Articles

The Reshaping of the Quantitative-Qualitative Divide: A Case of QCA

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Introduction

Researchers have long argued that quantitative and qualitative methods are distinct and, therefore, serve different analytical purposes. Quantitative methods tend to be associated with large-N analysis and systematic theory testing, while qualitative methods are believed to provide thick accounts of one or few cases. However, in recent years, a pair of interconnected processes has reshaped the quantitative-qualitative divide in political science. Not only is our discipline in the middle of a mixed methods boom, but that trend is also being bolstered by innovations to the very methods used in mixed methods scholarship. These two processes raise pragmatic questions about what counts as mixed methods research, and even more fundamentally about its best practices. Therefore, political scientists are prompted to reconsider the qualitative-quantitative divide, especially as the meaning of these two labels continues to evolve. Doubtlessly, sound methodological advice depends on a proper understanding of what separates these two research traditions.

Using Qualitative Comparative Analysis (QCA) as an example of a research tool that has evolved methodologically, this article shows that a number of previous understandings of the quantitative-qualitative divide are no longer salient. This essay extends the conceptualization of "two cultures" (Goertz and Mahoney 2012) and emphasizes that, since both cultures build on the same foundation of formal logic, they are not as distinct as previously assumed. On the other hand, despite a common foundation in formal logic, both quantitative and qualitative methods make use of specific, albeit different, types of mathematics. These mathematical superstructures are hugely important, because they determine which two methods can be combined for the purposes of mixed methods research (see, e.g., Humphreys and Jacobs 2015).

This article concludes by underscoring the importance of training institutes, focusing on QCA meetings worldwide (2005-2018), to demonstrate the point that the line separating quantitative and qualitative methods is not clear-cut and continues to evolve. QCA became more popular after the Comparative Methods for Systematic Cross-Case Analysis (COMPASSS) network was established in 2003, but its rise has been facilitated by its epistemological overlap with statistical approaches. Today, the method is regularly taught at key institutes around the world, and, in 2018, even the quantitatively oriented Inter-University Consortium for Political and Social Research (ICPSR) institute incorporated QCA into its curriculum.

New Boom, Old Questions

A new wave of mixed methods scholarship is sweeping political science. Indeed, from 2000 to 2013, "the number of references to multi-method research grew from 14% of the references to OLS regression, to 26%, while references to mixed-method research grew far more impressively, from 8% to 47% of the number of search results for OLS regression" (Seawright 2016, 3). The early phases of the mixed methods boom were underpinned by the implicit understanding that two methods were better than one. Using numerous tools within a single research design was meant to make inferences more robust. This approach was widely referred to as triangulation, and corroboration was its goal (see, e.g., Jick 1979). Seawright (2016) raised a number of objections to triangulation and proposed integration as an alternative way of strengthening mixed methods analysis. With integrative mixed methods, one

method produces a final inference while other methods are meant to test and refine the analysis producing that inference. Nevertheless, a common complaint among scholars practicing mixed methods research is that many potential practitioners lack the methodological training and knowledge to do it properly (see, e.g., Humphreys and Jacobs 2015, 655).

QCA is arguably the most formalized of what is usually understood as a qualitative method. Its development is evident both in methodological terms, as the method continues to incorporate more sophisticated algorithms, and in the way the method is practiced and taught. Consider that Charles Ragin developed QCA as a case-centered alternative to statistical inference, and yet these days the method is regularly taught by a number of key institutes around the world, including the quantitatively oriented ICPSR.

