POINT

COUNTERPOINT

An Ontological Turn in Categories Research: From Standards of Legitimacy to Evidence of Actuality

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ABSTRACT   In this Counterpoint to Durand and Paolella, we argue that prior work on categories has neglected processes of category emergence and dissolution. In response, we call for studies of categories that focus on how they emerge and fall out of use and on what they come to mean. We call this an ontological turn in categories research because systems of categorization and their associated meanings capture and reflect what societies view as social realities, or ontologies. As a guide to this broad topic, we develop a framework that relates the effects of categories to the familiarity of (1) occasions and motivations for their usage and (2) meanings and ontologies they carry, and we use this framework to elaborate two paths by which previously unfamiliar categories become accepted as elements of common knowledge. These paths jointly inform the recognition front of the emergence question, an understudied problem in organization studies. Finally, we outline two methodologies – set theoretic analysis and network-based analysis – that offer particular promise for analysing processes of category emergence and dissolution.

Keywords: categories, emergence, methodology, ontology

INTRODUCTION

Categories have captured the attention and imagination of organization scholars, and rightly so given the fundamental role they play in structuring markets, organizations, and actors more generally. In their article 'Category Stretching: Reorienting Research on Categories in Strategy, Entrepreneurship, and Organization Theory', however, Durand and Paolella (2013) argue that much of the research that uses categories to study markets and organizations has become rigid and somewhat narrow by overly focusing on the 'disciplining' role of categories – that is, their role as standards used to reward and punish things that fit or deviate from them. To correct this view, Durand and Paolella propose a research agenda that breaks free from viewing categories as

devices for disciplining deviation to instead pay more attention to situations in which markets and organizations 'blend, span, and stretch categories'. In particular, Durand and Paolella make a strong case for recognizing that ad hoc and nascent categories are not always viewed negatively, especially when they facilitate goals or explain the causes of specific situations such as meeting a sales forecast or explaining an anomalous result. Such cases, they argue, may require using categories that are not recognized elements of existing classification systems – at least not yet. Such non-standard categories can thus be judged as apt rather than viewed as suspect. We concur with this main point.

And yet we view these questions as part of a broader and more basic research programme that we refer to as an ontological turn in categories research. Rather than studying categories as devices that discipline society or provide ingredients for reimagining it, we urge research that focuses on fundamental questions about how categories emerge and fall out of use. We say these are ontological questions because systems of categorization and meaning capture and reflect the sets of things widely seen by any society as social realities. As Ruef (1999b, p. 1403) notes, ontologies, which he defines as 'symbolic systems of categorization and meaning', are a long-standing concern of social theory going back to Durkheim's work on the link between social structure and culturally shared systems of meaning and classification (Durkheim, [1912] 1995; Durkheim and Mauss, 1963). Obviously, this is not the ontology of philosophy and metaphysics, which concerns itself with what it means to exist as a singular fixed essence. Rather, the ontological turn we call for sees a plurality of ontologies that vary both over time and from society to society in any given time. Moreover, this emphasis is also different from institutional theory (DiMaggio and Powell, 1983), which concerns itself with the homogenizing effects of legitimacy considerations established by widely accepted norms, rules, and cognitive frameworks (Scott, 1991, 2008). In contrast, the ontological turn we call for is animated by the insight that category dynamics reflect and reinforce changing views about patterns widely seen as social realities – regardless of whether they acquire the legitimacy needed to serve as disciplining standards.

In this article, we offer our reactions to the category stretching call of Durand and Paolella and then add our own view on what the categories literature is missing. In particular, we sketch an ontological turn for categories research – one that focuses on questions of category emergence and dissolution – and offer a framework that relates this ontological turn to the Durand and Paolella programme. Our argument is that category emergence remains an under-researched aspect of categories research that merits much greater attention. In making this argument, we suggest that rather than starting with stable category structures, we need to view and study such category structures as an outcome and an accomplishment to be explained. To extend these expansive new themes into feasible research, we then speculate on research questions and methods likely to yield new and important contributions to theory. In conclusion, we argue that the ontological turn sketched here enables macro organization behaviour to better address the emergence and dissolution of categories – a topic of great importance that is at present largely neglected by organizational research that focuses on legitimacy and conformity.

