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Critical Realism as a Meta-Framework for Understanding the Relationships between Complexity and Qualitative Comparative Analysis

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Abstract

Many methods are used in research on complexity. One of these is qualitative comparative analysis (QCA). Although many authors allude to the relationships between complexity and QCA, these links are rarely made explicit. We propose that one way of doing so is by using critical realism as a meta-framework. This paper discusses the viability of this approach by examining the extent to which QCA is a complexity-informed method. This question is answered in three steps. First, we discuss the nature of complexity and its epistemological implications. Second, we focus on Bhaskar’s perspective on critical realism and show how it can be used as a framework for understanding social complexity. Third, we examine the ontological and epistemological assumptions underlying QCA and synthesize these with our critical realist approach to complexity. We argue that complex reality is non-decomposable, contingent, non-compressible, and time-asymmetric. We conclude that, although QCA is inevitably reductive (i.e. it compresses reality) and partial (i.e. it decomposes reality), its core premises are built upon the notions of contingency and time-asymmetry. Therefore, it is not only a powerful method for doing complexity-informed research, but is also a complexity-informed method by itself.

Keywords

Complexity Sciences, Critical Realism, Philosophy of Science, Qualitative Comparative Analysis (QCA), Research Methodology
Critical Realism as a Meta-Framework for Understanding the Relationships between Complexity and Qualitative Comparative Analysis

1. Introduction

Many different methods and tools are being used to carry out social scientific inquiry that is informed by the complexity sciences (Byrne, 1998). Agent-based modelling (e.g. Koliba, Zia and Lee, 2011) and action research-based theory (e.g. Wagenaar, 2006) are just two of the many methods of inquiry that are informed by theories and concepts from the complexity sciences. Each method or analytical tool used in the complexity sciences has a number of implicit or explicit ontological and epistemological assumptions, and these assumptions differ greatly across methods. Each method brings with it different assumptions about the nature of complexity, differing levels of access to reality, and differing explanations for observed phenomena. These differences have led many to ask whether there is a method in the mix that is not only helpful in analysing complexity, but that is itself informed by complexity, i.e. a native method or tool.

One such method that has received much attention, most notably from David Byrne (2005; 2009; 2011a; Buijs, Eshuis and Byrne, 2009), as being particularly suitable for analysing the complexity of reality is Charles Ragin’s qualitative comparative analysis or QCA (1987; 2000; 2008). The main feature of this case-based method is that it is able to account for the contingency of a social phenomenon. In addition (and not instead of doing so), it allows for an exploration of causal patterns. As such, it is a viable means by which to understand the systemic nature of case studies and to identify recurring patterns across such cases (cf. Gerrits, 2012). However, although many authors allude to the relationship between complexity and QCA, the logic underlying this relationship is rarely made explicit. This paper aims to map that relationship using critical realism as a meta-framework.

We argue here that any effort to research social complexity is implicitly or explicitly informed by Roy Bhaskar’s critical realism (cf. Reed and Harvey, 1992). We posit that Bhaskar’s view of the world as complex is not simply a truism, but provides a meta-framework for understanding reality as complex and systemic. Our discussion on complexity and critical realism translates into a specific take on complexity, summarized in four properties, which can also be found in QCA, if it is carried out following Byrne and Ragin’s guidelines.

This paper is structured as follows. We start with the understanding that complexity is a real, non-constructed, property of the world. This leads to a number of epistemological consequences (§2.1). We then discuss critical realism as a framework for articulating this complex reality (§2.2). Next, we discuss the basic ontological and epistemological assumptions behind QCA (§3) before relating them to Bhaskar’s critical realism. In doing so, we assess the extent to which QCA is complexity-informed (§4). The argument is summarized in the final section (§5).
2.1. Complex reality

According to many authors on the subject, ontologies in the realm of complexity sciences are different from the classical Newtonian worldview. A non-Newtonian worldview holds that reality is characterized by wholes rather than discrete entities and events; non-linear causality instead of linear causality; uncertainty about the future instead of total predictability; and partial truths rather than final truths (Morçöl, 2001). Although these statements describe the nature of complexity, they do not specifically answer the question: what exactly is complexity? Although there have been many attempts to answer this question, complexity has proven to be elusive to define unambiguously (Rescher, 1998). A tentative answer could be that complexity is the opposite of simplicity, i.e. complexity focuses on intricate causal patterns that progress non-linearly, making for a poorly predictable reality. But this answer is as vague as it is specific. While it points out that complexity is recursive, as each closer look reveals even more intricate details that mirror the larger whole, complexity is not exactly recursive in the sense that the whole can be fully known or understood by looking at the discrete details (Cilliers, 2002; 2005b; Rescher, 1998). It implies that a truly accurate description of a phenomenon’s complexity would be of the same extent as the phenomenon itself (Rescher, 1998). This is impossible for two reasons. First, complexity is not static but dynamic; thus, an exhaustive description would be temporally limited. Second, there are practical limitations in generating complete and dynamic descriptions of reality. Any description or model of complexity is incomplete by definition, as pointed out by Paul Cilliers, among others (1998; 2005a). Hence, the question becomes what characteristics of reality impede our understanding and generation of knowledge about the real world?

