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Embracing Causal Complexity: The Emergence of a Neo-Configurational Perspective

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Causal complexity has long been recognized as a ubiquitous feature underlying organizational phenomena, yet current theories and methodologies in management are for the most part not well-suited to its direct study. The introduction of the Qualitative Comparative Analysis (QCA) configurational approach has led to a reinvigoration of configurational theory that embraces causal complexity explicitly. We argue that the burgeoning research using QCA represents more than a novel methodology; it constitutes the emergence of a neo-configurational perspective to the study of management and organizations that enables a fine-grained conceptualization and empirical investigation of causal complexity through the logic of set theory. In this article, we identify four foundational elements that characterize this emerging neo-configurational perspective: (a) conceptualizing cases as set theoretic configurations, (b) calibrating cases' memberships

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into sets, (c) viewing causality in terms of necessity and sufficiency relations between sets, and (d) conducting counterfactual analysis of unobserved configurations. We then present a comprehensive review of the use of QCA in management studies that aims to capture the evolution of the neo-configurational perspective among management scholars. We close with a discussion of a research agenda that can further this neo-configurational approach and thereby shift the attention of management research away from a focus on net effects and towards examining causal complexity.

Keywords: *configuration; causal complexity; Qualitative Comparative Analysis (QCA); fuzzy sets; equifinality*

Fortunate is he, who is able to know the causes of things.

—Virgil, *Georgics II*

Introduction

Management research has long recognized that organizational outcomes tend to depend on the alignment or conflict among interdependent attributes (Siggelkow, 2002; Tushman & O'Reilly, 2002). Indeed, configurational theories that embrace the notion that an organization is a "multidimensional constellation of conceptually distinct characteristics that commonly occur together" (Meyer, Tsui, & Hinings, 1993: 1175) are well established (e.g., Miles & Snow, 1978; Miller, 1987; Miller & Friesen, 1984; Mintzberg, 1979). In viewing cases under study as constellations of interconnected elements, a configurational perspective emphasizes that causality is complex in that it is often characterized by three features: (a) *conjunction*, which means that outcomes rarely have a single cause but rather result from the interdependence of multiple conditions; (b) *equifinality*, which entails more than one pathway to a given outcome; and (c) *asymmetry*, which implies that attributes "found to be causally related in one configuration may be unrelated or even inversely related in another" (Meyer et al., 1993: 1178).

While these three facets of causal complexity have been recognized and theorized by a first wave of configurational research in management (see Short, Payne, & Ketchen, 2008, for a review), empirical work on configurations has generally not kept pace with its own theorizing. In fact, until recently, there was a void in tools capable of fully capturing causal complexity (Fiss, 2007; Fiss, Marx, & Cambré, 2013). Conventional correlation-based approaches are not designed to address conjunctural, equifinal, and asymmetrical causal relations (Ragin, 1987, 2000). The dominance of these approaches has instead resulted in theory and research marked by a "general linear reality" (Abbott, 1988) or "net effects thinking" (Ragin, 2008) and has channeled efforts towards building and testing theories shaped by conceptions of independent, additive, and symmetrical causality (Delbridge & Fiss, 2013; see also Meyer, Gaba, & Colwell, 2005). Hence, scholars have appropriately noted that a configurational perspective in organizational research has "yet to live up to [its] promise" (Fiss et al., 2013: 2) and that "research and theorizing on equifinality … is still at an embryonic stage" (Van de Ven, Ganco, & Hinings, 2013: 407).

A second wave of configurational management studies has emerged that overcomes some of these limitations through the use of Charles Ragin's (1987, 2000, 2008) Qualitative Comparative Analysis (QCA). By using the logic of set theory to conceptualize cases as configurations of causal attributes, QCA has been deliberately designed to both *conceptualize* and

analyze the causal complexity underlying much organizational phenomena (Fiss, 2007). Put differently, QCA explicitly casts causal relations along all three lines of complexity highlighted by earlier configurational theories in management, defining causal complexity as composed by "equifinality, conjunctural causation, and causal asymmetry" (Schneider & Wagemann, 2012: 78).[1] This approach enables management scholars to identify how multiple causal attributes combine into distinct configurations to produce an outcome of interest (conjunctural causation), assess whether multiple configurations are linked to the same outcome (equifinality) as well as the relative empirical importance of each of these configurations, and examine whether both the presence and the absence of attributes may be connected to the outcome (asymmetry).

Therefore, the recent proliferation of research embracing the use of QCA in management studies—along with adjacent fields such as marketing, management information systems, political science, and sociology—represents more than a renaissance of configurational thinking or merely a new methodological approach. Rather, because this new wave of research directly focuses on causal complexity, we suggest that it constitutes the emergence of a *neo-configurational perspective.* This neo-configurational perspective enables researchers to more adequately theorize and empirically examine causal complexity. Starting from a conviction that this configurational approach profoundly alters how we think about and understand managers, organizations, and their environments, the purpose of our review is to articulate the fundamental tenets of this neo-configurational perspective to management studies in order to outline how these tenets are applied in current research using QCA, and to chart promising future research areas.

In the remainder of this article, we begin by briefly reviewing the prior configurational literature in management research, upon which our current perspective builds. Against this background, we examine the emergence of the neo-configurational perspective. We then discuss the four foundational elements that are distinctive to this neo-configurational approach to the study of management and organizations. We do so with an eye toward differentiating QCA's set-theoretic approach from general linear regression approaches. Following this foundational discussion, we review the current state of neo-configurational research and analyze its growth in management (which we supplement with a review of its use in related disciplines in the supplemental online Appendix C). Building on this discussion of existing research, we highlight several research domains in management that stand to directly benefit from being addressed through a neo-configurational lens. We conclude by offering thoughts on QCA's promise to address causal complexity in management research.

The Roots of the Neo-Configurational Perspective

The "configurational approach" in management is frequently associated with research on organizational design (e.g., Miles & Snow, 1978; Miller & Friesen, 1984; Mintzberg, 1979) and on typologies, strategic groups, and archetypes of effectiveness (e.g., Bensaou & Venkatraman, 1995; Child, 2002; Doty, Glick, & Huber, 1993; Ketchen, Thomas, & Snow, 1993). Less widely acknowledged are the roots of this configurational research in an earlier tradition of organization studies inspired by systems thinking (e.g., Katz & Kahn, 1966; Lawrence & Lorsch, 1967; Simon, 1962; Thompson, 1967).[2] While this scholarship did not use the terms "configuration" or "causal complexity," it nevertheless conceptualized organizations as complex systems (Boulding, 1956) "characterized by an assemblage or combination

of parts whose relations make them interdependent" (Scott, 1998: 83) and whose "outcomes cannot be fully inferred from their constitutive parts analyzed in isolation" (Simon, 1996: 184). Furthermore, research taking an open systems perspective pointed to equifinality as integral to this complexity (Katz & Kahn, 1966; von Bertalanffy, 1968). Although these configurational ideas also featured in the initial systemic statements of contingency theory (e.g., see Grandori & Furnari, 2013, for a review), they were quickly "stripped away" in empirical applications (Van de Ven et al., 2013: 402) based on assumptions of linearity and a "reductionist mode of inquiry" (Meyer et al., 1993: 1177).

By the late 1970s, strategy research began to leverage configurational insights for studying effective organizational designs (e.g., Miles & Snow, 1978; Miller, 1986; Miller & Friesen, 1984; Mintzberg, 1979). This body of work aimed at capturing coherent "patterns" among strategic, organizational, and environmental attributes that lead to organizational effectiveness (Meyer et al., 1993). This holistic approach assumed that superior organizational performance is achieved through "gestalts" or "archetypes" combining organizational structures, strategies, and/or environmental conditions rather than through any of these attributes in isolation. Implicitly, it therefore incorporated the conjunctural and equifinal components of complex causality while paying less attention to causal asymmetry.

Building on these earlier studies, subsequent configurational research on organizations in the 1990s continued to investigate the link between the coherence of organizational and environmental elements and organizational effectiveness (e.g., Bensaou & Venkatraman, 1995; Child, 2002; Doty et al., 1993; Ketchen et al., 1993, 1997; Meyer et al. 1993). This research stream shared the underlying assumption that effectiveness can be attributed "to the internal consistency, or fit, among the patterns of relevant contextual, structural and strategic factors" (Doty et al., 1993: 1196). Among these works, Meyer et al.'s (1993) introduction to the "Special Forum on Configurations" in the *Academy of Management Journal* laid the foundations for a neo-configurational approach by emphasizing that causality is often conjunctural, equifinal, and asymmetric, and urging configurational researchers to focus on examining this causal complexity more directly. In the absence of methodological alternatives, the ensuing configurational research continued to rely on correlational techniques to uncover configurations and relate them to outcomes of interest, especially performance (e.g., Bensaou & Venkatraman, 1995; Doty et al., 1993; Ketchen et al., 1993). Thus, although this phase of configurational studies conceptually emphasized the core concepts of conjunctural, equifinal, and asymmetric effects and thereby provided important foundations for the neo-configurational perspective, which we next review, in practice they presented a mismatch between theory and method due to their reliance upon multivariate regression methods that involved additive, unifinal, and symmetrical effects (Fiss, 2007; Grandori & Furnari, 2008).

The Emergence of the Neo-Configurational Perspective

While the earlier wave of configurational research offered the intellectual roots for today's emergent neo-configurational perspective on management and organizations, the latter has its ontological and epistemological roots in Charles Ragin's introduction of QCA (1987, 2000, 2008). Ragin initially developed QCA largely to address problems resulting from studying comparative political science and sociological phenomena at the macro-level (e.g., involving countries or governments) with sample sizes too small for regression techniques but too large for systematic cross-case comparisons.

In this light, it is not surprising that management researchers initially applied QCA primarily at this macro-level of analysis. Additionally, early management inquiries largely utilized QCA as a supplement to conventional analytical techniques to more holistically understand the phenomena studied. For example, Guillén (1994) used QCA as a supplement to historical comparative case analysis to analyze the configurations of country-level factors (e.g., the presence versus absence of labor unrest and/or professional groups) underlying the diffusion of management models across countries. Stevenson and Greenberg (2000) supplemented network analyses with QCA to identify patterns in the strategies of action used by social actors to influence public policy in a small city. Stokke's (2007) study of shaming in international fisheries management regimes and Häge's (2007) study of communicative action in international trade negotiations both illustrated how QCA could augment the interpretation and the validity of conclusions drawn from more conventional case-oriented analysis on very small samples.

Gradually, however, management scholars moved to applying QCA as a standalone method focused on exploring causal complexity. Studies by Kogut and colleagues (Kogut, MacDuffie, & Ragin, 2004; Kogut & Ragin, 2006) are early exemplars of how QCA enables researchers to analyze causally complex relationships. For instance, Kogut et al. (2004) used QCA to uncover equifinal combinations of complementary technological and organizational practices in the international auto industry, showing that plants achieved performance advantages through alternative combinations of complementary production practices. To give another example, Pajunen (2008) used QCA to explore how institutional factors work in combination to influence the relative attractiveness of countries for foreign direct investments.