ON STRETCHING BEYOND PROTOTYPES

Durand and Paolella make a bold move in aiming to 'unsettle and redirect the existing literature on categories' (p. 1101). The theme of their call for a new type of research is this: 'it is not the fact of spanning categories *per se* (i.e. increasing the total cognitive distance relative to established prototypes) that might matter to audiences, but their capacity to make coherent sense of the categorical combinations they observe.' As a corollary, they further note, 'Multi-category membership is in the eye of the beholder, who associates entities depending on their goals and ideals.' Categories are thus important to studies of organizations and markets because they reflect the eyes of the many beholders of organizations and their offerings. On these statements about what is and what ought to be, we wholeheartedly agree.

Nonetheless, our perspective on the extant literature differs from theirs in two important respects. First, we see more of what Durand and Paolella call for in the existing literature than they apparently do. They write, 'in most current research, scholars assume that the categories as perceived by producers and those used by any given audience – buyers, critics, or secondary stakeholders – align perfectly' (p. 1105). This strikes us as a bit strong. They also write, 'The literature on categorization has overemphasized the stability of categories and the inertia of classificatory systems, overlooking category dynamics and their development and evolution.' Whether these things are true of 'most' research in 'the literature on categorization' depends, of course, on what one pays attention to and, ironically, on how one categorizes research. Admittedly, the conformity pressure exerted by stable widespread agreements about category meaning is a central tenet of research that applies institutional and ecological theories of organizations to understanding how categories affect organizational and market behaviour (e.g. Hannan et al., 2007; Hsu, 2006; Zuckerman, 1999). These widespread agreements and their related effects, however, are outcomes rather than starting points in the growing literature on the emergence of categories applied to industries, markets, and organizations (Kennedy, 2008; Khaire and Wadhwani, 2010; Lounsbury et al., 2003; Navis and Glynn, 2010; Rao et al., 2003; Rosa et al., 1999; Santos and Eisenhardt, 2009). This type of research shows, as Durand and Paolella note, that producers can and do sometimes manipulate 'category meaning and boundaries according to their interests and where they think audiences' focus might be, or might shift to.' In our view, the literature on categories includes these two complementary approaches to categories. First, there is research that treats categories as factors that affect organizational and market behaviour; second, there is also research that treats categories as outcomes that reflect the recognition of new types of organizations and markets. That is, categories both affect and reflect organization and market behaviour.

Second, whereas Durand and Paolella regard the prototype view of categories as something to be emancipated from (p. 1118), we believe there is value to keeping prototype-based categories in the picture with the goal-based categories Durand and Paolella are keen to study. This is because we are interested in the flow between the two that occurs when, for example, goal-based categories themselves become prototypical. To explain, we agree with Durand and Paolella that there is value to rethinking audience reactions to non-standard categories, and as elaborated below, we also agree that goal-

and causality-based views of categories offer a solid theoretical foundation for taking a more liberal view of category blends, spans, and recombinations. While understanding the variety of situations in which organizations propose or invoke non-standard categories is itself a worthy research aim, we see additional value in examining why such categories become new prototypes, or fail to do so. Consider, for example, how corporations pursuing their familiar interest in cost-cutting strategies found a surprising connection between these interests and the goals of environmental activists pushing them to be 'green', or more friendly to the environment. As corporations increasingly framed various efficiency-boosting initiatives as enhancing their reputation for being green, they found common ground with activists that helped make the notion of being green a new criterion for corporate reputation (see Kennedy et al., 2012). Moreover, engaging their critics enabled corporations to shift what it means to be green towards their interests. And yet, this new criterion did not emerge as the result of a deliberate strategy on the part of a company or group of companies plotting to change what it means to be green; rather, it emerged because of fruitful, yet unintentional interactions between corporations trying to solve one problem and activists trying to solve another. It thus seems to us that the notions of prototypes and emergence are in some ways complementary.

EMERGENCE AS A NEGLECTED ASPECT OF CATEGORIES

Like Durand and Paolella, we also regard studies that emphasize the disciplining function of categories as leaving out an important aspect of categories. In our view, what is missing in this research is a deeper understanding of how categories emerge – that is, how they acquire meaning and cultural relevance. Whereas the disciplining view of categories highlights the difficulties of succeeding with innovations radical enough to defy existing categories, the study of emerging categories emphasizes their dramatic impact on economy and society – an impact that often rises to the 'creative destruction' famously described by Schumpeter (1934). As durable as categories often are (Tilly, 1998), the emergence of new categories and the dissolution of existing ones are events that both shift fortunes, as Schumpeter observed, by conferring new sources of advantage (Lieberman and Montgomery, 1988). These shifts make the study of category emergence and dissolution important topics in their own right.