Perhaps the most fundamental statement about complexity that can be made is that the world is composed of open systems that are nested within, and have nested within themselves, other open systems (Byrne, 2005). This openness means that systems, although bounded, interact with other open systems in their environment (Cilliers, 2001). This interaction results in changes to the systems as environmental influences become part of the system’s structure. However, such environmental influences are not magically transferred to the system; the components that form the structure of the system interact and it is through this interaction that environmental influences become internalized. The process by which this happens is referred to as emergence: structure is formed through the interaction of components, and the resulting structures are not linearly traceable to their roots. Without interaction, there is no structure, only a sum of components. Thus, complex reality consists of open systems that are emergently structured (Reed and Harvey, 1992). Note, however, that emergence does not mean that a discrete entity or phenomenon that can be investigated under controlled conditions in the real world exists (Elder-Vass, 2005). Instead, emergence serves as an ontological vehicle for thinking about the nature of causation.

Thinking through emergence points towards another important characteristic of complexity: time-asymmetry, which implies time-irreversibility. If social reality is a
non-linear emergent result of interacting components, then the future is not a mirror of the past. Although the situation at a given time may appear to be the logical consequence of the sequence of prior events, that logic is not as easily apparent when predicting the future (Byrne, 1998). This is because systems do not follow fixed trajectories. The occurrence of non-ergodic chance events means that reality is developmentally open: ‘causally undetermined or underdetermined by the existing realities of the present and open to the contingencies of chance or choice’ (Rescher, 1995: 41). Thus, the future consists of a number of possible future states, some more likely than others. Which one of those future states becomes the actual state depends on the past, and the occurrence of random or chance events. These chance events introduce a level of instability into the trajectories of phenomena, and explain why the future is probabilistic even though the past often (falsely) appears as a fixed sequence (Prigogine, 1997). In an indeterministic or developmentally open world, certain events may or may not happen – depending on the conjunction of conditions. Some configurations may bring forth a future more probable than others (Gerrits, 2012).

These ontological points of departure highlight four properties of reality (Byrne, 2011a). First, since reality is non-decomposable, simply describing components of reality as discrete entities is insufficient, because real structures and processes come about through the internal and external interactions between these components. Second, reality is contingent. This means that any explanation is temporal in time and local in place. Since systems are nested within their systemic environments, there is mutual influence between different systems. This property also implies that some mechanisms are in operation at given points of time, while others are not, which we expand on in §2.2. Third, the previous two properties mean that reality cannot be compressed without losing some of its aspects. In other words, while reduction or compression may be inevitable given the limits of human cognition and for practical research purposes, such a reduction or compression implies the loss of some of reality’s properties such that any explanation is reductionist, i.e. an explanation can never fully contain the complexity it describes. This is also indicative of the role of semiotics in defining the world in terms of systems. Finally, time is understood to be asymmetric, which means that the trajectory of all systems is unidirectional. An event may appear in hindsight to be the result of a logical sequence of events, but, as mentioned earlier, this logic is not as easily apparent when looking into the future. Epistemologically, this constrains the extent to which meaningful predictions can be made.

In the next section, we argue that critical realism functions as a meta-framework for understanding this complex reality. We also look at the implications of critical realism for the type of statements that science can substantiate, and the methods than can be deployed to substantiate them.
2.2. Real complexity

The common theme in arguments about the complexity of social reality is that this reality is real. Many authors in the field of complexity science maintain that attempts can be made to understand this reality. A realist stance is implied in social complexity that is explicitly not postmodernist, but also not modernist, because it argues that reality can be understood through the deployment of research tools (Cilliers, 1998). It echoes Kant’s stance on empirical realism in holding that there is a reality that exists independently of our knowledge and perception (Losch, 2009), but goes beyond Kant in assuming that research allows us to approach reality and that the tools of research actually allow us to come closer to reality (Sayer, 1992). This way of thinking is propagated in critical realism, and it is often thought of as the way to navigate between empiricism and the interpretive sciences (Wuisman, 2005).