QCA was created to synthesize the best aspects of both quantitative and qualitative approaches. Over the years, the method has evolved from crisp-set analysis (Ragin 1987) to fuzzy-set analysis (Ragin 2000, 2008), and to enhanced standard analysis (Schneider and Wagemann 2012) and beyond. As QCA became more formalized, it also began to attract more attention from methodologists who were critical of the approach. For instance, Krogslund, Choi, and Poertner (2015) argue that QCA's findings are highly contingent upon the parameters selected by the user. Similarly, Braumoeller (2015) complains that QCA is highly susceptible to producing results that exhibit Type I error (i.e., false positive). QCA's methodological merits and drawbacks were also the topic of many symposia in high-profile journals. In 2013, *Political Research Quarterly* published a mini-symposium titled "QCA, 25 Years after 'The Comparative Method'" and *The Qualitative & Multi-Method Research Newsletter* released in the spring of 2014 was also almost exclusively focused on set-theoretic approaches. Likewise, in May 2016, *Comparative Political Studies* published a special issue titled "Debating Set Theoretic Comparative Methods." Both methodological criticism and debates in highly respected research journals have made QCA more well-known while helping the method's practitioners address some of its technical shortcomings. However, a key point of contention in these debates is the question of contrast between QCA and standard statistical methods (see, e.g., Grofman and Schneider 2009; Schneider and Wagemann 2012, 86-90; Thiem, Baumgartner and Bol 2016). The key question is whether QCA is more of a qualitative or quantitative method. It thus becomes necessary to re-examine how political scientists have conceptualized these two research traditions.

The Quantitative and Qualitative Research Traditions in Political Science

When the study of politics was still in its incipient stages, qualitative research served as the dominant methodological paradigm. Munck (2007) shows that comparative social science has a particularly long-standing tradition of qualitative work, and Adcock (2007, 184) reminds us that the same can be said about political science in the post-World War II era in general. In the 1960s, the behavioral revolution re-shaped American political science. As more scholars began using statistical inference in search of systematic patterns and greater generalizability, qualitative approaches began to lose their appeal. Around that time, Lijphart (1971, 683-5) underscored that there exists a hierarchy of research methods. Experiments produce the most valid inferences, followed by statistical approaches. Qualitative methods come in last, and the author portrays them as the least reliable in producing robust findings. The supposed problem with comparative case studies, and qualitative methods in general, is that they analyze too few cases to permit proper control (Lijphart 1971, 684).

Researchers have long argued that a quantitative template can and should be applied to qualitative research. That indeed was the primary goal of King, Keohane, and Verba (KKV). Their 1994 book proved to be hugely influential, achieving a canonical status in the discipline. The impact of the publication was so great that Mahoney (2010, 122) speaks of a post-KKV era in the social science methodology. Brady and Collier's (1994) edited volume was published as a reaction to the challenges posed by KKV. While the book attempted to underscore the distinctiveness of qualitative methods, with some authors going as far as to accuse KKV of methodological imperialism, the volume, nonetheless, emphasized the importance of shared standards. Hence, the underlying aim of the volume was to underscore the distinctiveness of qualitative methods, while at the same time bringing them more in line with the quantitative research tradition.

Only in recent years has the distinctiveness of qualitative methods been described and then defended on its own terms. George and Bennett (2005) showed why even a single case study could be important from both methodological and substantive points of view. And, while both Sartori (1970) and later Collier and Mahon (1993) wrote about the importance of proper

concept formation, this critical element of social science research was formalized only more recently by Goertz (2006). Qualitative methodologists continue to assert their place in political science (see, e.g., Cyr 2019; Goertz 2017; Kapiszewski, MacLean and Read 2015). The insistence that qualitative methods are valuable, albeit different from statistical methods, has led Goertz and Mahoney (2012) to conclude that qualitative and quantitative methods belong to different cultures. However, what exactly differentiates these cultures is still a matter of considerable debate. Not only are scholars oscillating between narrower and more encompassing conceptualizations of the two research traditions, these definitions are also continuing to evolve. In light of methodological developments associated with QCA and other methods (e.g., process tracing), few of these definitions give us clear guidance on how a particular approach should be classified.

Some scholars advocate a clear-cut categorization. King, Keohane and Verba (1994) insist that:

> Quantitative research uses numbers and statistical methods. It tends to be based on numerical measurements of specific aspects of phenomena; it abstracts from particular instances to seek general description or to test causal hypotheses; it seeks measurements and analyses that are easily replicable by other researchers. Qualitative research, in contrast, covers a wide range of approaches, but by definition, none of these approaches relies on numerical measurements. Such work has tended to focus on one or small number of cases, to use intensive interviews or depth analysis of historical materials, to be discursive in method, and to be concerned with a rounded or comprehensive account of some event or unit (3-4).

