods*: Chapter 11; Emmenegger, Kvist and Skaaning, “Making the Most of Configurational Comparative Analysis.”

³² Cf. Schneider and Wagemann, *Set-Theoretic Methods*; Thiem, “Unifying Configurational Comparative Methods.”

³³ *The Comparative Method*.

³⁴ E.g. Schneider and Wagemann, *Set-Theoretic Methods*; Thiem, Baumgartner and Bol, “Still Lost in Translation!”

This not only means that researchers using QCA and explanatory typologies have to interpret their findings using set-theoretic logic and language. It also means that the initial choice of method is conditional on the nature of the theoretical propositions that are to be interrogated. According to Schneider and Wagemann, the requirement is that "one must find it plausible to claim that the outcome of interest is based on equifinal, conjunctural, and asymmetric relations in terms of necessity, sufficiency, INUS, and/or SUIN conditions."³⁵ If the theoretical expectations are (directly or indirectly) expressed in terms of set-theoretic relationships, the use of QCA or other set-theoretic methods is warranted. If the theoretical propositions instead reflect the logic of linear algebra, regression methods have more purchase.³⁶

Causal claims. This criterion concerns whether researchers make strong causal claims based on the findings of set-theoretic methods. This issue merits attention because, at the end of the day, QCA as a technique is only able to identify explicit connections between different sets.³⁷ As Munck points out in an article criticizing QCA, "a causal relation is not a logical relation but, rather, a relation between events or, more precisely, between changes in the properties of

³⁵ *Set-Theoretic Methods*: 276.

³⁶ Emmenegger, Kvist and Skaaning, "Making the Most of Configurational Comparative Analysis"; Vis, "The Comparative Advantages."; Thiem, Baumgartner and Bol, "Still Lost in Translation!": 752. Based on more elaborate arguments along these lines, Thiem, Baumgartner and Bol reject the claim made by Clark, Gilligan and Golder ("Conceptual 'Stretching' Revisited) and Paine ("Set-Theoretic Comparative Methods") that regression models including interaction terms offer a superior way to assess propositions about necessity and sufficiency. As it is not possible to condense this important discussion into a single paragraph without doing injustice to the sophisticated, we refer the interested reader to the original exchange.

³⁷ Ragin and Rihoux, "Qualitative Comparative Analysis."

things.”³⁸ While causal theories need to pay attention to the rules of logic, and while the absence of particular set-theoretic connections can provide strong evidence *against* particular causal relationships, the establishment of logical relationships is not sufficient to corroborate claims about causality. The basic problem is that explicit empirical connections cannot be interpreted as causal relationships without some strong, simplifying assumptions about potential confounders and endogeneity.

In this connection, it is important to note that QCA has not developed anything similar to the tools used to solve the causal identification problem in quantitative studies, including IV estimation and GMM models.³⁹ This means that scholars who apply QCA need to be very cautious when interpreting their findings in causal terms. This point of course also applies to studies using explanatory typologies to assess cross-case distributions in a property space. However, as already mentioned, these studies normally enlist within-case analysis to further probe causal claims. If within-case evidence is similarly enlisted by scholars using QCA, there is more leverage for interpreting relationships in causal terms.

Robustness tests. Explicit robustness tests have become standard practice in quantitative studies. Such tests are used to increase the confidence in the results by probing their sensitivity to changes in different parameters of the methods application. Though Goldthorpe⁴⁰ long ago emphasized the potential fragility of the robustness of QCA results, explicit robustness tests are relatively new to set-theoretic methods. The reasons seems to be

³⁸ Munck, “Assessing Set-Theoretic Comparative Method”: 777.

³⁹ However, as emphasized in Seawright’s article in this volume, it can be seriously questioned to what extent these and other forms of statistical methods actually help us identify causal rather than merely correlational relationships.