There are a number of different and disconnected strands under the heading of critical realism (Losch, 2009) which may cause some confusion about what critical realism actually means. Still, variants have been adopted in many scientific domains (Easton, 2010). We do not intend to comment directly on that diversity, but to build more specifically on the early work of Bhaskar (2008[1975]) who is credited with the philosophical elaboration of the first-wave of critical realism, as well as two subsequent waves (Bhaskar and Hartwig, 2010). While we acknowledge that Bhaskar himself at first used the term ‘transcendental’ and not ‘critical’ realism (Losch, 2009), we conform to the nomenclature that has developed over time and use the latter as shorthand for Bhaskar’s philosophy and strongly related accounts.

Bhaskar’s work indicates the existence of a reality independent from human observation. In contrast to others who have a similar view, he believes that we can in fact research, observe the effects of and analyse the mechanisms underlying the occurrence of events. Thus, he moves beyond the idea that humans can only describe what they think they perceive without claiming to gain better access to the causal mechanisms that are behind events, processes or behaviour. In this way, Bhaskar presents a stratified perspective on social reality that gives meaning to how one can understand the world. As Andrew Sayer puts it, ‘critical realism distinguishes not only between the world and our experience of it, but between the real, the actual and the empirical’ (2000: 11). The empirical is the domain of personal experiences. These are accompanied by the realities of actual events, processes and behaviour, and the mechanisms underlying these events and processes of structure and power. It is important to note that while these mechanisms exist a priori, particular configurations can bring the mechanisms into action, or fail to do so. A well-known example of this is labour-power. The power to perform labour is very real, but becomes actualized when labour is actually performed (Sayer, 2000). This position has implications for the type of statements that science can substantiate, and the methods that can be deployed to substantiate them.

In relation to the first point, Bhaskar posits that causality is real and can be researched. External events, processes or behaviours (Bhaskar’s second dimension of stratification), the effects of underlying mechanisms (the third dimension), can be
observed (the first dimension) as they unfold (Easton, 2010). Critical realism favours the language of causality to describe the world, even though it accepts that any analysis of causality is partial at best. Therefore, critical realism advocates that it can generate provisional explanation about how events follow from previous events, what drives processes, or the mechanisms by which human behaviour transpires. In the words of Sayer: ‘To ask for the cause of something is to ask “what makes it happen”, what “produces”, “generates”, “creates” or “determines” it, or, more weakly, what “enables” or “leads to” it’ (Sayer, 1992: 104).

Bhaskar accepts that, while the world ticks because of certain mechanisms, it is not possible to uncover these mechanisms unambiguously or comprehensively (Cilliers, 2001; 2002; 2005b). Following Malcolm Williams (2009; 2011), it is on this point that we feel that Bhaskar’s critical realism needs to be amended. Critical realism argues that ‘there are often sufficient conditions for something to occur, but they are not necessary ones, except under specific circumstances whereby the “natural necessity” is actualized’ (Williams, 2009: 3). We follow Sayer in saying that, although ‘in the “open systems” of the social world, the same causal power can produce different outcomes, according to how the conditions for closure are broken’ and ‘sometimes, different causal mechanisms can produce the same result’ (Sayer, 2000: 15), this critical realist view of causation is still open to natural or nomic necessity (Williams, 2009). However, critical realism in Bhaskar’s view holds that it is impossible to know this necessity up to the moment that it is actualized (the dimension of the actual): structures and powers are considered dispositional.

Again, labour-power provides a striking example. We agree with Bhaskar that recursive complexity impairs complete knowledge of the world, but we add that this recursive property is not the sole reason for partial knowledge. Indeed, reality is itself contingent, and for that reason, any explanation is partial and contingent. As stated before, some mechanisms operate while others do not, and this marks the difference between potential and achieved influence. However, it does not mark an apparent difference between real influence (realized, therefore observed and appearing to be present) and influence that is not real (unrealized, therefore unobserved, and appearing to be absent). This difference between potential and realized influence can differ between events, processes, systems or cases (cf. Bhaskar and Hartwig, 2010: 109-110). Whether certain mechanisms are in operation or not is a question that can only be answered empirically. We want to emphasize that this does not imply total unpredictability. We learn from past research and experience that given a certain configuration of conditions, some future states are more probable than others (Byrne, 2011a). However, this is true only in so far as such estimations are not built on the homogenizing assumptions of time symmetry (Prigogine, 1997; Ragin, 2000). To us, this implies that contingency is both epistemological and ontological in nature.