King, Keohane, and Verba's distinction rests upon the questionable assumption that qualitative methods do not deal with numbers, but the practice of calibration in QCA (i.e., the process by which set membership scores are assigned to cases) shows that, in fact, the opposite is true.

Other definitions are equally encompassing, but provide a more fine-grained analysis of what separates both research traditions. Collier and Elman (2010, 781) argue in favor of disaggregating the qualitative-quantitative distinction in terms of four criteria: level of measurement, large-N versus small-N, use of statistical and mathematical tools, and whether the analysis builds on a dense knowledge of one or few cases or on the thin analysis of large-N studies. QCA, however, can be applied to any level of measurement and process any number of cases. Although its methodological superstructure is different from that of statistical methods, the method nonetheless builds on a sound mathematical framework. Finally, although QCA calibration should always be informed by a case study expertize, researcher's knowledge of particular cases decreases as the number of countries in the analysis goes up. This is not a problem with calibration per se, but an observation that our resources and intellectual capabilities are limited. A single person can be an expert only in so many cases. Because of this trade-off, calibration in large-N QCA analysis necessarily depends on a thinner knowledge of cases, making such analysis very similar to other cross-sectional methods that can also process an unlimited number of cases.

On the other hand, Gerring (2017) provides a much narrower understanding of qualitative methods. He classifies methods based on the type of data they can process. Thus, quantitative methods analyze observations that are comparable, while qualitative methods make use of non-comparable data, regardless of how many observations there are (Gerring 2017, 18). The proposed dichotomy is so minimalist that it actually says very little about the two research traditions and focuses instead on two types of data. However, even that distinction is not perfect because qualitative data can be translated into quantitative observations, although not the other way around. As an illustration, we can reduce qualitative data about any country to a single number in a data matrix, but once the reduction is complete the initial qualitative information will be impossible to infer. Furthermore, the author also recognizes that QCA – widely recognized as a qualitative method – escapes this clear-cut dichotomy by being able to analyze comparable observations (Gerring 2017, 19).

Each of these distinctions between qualitative and quantitative methods is challenged by QCA. When King, Keohane, and Verba (1994) published their book, QCA was still in its incipient stages, although even then crisp-set QCA would invalidate their unambiguous dichotomy. Collier and Elman (2010) offered a more nuanced conceptualization of the two research traditions, and yet their emphasis on four criteria does not allow us to place QCA neatly in either camp. Finally, Gerring (2017) created a minimalist definition of quantitative and qualitative methods, but his argument tells us more

about the data these methods analyze, rather than the methods themselves.

Goertz and Mahoney's discussion of the two cultures, by contrast, is extremely useful, I suggest, because it sheds new insight on the difficult problem of what exactly separates qualitative and quantitative traditions: "We even suggest that the two traditions are best understood as drawing on alternative mathematical foundations: quantitative researchers grounded in inferential statistics (i.e., probability and statistical theory), whereas qualitative research is (often implicitly) rooted in logic and set theory" (2012, 2). In making this comment, Goertz and Mahoney (correctly, I think) point out that qualitative and quantitative methods are dissimilar because they make use of different types of mathematics. They do not, however, extend their definition to its logical conclusion. One implication of Goertz and Mahoney's treatment of qualitative and quantitative traditions is that these traditions are closer to each other than the authors are willing to recognize. As the prominent philosopher and logician Bertrand Russell put it, "all pure mathematics follows from purely logical premises and uses only concepts definable in logical terms" (Russell 1995, 57). The essence of Russell's argument is that every rule of arithmetic can be expressed in the language of formal logic. We might even say that logic provides the structure for all branches or superstructures of mathematics. Therefore, both research cultures are built on the basis of formal logic and make use of particular branches of mathematics only later on. When Goertz and Mahoney insist on thinking about these cultures as distinct, they undervalue the extent of overlap that exists between them.