⁴⁰ Goldthorpe, “Current Issues in Comparative Macrosociology.”

that many scholars doing QCA feel that it is not necessary to assess alternative scenarios if the aim of the research is very contextual, that is, if there are no ambitions to generalize the findings beyond a certain scope. However, in recent years several ways of testing the robustness of QCA studies have been proposed, for instance by modifying the calibration of raw data into set membership scores, establishing thresholds for consistency and case frequency, and changing the sample, data sources, or even the conditions included into the model. It has been demonstrated that such tinkering can have significant consequences for the findings that come out of QCA.⁴¹

In what follows, we evaluate studies that use explanatory typologies and QCA against these criteria. We also report how the studies fare on two additional parameters: the conditions-to-cases ratio and whether the studies supplement the cross-case comparisons with in-depth case analysis. These parameters serve to reveal whether set-theoretic methods are mainly used to handle research questions with many variables and a small or intermediate N – the situation where Lijphart⁴² found it relevant to use comparative methods rather than statistical tools – and whether the cross-case evidence is further substantiated by within-case evidence, as we have argued it should be if set-theoretic methods are to deliver convincing interpretations of empirical patterns.

Explanatory typologies in democratization studies

As described in the Introduction, explanatory typologies are not only based on identifying cross-case configurations, they also take the individual cases serious in a way that remains an

⁴¹ E.g., Hug, “Qualitative Comparative Analysis”; Cooper and Glaesser, “Exploring the Robustness”; Krogslund, Choi and Poertner, “Fuzzy Sets on Shaky Ground”; Lucas and Szatrowski, “Qualitative Comparative Analysis in Critical Perspective”; Skaaning, “Democratic Survival or Autocratic Revival in Interwar Europe?”

⁴² Lijphart, “Comparative Politics and Comparative Method”: 686.

ideal in descriptions of QCA as a case-oriented approach. A number of landmark studies within democratization research follow this typological formula, where in-depth case studies are nested in set-theoretic cross-case analysis. Besides Rokkan's⁴³ conceptual map, which has been used to explain democratic survival and breakdown in the interwar period by Aarebrot and Berglund,⁴⁴ we can highlight Barrington Moore's *Social Origins of Democracy and Dictatorship*. This typological formula has had so much staying power that it has also been used in democratization studies after the advent of QCA. Four influential examples are Gregory M. Luebbert's *Liberalism, Fascism, or Social Democracy*, Brian Downing's *The Military Revolution and Political Change*, John Stephens's reassessment of Moore's work, and Thomas Ertman's *Birth of the Leviathan*. In a more informal sense, the typological approach also infuses many studies of transition and consolidation of democracy.⁴⁵

As we have demonstrated elsewhere, the listed studies can be understood as explanatory typologies that seek to identify configurations of conditions that produce at least two different outcomes.⁴⁶ The real strength of these studies – besides probing necessary and/or sufficient conditions based on cross-case patterns – is that they include in-depth interrogations of most of the cases ordered in the typologies.

We have carried out a general review of the way explanatory typologies have been used in democratization research. Our review includes some of the landmark studies within the field. This overview is not exhaustive because, in contrast to QCA applications, only a few studies in democratization research explicitly refer to their method as “typological” and/or use

⁴³ Rokkan, *Citizens, Elections, Parties*.

⁴⁴ Aarebot and Berglund, “Statehood, Secularization, Cooptation.”

⁴⁵ E.g., Karl and Schmitter, “Modes of Transition”; Linz and Stepan, *Problems of Democratic Transition and Consolidation*.

⁴⁶ Møller and Skaaning, “Explanatory Typologies as a Nested Strategy of Inquiry.”

the more "technical" terms associated with it, such as property space. Hence, it is not possible to identify the relevant studies by carrying out a search on key words in different databases. Moreover, the number of potentially relevant studies is so large that even a cursory review of them would be difficult to fit into the format of our review. What we do is therefore to measure the landmark typological against the criteria set out above.

Table 1 about here

Table 1 shows that the identified typological studies consistently present their propositions in set-theoretic terms. This is sometimes done in a rather informal way⁴⁷ but what matters is that the propositions are not construed in correlational terms but based on formulations that indicate necessity and/or sufficiency. The table also shows that these studies consistently interpret their findings in causal terms by, for instance, referring to the configurations as causal pathways. However, as they are also consistently based on within-case analysis this makes more sense than if the findings had solely been based on cross-case patterns.

The table finally reveals that typological studies include few conditions (basically only those that make up the core argument) and that the number of cases is relatively limited (with one exception they range from six to thirteen). This is of course one of the reasons why it is possible for these studies to probe their cases in-depth. Virtually all the studies reviewed in Table 1 analyze *all* cases that enter the typological property space, meaning that they are shorn of any considerations about case selection.⁴⁸ Finally, the lack of robustness tests is striking. However, here, too, case orientation matters. If the number of cases is limited and the

⁴⁷ E.g. Moore, *Social Origins*.