However, the approach we advocate makes another distinction in that it views challenges to existing categories as routine rather than rare events. That is, we regard the meanings of even long-standing categories as both subject to challenge and vulnerable to change through reinterpretation or, in the extreme, outright rejection. From this view, the stability of categories and classification systems is an accomplishment to be explained, not an automatic result of inertial forces. In effect, this reverses the usual direction of explanations of organizational research. Whereas the homogenizing effects of categories have been most often used as independent variables in organizational research, we suggest not only that category emergence and change processes deserve greater attention, but also that emergence and change are important dependent variables in their own right.[1]

This shift has obvious ramifications for organization studies. While the idea that organizations shape their environments is not a novel one and has already been made forcefully by others (e.g., Carruthers, 1995; Mezias, 1990), we stress it here because it

underscores the need to view organizations not only as subject to conformity pressures but also as contributors to the emergence of new sources of such forces (Padgett and Powell, 2012). To be sure, prior research shows that new organizational fields emerge from interactions among different kinds of organizations (Padgett and Powell, 2012; Powell et al., 2005). We believe, however, that this point is not reflected in much of the current work on the disciplining force of categories. Understanding how categories emerge and change is important because the emergence process underlies and is causally prior to this disciplining function of categories. That is, we need categories to tell us what exists and what to pay attention to before we can use them to determine the desirability of things that fit them, or fail to. Category emergence is thus important to study because it orients attention to processes by which new kinds of organizations or products become 'real' enough to be recognized as elements of classifications systems, be it with a positive or negative valence. If, as we argue, social life involves a continuous flow of proposed new categories, we need theory that engages questions about how proposed or nascent categories become real enough in people's minds to have the homogenizing and disciplining effects observed in much prior research.

A FRAMEWORK FOR NEW DIRECTIONS

To flesh out the proposed ontological turn in categories research, we introduce a framework that situates two complementary yet different topics of research in a broader programme of study focused on questions about how categories emerge and fall out of use. Specifically, the two topics are: (1) the occasions and motivations for invoking categories, and (2) their meanings and encompassing ontologies. After fleshing out these two topics, we introduce a framework – illustrated in Figure 1 – that relates these two topics to paths by which categories emerge and fall out of use.
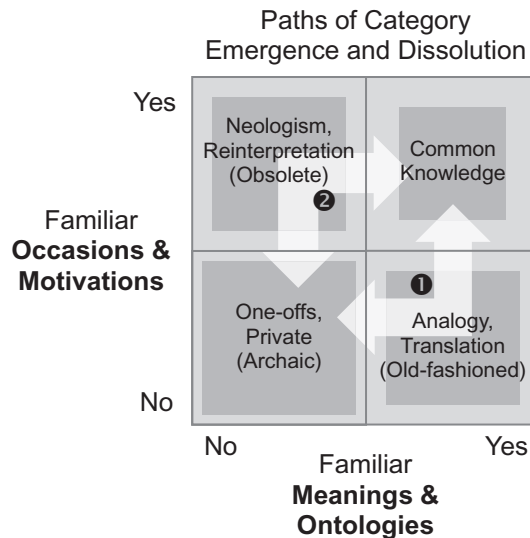

Figure 1. Paths of category emergence and dissolution

Occasions and Motivations

Durand and Paolella's approach to research on categories in organizations and markets aims to explore situations where categories are defined around goals or causal theories. While this is worthwhile, we suggest broadening the focus to explore a more general question: what are the occasions and motivations associated with using or proposing categories for which there are no widely shared prototypes?

To illustrate this broader question, consider how Microsoft Corporation categorized its business when it was prosecuted for allegedly violating US antitrust law by integrating its web browser and operating system products. Rather than accepting its positioning as the *largest* player in the operating system or application software business (as it was generally viewed by analysts and investors), Microsoft presented itself as having a much *smaller* share of a then-hypothetical category it described as the 'information at your fingertips' market (Microsoft, 1998). The occasion of being sued for abusing monopoly power in an understood category and the motivation to reframe the debate made this sensible, if not entirely credible. Microsoft lost the case, but was later proved right about its hypothesis that there would be something like an 'information at your fingertips' market – one widely recognized today as the search market.