On the other hand, Goertz and Mahoney's conceptualization of qualitative methods is too broad. Not every qualitative approach is committed to making use of formal logic, and thus to a systematic analysis of social phenomena. Gensler writes that "logic is the analysis and appraisal of arguments" (2002, 1). On such a reading, logic is a tool that we use to understand the world around us. Social scientists might not be able to provide definitive answers, but their commitment to logic as a mode of rational thinking orients them towards a neo-positivist tradition. Here is how another methodologist explains this view: "they [social scientists] intend to study human action in a systematic, rigorous, evidence-based, falsifiable, replicable, generalizable, nonsubjective, transparent, skeptical, rational, frequently casual, and cumulative fashion" (Gerring 2011, 2). Advocates of deconstruction, postmodernism, post-structuralism and

other related approaches would likely reject some or all of these goals. That is also why they have been subjected to fiercer methodological criticism (see, e.g., Elster 2015; Sokal and Bricmont 1998). Goertz and Mahoney (2012, 4) do acknowledge that the qualitative camp has many divisions, but by not extending their definition fully, the authors group under one label of qualitative methods a great variety of approaches that are radically different, if not outright contradicting, in their methodological orientation. For example, the epistemological and ontological gulf between QCA and post-modernism is much wider than the gap between QCA and regression analysis. Epistemological differences and similarities matter (see also, Koivu and Damman 2015), and, in this case, they help explain why QCA overlaps with statistical methods and why the former approach is a part of ICPSR's curriculum.

Acknowledging that some qualitative methods build on the structure of formal logic while others do not may seem trivial. It is, in fact, crucial in terms of today's concern over mixed methods best practices. The final implication of Goertz and Mahoney's conceptualization of two cultures is that mathematical superstructures determine whether two methods are compatible with each other. This suggestion is already acted upon in the practice of mixed methods research. Consider the Bayesian Integration of Quantitative and Qualitative data (BIQQ). Humphreys and Jacobs (2015) present BIQQ as a new mixed methods approach that combines elements of correlation-based techniques and process tracing. This innovation, however, is only possible "because the inferential strategies of both qualitative and quantitative analyses can be described in Bayesian terms," and from there "it is a short step to combine the two forms of inference within a single analytic framework" (Humphreys and Jacobs 2015, 671). Basically, mathematical superstructures of both approaches are similar enough to allow for their fusion. In other cases too, the merging of the Bayesian approach with statistics (Kennedy 2008, 213-26) or with process tracing (Bennett 2014) is built upon and presupposes the already existing mathematical commonality.

Bridging the Quantitative-Qualitative Gap while Remaining Distinct

Although QCA tends to be presented as a qualitative-based alternative to statistical approaches (see, e.g., Ragin 2008; Schneider and Wagemann 2012), the method does in fact build on the same logical structure as regression analysis. It is thus worth asking if QCA can serve as

a bridge between statistical methods and more case-oriented approaches. Generally speaking, both QCA and OLS regression aspire to generalizable cross-sectional findings, while sharing a common challenge of separating association from causation. Moreover, both need to be supplemented by process-tracing analysis to examine causal mechanisms in particular cases. Furthermore, Paine focused on technical parallels to demonstrate that truth table analysis is similar to that of multiplicative interaction terms because "regression can be used to convey the same information about necessary/sufficient condition hypotheses as a truth table" (2016, 4). I extend his analysis by adding a meta-commentary that embeds the discussion of multiplicative interaction terms within the broader context of heteroskedasticity. The latter serves as a fruitful point of comparison because both methods deal with this phenomenon differently, and this contrast allows us to see the degree of epistemological overlap between them as well as the limits of methodological fusion.

In OLS regression, the homeskedasticity criterion assumes that the variance of the error term is constant across observations (Lewis-Beck 1980, 26). Thus, if educational attainment has a positive impact on future earnings, we would expect this finding to hold for all observations in our sample. Consider, however, that an investment banker with an MBA degree from a prestigious university might make significantly more money than a social worker with a similar level of formal education. In this hypothetical example, the variance of the error is larger at higher levels of educational attainment. In short, heteroskedasticity is present because highly educated people have considerably different income levels.