⁴⁸ See Møller and Skaaning, "Explanatory Typologies" for how to select cases in connection to explanatory typologies.

cases are investigated in-depth, the absence of robustness tests is clearly less problematical than if the logic of inference is solely based on cross-case analysis with a relatively high number of cases.⁴⁹

The use of QCA in democratization studies

We have carried out an exhaustive search of the explicit use of QCA – whether csQCA, mvQCA, or fsQCA – in studies that have democratization or democratic stability as the outcome.⁵⁰ First, we checked the extensive bibliography of QCA applications in comparative politics, which can be found on the COMPASSS website (<http://www.compassss.org/bibdata.htm>). Second, we expanded this list by searching Google scholar using the keywords “QCA” and “democratization” or “democracy”.

On this basis, we have identified sixteen studies. This number is not impressive when we look at the magnitude of the research field of democratization studies. Considering that the method has been available for several decades now, this indicates that QCA has not become a standard tool in democratization research. Case studies and statistical studies are still the norm within the field (see the other articles in this volume). In comparison, more studies using QCA have been published in neighboring fields such as comparative policy analysis, welfare

⁴⁹ See also Mahoney, “Strategies of Causal Assessment”: 352.

⁵⁰ We did not include studies that solely uses data related to democratization to illustrate methodological arguments (e.g., Rihoux and Ragin, *Configurational Comparative Methods*) or where QCA is not used as the primary method (e.g., Berg-Schlosser, “Conditions of Authoritarianism, Fascism and Democracy in Interwar Europe”; Møller and Skaaning, “The Three Worlds of Post-Communism”). Moreover, we have cast our net in a way that means that we have only included studies published in English by professional publishers (whether in journals or books).

state research, and political parties. More generally, the number of published articles applying QCA has been increasing at an impressive rate in recent years.⁵¹

QCA was relatively slow to make an appearance within democratization research, considering the strong prior place of set-theoretic reasoning within the field and the subject itself, which makes it relatively well suited to medium-N configurational studies. We have only identified two publications in the early 1990s and these were followed by more than a decade where we register no new democratization studies using QCA. However, 2008 marked a turning point and since then one or two studies have been published most years.

This development has clearly been facilitated by the introduction of user-friendly software, the extension of crisp-set QCA with fuzzy-set (and multi-value) QCA, the publication of several textbooks, and the offering of QCA courses. The fact that some of the prominent figures in this community, including Dirk Berg-Schlosser and Carsten Schneider, have democratization studies as their main substantive field and therefore used examples from this research agenda to illustrate the method, probably also provided an important spur.

Next, our overview shows that no single version of QCA has become dominant. MvQCA is only used in a single study, fsQCA tends to be increasingly used but we also find recent applications of csQCA, and in any case the number of studies is too low to identify clear trends. In what follows, we evaluate the fourteen studies against the three criteria and two additional parameters outlined above.

Table 2 about here

⁵¹ Marx, Rihoux and Ragin, “The Origins, Development and Applications of Qualitative Comparative Analysis”; Rihoux et al., “From Niche to Mainstream Method?”

Set-theoretic propositions. Only seven of the sixteen studies present set-theoretic propositions before the empirical analysis. In this group, we find Berg-Schlosser and De Meur's and Skaaning's reassessments of prominent explanations of interwar democratic (in)stability, which are explicitly stated as set-theoretic associations.⁵² For instance, Skaaning reformulates Aarebrot and Berglund's Rokkan-inspired theoretical account (see above) in the following way: "the Charlemagne heritage (early state-building) and the isolation of religious interests from political rule (Protestantism and/or secularized) were individually necessary and jointly sufficient conditions for democratic survival"⁵³

The remaining nine studies do not theorize their arguments in this way. For instance, Gherghina lists no less than nine conditions, each of them linked to separate hypotheses, which in several cases are not expressed in set-theoretic language. To illustrate: "The states that opted for a parliamentary system at the beginning of the transition period have *greater chances* to achieve democratic performance than the rest."⁵⁴

Another example is Kuehn et al., who note that the relationship between conditions and outcome might be complex and asymmetrical but go on to argue that "civil-military relations theory is too weak to solve these issues analytically and to generate clear and unambiguous causal hypothesis".⁵⁵ In such case, one would have liked more theoretical consistency with respect to the nature of the hypotheses (i.e., coherent assumptions underlying the suggested associations) and the construction of a more elaborate framework regarding the formulation of

⁵² Berg-Schlosser and De Meur's, "Conditions of Democracy in Interwar Europe"; Skaaning, "Democratic Survival or Autocratic Revival in Interwar Europe?" However, in the same article, Berg-Schlosser and De Meur also use QCA to reassess hypotheses that are stated in terms of linear, additive relationships.