While such occasions and motivations are often associated with goals or causal theories relevant to goals, there are others worth studying, too. In marketing research and practice, for example, there is an established multi-attribute approach to new product design that largely disregards nominal aspects of category membership to focus instead on consumer preferences for various combinations and configurations of features (for a seminal paper, see Green and Srinivasan, 1990; for an influential text, see Ulrich and Eppinger, 1999). Such feature- or configuration-based research is consistent with the Durand and Paolella observation that audience reaction to category misfits depend not on 'spanning categories *per se*' but instead on 'their capacity to make coherent sense of the categorical combinations they observe' (p. 1112). For instance, the occasion of early adoption of an innovation combines with the motivation to be seen as a leader to explain away what might otherwise be a reason for sanctioning a departure from the pack (Kennedy and Fiss, 2009).

The promise of this topic is that it will inform our understanding of Zuckerman's (1999) categorical imperative. While the net result may well make this important finding look less axiomatic than it has been commonly viewed, it in fact follows Zuckerman's own approach of systematically exploring how and why actors get relief from the pressures for categorical purity – that is, pressures to fit category prototypes quite closely. For example, Phillips and Zuckerman (2001) show that pressures for conformity are generally lower for very high- and low-status actors, while Phillips et al. (2012) elaborate this idea by noting that non-conformity is both more possible and more risky for high-status actors. Exploring the occasions and motivations behind achieving and occupying such positions should shed further light on systematic variations in the illegitimacy discount applied to category misfits.

Meanings and Ontologies

A second topic involves studying changes in the meanings and ontologies of categories. That is, it involves studying the changing meaning of existing categories or of new categories that are emerging or failing to emerge, and it involves studying the implications for encompassing ontologies.

Compared to studies of meaning anchored in new institutional theory (e.g. Zilber, 2002), the value of studying meanings and ontologies separates questions about the legitimacy of a thing from questions about its mere existence as a social reality. By social reality, we mean any pattern of human relations, interactions, or activities widely recognized by members of a particular society and also widely seen as having an all but undeniable tendency to occur – even if generally punished when it does occur. That is, social realities are seen as inevitabilities and, therefore, as all but impossible to eliminate.[2] One major advantage of distinguishing the ontological status of social realities from their legitimacy or illegitimacy is that it provides a way of talking about things that diffuse without presuming they will become legitimate.

To explain, consider again the two notions of 'information at your fingertips' and 'search'. Both can be explained by a single three-step cycle of meaning construction sketched by Kennedy (2008). In the first step, hypothesis, observed or expected patterns are hypothesized to be important or prevalent enough to be a thing worth *naming*. The skeletal grammar of hypothesis is 'There is a new thing here', or 'There is a new thing coming'. This view draws on the work of Charles Saunders Peirce (see especially Peirce, 1992), the founder of Pragmatist philosophy and originator of formal logic who distinguished this sort of inference from induction and deduction by calling it, at various points in time, hypothesis, abduction, and retroduction. Applied to Microsoft, the information at your fingertips hypothesis is a statement about a new thing Microsoft executives believed was emerging in the PC industry.

Because consensus about a hypothesis is what determines its ultimate usefulness to both the proposer and society in general, the second step, *translation*, involves communicating the hypothesis to others. Translation statements take the following basic form: 'There is a new thing here that you should know about.' Following Quine's (1960) indeterminacy thesis, this step is called translation rather than communication to acknowledge the telephone game aspects of conveying meaning between two actors – to say nothing of trying to broadcast it to a larger audience and the fidelity of reception by that audience. In both the Microsoft case and more generally, public discourse and the media are particularly important venues for getting the word out, both literally and figuratively. In our case, Microsoft's power and visibility gave it considerable leverage in getting this word out. In the third step, *evaluation*, the person or audience receiving the translation weighs the hypothesis. In essence, this involves asking and answering a simple but profound question of the new thing being proposed: 'Is this anything?' It is a process that will frequently involve what Boltanski and Thévenot (1991) call 'testing'. With the 'information at your fingertips' meme, the ultimate answer was 'no'. Though widely discussed, it did not catch on at the time. This third step is elaborated by the work of Richard Rorty, a major figure in philosophy's linguistic turn where some philosophers of meaning turned to natural language rather than symbolic maths as supplying both the

data and the toolkit for judging the truth value of any statement – including, of course, ones like 'There is a new thing here you should know about.' Both theoretically and practically, this means that public discourse contains patterns of association that offer a window into the ongoing process of meaning construction. This process is conceptualized as an ongoing cycle because receivers' reactions become data and an outlook that informs subsequent hypotheses. So while 'information at your fingertips' did not catch on, it arguably laid a foundation for people to see search as the large and important market it has become.