The growth of the neo-configurational perspective in management research was greatly spurred on by the publication of several pieces that aimed at explaining (Fiss, 2007, 2009; Lacey & Fiss, 2009; Ragin & Fiss, 2008) and demonstrating (Grandori & Furnari, 2008; Greckhamer, Misangyi, Elms, & Lacey, 2008) how this novel configurational approach could be applied to analyze phenomena at various levels of analysis. Fiss (2007) introduced QCA's set-theoretic approach to management research as a means to study configurations and complex causality, demonstrating how it might overcome the mismatch between theory and methods that had plagued earlier configurational theorizing. Greckhamer et al. (2008) aimed to advance the use of QCA in strategic management research. Their study of how industry, corporate, and business-unit attributes combine to produce both superior and inferior performance illustrated QCA's potential to examine all three aspects of causal complexity (conjunction, equifinality, and asymmetry) and to explore the inherent limited diversity of organizational phenomena. Grandori and Furnari (2008) drew on QCA's logic and methodological approach to revisit the classic link between organizational design and effectiveness prevalent in earlier configurational studies. They identified types of organizational elements that differ "in kind" and showcased how "combinatory laws" regulate the configurations among these elements and their associations with organizational efficiency and innovation. Further, a special issue in the *Journal of Business Research* in 2007 featured seven articles that used QCA across a variety of contexts.

Fundamental Elements of the Neo-Configurational Perspective

Beyond simply sharing a novel methodology, the QCA-inspired management studies reviewed above (and below) share a *configurational way of thinking and theorizing* about the

complexity inherent in causation among management and organizational phenomena. In short, QCA's set theoretic approach has facilitated a neo-configurational perspective that fully embraces causal complexity. The foundations for this neo-configurational perspective differ fundamentally from conventional linear regression approaches in how phenomena and causal relationships are conceptualized and analyzed. In this section, we discuss the four distinctive elements of the set-theoretic approach to causal complexity, illustrating along the way how these differ between QCA and conventional linear regression approaches.[3] Specifically, we elaborate on QCA's set-theoretic approach, which (a) treats cases as set-theoretic configurations, (b) uses calibration to measure cases' set memberships in the attributes and outcomes of theoretical interest, (c) assesses causality through the necessity and/or sufficiency of attributes for outcomes of interest, and (d) incorporates counterfactual analysis given the limited diversity inherent in social phenomena.

Cases as Set-Theoretic Configurations

While cases can be viewed in various ways, including as theoretical constructs or as empirical units, QCA explicitly conceptualizes cases as configurations of attributes (Ragin, 1987, 2000). Doing so is consistent with case-oriented strategies in general, which imply a holistic and configurational understanding of the phenomena of interest (Fiss, 2009). In other words, cases are conceptualized as combinations of theoretical attributes of interest rather than as a disaggregation of their attributes that are treated in isolation from each other as is done in conventional regression approaches (Ragin & Rubinson, 2009). The configurational understanding of cases as "complex wholes" is made possible by QCA's use of the set-theoretic approach and Boolean algebra (also referred to as the "algebra of sets"; Ragin, 1987). These two integral features of QCA differentiate this approach from conventional correlational methods and allow the researcher to effectively conceptualize and analyze causal complexity (for in-depth discussions of the set theoretic basis of QCA and an introduction to Boolean Algebra, see, e.g., Ragin, 1987, 2000; Smithson & Verkuilen, 2006).

QCA uses set theory to conceptualize causal attributes and outcomes of interest as sets and to examine relationships between attributes and outcomes through a set-theoretic analysis of subset relations. Considering attributes of cases as sets aligns with our intuitive cognitive approach of classifying empirical observations as belonging to categories (i.e., sets). For example, researchers commonly describe organizations as large, innovative, or successful, or describe industries as dynamic or competitive. Similarly, many theoretical arguments in the social sciences are stated in terms of sets and their relations rather than correlations or net effects; "the *analysis of set relations*" (Ragin, 2008: 13) is vital to social research. For example, the argument that organizations whose attributes fit well with industry attributes will be high performers implies a subset relation—that firms with such a fit are a subset of all high-performing firms. This suggests that the presence of a fit between organizational and industry attributes leads to high performance, but does not imply that all high-performing firms exhibit this fit (e.g., other paths to high performance may include factors such as lucrative patents and monopoly or quasi-monopoly positions).

QCA and regression analyses are also built on different algebraic systems—Boolean versus linear algebra, respectively—that provide significantly different formal mathematical tools and languages through which phenomena and causal relations are conceptualized (Ragin,

1987, 2008; Thiem, Baumgartner, & Bol, 2015). Whereas the linear algebra underlying linear regression leads researchers to conceptualize case attributes as separable independent variables and to examine the net effects of such variables on outcomes, the Boolean algebra underlying QCA leads researchers to view cases as combinations of attributes and to identify attribute combinations that are consistently linked to outcomes. In sum, by using Boolean algebra to conceptualize causal relations as subset relations, QCA enables researchers to capture all three aspects of causal complexity: conjunction, equifinality, and causal asymmetry.

A cornerstone to understanding causal relations in QCA is that it views *conjunctural causation* through "causal recipes" (Ragin, 2008: 109) in which case attributes combine to produce an outcome. This approach shifts the focus of causal explanation away from attempts to identify attributes with the strongest independent effects toward how attributes combine (in a recipe): to "think in terms of recipes is to think holistically and to understand causally relevant conditions as intersections of forces and events" (Ragin, 2008: 109). While general linear regression models can to some extent capture conjunctural causation through interaction effects, interpreting interactions of more than two variables is challenging (Vis, 2012). QCA, in contrast, readily enables the examination of conjunctural causation through the combinatorial logic of Boolean algebra, using the Boolean operator *and* to capture the intersection of sets. For example, one of the seven recipes of industry, corporate, and business-unit attributes found by Greckhamer et al. (2008) to produce high business-unit performance in the manufacturing sector involved large business-units in munificent industries. That is, this causal recipe shows that business-units that were both large *and* operate in a munificent industry were successful performers.

Causal recipes also orient researchers toward the possibility of *equifinality*, that is, that an outcome may follow from several different causal recipes (Ragin, 2008). While general linear regression models cannot uncover equifinality (Vis, 2012), QCA's focus toward whether or not more than one causal recipe may lead to the same outcome embraces equifinality. The Boolean operator *or* enables assessment of potential equifinality by capturing the union of set configurations. For example, another recipe among the seven configurations found by Greckhamer et al. (2008) was that high performance in the manufacturing sector resulted when business units were part of highly diversified corporations and operated in munificent industries—that is, business-unit success came through either large size *and* high industry munificence *or* being part of a diversified corporation *and* a highly munificent industry.

Finally, in contrast to the symmetry inherent in general linear regression, set relations are fundamentally *asymmetrical* (Ragin, 2008). In its most typical form, asymmetry means that the presence as well as the absence of any attribute may produce the same outcome, depending on its combination with other attributes. This possibility is captured through the use of the Boolean operator *not* that indicates the absence of attributes (or of the outcome). Continuing the previous example, a third recipe among Greckhamer et al.'s (2008) findings for high performance in manufacturing involved business units that were *not* large *and* part of highly diversified corporations *and* that competed in industries that were *not* highly competitive *and not* highly dynamic. In total, these recipes show that both large business-units and not-large business-units achieved superior performance depending upon their combinations with other corporate and industry attributes. This finding would not be uncovered by the symmetry inherent in regression methods, which treat attributes as either positively or negatively related to the outcome.

Calibration of Cases' Set Memberships

A second fundamental element of the neo-configurational perspective is the measurement of cases' set memberships through calibration that reflects meaningful standards and that captures variation directly relevant to the research question and the target set of cases. Meaningful standards for calibration are derived from theory and substantive knowledge external to the sample itself when possible and are enacted as the qualitative thresholds used in the set calibration (Ragin, 2008). Calibration therefore contrasts with the use of uncalibrated measures of variables in regression techniques. Measurement in correlational approaches is founded upon sample-specific means—measures are constructed such that they vary around inductively-derived central tendencies with no distinction as to whether the found variance corresponds to meaningful thresholds that distinguish differences in kind. The conventional use of uncalibrated measures simply makes it possible for the researcher to know whether one case is relatively higher or lower than another on a particular measure; it does not afford an interpretation of whether the variation on the measure is relevant or meaningful as does calibration.

For example, in their study of corporate governance mechanisms, Misangyi and Acharya (2014) sought to capture CEOs' and directors' equity stakes in the firms they lead, as such equity ownership is thought to help align managerial and shareholder interests. Conventionally, such equity stakes have been measured through the percentage of outstanding firm shares held by the CEO or directors. Though this uncalibrated measurement allows for relative comparisons among CEOs, it does not capture whether the ownership stake is meaningful. Thus, instead, Misangyi and Acharya (2014) drew upon theory and evidence directly relevant to their cases. In particular, they used theory that suggested that managers and directors have a meaningful stake in a firm when they have a substantive amount of their *own net worth* invested in the firm (Hambrick & Jackson, 2000). Based upon this conceptualization of a meaningful stake, they then turned to extant evidence which showed that CEOs and directors of the largest U.S. corporations are among the top 1% of U.S. income earners (Bakija, Cole, & Heim, 2010) and that the average 1-percenter in the US around the time of their study had a net worth of around $18 million and invested about half of it in stocks (Wolff, 2010). This theory and evidence was thus used to establish the qualitative thresholds of the dollar amounts that constituted the set of CEOs and directors with a meaningful ownership stake in their firms. Note that this example highlights that while *quantitative data* are often used as the basis for the measurement of set memberships, the *qualitative thresholds* used in the calibration are nonetheless derived from theory and evidence.

While originally QCA utilized a "crisp" set approach (Ragin, 1987) that qualitatively distinguishes full membership and full non-membership, it has since evolved to enable the use of fuzzy sets that additionally incorporate degrees of membership (Ragin, 2000, 2008). In so doing, fuzzy sets "bridge quantitative and qualitative approaches to measurement" (Ragin, 2008: 82) by synthesizing the strengths of both approaches: By assessing the degree of membership, they provide the precision of measurement valued by quantitative researchers; and by calibrating according to theory and substantive knowledge and relevant variation, they incorporate the best aspects of qualitative research measurement. QCA research designs may simultaneously use fuzzy and crisp sets; their use is a function of the nature of the studied attributes. Whichever type of calibration is chosen, and whatever data (i.e., qualitative or quantitative) are being calibrated, it is vital that all decisions are described transparently to

enable readers to assess the (face) validity of the thresholds (Ragin, 2008) and to replicate this core part of a QCA research design.

Calibration presents a number of challenges. First, regression approaches generally do not require researchers to ponder what constitutes the thresholds for membership in sets, and thus theory that could guide calibration is frequently lacking. While the intention underlying calibration is to base qualitative anchors upon theoretically meaningful standards (Ragin, 2000, 2008), when this is not possible researchers may have to rely purely on substantive evidence in establishing the calibration. While ideally in such circumstances researchers will turn to sample distribution characteristics from the extant evidence beyond the particular study sample, when such data are not existent qualitative anchors must be decided based upon the study's sample distribution (Thiem & Dusa, 2013; Verkuilen, 2005). Such data-based calibration may use points from the cumulative data distribution function or from visualizing the frequency or density distribution of the data through tools such as bar graphs or density plots as anchors for calibrating sets that capture differences in kind and in degree in the case attributes included. For example, lacking theory and comparative data as to what constitutes highly paid CEOs and workers cross-nationally, Greckhamer (2016) chose measures of dispersion as break points for deciding on full membership, full nonmembership, and the point of maximum ambiguity in calibrating fuzzy sets of highly compensated CEOs and highly compensated workers.