⁵³ Skaaning, "Democratic Survival or Autocratic Revival in Interwar Europe?": 251; Aarebrot and Berglund, "Statehood, Secularization, Cooptation."

⁵⁴ Gherghina, "The Helping Hand": 71; our emphasis.

⁵⁵ Kuehn, Croissant, Kamerling, Lueders and Strecker, "Conditions of Civilian Control in New Democracies": 5.

explicit expectations. That said, it is of course legitimate to use QCA for purposes of theory-building rather than theory-testing, something which our assessment does not appreciate.⁵⁶

In sum, we both find examples of studies that are basically agnostic about their expectations, and studies that express their expectations using net-effects and correlational thinking. Interestingly, the first three studies we have identified present explicit set-theoretic propositions⁵⁷ – from there it very much went downhill. However, four of the more recent studies also fulfil this criterion.⁵⁸

Our overview thus indicates that the alignment of propositions and methods has received too little attention in democratization studies employing QCA. This observation also speaks to a more general consideration, namely that in order to carry out a genuine test, we need to theorize a relationship before analyzing it empirically. In the absence of clear pre-analysis propositions, we are at most describing aspects of the social world using theoretical terms.⁵⁹

⁵⁶ Schneider and Wagemann (2012, 295) even state that “QCA is inductive in spirit” because it by default examines all possible combinations of conditions. We take issue with this statement as one can always compare the results based on QCA (as a technique) with theoretical expectations (cf. Thomann and Maggetti, “Designing Research with Qualitative Comparative Analysis.”). Actually, the fact that QCA sometimes has a hard time distinguishing relevant from irrelevant conditions (Baumgartner, “Detecting Causal Chains in Small-N Data”) speaks in favor of employing it in a more theory-oriented fashion. However, the distinction between theory-building and theory-testing studies is not always clear-cut. Among the sixteen studies, the article by Kuehn et al. (2017) is arguably the only one that tends to fall more into the category of inductive studies.

⁵⁷ Berntzen, 1993; Berg-Schlosser and De Meur 1994; Schneider 2008.

⁵⁸ Skaaning, “Democratic Survival or Autocratic Revival in Interwar Europe?”; Palm, “Embedded in Social Cleavages”; Grauvogel and von Soest, “Claims to Legitimacy Count”; Schneider and Maerz, “Legitimation, Cooperation.”

⁵⁹ Coppedge, *Democratization and Research Methods*: 148-149.

Causal claims. In Table 2, + means that the results are expressly construed as causal, (+) that the relationship are described as causal in somewhat more cautious terms. Seven studies fall in the former category and the rest in the latter. Interestingly, none of the studies present strong reservations by saying that the results have merely identified “logical connections” or the like. Accordingly, all sixteen studies to some extent posit causal claims, although a majority are careful not to formulate this too boldly.

To illustrate a strong claim about causality, Fink-Hafner and Hafner-Fink claim that “involvement in a war, the presence of a predominant party immediately after the first multiparty elections and the involvement of foreign forces are characteristic of causal configurations for a discontinuous transition.”⁶⁰ Similarly, Krasnozhon concludes that the “absence of neighboring democracy is necessary for institutional stickiness of democracy in post-communist countries if other causal co-factors lower transaction costs of institutional change.”⁶¹ Kuehn et al. are more in tune with the limited causal leverage provided by their study when they modestly state that “the fsQCA findings indirectly support our purported causal mechanism ... The evidence is circumstantial ... Actually testing the proposed causal mechanism would require with-in case analyses”.⁶²

Robustness tests. Table 2 shows that only two of the sixteen studies report results from robustness tests. Grauvogel and von Soest evaluate what happens when changing the frequency threshold (cases per configuration) and using different datasets to define their sample.⁶³ Schneider and Maerz assess the influence of the frequency threshold and in addition

⁶⁰ Fink-Hafner and Hafner-Fink, “The Determinants of the Success”: 1619.