Although it is not possible to fully know reality because of the reasons given above, people act upon their interpretations of reality nonetheless. Their interpretations of a situation causally affect their actions and so interpretations must be considered real, as implied by the Thomas theorem. In other words, people accept in their actions that the world as interpreted by them is real (Easton, 2010). This
extends to the researcher who attempts to discover the causal mechanisms but who has to understand that his interpretation can only gain meaning through comparison with other interpretations as every interpretation carries with it normative judgments. This observation makes a strong case for negotiated subjectivism (Byrne, 2003; Haynes, 2001; Uprichard and Byrne, 2006), which is the main point of departure in critical realism (Guba and Lincoln, 1989).

Critical realism may accept the notion of causality, yet Bhaskar takes issue with grand narratives about how positivism and its methods, especially the golden standard of the double-blind experiment, can uncover truth. Bhaskar holds that reality is an open system and that causality is systemic by definition. Inevitably, each research attempt draws artificial boundaries around its subject. Those boundaries may be negotiated, perhaps based on common sense in the most literal sense of the word, but they are boundaries nevertheless (Cilliers, 2005b). The real world, however, is unbounded. The choice to focus on certain variables invariably brings with it the choice to ignore others. Unavoidably, it also means that the observer’s normative stances are (implicitly or explicitly) embedded in the research, thus translating into what is being researched. Therefore, under the complexity sciences, the positivist claim to true, objective knowledge is unsupported.

These premises lead to the second point, namely that Bhaskar moves away from the positivist orientation and methods that are built on the premise of controlled conditions and stability in the system (e.g. Callaghan, 2008). The absence of control over the conditions in the real world (as opposed to enclosed laboratories) means that it is impossible to establish a definitive causal account because one does not know how the conditions in which a certain event or process takes place impact causality, i.e. whether they promote or dampen the occurrence. This perspective has consequences for the way reality is assumed to unfold. Stable systems promote predictability because the same incentives lead to the same result when repeated. But Bhaskar’s premise of open systems means that the events, processes or behaviours that are witnessed are not caused by a supposedly fixed set of variables but rather by a conjunction of variables at a certain point in time. This can be explained (provisionally) but not predicted (Williams, 2009).

The argument above can be summarized in a description of the nature of complex causality, following Byrne (2011a; 2011b). Complex causality is an interaction of generative mechanisms in specific contexts, resulting in unidirectional outcomes, meaning that the outcomes are subject to time-asymmetry. In addition to Byrne’s description, we argue for the plural form of mechanisms because multiple mechanisms produce an outcome in conjunction with context. In other words, a space of possible combinations exists, from which a specific configuration is triggered at a given point in time. Thus, causality is both real and complex, and, importantly, its contingency also applies to those studying it, implying that causality is, by definition, interpreted.
3. Principles of qualitative comparative analysis

In this section, we discuss the main principles of QCA and its ontological and epistemological assumptions before connecting the dots. QCA is an umbrella term that captures different types of case-based, comparative methods (Rihoux and Ragin, 2009). The method was developed in 1987 by Ragin as a way of integrating the case-oriented and variable-oriented approaches so as to exploit the strengths of both (Ragin, 1987). Ragin argues that scientists using QCA do not have to choose between the ‘understanding of complexity and knowledge of generality’ (Ragin, Shulman, Weinberg and Gran, 2003: 324). QCA can be used to ‘achieve a systematic comparison across a smaller number of individual cases ... in order to preserve complexity, and yet being as parsimonious as possible and illuminating otherwise often hidden causal paths on a micro level’ (Rihoux and Lobe, 2009: 228).

It is a comparative case-based approach that allows for the examination of multiple causal configurations. The configurational approach implies that combinations of conditions (i.e. configurations) produce certain outcomes, different combinations may produce the outcome, and certain conditions can have different effects in different contexts. These characteristics are referred to respectively as conjunctural causation, equifinality and multifinality (Grofman and Schneider, 2009; Schneider and Wagemann, 2010), and summarized collectively as causal complexity or complex causation.