A second challenge of calibration involves the use of survey data, which is particularly relevant for research on micro-behavioral phenomena (Crilly, 2013; Ordanini & Maglio, 2009). A possible strategy to calibrate survey data is to draw on prevalidated scales to measure the constructs that matter in their theories, which presents both an opportunity and a challenge. The use of ordinal Likert scales to measure constructs provides qualitative anchors (e.g., "strongly agree," "somewhat agree," "neither agree nor disagree," "somewhat disagree," and "strongly disagree") that conceptually could directly inform the calibration thresholds of set memberships (see Fiss, 2011). While statements such as "strongly agree," "neither agree nor disagree," and "strongly disagree" provide qualitative anchors that potentially directly correspond to anchors for the calibrations of "fully in," "neither in nor out," and "fully out," respectively, evidence from sample distributions of responses tend to suggest that this may not be the case due to range restriction or other response biases (Ordanini & Maglio, 2009). Thus, researchers using ordinal scales face the challenge of reconciling these conceptual anchors with the actual distribution of the data.

Third, the calibration of qualitative data presents its own challenges. Unlike with quantitative data wherein researchers need only to set three qualitative break points to calibrate measurement (e.g., thresholds for fully in, crossover point, and fully out when using continuous data; Ragin, 2008), when calibrating qualitative data into fuzzy sets researchers need to establish some procedure to code the qualitative data accordingly (Livne-Tarandach, Hawbaker, Boren, & Jones, 2015; O'Neil, 2008). For example, Crilly, Zollo, and Hansen (2012) developed a detailed coding lexicon to calibrate data from a total of 292 interviews of managers and stakeholders into measures of managerial consensus and stakeholder consensus on the firms' corporate social engagement using four-value fuzzy sets. More generally, Basurto and Speer (2012) offer a number of recommendations for approaching the calibration of interview data into set memberships. Additionally, while researchers working with qualitative data may gravitate towards using case-specific data to set thresholds for set

calibration, Hodson and Roscigno (2004) provide an example of how external standards can be used to calibrate qualitative data into set memberships; they transparently describe their process of constructing an instrument to calibrate a sample of organizational ethnographies to determine their membership in sets capturing organizational practices and managerial behavior that are then linked to positive and negative outcomes for organizations and workers.

Necessary and Sufficient Relations Between Sets

As already discussed above, the QCA and general linear regression approaches differ fundamentally in how they conceptualize causal relations (Katz, Vom Hau, & Mahoney, 2005; Ragin, 2006, 2013; Thiem et al., 2015). Whereas general linear regression methods treat causal relationships as the covariation between independent and dependent variables, QCA identifies commonalities across cases in the form of consistent subset relations between theoretically relevant attributes and outcomes of interest (Ragin, 2008).[4] More specifically, QCA's set-theoretic approach enables researchers to utilize two general analytical strategies to examine such commonalities.

One focuses on the *necessity* of the attribute(s) for observing the outcome—that is, the attribute(s) must be present for the outcome to occur. This analytical strategy involves studying cases that all exhibit the outcome of interest to identify whether all (or almost all) of them also exhibit the particular theoretical attribute or combination of attributes. As such, the outcome is a subset of the instances of the attribute(s): While all cases experiencing the outcome would also display the attribute(s), not all of the cases displaying the attribute(s) must exhibit the outcome. In essence, this strategy involves examining commonalities by comparing cases that experience the same outcome (analogous to selecting on the "dependent variable")—a commonly employed design in qualitative research but in stark contrast to general linear regression approaches.

A second analytical strategy involves studying cases that all exhibit a particular attribute or configuration of attributes to examine whether they all (or almost all) also experience the same outcome. This implies that the attributes are a subset of the specific outcome, which in combination with theoretical considerations would provide evidence for the *sufficiency* of the attributes for the outcome. Here, while sufficiency means that all cases possessing the attribute(s) must experience the outcome, there likely will be other cases experiencing the outcome which do not possess the same attribute(s). Note that this analytical strategy inherently involves the examination of commonalities by comparing cases that display a particular theoretical attribute(s), which though a common research practice in qualitative research, it stands in contrast to general linear regression approaches.

In short, this third fundamental element of the set-theoretic approach consists of looking for commonality across cases either through the analysis of the necessity or the sufficiency of attributes for a given outcome. This allows the researcher to both conceptualize and analyze the asymmetrical nature of set relations as already discussed. Furthermore, sufficiency analysis is well-equipped for unraveling the equifinality inherent in complex causality: It allows the researcher to examine how multiple combinations of attributes may lead to the same outcome.

Counterfactual Analysis of Unobserved Configurations

Causal complexity typically implies that the empirically observed diversity of cases "is limited by the attributes' tendency to fall into coherent patterns … because attributes are in fact interdependent and often can change only discretely or intermittently" (Meyer et al., 1993: 1176). The limited diversity inherent in causal complexity both complicates and enriches its analysis because the logically possible configurations that do not appear among the empirical cases (i.e., unobserved or counterfactual configurations) can inform conclusions about the causal relations under study (Ragin, 2008). General linear regression models and QCA differ in how they tackle limited diversity (Thiem & Duşa, 2015; Vis, 2012). While in correlation-based approaches "the problem of limited diversity is obscured" because of the assumed homogeneity of populations and samples (Ragin, 1987: 106), QCA's set-theoretic approach enables researchers to examine the configurations that do not exist in the data through "counterfactual analysis"—that is, a reasoned evaluation of the outcome that an unobserved configuration would exhibit if it did exist (Ragin & Sonnett, 2004; Soda & Furnari, 2012).

QCA uses a Boolean chart referred to as a "truth table" to capture and examine all logically possible combination of attributes, including those combinations that lack empirical instances (e.g., see Greckhamer et al. [2008] and Soda and Furnari [2012] for illustrations of such diversity mapping among organizational phenomena). The truth table allows researchers to "systematically explore counterfactual configurations and evaluate the plausibility of their outcomes" (Soda & Furnari, 2012: 288), and requires them to make explicit simplifying assumptions that need to be "clarified and brought forward for examination" (Ragin, 1987: 112). QCA also facilitates counterfactual analysis through the production of multiple solutions (complex, intermediate, and parsimonious) that vary in the extent to which they incorporate the examination of "easy" counterfactuals (i.e., consistent with the empirical evidence at hand and with existing assumptions) and "difficult" counterfactuals (i.e., consistent with the empirical evidence but not with assumptions; see Ragin & Sonnett, 2004). Among management researchers, it has become conventional to report the results of these counterfactual analyses by distinguishing those attributes among the reported solution that are "core" from those that are "contributing" conditions (e.g., Crilly, 2011; Fiss, 2011; Misangyi & Acharya, 2014).[5] Recently, Greckhamer (2016) has extended this convention to integrate necessary conditions. In sum, this element of a neo-configurational perspective pushes researchers to think about unobserved cases.

The Neo-Configurational Perspective: Current State

Building on extant reviews of the use of QCA across a number of disciplines (e.g., business, political science, sociology) (Kan, Adegbite, El Omari, & Abdellatif, 2015; Rihoux & Marx, 2013), our particular aim in this review is to capture the evolution of the neo-configurational perspective among *management* scholars. In this section, we begin by describing the methodology we used to identify the set of articles we reviewed. We then discuss our findings from this exercise and identify common themes of QCA applications in management studies. For readers interested in how this perspective has taken hold in other business (e.g., marketing, operations management, etc.) and nonbusiness disciplines

(e.g., political science, sociology, the natural sciences), we provide a brief overview of research using QCA in these other areas in an online supplement available at the JOM website (as Appendix C).

We selected articles to be included in our review as follows. First, in identifying journals to include in our search, we started with the most recent list of journals indexed in the "management" category of Thomson Reuters Web of Science (2014). From this initial list of 185 journals, we omitted 88 journals that pertained to other disciplines such as supply chain (e.g., *Journal of Supply Chain Management*) and operations management (e.g., *Journal of Operations Management*, etc.), information systems management (e.g., *MIS Quarterly*), hospitality management (e.g., *Cornell Hospitality Quarterly*), and sports management (e.g., *Journal of Sports Management*), leaving a list of 97 management journals. We then reviewed all journals included in the Web of Science "business" category and identified 16 journals that are frequent publication outlets for management scholars, which included the *Journal of Business Research*, *Family Business Review*, as well as primary outlets for business ethics (e.g., *Business Ethics Quarterly*, *Journal of Business Ethics*) and entrepreneurship (e.g., *Journal of Business Venturing*, *Entrepreneurship Theory and Practice*). The complete final list of 113 journals included in our review is available as an online supplement at the JOM website (as Appendix A). Second, to select articles, we set the start date for our search for the year after Charles Ragin's (1987) initial seminal formulation of QCA and thus searched for articles in these outlets over the period of 1988 through 2015. Third, we searched the terms "Qualitative Comparative Analysis," "Configuration," "QCA," "fuzzy-set," and "crisp-set" in the selected journals and eliminated the articles that contained the term 'configuration' but did not explicitly use QCA. This process resulted in a sample of 96 articles included in our review and summarized in Table 1 in the online Appendix B.

QCA and the Neo-Configurational Perspective in Management Studies

Table 1 in Appendix B provides an overview of the 96 articles and their main characteristics. A first takeaway from this table is that the use of QCA by management scholars has accelerated in recent years. To take stock of the current state of the neo-configurational perspective, in this section we first identify several common themes that characterize how QCA has been used to advance an understanding of causal complexity in management studies. Specifically, we observe (a) a trend from small-N to large-N analysis, (b) an extension towards including lower levels of analysis (i.e., organizations and individuals), (c) an interest toward deductive analyses, and (d) an increasing emphasis on using QCA as a complementary tool in both inductive and deductive mixed method studies.

From small-N to large-N analysis. As discussed above, QCA was developed to tackle the challenge of conducting systematic analysis of cross-case patterns in comparative sociology and political science research lacking the number of cases required for conventional statistical approaches (Ragin, 1987). In line with these roots, studies in our review sample frequently involved nation-level research with small or intermediate samples (e.g., Greckhamer, 2011; Kogut & Ragin, 2006; Pajunen, 2008; Schneider, Schulze-Bentrop, & Paunescu, 2010). However, our review also revealed a shift towards using QCA for analyzing large-N samples. For instance, in their analyses of corporate governance, García-Castro, Aguilera, and Ariño (2013) and Misangyi and Acharya (2014) used datasets with 363 and 1,135 cases, respectively; and

Greckhamer et al. (2008) analyzed a sample of 2,841 cases to study business-unit performance. More generally, of the 62 articles spanning the last three years included in our sample (i.e., 2013-2015), most analyzed large-N datasets (from 100 to 500 cases), with some studies working with substantially larger ones (e.g., 9,000 units of observation in Hervas-Oliver, Sempere-Ripoll, & Arribas, 2015). Put differently, QCA is clearly *not* confined to studies with an intermediate-N sample that cannot be analyzed with conventional regression.