⁶¹ Krasnozhon, “Institutional Stickiness”: 234.

⁶² Kuehn et al., “Conditions of Civilian Control”: 20.

⁶³ Grauvogel and von Soest, “Claims to Legitimacy Count.”

report that their findings are robust to changes in consistency thresholds.⁶⁴ The fourteen other studies are silent on this issue. Though the two studies that carry out robustness tests are among the more recent ones, most studies are thus still being published without any such tests, even though recent writings on best practice call for them.⁶⁵ One hesitation seems to be that robustness checks take up valuable space, which makes it difficult to include them in journal articles. However, details of such analyses can be reported in online appendices.

Additional parameters. Our two additional parameters do not make up best practice criteria but mainly serve to identify what kind of studies enlist QCA. The first has to do with how the studies deal with individual cases. As we noted above, paying attention to the cases has always been an ideal in QCA. To some extent, case orientation is integrated directly into the coding of the cases, for instance in the assignment of set-memberships. However, as a complexity reducing analytical technique, QCA is still a cross-case technique that does not per se require researchers to reflect on the individual cases. So, only by returning to the cases in order to make sense of the findings after presenting solution terms is the case level truly appreciated.

If the scholar can demonstrate that the results make sense by delving into the cases in this way, it increases our confidence in the findings – and, as we noted when discussing typological analyses, it mitigates the need for explicit robustness tests, particularly when the case number is low. If a large number of cases are included, it obviously becomes difficult or even unviable to return to all cases. However, recent scholarship has presented guidelines for

⁶⁴ Schneider and Maerz, “Legitimation, Cooptation, and Repression.”

⁶⁵ Schneider and Wagemann, *Set-theoretic Methods*.

case selection when carrying out large-N QCA.⁶⁶ The advice of this literature is that “typical cases” should be at the center of subsequent within-case analysis. Translated into QCA, this means that cases should exhibit the positive outcome that is being explained and the condition – or combination of conditions – that produce this outcome. The aim of the within-case analysis is then to probe whether it is meaningful to interpret the particular association between condition(s) and outcome in causal terms by examining the extent to which in-depth case evidence fits this (and only this) interpretation. Hence, irrespective of the number of cases, QCA can be complemented with genuine within-case analysis or, less ambitiously, a simpler use of additional case-related evidence to illustrate the findings.

Our review shows that only three of the sixteen studies do this in a comprehensive way, with two others touching upon the cases in a more tentative manner. This is somewhat disheartening considering that most of these studies enlist a relatively low number of cases (i.e., enlist limited cross-case evidence). A good example of how to return to the cases is provided by Berntzen, who includes a discussion of democratic consolidation in three Central American cases.⁶⁷ Mainwaring and Pérez-Liñán provide an alternative way of establishing a strong connection between cases and QCA results. Rather than returning to their cases, they initially carry out in-depth case analysis and thereafter use QCA to further support their findings.⁶⁸

Table 2 finally shows that QCA has first and foremost been used to study an intermediate number of cases. Many methodological writings have emphasized that QCA methods have an advantage vis-à-vis case studies on the one hand and statistical studies on

⁶⁶ See Beach and Rohlfing, “Integrating Cross-Case Analyses and Process Tracing”; Schneider and Rohlfing, “Combining QCA and Process-tracing.”

⁶⁷ Berntzen, “Democratic Consolidation in Central America.”

⁶⁸ Mainwaring and Pérez-Liñán, *Democracies and Dictatorships in Latin America*.

the other hand when the case number lies between, say, 8 and 60.⁶⁹ However, the literature on QCA has also emphasized that the number of cases cannot in itself justify resorting to QCA. As mentioned in our discussion of set-theoretic hypothesis above, QCA is not the right choice of method for analyzing all kinds of relationships. So, even if it tends to be less sensitive to the small-N problem, the number of cases does not in itself provide a justification for using QCA.