The presence of heteroskedasticity poses a serious problem for standard OLS models since it makes regression estimators inefficient. That is why statistical software programs are equipped with diagnostics tests meant to recognize the presence of heteroskedasticity (e.g., the Breusch-Pagan test) and with remedies to mitigate its impact (e.g., the bootstrap technique). These mechanical solutions are useful if the origins of heteroskedasticity are an artifact of incomplete data or flawed survey instruments. For instance, if economic crises are more dangerous to survival of dictatorships than democracies, then scholars interested in the validity of modernization theory might face a challenge in that quality country-level data is often contingent on the level of economic development because non-democratic regimes will have an incentive to hide their poor economic performance (Przeworski and Limongi 1993, 62). Moreover, highly-developed countries collect and report data on economic performance much better than authoritarian regimes since democracies derive legitimacy from more than their economic performance, and therefore imprecise financial data about the economic performance of poor and/or non-democratic regimes would lead to biased OLS estimators (Przeworski and Limongi 1993, 62-64).

But, in some cases, heteroskedasticity might simply be a fact of the world around us. As in the hypothetical example above that links educational attainment with increased earnings, it simply might be true that education does, in fact, have a different effect on the wages of highly trained people because the type of occupation they pursue moderates its effects. When scholars expect that an independent variable will not have the same effect on different groups they have turned to using interaction terms. This, in turn, relaxes the unit homogeneity assumption. An interaction effect among independent variables occurs when a change in the value of one independent variable affects the impact of another independent variable on the outcome. To illustrate this point, consider the following example: "Changes in the amount of sunlight a plant is exposed to make little difference if the plant does not receive any water, but makes substantial difference if it does: water (or its absence) moderates the impact of sunlight on plant growth; and the converse is true as well, of course: the amount of sunlight that a plant receives moderates the impact of water on plant growth" (Braumoeller 2014, 42). Interaction terms are very useful because they allow us to analyze politics in a more realistic way. Yet, this technique is not easy to use in the context of standard regression analysis. Brambor, Clark, and Golder (2005) found that only 10% of articles published in the top three political science journals between 1998-2002 applied and interpreted interaction terms correctly. Moreover, analysis of three or more interaction terms, while technically possible, would be very difficult to carry out and interpret.

QCA differs from regression analysis in that it does not treat heteroskedasticity as a problem to be solved. To illustrate this point, Ragin examines data on electoral districts voting in Great Britain and observes that, when the percentage of the population employed in manufacturing sector was low, the degree to which people vote along class lines could be either high or low. Yet, when the percentage of the population employed in manufacturing was high, the level of class-based voting was always high (2000, xiii). From the perspective of statistical analysis, such findings exhibit severe

heteroskedasticity. Furthermore, a conventional theory of voting behavior would suggest that in manufacturing areas class-based voting is high, but this theory does not claim that having a high level of manufacturing is the only way to generate high level of class-based voting (Ragin 2000, xiv). Thus, Ragin's findings do not contradict the overall theoretical argument and, in fact, we have learned something important. Namely, that class-based voting can also be present in areas where people are not primarily employed in manufacturing sector. Ultimately, then, QCA practitioners recognize and even embrace a scenario in which alternative factors can produce the same outcome (i.e., equifinality), while statistical analysis aims to identify the most powerful predictor for explaining the variance in the dependent variable, and thus are driven by the assumption of unifinality (Schneider and Wagemann 2012, 86).