Taking a set-theoretic approach to the study of large-N samples differs from a small-N approach in terms of researchers' goals, assumptions, and research processes (Greckhamer, Misangyi, & Fiss, 2013). In terms of goals and assumptions, to the extent that large-N studies tend to be deductive, developing specific *a priori* causally complex predictions presents a challenge given our field's inclination toward formulating net-effects-oriented propositions and hypotheses (Delbridge & Fiss, 2013). However, as we will discuss below, studies have begun to develop and test configurational hypotheses (e.g., Bell, Filatotchev, & Aguilera, 2014; Fiss, 2011; Grandori & Furnari, 2008). Furthermore, as one moves from small-N to large-N analysis, researchers' closeness to the cases becomes more difficult to maintain. Nevertheless, recent studies have shown that an iterative process between the findings and returning to empirical cases can prove to be fruitful in large-N settings (Crilly, 2011; Campbell, Sirmon, & Schijven, 2015; Misangyi & Acharya, 2014) even without the intimate case knowledge typical of the small-N QCA approach.

Extension in the level of analysis. Closely connected to the shift from small-N to large-N analysis is a corresponding downward extension of the level of analysis towards the organizational level, and to some extent toward the individual level. Only five of the 62 most recent articles in our sample (those published between 2013 and 2015) centered on the country level, with the organizational level becoming the dominant focus (32, or roughly half of the articles during this time period). Further, while only two articles (Bijlsma & van de Bunt, 2003; Marx & van Hootegem, 2007) before 2012 used data measured at the level of the individual, 14 articles since then have conducted analyses at the individual level (e.g., Wu, Yeh, & Woodside, 2014).

This broadening of levels of analysis largely reflects researchers' desire to further develop an understanding of how contextual conditions lend themselves to causal complexity (e.g., Bell et al., 2014; Crilly et al., 2012; García-Castro, Aguilera, & Ariño, 2013; Greckhamer, 2016; Greckhamer et al., 2008; Misangyi & Acharya, 2014). For example, Greckhamer (2016) uncovered how different institutions (i.e., labor and capital) as well as levels of economic development, market forces, and cultural aspects shape cross-national variations in the pay gap between CEOs and workers. Bell et al. (2014) explored how different country-level governance institutional structures influence investors' perceptions of foreign IPOs and thereby the conjunction between national-, firm-, and individual-level factors. Crilly et al. (2012) examined how the interdependence between internal and external organizational stakeholders affects organizational-level decoupling. Misangyi and Acharya (2014) studied how incentive and monitoring mechanisms substitute and complement each other in affecting firm performance, exploring how firm- and industry-level governance mechanisms affect the operation of individual- and board-level mechanisms. Furthermore, most of these studies devote attention to uncovering the asymmetry inherent to the causal conditions, examining how the attributes under study differentially affect the presence and the absence of the outcome of interest.

Inductive versus deductive theorizing. Because both quantitative and qualitative data can be calibrated into sets when using QCA, distinguishing studies on data type would be less clear than would a classification based on mode of inquiry.[6] Therefore, in our review we focused on capturing how studies adopted different modes of inquiry (i.e., inductive vs. deductive) rather than their data type. We draw on Lee's (1999) classification of inquiry modes—theory generation, theory elaboration, and theory testing—because it afforded a classification that transcends data types (Edmonson & McManus, 2007). Our review along these lines thus complements and extends prior work that has done broad overviews of QCA research (Kan et al., 2015; Rihoux & Marx, 2013) or has more narrowly focused on QCA's use with qualitative data (Livne-Tarandach et al., 2015). We classified studies as deductive when the researchers derived relationships from extant theory (while hypotheses would be the norm, some studies did so using *a priori* propositions), which were then examined for support in the sample data (i.e., theory testing; Lee, 1999). We classified studies as inductive that sought to develop theory from empirical observations—either through theory generation or theory elaboration (Lee, 1999).

Our review revealed that a majority of the studies have employed QCA's configurational logic to engage in inductive rather than deductive research. Moreover, management researchers inductively using QCA typically did so as a means to elaborate existent theory (i.e., refining existing theories and constructs; Lee, Mitchell, & Sabylinski, 1999). While we also found that a few management studies used QCA inductively as part of a theory generation effort, this research did so in a complementary fashion by integrating the QCA approach together with other inductive methods (a finding consistent with Livne-Tarandach et al.'s (2015) overview of qualitative QCA studies). Since we review the use of QCA as a complementary method in the next section, here we focus upon the subset of articles that used QCA inductively for elaborating existing theories and constructs.

Our review of management studies using QCA as a means of theory elaboration revealed two general themes. First, researchers frequently used QCA in an inductive theory elaboration effort to reevaluate theoretical domains in a configurational manner: for example, in the domains of acquisitions (Campbell et al., 2015), of business- and corporate-level strategies (Greckhamer et al., 2008), of corporate governance (Misangyi & Acharya, 2014), of decoupling (Crilly et al., 2012), and of innovation (Meuer, 2014). These studies seem to have taken an inductive theory elaboration approach precisely because existing theories—which largely reflect a "general linear reality" (Abbott, 1988)—often do not readily lend themselves to an *ex ante* deduction of configurational hypotheses (Fiss, Sharapov, & Cronqvist, 2013). Moreover, because QCA requires the *a priori* specification of attributes and outcomes, and because the theoretical and empirical puzzles examined in these theoretical domains have typically stemmed from the complexity of relationships between existing constructs and outcomes, such theory elaboration is ripe for the QCA approach as it lends both to an *a priori* model specification and an inductive exploration. Thus, while the use of QCA as a tool for theory elaboration has been previously noted (see Livne-Tarandach et al., 2015), our review points to its common usage among management researchers for inductively elaborating the complexity of the causal relations inherent in existing theories, thereby contributing to the emergence of a neo-configurational perspective.[7]

A second commonality among management researchers' inductive use of QCA is the elaboration of "typological theories" that describe a complex web of causal relationships among multiple and interdependent elements (Doty et al., 1993; Fiss, 2011). In fact, the combining

of inductive reasoning typical of qualitative methods and the formal systematic cross-comparisons allowed by QCA naturally lends to typology building or typological extensions of existing theories (e.g., Hotho, 2014; Kvist, 2007). Typological theorizing that takes into account the configurational nature of many management phenomena is promising for management studies because it has so far remained rare (Delbridge & Fiss, 2013). At the same time, the use of QCA for inductive theorizing versus more traditional qualitative methods such as grounded theorizing is limited by QCA's inability to conduct the kind of process-oriented theorizing that is often the focus of qualitative inductive research (Livne-Tarandach et al., 2015).

Despite this emphasis on induction, our review shows an increasing use of QCA for deductive theory testing. In the last 5 years, just under 40 studies have taken a deductive approach, and while 15 of these studies were conducted with a small- to medium-N (ranging from 14-94), the majority involved large-N samples (ranging from 107 to 6,592). While many of these deductive efforts used QCA to complement regression analysis (which we discuss further below), a few deductive studies used QCA as the primary technique in their theory testing. For example, Fiss (2011) used QCA to reexamine the typology established by Miles and Snow's (1978) early configurational approach, testing *a priori* propositions regarding the presence of core versus peripheral elements, neutral permutations of configurations, and causal asymmetry by using fuzzy set analysis. As another example, Bell et al. (2014) developed hypotheses regarding how governance mechanisms at the national and firm levels combine to influence investor perceptions of foreign IPOs and found support using fuzzy set analysis. In a similar fashion, Grandori and Furnari (2008) developed and tested "combinatory laws" specifying what attributes of organization design configurations can be expected to be core or peripheral in producing innovation and efficiency.

Hypotheses testing has been less common in QCA research most likely because of the challenge presented by having to *a priori* explicate the causal complexity that underlies theorizing (Fiss et al., 2013; Greckhamer et al., 2013). Nevertheless, we believe that deducing and testing hypotheses around the facets of causal complexity will become more important—and more feasible—as the neo-configurational perspective continues to grow.

We would like to highlight several critical issues regarding deductive approaches for future research. First, formally testing causal complexity implies that the researcher develops specific hypotheses about how multiple theoretical attributes will combine (conjunctural causality), what different combinations will comprise multiple pathways to the outcome (equifinality), and/or how both the presence and absence of particular attributes may lead to the outcome (causal asymmetry). While developing configurational hypotheses remains more challenging than developing linear predictions, the fundamental elements of the neo-configurational perspective reviewed above provide the theoretical and methodological tools to develop and test these kinds of hypotheses.

Second, a key issue in formal hypothesis testing pertains to the criteria used to evaluate whether the evidence at hand provides support for predicted relationships. Whereas significance and effect sizes are the criteria of regression methods, the necessity and sufficiency of subset relations are instead generally evaluated through the set-theoretic measures of consistency and coverage. Consistency is a measure for "how closely a perfect subset relation is approximated" (Ragin, 2008: 44). Coverage gauges the "empirical relevance or importance" of each of multiple equifinal configurations (Ragin, 2008: 45). These set-theoretic measures are analogous to the respective assessments of significance and strength in regression

analysis (Ragin, 2008). Therefore, a subset relation that does not meet a minimum level of consistency should not be interpreted. By the same token, a highly consistent configuration may have low coverage, that is, only explain a small proportion of cases showing the outcome. As Frambach, Fiss, and Ingenbleek (2016) demonstrated, support for hypotheses can be examined with the Boolean method spelled out by Ragin (1987) through the evaluation of the intersection of the theoretical predictions and the obtained results, showing that the obtained combinations of conditions are in fact proper subsets of the predictions. Furthermore, researchers can use probabilistic criteria to compare the proportion of cases exhibiting a combination to a specified benchmark proportion, though this is often not feasible given the large numbers of cases required (Ragin, 2000).

Third, conceptualizing cases as configurations of attributes places special emphasis on the specification of a configurational model to be studied. What attributes are relevant for a study should be driven by theoretical consideration as well as by knowledge of the cases studied (Berg-Schlosser & De Meur, 2009). Because QCA considers all possible combinations of explanatory conditions, the number of combinations increases exponentially with the addition of conditions by a factor of 2^k (k = number of conditions). Even in large-sample studies, researchers should be judicious about choosing theoretically relevant conditions to limit the complexity of analyses and findings, as the challenges of interpreting configurations increases with the complexity of the models. This is a stark departure from the use of a host of "control" variables as has become customary in conventional regression analyses (although even in general linear models there have been calls for reconsidering the widespread use of control variables and for the building of more parsimonious models; e.g., Spector & Brannick, 2011).