QCA relies on set theory; variables are conceived as conditions and collections of conditions make up sets. Sets can be, and most often are, conceptualized and defined using existing theories. Cases can have different degrees of membership in a certain set. Different set relations or logical operators (e.g. Smithson and Verkuilen, 2006) express the characteristics of causal complexity. ‘Logical and’ expresses conjunctural causation (i.e. configurations as sets) and ‘logical or’ expresses equifinality and multifinality. All the logically possible configurations are listed in a truth table (Ragin, 2008). This truth table is the key tool for the analysis. It sorts the cases across the various configurations and, based on measures of consistency and sufficiency, allows the researcher to examine the set relations between conditions and outcomes.

Next, the truth table can be minimized using Boolean algebra to produce general statements of the necessity and/or sufficiency of (combinations of) conditions for the outcomes to emerge. A condition is necessary if it has to be present for the outcome to occur, and sufficient if it can produce the outcome by itself. However, most often conditions are not individually necessary or sufficient for phenomena to occur, but they can be in the context of certain other conditions (i.e. within a configuration). Such conditions are called INUS conditions: insufficient but non-redundant parts of a condition which is itself unnecessary but sufficient for the occurrence of the effect (Mackie, 1980). The minimization process leads to a summarized statement or solution formula about the patterns and conditions that lead to certain outcomes observed across the cases. However, the formula only makes sense if its constitutive conditions are theoretically related, and if it is reinterpreted in
the light of the individual cases. Boolean minimization is only one part of the cycle of scientific discovery, and the researcher should return to the in-depth case studies, and perhaps even add new ones, to understand the meaning of the solution formula. Adding new cases or new conditions, or re-conceptualizing sets, may cause the solution formula to shift.

QCA is be used in a number different of ways for social science research. Some authors, including Ragin himself, regard it as an approach that brings to the forefront the iterative movements between induction and deduction that are part of the social sciences but often remain implicit in research reports. This relates well to Jan Wuisman’s argument that, for critical realism to show its potential when examining complex systems, it is necessary that both induction and deduction be included in a single research cycle. He argues that, when the lens of critical realism is adopted by a researcher, the ‘process of social research is reconceptualized as a process of discovery in which two distinct elements as integral parts are incorporated’ (Wuisman, 2005: 393). Using QCA to conduct research in this way means exposing and mapping the steps back and forth between induction and deduction.

Moreover, this approach allows qualitative and quantitative data to be combined and related to each other (Byrne, 2011a; Ragin, 2000). For example, a qualitative in-depth analysis of a limited set of cases could lay the foundations for a quantitative large-n study. The results from that large-n study could be fed back to the in-depth case analysis. While QCA perceives complexity as real, it can be used to compress large amounts of qualitative data without losing the essential qualitative nature of the data to facilitate comparison across cases so as to render patterns of complex causality apparent.

QCA can also be used as an alternative tool for analysing quantitative data when the sample is too large to allow in-depth analysis, but too small to allow conventional regression analysis. Such studies, and variations on those approaches, use QCA as a frugal way to compress data and to arrive at meaningful results.

A somewhat similar application is when QCA is used to describe systems’ trajectories (Byrne, 2011b). This approach uses QCA as a descriptive tool and addresses the configurations of components characterizing the state of a certain system at different moments in time (e.g. Vis, 2007). This configurational approach means that systems are considered conjunctural, and that cases or (sub-) systems are heterogeneous wholes made up of different parts or conditions. At the explanatory level (or Bhaskar’s third dimension), their heterogeneous context is assumed to influence their development and structure. Thus, social phenomena are considered emergent (Ragin, 1987): they result from the interactions between different parts or conditions. Hence, their explanation requires a consideration of the interactions of different conditions in relation to the phenomenon, event or process. Contextual heterogeneity also implies that reality is contingent. Social phenomena operate in context but this context is not similar for all social phenomena. Nevertheless, a certain phenomenon, event or process can occur in a similar vein despite being embedded in a different context. This also means that the effects of specific conditions in this heterogeneous contextual configuration depend on other
conditions in the configuration. Hence, causality in QCA is conjunctural, equifinal and multifinal, as mentioned before, and characterized by INUS conditions. This is important, not because social phenomena are multivariate, but because ‘different causally relevant conditions can combine in a variety of ways to produce a given outcome’ (Ragin, 1987: 26). In this way, QCA can be used to elucidate contrary or combined causal mechanisms that lead to certain system states in particular contexts.