OLS regression and QCA might overlap in the way they deal with heteroskedasticity, but the two approaches remain distinct. Ragin writes that interaction terms "have all the appearance of testing for combined causes, but they are really generic, omnibus tests for non-additivity, not tests for the exact causal combination specified in the multiplicative term" (Ragin 2013, 1). This contrasts with QCA and its set-theoretical superstructure, which allows it to focus on combinations of conditions rather than non-additivity. Indeed, "the basic idea behind truth table analysis is to find the combinations of conditions that yield highly consistent membership in the outcome set and the focus, then, is on what it takes to meet or surpass a threshold value" (Ragin 2013, 1). In OLS regression, multiplicative interaction terms are a way to analyze politics in a more complex way, while also addressing the presence of heteroskedasticity, but this strategy requires that certain assumptions underpinning standard regression analysis be relaxed. QCA, by contrast, was designed to discover causal paths that lead to specific outcomes, and the method's focus is on combinations of conditions required to reach a specific outcome threshold. That is also why QCA can easily deal with three-way and higher order terms (Axel, Rihoux, and Ragin 2014, 118).

On the one hand, Paine's (2015) argument that QCA and OLS regression are related because truth table analysis and multiplicative interaction terms allow researchers to carry out similar analyses rests on the implicit assumption that their methodological structures are similar enough to allow for such convergence. On the other hand, such insistence overlooks the fact that these methods make use of distinct mathematical superstructures (probability calculus/matrix algebra vs. set-theory), which, in turn, makes them approach the issue of heteroskedasticity differently. These observations have significant implications for the practice of mixed methods research, as well as for the potential to bridge the quantitative-qualitative gap. Compatibility among methods is, for the most part, determined by their mathematical superstructures. Where epistemological overlap does not exist, the gap between quantitative and qualitative methods will persist. Hall (2003) reminds us about the importance of achieving a fit between the character of the world as it actually is and the choice of research method in order to increase the validity of empirical inferences. It becomes apparent that his recommendation to align ontology and methodology also extends to the practice of mixed methods scholarship. As we will see next, the existing epistemological overlap between QCA and statistical methods is also reflected in the way the former approach is taught. These days even highly quantitative training institutes (e.g., ICPSR) have incorporated QCA into its curriculum.

Methodological Institutes

This section focuses on methodological institutes to show that QCA is now a mainstream method. Over the last decade, the QCA approach has been transformed from a method on the fringes to being taught at all major methodological institutes worldwide. Such institutionalization is most likely aided by the fact that QCA shares important epistemological similarities with mainstream statistical approaches. Mixed methods research is certainly on the rise, but the relationship between quantitative and qualitative methods continues to be asymmetrical. For example, a survey of the top ten political science and sociology journals from 2001 to 2010 reveals that both fields favor quantitative methods, as 73% of the articles utilize some form of statistical research methods (Goertz and Mahoney 2012, 227). Qualitative methods are used in 31% of the articles, of which only 1% used QCA (Goertz and Mahoney 2012, 228). To be sure, there are exceptions to this rule in some pockets of our discipline. Moravcsik (2010, 29) notes that over 90% of IR scholars employ some form of qualitative analysis. However, when it comes to methodological training, the asymmetry becomes especially acute. Emmons and Moravcsik (2016) find that only sixty percent of the top political science departments offer

any dedicated graduate training in qualitative methods, and that percentage is declining over time.

Social scientists have long recognized the importance of institutional infrastructures for the development and promotion of various methodological approaches. Seawright (2016, 4) acknowledges that the launching of *The Journal of Mixed Methods Research* has been crucial for the spread of mixed methods research. Similarly, Goertz and Mahoney (2012, 5) emphasize that political science methodologists have organized themselves into either the Section on Political Methodology to represent quantitative methods, or the newer Section on Qualitative and Multi-Method Research. Methodological institutes matter as well (Collier and Elman 2010). Consider that between 1984 and 1997 only 39 articles using QCA appeared in peer-review journals (Axel, Rihoux, and Ragin 2014, 121). However, Axel, Rihoux, and Ragin point out that political scientists started to use the method more frequently once the COMPASSS network was created in 2003; the network aims to stimulate the discussion of best QCA practices, offers an informal peer-review section, and develops courses for the ECPR (European Consortium for Political Research) (2014, 125).