Finally, researchers using QCA for theory testing should be cautious when they develop theoretical insights beyond a study's cases (Cress & Snow, 2000; Greckhamer et al., 2013). In contrast to random sampling, specifying the population and case selection in QCA proceeds according to theory and, as discussed above, either the outcome or attributes of interest (see Berg-Schlosser & DeMeur, 2009; Greckhamer et al., 2013). Accordingly, generalization in QCA studies is best conceptualized as "modest" (Rihoux & Ragin, 2009: 12), and studies using QCA typically build or elaborate "midrange theories" (e.g., Campbell et al., 2015; Crilly, 2011; Fiss, 2011)—that is, theories of specific phenomena within a bounded scope. In short, while these last two features of the QCA method—its limited generalizability to other samples and its inherently focused model specification—can be considered as limitations, this simply means that researchers must account for them in their research designs and theoretical claims.

QCA as a complementary method. Management researchers have also used QCA as a complementary analytical approach, both inductively and deductively. Indeed, our review of the empirical QCA literature uncovers that quite a few studies are multimethod, but we note that these studies vary widely in how fully they exploit the potential of the QCA approach.

First, inductively, several studies have used QCA in a complementary manner with more grounded theory approaches in their theory generation efforts (Aversa, Furnari, & Haefliger, 2015; Crilly, 2011; Mol & Birkinshaw, 2014). These studies differ from the post hoc abductive research previously noted by Livne-Tarandach et al. (2015)—in which qualitative researchers leveraged QCA as a *supplementary* tool to solidify relationships generated through grounded theorizing (e.g., Bromley, Hwang, & Powell, 2012)—in that they used QCA as the *primary* methodological technique to generate theory from qualitative data. In

contrast to researchers who have used QCA as a supplementary tool and thus typically "did not predefine a focus on the interplay among conditions" (Livne-Tarandach et al., 2015: 164), the authors of the studies reviewed here initiated their qualitative data collection with a configurational mindset and their research designs involved, from the outset, QCA as a theory-building tool to systematically explore combinations of conditions across cases and to generate theories that are inherently configurational in nature. Moreover, the authors of these studies typically returned to the qualitative data to interpret the results of QCA's configurational analysis, engaging in an iterative dialogue with cases (Rihoux & Lobe, 2009). For example, Aversa and colleagues (2015) started with a configurational view of firms as combinations of business models in Formula 1 and then used grounded theorizing to identify business model attributes, and then turned to QCA to uncover how they combined to produce performance. Further, after conducting QCA, these authors further qualitatively analyzed two selected polar cases of Formula 1 firms to elucidate the mechanisms underlying the configurations discovered through QCA. In short, QCA views of cases as configurations and its ability to conduct systematic comparisons across cases allows researchers to *see* empirical cases differently and to thus generate theories that address complex interactions among multiple causal conditions (Rihoux & Ragin, 2009: 13-15).

Second, deductively, QCA and different forms of regression analyses have been used as complements in mixed-method research designs. Specifically, the recent trend towards large-N QCA applications has created a dialogue regarding the possibilities of multimethod research designs that combine QCA with correlational methods. One common purpose of such an analysis has been to compare the results obtained from regression analysis with those obtained using QCA (e.g., Fiss, 2011; Huang & Huarng, 2015; Skaaning, 2007). QCA has also been used as a supplementary approach to explore phenomena when regression approaches fail to find results. For example, while García-Castro et al. (2013) found no significant effects in a regression analysis of six corporate governance explanatory factors thought to produce high firm performance, a QCA investigation showed that combinations of such practices did indeed explain high performance. Furthermore, Fiss, Sharapov, and Cronqvist (2013) offer several possible options of integrating configurational QCA paths into regression analysis to calculate the relative importance of each path. Consistent with such an approach, Meuer, Rupietta, and Backes-Gellner (2015) used QCA to uncover configurations of institutional and organizational elements associated with innovation and then used firms' membership scores as predictor variables in a regression analysis to predict radical or incremental organizational innovation.

Several studies have also combined the use of structural equation modeling (SEM) and QCA, again typically to compare the results obtained by each analysis. For instance, Tho and Trang (2015) employed SEM to test whether intrinsic motivation, innovative culture, and acquired knowledge predict knowledge transfer using a sample of 843 in-service training business students. These authors reanalyzed their data with QCA to find that none of these dimensions alone are sufficient conditions for knowledge transfer. Similarly, a handful of studies have compared the results obtained from cluster analysis with those obtained using QCA (e.g., Fiss, 2011; Hotho, 2014). Additionally, an innovative study by Joshi, Son, and Roh (2015) first used traditional meta-analysis to examine whether occupation-, industry- and job-level factors individually affect gender pay gaps and then used QCA to explore whether and how these factors combined to affect gender pay gaps.

The joint application of QCA with regression analysis methods has not been without its critics. Thiem et al. (2015) have argued that configurational analysis using Boolean algebra and correlational analysis using linear algebra draw on semantically incommensurable languages. They take issue with Grofman and Schneider's suggestion that "… once we have completed QCA we can use what we have learned to mimic its results with more traditional methods such as binary logistic regression. …" (2009: 669). As discussed above, regression analysis and QCA rest on different epistemological and methodological assumptions. However, dissimilar forms of analyses may be triangulated to generate complementary and novel insights. While more work is needed to understand how QCA can be used to create fruitful synergies and complementary insights with other approaches, our view is that there is indeed much to gain from exploring this interplay between the set-theoretic approach and other, inductive and deductive, approaches.

The Neo-Configurational Perspective: Future Research

Although we have offered insights into how future research can benefit from the use of QCA into our foregoing review—including a discussion of the challenges and opportunities of applying QCA, how QCA may be used as a complementary tool, and how it may be used in both inductive and deductive research—in this final section, we point to a number of particularly promising research areas for a neo-configurational approach in management studies. Causal complexity is pervasive across management and organizational phenomena, and our goal here is to highlight how the neo-configurational logic may enable researchers to address several core questions in management research from this different perspective.

A first research area that stands to benefit from the neo-configurational perspective is research on opportunity recognition (i.e., how do strategists understand and discover business opportunities?). While previous approaches map existing market landscapes (e.g., Levinthal & Rerup, 2006), a neo-configurational perspective emphasizes taking into account opportunities that are "empirically unobserved, yet plausible and potentially more effective" (Soda & Furnari, 2012: 286). These opportunities are seen as "theoretically feasible combinations of product or service features around which no products or markets have yet emerged" (Kennedy & Fiss, 2013: 1148). The focus on limited diversity and counterfactual analysis in the neo-configurational approach enables the mapping of the full opportunity space (including empirically unobserved configurations of product/service and market features) and to analyze the plausibility of combinations that have not been empirically observed. The logic of counterfactual analysis can also advance the idea of *design* as a "generative grammar" focused on strategies and organizational forms yet-to-be-discovered (Grandori, 2001) and by enriching existing studies of situations where strategy is expected but not observed (Inkpen & Choudhury, 1995).

Given the strong affinity between categories and sets, a neo-configurational perspective is also well suited to advance the study of categories in organizations and markets. Prior research has demonstrated that an organizational "categorical imperative" of fitting into a category to obtain legitimacy (Zuckerman, 1999) is moderated by a variety of category properties, such as "similarity," "fuzziness," and "contrast" (e.g., Negro, Kocak, & Hsu, 2010). A neo-configurational extension of this research stream could explain how different *configurations* of categorical properties potentially result in different levels of legitimacy or in equifinal paths to social

approval. Further, fuzzy sets readily account for the fuzziness of categories. In addition, the set-theoretic logic of QCA could be leveraged to theorize and study the consequences arising from membership in multiple categories (Kennedy & Fiss, 2013), such as the performance of firms competing in multiple product categories simultaneously (Negro et al., 2010).

A third area for which the neo-configurational approach holds great promise is research on institutional complexity resulting from incompatible prescriptions from multiple conflicting institutional logics (Greenwood, Raynard, Kodeih, Micelotta, & Lounsbury, 2011). Specifically, recent research has moved beyond the common focus on two competing logics and into how organizations combine distinct logics or respond to "constellations" of institutional logics (Goodrick & Reay, 2011; Jones & Livne-Tarandach, 2008). More broadly, Thornton, Ocasio, and Lounsbury (2012: 146) have called for new methodological approaches that would allow researchers to "understand the nestedness of levels and the interrelations of institutional logics with organizational identities and practices." Relatedly, Raynard (in press) suggested that there are four fundamental configurations of institutional complexity whose components both enable and constrain organizational action, while Zhao, Fisher, Lounsbury, and Miller (in press) recommend a configurational approach to institutional logics that helps to integrate logics with prior work on configurations of strategy and structure.

QCA also offers the tools for research to respond to the call for bringing "the organization as a whole" back to center stage in institutional theory (Greenwood, Hinings, & Whetten, 2014: 1208); it would be useful for investigating how "hybrid" organizational configurations enact the various logics which they seek to combine (e.g., Battilana & Lee, 2014). Indeed, QCA can be utilized to study the variety of organizational responses, ranging from organizational decoupling to hybrid organizing, that organizations may use to cope with this complexity. Studies have already begun to take up this charge. For instance, Crilly et al. (2012) showed that when confronted with incompatible institutional pressures, organizational decoupling responses can amount to combinations of practices that essentially involve "muddling through" rather than adhering to one logic or another. A recent study by Misangyi (in press) illustrates that the connections that coupled and decoupled practices have to the institutional logics competing to guide the adoption of an institutional program imbues the program adoption with meaning. In summary, many unanswered questions on institutional complexity remain, including the conditions that enable actors to invoke or combine different logics and the resulting effects of such combinations (Ocasio, Thornton, & Lounsbury, 2016: 41); the neo-configurational approach outlined in this article is well positioned to enhance and further this research stream.

QCA can also advance research on institutional, strategic, organizational, and intertemporal change. For example, studies on institutional entrepreneurship have suggested that institutional change may be explained by conditions at different levels of analysis (e.g., field-level and social actor–level characteristics), and thus research has advocated for the use of set-theoretic methods that are "well-suited to examining which combinations of variables lead to specific outcomes" of institutional entrepreneurship (Battilana, Leca, & Boxenbaum, 2009: 95). Although configurational studies have underplayed "the temporal dimension" and "how configurations can evolve in form and substance over time" (Ketchen, 2013: 305), possible ways to incorporate time into QCA are developing (e.g., Aversa et al., 2015; Hak, Jaspers, & Dul 2013; Ragin & Strand, 2008).

At least two promising approaches are emerging to incorporate time into QCA. A first, more case-oriented approach leverages fuzzy-set calibration to assess the degree to which cases have membership in patterns of change of relevant causal conditions. For example, QCA could be used to explore different configurations of organizational change patterns and their relation to an outcome of interest, thereby tackling questions such as: Do firms that radically change all elements of their organizational configuration perform better than those that change only one element radically? Although such questions were at the core of early configurational studies (Miller & Friesen, 1984), they have been mostly addressed through single case studies (Siggelkow, 2002) or large-scale correlational studies that cannot detect how patterns of change combine into different change configurations (Whittington, Pettigrew, Peck, Fenton, & Conyon, 1999). Another approach integrates QCA with panel-data econometrics and develops measures of set consistency and coverage that are suited for "longitudinal set-theoretic research" (García-Castro & Ariño, 2013: 3). García-Castro and Ariño (2013) used this approach to show that certain configurations of stakeholders' investments were conducive to firm performance in some time periods, while other configurations were effective in other periods.