4. Connecting the dots

We set out to map the connections between complexity, critical realism and qualitative comparative analysis, connections that are often alluded to but seldom explicitly explained. We began by explicating four ontological statements about the complexity of open social systems: reality is non-decomposable (emergence: the whole is more than the sum of the parts), contingent (systems are located in systems), non-compressible (complexity is recursive) and time-asymmetric (emergence: the future is developmentally open). We then described the usefulness of Bhaskar’s approach to critical realism as a meta-framework for understanding how these four statements impact the type of statements social research can substantiate, and the methods than can be deployed to substantiate such statements.

In short, we postulate that a reality exists outside human perception and this reality is driven by causality. The term ‘causality’ does not imply universal laws or necessity. Rather, it concerns specific configurations that are temporal in time and local in place, which activate certain mechanisms that bring about that specific reality. Research can aid in describing and understanding how these configurations operate. However, critical realists understand that social reality is too complex to be fully understood, and that there is a difference between achieved and potential influence and that the absence of a certain effect does not mean that its mechanisms are also absent.

Critical realism appears to have much in common with the ontological statements about complexity. Its focus is on contingency, i.e. how particular configurations activate certain mechanisms and how these configurations shift in time and place. This focus on contingency has implications for the extent to which patterns are said to reoccur over time. As such, it addresses the issue of time-asymmetry. Its position on reality aligns with complexity’s properties of non-decomposability and non-compressibility. It implies that both complexity and critical realism offer an anti-reductionist take on social reality (Sibeon, 1999).

This anti-reductionist approach is evident in QCA. It accepts that, while reality is real, we perceive and reconstruct it. To study this complex reality and find causal patterns that may explain the emergence of events, processes or other kinds of social phenomena, we need to make choices, as with any study. We need to choose the descriptive and explanatory conditions to include in the analysis, and how to define and operationalize (i.e. perceive and reconstruct) these conditions. QCA provides a dialogical research framework in which the researcher moves iteratively – based on actualized events (i.e. cases) – between observations and the discovery of
mechanisms, thereby covering Bhaskar’s three dimensions. In this way, the operations of QCA articulate the iterative nature of complexity research as a critical realist cycle of scientific discovery (Wuisman, 2005). In line with Byrne’s view of cases as configurations of conditions (2005) and as argued by Ragin, the researcher constructs sets of conditions that constitute the case. As implied in the literature, these conditions can be descriptive (Berg-Schlosser, De Meur, Rihoux and Ragin, 2009), in which case the comparative analysis – conducted at different times of the cases’ development – can point at patterns across cases ‘as variate traces of the character of open systems’ (Byrne, 2005: 107). Another use can be to construct different (competing) mechanisms as sets, whereby these are comparatively analysed to see which combinations yield certain outcomes. Taken together and referring to Byrne's causal critical realist formula of complex causality (Byrne, 2011a), cases can be reconstructed as instances of ‘mechanisms and context’, and subsequently analysed to find patterns of causal complexity. Any analytically produced complex pattern is derived from the complexity of in-depth case studies, and has to be interpreted as such. This makes QCA a powerful methodology for analysing complexity.

Although QCA is reductive (i.e. compresses reality), as with any type of research, and partial (i.e. decomposes reality), it is built on the notion of a contingent reality, which is at the core of complexity. This is evident in its notion of causal complexity or chemical causation (Ragin, 1987), as pointed out in the previous section. Furthermore, it adheres to the premise of time-asymmetry. Statements of complex causality are derived in hindsight. The cases that form the basis for these statements are actualized instances. This does not imply total unpredictability since we can learn from past research and experiences that certain patterns have a higher probability than others. This is evident in QCA’s identification of limited diversity or logical remainders, and its suggestion that we use counterfactual analysis (Ragin, 2008) to cope with this.

5. Conclusion

We have argued that critical realism provides a meta-framework for understanding the relationship between the complexity of the real world and qualitative comparative analysis as a complexity-informed method. We explored how complexity impacts the extent to which we can generate pertinent knowledge of social reality and discussed the extent to which QCA can be used to generate provisional explanations of emergent social phenomena across multiple cases – provisional because the explanations are temporal in time and local in place. Using critical realism as a meta-framework for understanding social complexity enables us to position the research in this field within the debates in the philosophy of science. While methodological issues related to QCA’s a-temporal conception of cases and the deductive logic that is currently dominant in its application are yet to be resolved, and although its use as a critical or complex realist method of scientific discovery is still limited, QCA is at its core a contingent and time-asymmetric method of social inquiry. QCA is not only a
helpful method for analysing complexity, as seen in its increasing use in the realm of complexity science, but is also complexity-informed in itself.

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