QCA has been a part of the IQMR's (Institute for Qualitative and Multi-Method Research) curriculum since the institute's inception in 2002 and, according to COMPASSS newsletters, the method was taught at ECPR already in 2005. Although the COMPASSS network makes a distinction between QCA trainings and QCA events, these two categories overlap considerably. The training category tends to describe highly institutionalized schools, such as the ECPR methods schools, while events usually indicate smaller workshops, colloquiums, and conferences.[1]

Graph 1. QCA meetings worldwide

Graph 1 illustrates that QCA meetings worldwide gradually declined after 2005, only to increase dramatically after 2012. It is hard to explain why such a sharp change occurs. One compelling hypothesis is that the method is gaining popularity, especially since 2012. In 2013, there were 19 QCA-related meetings worldwide, and just five years later, in 2018, that number rose to 30. Between 2005 and 2018, a total of 208 QCA meetings took place (138 trainings and 70 events). In 2018, another milestone was achieved when QCA was incorporated into the ICPSR's schedule as a three- to five-day workshop (ICPSR 2018).

The discussion above is addressing the larger matter of the method's ongoing and progressing mainstreaming. QCA is no longer a periphery method, and its absorption into ICPSR's curriculum further validates this view. Currently, the approach is taught at leading methods institutes both in Europe and in America. QCA's institutionalization is, in turn, possible because of the methodological overlap it shares with mainstream statistical approaches. Consistent with the argument that formal logic underpins both quantitative and qualitative methodology, QCA is an example of a qualitative research method that has been embraced even by institutes committed to the promotion of quantitative approaches.

Conclusion

Contemporary political science continues to be re-shaped by the increasingly popular mixed methods boom. One consequence of this development is that social scientists must reconsider what exactly separates quantitative and qualitative research, especially since the mixed methods wave presupposes the use of two or more approaches within a single research design. Methodological advice and new best mixed methods practices depend, therefore, on proper reconceptualization of the quantitative-qualitative divide. This article contributes to such a reconceptualization by extending the work of Goertz and Mahoney (2012) to argue that the gap between quantitative and qualitative research is not as large as previously assumed. In fact, this article stresses the importance of formal logic understood as an epistemological structure that unites both research traditions. Secondly, this article stresses the importance of mathematical superstructures. While both QCA and regression analysis are cross-sectional in their orientation, they make use of different types of mathematics and, therefore, serve different analytical purposes. Although both approaches are ultimately rooted in formal logic, their mathematical superstructures
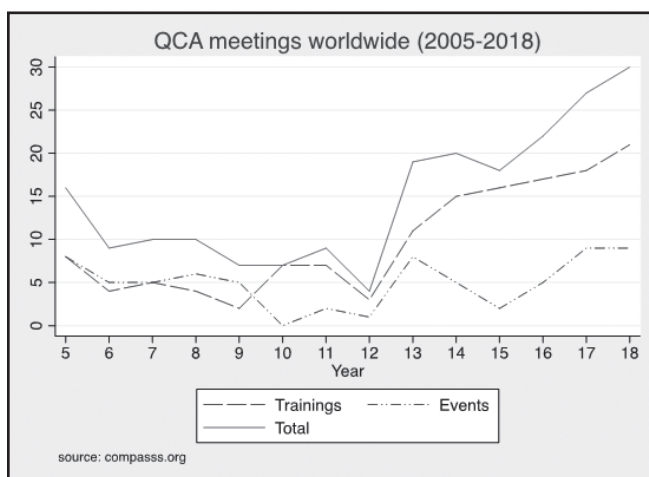
are not complementary, which means that they are suited to answer different types of questions.

Finally, the increased institutionalization of QCA demonstrates two related points. On the one hand, QCA is becoming more institutionalized and better known. By now the method is a part of major methodological institutes including the ECPR, the IQMR and the ICPSR. On the other hand, this increased incorporation of QCA into these institutes demonstrates the point that formal logic can serve as the epistemological structure that scientific methods build on. QCA is an example of a qualitative approach that is now embraced by the quantitatively oriented ICPSR in large part because its methodological structure is similar enough to that of quantitative methods.

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