The neo-configurational approach is also relevant to the management field's flourishing interest in behavioral approaches to strategy that "bring realistic assumptions about human cognition, emotions, and social behavior to the strategic management of organizations" (Powell, Lovallo, & Fox, 2011: 1371). Understanding why social actors behave as they do stands to benefit from using QCA to explore the complex interplay of factors based in rational judgment, perceptions, heuristics, emotions, and the social context (Campbell et al., 2015). Moreover, QCA is a promising analytical tool for assessing managerial decision making as it is a function of a confluence of multiple factors at different levels of analysis.

Finally, QCA can significantly contribute to help better understand causal complexity at the team, dyad, and individual levels (e.g., Ragin & Fiss, 2016), as well as in "meso-level" or multilevel research. In general, as Greckhamer et al. (2013) have noted, many theories in the organization behavior domain explicitly propose multiway interactions (i.e., conjunctural causation) that could readily be conceptualized and studied by future research using a QCA approach; examples include theories on job complexity (Oldham & Cummings, 1996), on interpersonal rejection (Smart Richman & Leary, 2009), and on individuals' task performance (Lawler, 1966). At the individual level, many psychological constructs and theories are inherently configurational (Ketchen, 2013) and could be productively conceptualized and investigated using QCA (Crilly, 2013). QCA also would seem to hold promise for research on teams. For example, a neo-configurational perspective is well-suited to answer recent calls for research that considers how individual-level attributes such as personality combine with team-level contextual attributes such as task requirements to produce team outcomes (e.g., Humphrey & Aime, 2014; Mathieu, Tannenbaum, Donsbach, & Alliger, 2014). Furthermore, individuals oftentimes belong to multiple teams at work, and the number and variety of their team memberships may potentially influence their productivity and learning, as may the nature of the external environment (O'Leary, Mortensen, & Woolley, 2011). QCA offers a conceptual and analytical approach that could help to disentangle the causal complexity resulting from such interrelations of individual, team, and organizational attributes.

This highlights then that that the neo-configurational approach could be beneficial for meso-level or multilevel research, that is, research that investigates how relationships between attributes that may span various levels (individual, teams, organizational) affect outcomes at these different levels of analyses (House, Rousseau, & Thomas-Hunt, 1995). As already outlined above, QCA and its neo-configurational approach is well suited to the study of how contextual effects combine with lower-level attributes to affect outcomes. QCA is also well equipped to examine how lower-level attributes configure to produce higher-level constructs. For instance, although researchers often look for consensus or consistency across the members of a team or organization so that they can speak meaningfully about shared team characteristics, group-level constructs are often configurational in nature. As Klein and Kozlowski (2000: 217) have argued, "team performance is a configural property insofar as team performance emerges from the complex conglomeration of individual team members' performance." Indeed, research spanning multiple levels requires explicit assumptions about the logic by which lower-level (e.g., individual) phenomena aggregate to a higher-level (e.g., team, group, or organization) (Klein, Dansereau, & Hall, 1994; Rousseau, 1985), and QCA is able to address these issues both in its calibration process as well as in its ability to theorize and investigate conjunction.

Conclusion

Understanding causal complexity is a serious challenge lying at the heart of management and organization studies. In this review, we have synthesized research on a neo-configurational approach that embraces and tackles this challenge. In doing so, we have outlined the tenets of this emerging neo-configurational perspective, reviewed its current state, and highlighted its promise for future research that scholars can use to inform their work. We see our article as part of a growing response to a hegemony of general linear approaches and a move towards a greater diversity of approaches that includes linear approaches alongside of QCA, qualitative methods of various kinds, laboratory experiments, simulation-based approaches, and others. The guiding principle underlying this perspective and methodological diversity should be that the research approach matches the research question. Our argument is that unraveling causal complexity requires a conceptual and methodological approach that is specifically equipped to do so.

Attention to causal complexity may be of particular relevance in settings where progress in a research stream has stalled because of conflicting results and lurking potential moderators. Lampel and Shapira (1995: 128) note that such a pattern is often observed where "after producing a considerable number of studies, researchers are forced to concede that the phenomenon … is more complex and ambiguous than the question that originally gave rise to this stream of research." The progress of these research programs is likely to have been impaired by methodological approaches that do not match the complexity of the phenomena they study. In such situations, the kind of configurational approach advanced here may provide a way forward.

The neo-configurational perspective is not merely methodological; it is an example of the tight interplay between theory and methods (cf. Van Maanen, Sorensen, & Mitchell, 2007) and shows the methods we use influence the theories we can articulate (Abbott, 1988). The application of QCA's theoretical and methodological approach enables researchers to

conceptualize and embrace the facets of causal complexity—conjunction, equifinality, and asymmetry—and to advance a neo-configurational perspective. We hope that this review article contributes to stimulating the work that remains to be done to complement recent methodological developments with commensurate theoretical ones and to further integrate the neo-configurational perspective in our field.

Notes

1. In the remainder of this article, our references to causal complexity encompass all three of these defining elements.

2. These roots date back to Max Weber's inherently configurational conception of bureaucracy as "an internally consistent system" of organizational traits (Weber, 1904: 48), which spurned a rich tradition of comparative organizational analyses of "patterns" of bureaucracy (Gouldner, 1954) and typologies conceiving "types" of organizations as clusters of attributes (e.g., Blau & Scott, 1962; Etzioni, 1961). Both these traditions are intrinsically configurational (see King, Felin, & Whetten, 2009).

3. For detailed explanations of QCA, see Ragin (1987, 2000, 2008), Rihoux and Ragin (2009), Schneider and Wagemann (2012), and Greckhamer et al. (2008). For empirical demonstrations of the differences between QCA and linear regression, see Grofman and Schneider (2009); Katz, Hau, and Mahoney (2005); and Vis (2012).

4. As with regression approaches or any other method of inquiry, so it is too in QCA that any claims that an empirically found relationship is causal are a function of the study's underlying theory and research design.

5. Core conditions are considered to be more "decisive causal ingredients" because they do not require assumptions; they remain part of the solution after the inclusion of all simplifying assumptions (based on both easy and difficult counterfactuals). Contributing conditions, on the other hand, remain as part of the solution because they "can be removed from the solution only if the researcher is willing to make assumptions that are at odds with existing substantive and theoretical knowledge" (Ragin & Fiss, 2008: 204). Thus the convention of distinguishing them in reporting is largely a matter of transparency: It allows consumers of the study to see which elements of the solution are definitive (core) versus those that would take implausible assumptions to remove them from the solution (contributing). For more in-depth discussions of counterfactual analysis, see, for example, Ragin (2000, 2008), Schneider and Wagemann (2012), and Soda and Furnari (2012).

6. Distinguishing mode of inquiry is, however, not straightforward given that a third mode of inquiry—abduction (e.g., see Van Maanen, Sorensen, & Mitchell, 2007)—characterizes QCA's initial formulations (Ragin, 1987, 2000). Our review of the management literature revealed, however, that studies that have used QCA in a directly abductive way have done so as part of an inductive theory generation endeavor in a similar manner as described by Livne-Tarandach et al. (2015). Therefore, rather than treat abduction as a separate classification, we include a discussion of it within the review of inductive studies.

7. At a field-level, we see these inductive elaborations of existing management theories in configurational terms as a natural extension of QCA's roots as an abductive method (Ragin, 1987, 2000). Abduction is an "ampliative and conjectural mode of inquiry" through which the researcher explores "hunches, explanatory propositions, ideas, and theoretical elements" that arise with the "recognition of puzzling observations that enable us to discern and construct new plots" (Locke, Golden-Biddle, & Feldman, 2008: 907-908). QCA has been used by management researchers to elaborate a new configurational perspective in theoretical domains in which inherent complex causality had been acknowledged but had so far gone largely uncovered by conventional linear thinking and regression approaches.

References

Abbott, A. 1988. Transcending general linear reality. *Sociological Theory*, 6 (2): 169-186.

Aversa, P., Furnari, S., & Haefliger, S. 2015. Business model configurations and performance: A qualitative comparative analysis in Formula One racing, 2005-2013. *Industrial and Corporate Change*, 24: 655-676.

Bakija, J., Cole, A., & Heim, B. T. 2010. *Jobs and income growth of top earners and the causes of changing income inequality: Evidence from US tax return data*. Unpublished manuscript. Retrieved from http://piketty.pse.ens.fr/files/Bakijaetal2010.pdf

Basurto, X., & Speer, J. 2012. Structuring the calibration of qualitative data as sets for qualitative comparative analysis (QCA). *Field Methods*, 24: 155-174.

Battilana, J., Leca, B., & Boxenbaum, E. 2009. How actors change institutions: Towards a theory of institutional entrepreneurship. *Academy of Management Annals*, 3: 65-107.

Battilana, J., & Lee, M. 2014. Advancing research on hybrid organizing – Insights from the study of social enterprises. *Academy of Management Annals*, 8: 397-441.

Bell, R. G., Filatotchev, I., & Aguilera, R. V. 2014. Corporate governance and investors' perceptions of foreign IPO value: An institutional perspective. *Academy of Management Journal*, 57: 301-320.

Bensaou, M., & Venkatraman, N. 1995. Configurations of interorganizational relationships: A comparison between U.S. and Japanese automakers. *Management Science*, 41: 1471-1492.

Berg-Schlosser, D., & De Meur, G. 2009. Comparative research design: Case and variable selection. In B. Rihoux & C. C. Ragin (Eds.), *Configurational comparative methods: Qualitative comparative analysis (QCA) and related techniques*: 19-32. London: SAGE Publications.

Bijlsma, K. M., & van de Bunt, G. G. 2003. Antecedents of trust in managers: A "bottom up" approach. *Personnel Review*, 32: 638-664.

Blau, P. M., & Scott, W. R. 1962. *Formal organizations: A comparative approach*. Stanford, CA: Stanford University Press.

Boulding, K. 1956. General systems theory: The skeleton of science. *Management Science*, 2: 197-208.

Bromley, P., Hwang, H., & Powell, W. W. 2012. Decoupling revisited: Common pressures, divergent strategies in the U.S. nonprofit sector. *M@n@gement*, 15: 468-501.

Campbell, J. T., Sirmon, D. G., & Schijven, M. 2015. Fuzzy logic and the market: A configurational approach to investor perceptions of acquisition announcements. *Academy of Management Journal*, 59: 163-187.

Child, J. 2002. A configurational analysis of international joint ventures: Drawing upon experience in China. *Organization Studies*, 23: 781- 815.

Cress, D. M., & Snow, D. A. 2000. The outcomes of homeless mobilization: The influence of organization, disruption, political mediation and framing. *American Journal of Sociology*, 105: 1063-1104.

Crilly, D. 2011. Predicting stakeholder orientation in the multinational enterprise: A mid-range theory. *Journal of International Business Studies*, 42: 694-717.

Crilly, D. 2013. Corporate social responsibility: A multilevel explanation of why managers do good. *Research in the Sociology of Organizations*, 38: 181-204.