The contribution of set-theoretic methods to democratization research

On the basis of the reviews carried out above, the first observation we can make is that it is striking how much more influential typological analysis have been in democratization research, even after QCA was introduced. Surveying the literature thirty years after Ragin's introduction of QCA, we find no studies using this method within the field of democratization research that come close to rivalling the fame of classical typological analyses such as that of Moore.⁷⁰ Moreover, even after the introduction of QCA, we find a series of influential contributions to democratization studies that use simple explanatory typologies, e.g. to highlight different structural conditions that influence the power resources and strategies of key collective actors.

To be fair, our QCA review was only meant to pick up studies that deal directly with democratization or democratic stability, meaning that studies that deal with the antecedents of democracy – as Ertman's⁷¹ path-breaking typological analysis of European state formation and regime change does – have not been included. Moreover, explanatory typologies have been used for a longer time and in more elaborate (book length) studies. Nonetheless, based

⁶⁹ Ragin, *The Comparative Method*; Schneider and Wagemann, *Set-theoretic Methods*.

⁷⁰ Moore, *Social Origins of Dictatorship and Democracy*.

⁷¹ Ertman, *Birth of the Leviathan*.

on our more general acquaintance with the field and a cursory look at citations patterns, we feel confident in stating there are, so far, no QCA studies that rival the landmark typological studies in influence. Studies can of course be influential even if they are methodologically unsophisticated or even outright bad. But the field of democratization research nonetheless confirms one of the core concerns about QCA: that the most influential works remain discussions of the method itself, rather than works that apply it to understand processes of democratization, among other things.

That said, we can flag a couple of important contributions of QCA to democratization research. The most general is that QCA has provided a new and mathematically more sophisticated way of analyzing hypotheses stated in set-theoretic terms about the dynamics and drivers of democratization and democratic stability. As we showed in the first part of the article, set-theoretic approach has long infused democratization research, especially studies that take the form of comparative historical analysis. The aim of many of these studies has been to identify the conjunction of causes that produce one or more outcomes. QCA provides a way of making this research agenda more methodologically sophisticated. As such, democratization research is ripe for a more systematic use of QCA, which might replace the typological analyses that have been so influential. In this sense, QCA clearly has an unfulfilled potential in democratization research.

With regard to more particular contributions, the studies by Berntzen and Schneider stand out.⁷² They perform relatively well on most of the different criteria we have assessed. Most importantly, they explicitly use QCA to assess novel and interesting set-theoretic expectations. Berntzen presents a theoretical argument which suggests that democratic consolidation in Central America rests on the conjunction of three conditions (structural change reducing oligarchic power, a democratically oriented elite, and a favorable

⁷² Berntzen, “Democratic Consolidation”; Schneider, *The Consolidation of Democracy*.

international climate, i.e., US support of the government). Within the length of a standard article, he furthermore carries out a cross-case comparison based on a rudimentary use of QCA supplemented by three case studies.

Schneider presents a general argument, which links democratic consolidation to the way institutions and power resources match. The gist of the idea is that consolidated democracy (CoD) is a result of the proper fit between the demands created by the societal context and the power dispersion created by the political institutions. Different collective actors are relevant and they have different resources and different interrelations based on the context of the society in question: “This, in turn, defines their ‘need’ for a specific degree of dispersion of opportunities for participating in the process of making collectively binding decisions and in distributing public goods. Hence, certain contexts require more concentration of political power than others in order to achieve CoD.”⁷³ This expectation is examined by the help of a novel dataset and, especially at the time the research was done, a very innovative use of fsQCA.

Conclusions

We have reviewed a series of typological studies and fourteen QCA studies in democratization research. These reviews show that studies using QCA have so far had much less impact on substantial matters of democratization than studies using explanatory typologies. Virtually all the reviewed applications have shortcomings when set against our best practice criteria drawn from the methodological literature. Yet, whereas the uses explanatory typologies fall short on one and the same criterion (robustness checks), the QCA studies fall short on different criteria.

⁷³ Schneider, *The Consolidation of Democracy*: 4.

The lack of explicit set-theoretic propositions, the few attempts to go back to the cases, and the almost total dominance of studies with a "medium" number of cases (there are only two with more than 100 observations) indicate that QCA methods have often used as an *ersatz* for statistical methods. The obvious reason is low degrees of freedom due to the well-known problem of many variables and few cases.⁷⁴ This is explicitly invoked as the main argument for using QCA in a number of studies.⁷⁵ However, this is unfortunate due to the different assumptions and logic of QCA methods, on the one hand, and regression-based methods, on the other hand. The two kinds of methods are not substitutable, irrespective of the number of cases. Scholars who use explanatory typologies and QCA should take the advantages and disadvantages of these methods seriously and restrict their use to theories that can meaningfully be stated in set-theoretic terms. We need to keep in mind that the limitations of empirical applications are not necessarily related to the potential of a particular method.