Categories and the Broader Problem of Emergence and Dissolution

We distinguish these two topics in categories research because thinking about how they inform each other holds the promise of shedding light on an important and understudied topic in the social sciences: the emergence problem (Padgett and Powell, 2012). Especially in organization studies, relatively little is known about how oft-studied pressures for conformity and homogeneity are overcome to permit the emergence of new types of organizations, practices, and strategies (Ruef, 1999a).

We see two fronts to the emergence problem. First, there is the question of where new ideas, or novelty comes from; this is the research question that Padgett and Powell address with their collaborators in a series of studies of new markets and forms of organization (Padgett and Powell, 2012). Drawing on biology that addresses the origins of life, they borrow the concept of autocatalysis – the process by which interactions between different chemicals yield reactions that produce new chemicals capable of reproducing themselves. Applied to emergence in studies of markets and organizations, they stress the importance of interactions across social networks in multiple domains.

Second, there is the research question we focus on, which is naturally addressed by categories research: How do novelties get recognized as new social realities? As Padgett and Powell observe (p. 1), 'New ideas, new practices, new organizational forms, new people must enter from off the stage of our imaginary before our analyses can begin.' This process of entering the stage is what we have called entering ontologies of common knowledge, and understanding how it happens is different from but complementary to asking where novelty comes from. Since categorization is essential for the social recognition of new realities, advances in categories research are most likely to contribute to this aspect of the emergence problem, and this is our focus. In our view, research that sheds light on the recognition of new categories as social realities is also likely to feature analyses of interactions across multiple networks; we say more about that briefly in the section on methods, below.

Also, asking how new categories emerge as social realities brings together the two paths for advancing categories research, as outlined above. This is because these two paths for advancing research mirror two paths by which new categories get recognized and, conversely, fall into disuse.

A Framework for Understanding Category Emergence and Dissolution

As mentioned above, Figure 1 sketches two paths by which categories emerge and fall out of use. First, as indicated by path 1, new categories become common knowledge

when a private or one-off insight applies a familiar meaning, often by analogy or translation, to a novel, unfamiliar occasion or for unusual purposes, and the situation and meaning then become widely accepted. Conversely, as indicated in parentheses, once-familiar categories can fall out of common knowledge when new technologies or changing ways of doing things outmode the situation that called for the category, so that the category label then declines in use and perceived value. For example, consider the now-familiar categories of brakes and throttles and the all-but-forgotten spurs and crops.

Second, as indicated by path 2, new categories can also enter common knowledge when a private or one-off insight is attached to a new word, or neologism, or to a new interpretation of an existing word – but only if, of course, the new or reinterpreted word is then used in increasingly similar ways on particular occasions and for increasingly similar and familiar purposes. In the reverse, things can drop out of common knowledge when changing tastes make labels and what they stand for seem old-fashioned or out of date, leading to the gradual disappearance of related ways of doing things.

Thus, common knowledge of new social realities can emerge from specific occasions and motivations, like goal-based categories, where there was no strategic intent to create a new category, or from more deliberate efforts to propose new meanings that fold elements of existing ontologies in on each other to create new categories. Note also that the emergence of new categories can drive prior ones out of use, thus changing ontologies not only by adding categories that describe newly recognized social realities, but also by forgetting existing categories or relegating them to history.

To illustrate, let us turn again to Microsoft's 'information at your fingertips' concept. As Microsoft's representatives began to articulate this vision of the company's position, they of course hoped it would go from being a one-off, private view of how the future would look to being an accepted category that would attract the efforts needed to transform their neologism into widely accepted common knowledge – that is, a new social reality. This did not happen. Instead, an analogy of employing engines to search for needed information took off like wildfire, and the idea of using a search engine, or search, is a widely embraced reality of modern life in a new incarnation of the information age. As search has become more important, established categories such as operating systems and desktop personal computers have diminished in importance compared to newer ones such as search and mobile networked computing devices that, ironically, bring information to users' fingertips.