Crilly, D., Zollo, M., & Hansen, M. 2012. Faking it or muddling through? Understanding decoupling in response to stakeholder pressures. *Academy of Management Journal*, 55: 1429-1448.

Delbridge, R., & Fiss, P. C. 2013. Editors' comments: Styles of theorizing and the social organization of knowledge. *Academy of Management Review*, 38: 325-331.

Doty, D. H., Glick, W. H., & Huber, G. P. 1993. Fit, equifinality, and organizational effectiveness: A test of two configurational theories. *Academy of Management Journal*, 36: 1196-1250.

Edmonson, A. C., & McManus, S. E. 2007. Methodological fit in management field research. *Academy of Management Review*, 32: 1155-1179.

Etzioni, A., 1961. *Complex organizations: A sociological reader*. New York, NY: Holt, Rinehart and Winston.

Fiss, P. C. 2007. A set-theoretic approach to organizational configurations. *Academy of Management Review*, 32: 1180-1198.

Fiss, P. C. 2009. Case studies and the configurational analysis of organizational phenomena. In C. C. Ragin & D. Byrne (Eds.), *The handbook of case study methods*: 424-440. London: SAGE Publications.

Fiss, P. C. 2011. Building better causal theories: A fuzzy set approach to typologies in organization research. *Academy of Management Journal*, 54: 393-420.

Fiss, P., Marx, A., & Cambré, B. 2013. Configurational theory and methods in organizational research: Introduction. In M. Lounsbury (Ed.), *Research in the sociology of organizations*: 1-22. Bingley, UK: Emerald.

Fiss, P. C., Sharapov, D., & Cronqvist, L. 2013. Opposites attract? Opportunities and challenges for integrating large-*N* QCA and econometric analysis. *Political Research Quarterly*, 66: 191-198.

Frambach, R. T., Fiss, P. C., & Ingenbleek, P. T. 2016. How important is customer orientation for firm performance? A fuzzy set analysis of orientations, strategies, and environments. *Journal of Business Research*, 69: 1428-1436.

García-Castro, R., Aguilera, R. V., & Ariño, M. A. 2013. Bundles of firm corporate governance practices: A fuzzy set analysis. *Corporate Governance: An International Review*, 21: 390-407.

García-Castro, R., & Ariño, M. A. 2013. *A general approach to panel data set-theoretic research*. COMPASSS WP Series 2013-76. Retrieved from http://www.compasss.org/wpseries/GarciaCastroArino2013.pdf

Goodrick, E., & Reay, T. 2011. Constellations of institutional logics changes in the professional work of pharmacists. *Work and Occupations*, 38: 372-416.

Gouldner, A. W. 1954. *Patterns of industrial bureaucracy*. Glencoe, IL: Free Press.

Grandori, A. 2001. Methodological options for an integrated perspective on organization. *Human Relations*, 54: 37-47.

Grandori, A., & Furnari, S. 2008. A chemistry of organization: Combinatory structural analysis and design. *Organization Studies*, 29: 315-341.

Grandori, A., & Furnari, S. 2013. Configurational analysis and organization design: Towards a theory of structural heterogeneity. *Research in the Sociology of Organizations*, 28: 79-107.

Greckhamer, T. 2011. Cross-cultural differences in compensation level and inequality across occupations: A set-theoretic analysis. *Organization Studies*, 32: 85-115. doi:10.1002/smj.2370

Greckhamer, T. 2016. CEO compensation in relation to worker compensation across countries: The configurational impact of country-level institutions. *Strategic Management Journal*, 37: 793-815.

Greckhamer, T., Misangyi, V. F., Elms, H., & Lacey, R. 2008. Using qualitative comparative analysis in strategic management research: An examination of combinations of industry, corporate, and business-unit effects. *Organizational Research Methods*, 11: 695-726.

Greckhamer, T., Misangyi, V., & Fiss, P. 2013. The two QCAs: From a small-N to a large-N set-theoretic approach. *Research in the Sociology of Organizations*, 38: 49-75.

Greenwood, R., Hinings, C. R., & Whetten, D. 2014. Rethinking institutions and organizations. *Journal of Management Studies*, 51: 1206-1220.

Greenwood, R., Raynard, M., Kodeih, F., Micelotta, E. R., & Lounsbury, M. 2011. Institutional complexity and organizational responses. *Academy of Management Annals*, 5: 317-371.

Grofman, B., & Schneider, C. 2009. An introduction to crisp set QCA, with a comparison to binary logistic regression. *Political Research Quarterly*, 62: 662-672.

Guillén, M. F. 1994. *Models of management: Work, authority, and organization in a comparative perspective*. Chicago, IL: University of Chicago Press.

Häge, F. M. 2007. Constructivism, fuzzy sets and (very) small-*N*: Revisiting the conditions for communicative action. *Journal of Business Research*, 60: 512-521.

Hak, T., Jaspers, F., & Dul, J. 2013. The analysis of temporally ordered configurations: Challenges and solutions. *Research in the Sociology of Organizations*, 38: 107-127.

Hambrick, D. C., & Jackson, E. M. 2000. Outside directors with a stake: The linchpin in corporate governance. *California Management Review*, 42(4): 108-127.

Hervas-Oliver, J. L., Sempere-Ripoll, F., & Arribas, I. 2015. Asymmetric modeling of organizational innovation. *Journal of Business Research*, 68: 2654-2662.

Hodson, R., & Roscigno, V. J. 2004. Organizational success and worker dignity: Complementary or contradictory? *American Journal of Sociology*, 110: 672-708.

Hotho, J. J. 2014. From typology to taxonomy: A configurational analysis of national business systems and their explanatory power. *Organization Studies*, 35: 671-702.

House, R., Rousseau, D. M., & Thomas-Hunt, M. 1995. The Meso paradigm: A framework for the integration of micro and macro organizational behavior. *Research in Organizational Behavior*, 17: 71-114.

Huang, C. W., & Huarng, K. H. 2015. Evaluating the performance of biotechnology companies by causal recipes. *Journal of Business Research*, 68: 851-856.

Humphrey, S. E., & Aime, F. 2014. Team microdynamics: Toward an organizing approach to teamwork. *Academy of Management Annals*, 8: 443-503.

Inkpen, A., & Choudhury, N. 1995. The seeking of strategy where it is not: Towards a theory of strategy absence. *Strategic Management Journal*, 16: 313-323.

Jones, C., & Livne-Tarandach, R. 2008. Designing a frame: Rhetorical strategies of architects. *Journal of Organizational Behavior*, 29: 1075-1099.

Joshi, A., Son, J., & Roh, H. 2015. When can women close the gap? A meta-analytic test of sex differences in performance and rewards. *Academy of Management Journal*, 58: 1516-1545.

Kan, A. K. S., Adegbite, E., El Omari, S., & Abdellatif, M. 2015. On the use of qualitative comparative analysis in management. *Journal of Business Research*, 69: 1458-1463.

Katz, A., Vom Hau, M., & Mahoney, J. 2005. Explaining the great reversal in Spanish America fuzzy-set analysis versus regression analysis. *Sociological Methods & Research*, 33: 539-573.

Katz, D., & Kahn, R. L. 1966. *the social psychology of organizations* (1st ed.). New York, NY: Wiley.

Kennedy, M. T., & Fiss, P. C. 2013. An ontological turn in categories research: From standards of legitimacy to evidence of actuality. *Journal of Management Studies*, 50: 1138-1154.

Ketchen, D. J. 2013. We try harder: Some reflections on configurational theory and methods. In P. C. Fiss, B. Cambre, & A. Marx (Eds.), Configurational theory and methods in organizational research. *Research in the Sociology of Organizations*, 38: 303-310.

Ketchen, D. J., Combs, J. G., Russell, C. J., Shook, C., Dean, M. A., Runge, J., Lohrke, F. T., Naumann, S. E., Haptonstahl, D. E., Baker, R., Beckstein, B. A., Handler, C., Honig, H., & Lamoureux, S. 1997. Organizational configurations and performance: A meta-analysis. *Academy of Management Review*, 40: 223-240.

Ketchen, D. J., Thomas, J. B., & Snow, C. C. 1993. Organizational configurations and performance: A comparison of theoretical approaches. *Academy of Management Journal*, 36: 1278-1313.

King, B. G., Felin, T., & Whetten, D. A. 2009. Studying differences between organizations: Comparative approaches to organizational research. *Research in the Sociology of Organizations*, 26: 91-116.

Klein, K. J., Dansereau, F., & Hall, R. J. 1994. Levels issues in theory development, data collection, and analysis. *Academy of Management Review*, 19: 195-229.

Klein, K. J., & Kozlowski, S. W. J. 2000. From micro to meso: Critical steps in conceptualizing and conducting multilevel research. *Organizational Research Methods*, 3: 211-236.

Kogut, B., MacDuffie, J. P., & Ragin, C. C. 2004. Prototypes and strategy: Assigning causal credit using fuzzy sets. *European Management Review*, 1: 114-131.

Kogut, B., & Ragin, C. C. 2006. Exploring complexity when diversity is limited: Institutional complementarity in theories of rule of law and national systems revisited. *European Management Review*, 3: 44-59.

Kvist, J. 2007. Fuzzy set ideal type analysis. *Journal of Business Research*, 60: 474-481.

Lacey, R., & Fiss, P. C. 2009. Comparative organizational analysis across multiple levels: A set-theoretic approach. *Research in the Sociology of Organizations*, 26: 91-116.

Lampel, J., & Shapira, Z. 1995. Progress and its discontents: Data scarcity and the limits of falsification in strategic management. *Advances in Strategic Management*, 12A: 113-150.

Lawler, E. E. 1966. Ability as a moderator of the relationship between job attitudes and job performance. *Personnel Psychology*, 19: 153-164.

Lawrence, P., & Lorsch, J. 1967. Differentiation and integration in complex organizations. *Administrative Science Quarterly*, 12: 1-30.

Lee, T. W. 1999. *Using qualitative methods in organizational research*. Thousand Oaks, CA: SAGE Publications.

Lee, T. W., Mitchell, T. R., & Sabylinski, C. J. 1999. Qualitative research in organizational and vocational psychology: 1979-1999. *Journal of Vocational Behavior*, 55: 161-187.

Levinthal, D., & Rerup, C. 2006. Crossing an apparent chasm: Bridging mindful and less-mindful perspectives on organizational learning. *Organization Science*, 17: 502-513.

Livne-Tarandach, R., Hawbaker, B., Boren, B. L., & Jones, C. 2015. Qualitative comparative analysis. In K. D. Elsbach & R. M. Kramer (Eds.), *Handbook of qualitative organizational research: Innovative pathways and methods*, 156. New York, NY: Routledge.

Locke, K., Golden-Biddle, K., & Feldman, M. S. 2008. Making doubt generative: Rethinking the role of doubt in the research process. *Organization Science*, 19: 907-918.

Marx, A., & Van Hootegem, G. 2007. Comparative configurational case analysis of ergonomic injuries. *Journal of Business Research*, 60: 522-530.

Mathieu, J. E., Tannenbaum, S. I., Donsbach, J. S., & Alliger, G. M. 2014. A review and integration of team composition models moving toward a dynamic and temporal framework. *Journal of Management*, 40: 130-160.