We end this article by setting out a particular way forward for QCA, which is likely to increase its potential for democratization research but might also have relevance outside of this field. We base this recommendation on the observation that simpler typological analyses have been so much more influential within the field. As we have made clear, the basic difference between these two lines of research is the attention devoted to within-case analysis by scholars using explanatory typologies. This presents a way of handling the causal identification problem that a cross-case use of set-theoretic methods – whether QCA or explanatory typologies in the form of the distribution of cases in a property space – has no way of solving. So, if within-case analysis can be nested systematically within QCA, it would be a way of avoiding some of the most obvious shortcomings of this method.

⁷⁴ Cf. Lijphart, "Comparative Politics and Comparative Method."

⁷⁵ E.g., Hao and Gao, "East Asian Pathways"; Ishiyama and Batta, "The Emergence of Dominant Political Party Systems."

As mentioned above, recent work on QCA includes explicit guidance about how to nest in-depth case studies in QCA solution terms.⁷⁶ If these guidelines are adopted by scholars, there is no apparent reason why QCA (or CNA) should not replace explanatory typologies as the medium for making novel contributions to democratization research. In the absence of within-cases analysis, QCA is left as a device for revealing logical connections through difference-making rather than identifying causal relations. This approach still has the potential to produce interesting findings, but researchers should be very conscious and open about the limited ability to sustain causal claims on this basis.

⁷⁶ See Beach and Rohlfing, “Integrating Cross-Case Analyses and Process Tracing”; Schneider and Rohlfing, “Combining QCA and Process-tracing.”

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Table 1. Explanatory typology applications in democratization research

	Set- theoretic propositions	Causal claims	Robustness tests	Within- case analysis	Conditions- to-cases ratio
Moore	+	+	-	+	2/6 (.33)
Stephens	+	+	-	+	2/13 (.15)
Luebbert	+	+	-	+	2/11 (.18)
Downing	+	+	-	+	2/7 (.29)
Ertman	+	+	-	+	2/13 (.15)
Aarebrot & Berglund (Rokkan)	+	+	-	(+)	2/28 (.07)

Note: + means the feature is present, - means the feature is absent, (+) means that the feature is partly or implicitly present.

Table 2. QCA applications in democratization research

	Type	Set- theoretic propositions	Causal claims	Robustness tests	Back to cases	Conditions- to-cases ratio
Berntzen (1993)	csQCA	+	(+)	-	+	3/13 (.23)
Berg- Schlosser and De Meur (1994)	csQCA	+	(+)	-	-	from 3/16 (.19) to 9/16 (.56)
Berg- Schlosser (2008)	mvQCA	-	(+)	-	-	6/48 (.13)
Schneider (2008)	fsQCA	+	(+)	-	(+)	6/32 (.19)
Fink-Hafner and Hafner- Fink (2009)	csQCA	-	+	-	-	4/10 (.4)
Gherghina (2009)	csQCA	-	+	-	-	9/20 (.45)
Howard (2011)	fsQCA	-	+	-	-	12/68 (.18)
Skaaning (2011)	csQCA	+	+	-	-	5/29 (.17)

Ishiyama and Batta (2012)	fsQCA	-	+	-	-	4/13 (.31)
Palm (2012)	fsQCA	+	(+)	-	-	4/13 (.31)
Mainwaring and Pérez- Liñán (2013)	csQCA	-	+	-	+	3/13 (.23)
Krasnozhon (2013)	csQCA	-	+	-	-	6/26 (.23)
Grauvogel and von Soest (2014)	fsQCA	+	(+)	+	(+)	5/120 (.04)
Hao and Gao (2016)	csQCA	-	(+)	-	+	6/14 (.43)
Kuehn et al. (2017)	fsQCA	-	(+)	-	-	5/55 (.09)
Schneider and Maerz (2017)	fsQCA	+	(+)	+	-	6/156 (.04)

Note: + means the feature is present, - means the feature is absent, (+) means that the feature is partly or implicitly present.