Meuer, J. 2014. Archetypes of inter-firm relations in the implementation of management innovation: A set-theoretic study in China's biopharmaceutical industry. *Organization Studies*, 35: 121-145.

Meuer, J., Rupietta, C., & Backes-Gellner, U. 2015. Layers of co-existing innovation systems. *Research Policy*, 44: 888-910.

Meyer, A. D., Gaba, V., & Colwell, K. A. 2005. Organizing far from equilibrium: Nonlinear changes in organizational fields. *Organization Science*, 16: 456-473.

Meyer, A. D., Tsui, A. S., & Hinings, C. R. 1993. Configurational approaches to organizational analysis. *Academy of Management Journal*, 36: 1175-1195.

Miles, R. E., & Snow, C. C. 1978. *Organizational strategy, structure and process*. New York, NY: McGraw-Hill.

Miller, D. 1986. Configurations of strategy and structure: Towards a synthesis. *Strategic Management Journal*, 7: 233-249.

Miller, D. 1987. The genesis of configuration. *Academy of Management Journal*, 12: 686-701.

Miller, D., & Friesen, P. H. 1984. *Organizations: A quantum view*. Englewood Cliffs, NJ: Prentice Hall.

Mintzberg, H. 1979. *The structuring of organizations*. Englewood Cliffs, NJ: Prentice Hall.

Misangyi, V. in press. Institutional complexity and the meaning of loose coupling: Connecting institutional sayings and (not) doings. *Strategic Organization*.

Misangyi, V. F., & Acharya, A. G. 2014. Substitutes or complements? A configurational examination of corporate governance mechanisms. *Academy of Management Journal*, 57: 1681-1705.

Mol, M. J., & Birkinshaw, J. 2014. The role of external involvement in the creation of management innovations. *Organization Studies*, 35: 1287-1312.

Negro, G., Kocak, O., & Hsu, G. 2010. Research on categories in the sociology of organizations. *Research in the Sociology of Organizations*, 31: 3-35.

Ocasio, W, Thornton, P. H., & Lounsbury, M. 2016. The institutional logics perspective. In R. Greenwood et al. (Eds.), *Handbook of organizational institutionalism* (2nd ed.). Thousand Oaks, CA: SAGE Publications.

Oldham, G., & Cummings, A. 1996. Employee creativity: Personal and contextual factors at work. *Academy of Management Journal*, 39: 607-634.

O'Leary, M. B., Mortensen, M., & Woolley, A. W. 2011. Multiple team membership: A theoretical model of its effects on productivity and learning for individuals and teams. *Academy of Management Review*, 36: 461-478.

O'Neil, K. 2008. Bringing art to market: The diversity of pricing styles in a local art market. *Poetics*, 36: 94-113.

Ordanini, A., & Maglio, P. P. 2009. Market orientation, internal process, and external network: A qualitative comparative analysis of key decisional alternatives in the new service development. *Decision Sciences*, 40: 601-625.

Pajunen, K. 2008. Institutions and inflows of foreign direct investment: A fuzzy-set analysis. *Journal of International Business Studies*, 39: 652-669.

Powell, T. C., Lovallo, D., & Fox, C. R. 2011. Behavioural strategy. *Strategic Management Journal*, 32: 1369-1386.

Ragin, C. C. 1987. *The comparative method: Moving beyond qualitative and quantitative strategies*. Berkeley: University of California Press.

Ragin, C. C. 2000. *Fuzzy-set social science*. Chicago, IL: University of Chicago Press.

Ragin, C. 2006. The limitations of net-effects thinking. In B. Rihoux & H. Grimm (Eds.), *Innovative comparative methods for policy analysis*: 13-41. New York, NY: Springer.

Ragin, C. C. 2008. *Redesigning social inquiry: Fuzzy sets and beyond*. Chicago, IL: University of Chicago Press.

Ragin, C. 2013. New directions in the logic of social inquiry. *Political Research Quarterly*, 66: 171-174.

Ragin, C. C., & Fiss, P. C. 2008. Net effects analysis versus configurational analysis: An empirical demonstration. In C. C. Ragin, *Redesigning social inquiry: Fuzzy sets and beyond*: 190-212. Chicago, IL: University of Chicago Press.

Ragin, C. C., & Fiss, P.C. 2016. *Intersectional inequality: Race, gender, test scores, and poverty*. Chicago, IL: University of Chicago Press.

Ragin, C. C., & Rubinson, C. 2009. The distinctiveness of comparative research. In *The SAGE handbook of comparative politics*: 13-34. London: SAGE Publications.

Ragin, C. C., & Sonnett, R. 2004. Between complexity and parsimony: Limited diversity, counterfactual cases, and comparative analysis. In S. Kropp & M. Minkenberg (Eds.), *Vergleichen in der Politikwissenschaft*: 180-197. Wiesbaden: VS Verlag fur Sozialwissenschaften.

Ragin, C. C., & Strand, S. I. 2008. Using qualitative comparative analysis to study causal order: Comment on Caren and Panofsky (2005). *Sociological Methods & Research*, 36: 431-441.

Raynard, M. in press. Deconstructing complexity: Configurations of institutional complexity and structural hybridity. *Strategic Organization*.

Rihoux, B., & Marx, A. 2013. *QCA, 25 years after "Comparative Method": Mapping, challenges, and innovations – Mini-symposium*. Political Research Quarterly, 66: 167-235.

Rihoux, B., & Lobe, B. 2009. The case for qualitative comparative analysis (QCA): Adding leverage for thick cross-case comparison. In *The Sage handbook of case-based methods*: 222-242. Thousand Oaks, CA: SAGE Publications.

Rihoux, B., & Ragin, C. C. 2009. *Configurational comparative methods: Qualitative comparative analysis (QCA) and related techniques (applied social research methods)*. Thousand Oaks, CA: SAGE Publications.

Rousseau, D. M. 1985. Issues of level in organizational research: Multi-level and cross-level perspectives. *Research in Organizational Behavior*, 7: 1-37.

Schneider, C. Q., & Wagemann, C. 2012. *Set-theoretic methods for the social sciences: A guide to qualitative comparative analysis*. New York, NY: Cambridge University Press.

Schneider, M. R., Schulze-Bentrop, C., & Paunescu, M. 2010. Mapping the institutional capital of high-tech firms: A fuzzy-set analysis of capitalist variety and export performance. *Journal of International Business Studies*, 41: 246-266.

Scott, W. R. 1988. *Organizations: Rational, natural and open systems*. Peabody, MA: Prince-Hall.

Short, J. C., Payne, G. T., & Ketchen, D. J. 2008. Research on organizational configurations: Past accomplishments and future challenges. *Journal of Management*, 34: 1053-1079.

Siggelkow, N. 2002. Evolution toward fit. *Administrative Science Quarterly*, 47: 125-159.

Simon, H. A. 1962. The architecture of complexity. *Proceedings of the American Philosophical Society*, 106: 467-482.

Simon, H. A. 1996. *The sciences of the artificial*. Cambridge, MA: MIT Press.

Skaaning, S. 2007. Explaining post-communist respect for civil liberty: A multi-methods test. *Journal of Business Research*, 60: 493-500.

Smart Richman, L., & Leary, M. R. 2009. Reactions to discrimination, stigmatization, ostracism, and other forms of interpersonal rejection: A multimotive model. *Psychological Review*, 116: 365-383.

Smithson, M., & Verkuilen, J. 2006. *Fuzzy set theory: Applications in the social sciences*. Thousand Oaks, CA: SAGE Publications.

Soda, G., & Furnari, S. 2012. Exploring the topology of the plausible: Fs/QCA counterfactual analysis and the plausible fit of unobserved organizational configurations. *Strategic Organization*, 10: 285-296.

Spector, P. E., & Brannick, M. T. 2011. Methodological urban legends: The misuse of statistical control variables. *Organizational Research Methods*, 14: 287-305.

Stevenson, W. B., & Greenberg, D. 2000. Agency and social networks: Strategies of action in a social structure of position, opposition, and opportunity. *Administrative Science Quarterly*, 45: 651-678.

Stokke, O. S. 2007. Qualitative comparative analysis, shaming, and international regime effectiveness. *Journal of Business Research*, 60: 501-511.

Thiem, A., Baumgartner, M., & Bol, D. 2015. A correction of three misunderstandings between configurational comparativists and regression analysts. *Comparative Political Studies*, 49: 742-774.

Thiem, A., & Duşa, A. 2013. Boolean minimization in social science research: A review of current software for qualitative comparative analysis (QCA). *Social Science Computer Review.*, 31: 505-521.

Tho, N. D., & Trang, N. T. M. 2015. Can knowledge be transferred from business schools to business organizations through in-service training students? SEM and fsQCA findings. *Journal of Business Research*, 68: 1332-1340.

Thompson, J. D. 1967. *Organizations in action: Social science bases of administrative theory*. New York, NY: McGraw-Hill.

Thornton, P. H., Ocasio, W., & Lounsbury, M. 2012. *The institutional logics perspective: A new approach to culture, structure and process* (1st ed.). Oxford, UK: Oxford University Press.

Tushman, M. L., & O'Reilly, C. A. 2002. *Winning through innovation: A practical guide to organizational change and renewal*. Boston, MA: Harvard Business School Press.

Van de Ven, A. H., Ganco, M., & Hinings, C. R. 2013. Returning to the frontier of contingency theory of organizational and institutional designs. *Academy of Management Annals*, 7: 393-440.

Van Maanen, J., Sorensen, J. R., & Mitchell, T. R. 2007. The interplay between theory and method. *Academy of Management Review*, 32: 1145-1154.

Verkuilen, J. 2005. Assigning membership in fuzzy set analysis. *Sociological Methods and Research*, 33: 462-496.

Vis, B. 2012. The comparative advantages of fsQCA and regression analyses for moderately large-N analyses. *Sociological Methods & Research*, 41: 168-198.

Von Bertalanffy, L. 1968. *General system theory: Foundations, development, applications*. New York, NY: George Braziller.

Weber, M. 1904. *Max Weber on the methodology of the social sciences*. Glencoe, IL: Free Press.

Whittington, R., Pettigrew, A., Peck, S., Fenton, E., & Conyon, M. 1999. Change and complementarities in the new competitive landscape: A European panel study, 1992-1996. *Organization Science*,10: 583-600.

Wolff, E. N. 2010. *Recent trends in household wealth in the United States: Rising debt and the middle-class squeeze—An update to 2007* (Working Paper No. 589). Annandale-On-Hudson, NY: Levy Economics Institute of Bard College.

Wu, P. L., Yeh, S. S., & Woodside, A. G. 2014. Applying complexity theory to deepen service dominant logic: Configural analysis of customer experience-and-outcome assessments of professional services for personal transformations. *Journal of Business Research*, 67: 1647-1670.

Zhao, E., Fisher, G., Lounsbury, M., & Miller, D. in press. Optimal distinctiveness revisited: Broadening the interface between institutional theory and strategic management. *Strategic Management Journal*.

Zuckerman, E. W. 1999. The categorical imperative: Securities analysts and the illegitimacy discount. *American Journal of Sociology*. 104: 1398-1438.