Tackling the recognition front of the emergence problem will require exactly the kind of loosening up that Durand and Paolella call for in their essay, and that we call for as well. Whereas extant organization theory focuses on inertial forces that promote stability and conformity, often precluding change, we view stability and conformity as products of concerted efforts in the face of change, and studies of changing ontologies are likely to make this clear. In shifting our view towards stable category structures as an accomplishment, attention moves towards the changing meaning of both nascent and established categories, and in particular the area around what may be termed the recognition front. Drawing on Turner's (1972) idea of liminality, this area resembles the liminal zone between 'the unseen and seen, the submerged and the apprehended, the recognized and the cognized' (Comaroff and Comaroff, 1991, p. 20). The liminal domain is an unstable zone where the established rules are suspended; it is a culturally creative and in a sense

dangerous space where categories may both congeal or dissolve. The processes that surround the recognition front are thus processes relating to the issue of collective awareness: 'on the one hand, the submerged, the unseen, the unrecognized may under certain conditions be called to awareness; on the other, things once perceived and explicitly marked may slip below the level of discourse into the unremarkable recesses of the collective unconscious [that] is the implicit structure of shared meaning that human beings absorb as they learn to be members of a particular social world' (Comaroff and Comaroff, 1991, p. 29). While much of prior research has focused on the emergence process where categories are proposed and some accepted, this view furthermore sees emergence as but one side of category dynamics and further points our attention to the processes by which some categories slip from usage and dip beneath the surface of collective recognition. This process is reflected in the fact that the arrows in Figure 1 are two-way arrows, suggesting that shared realities may both emerge and dissolve. Additionally, the light-shaded areas in each quadrant of Figure 1 vary in size to indicate the rank order of the sizes of the four different sets of categories it maps out. Though not to scale, our goal here is to acknowledge that there are more ad hoc or situationally idiosyncratic categories than there are categories that are common knowledge.

To relate this framework to Durand and Paolella, they call for studying *when* and *why* actors find it useful to invoke categories that are not widely recognized. While we find this focus promising, we situate it in a broader programme of research concerned with understanding the *how* and *what* of category dynamics. That is, we urge scholars to explore how categories emerge or fall out of use, and also what they come to mean.

METHODS FOR STUDYING CATEGORY EMERGENCE AND DISSOLUTION

The inherent dialectic between theory and method (Sørensen et al., 2007) means that how we search for evidence of new ideas affects where we look and what we find – that is, theory is inextricably linked to method. In our view, significant new ideas in categories research are likely to benefit not only from an ontological turn towards theorizing about emergence and dissolution, but also from taking up these questions with research designs well suited to them. Towards that end, we briefly highlight two toolkits we regard as particularly well suited to realizing new directions in categories research: set theoretic approaches and the analysis of networks of relations observed in publicly available discourse. Both toolkits combine distinctive approaches to theorizing with specific methods of analysis.

Set Theoretic Approaches

First, set theoretic methods have much to offer the study of categories in organizations and markets. Since categorization is a process for recognizing and grouping similar things, set theory is well-suited to understanding this process. Given this affinity between categories and set theory, surprisingly little of the set-theoretic toolkit for organizational analysis has been used to date in empirical studies of categories in markets and organizations. To be fair, fuzzy sets are central to the new programme of organizational ecology developed by Hannan et al. (2007), in which grade-of-membership functions are

used to model partial membership in multiple categories rather than full or non-membership in a focal category. This shift in modelling allows ecologists to theorize and test effects of partial membership in more than one category and the dynamics of categories with clear contrast or some degree of overlap. Whereas this programme of research is generally one in which 'fuzziness is restricted to the language of agents' (Hannan et al., 2007, pp. 17–18), we believe substantial gains are possible from using both crisp and fuzzy membership in overlapping categories as evidence of category emergence and change, as in Negro et al. (2010).

Beyond partial membership functions, however, there is a richer set theory-based toolkit suitable for analysing categories: the method of Qualitative Comparative Analysis (QCA) developed by Charles Ragin (1987, 2000, 2008) and already widely used in sociology, political science, and more recently management studies (e.g., Crilly et al., 2012; Fiss, 2011; Fiss et al., 2013; Greckhamer, 2011). In QCA, researchers explicitly use membership in either fuzzy or crisp sets to operationalize membership in multiple categories. For instance, a study of organizations might entail assessments of membership in sets of large firms, firms manufacturing a particular product, firms seen as legitimate by a certain audience, and so forth.

QCA holds the promise of opening up significant new fronts in research on categories. As just one example, QCA lends itself naturally to the study of what strategists call 'white space' opportunities (Johnson, 2010) – that is, theoretically feasible combinations of product or service features around which no products or markets have yet emerged. QCA is well-suited to identifying and exploring such opportunities because it uses truth tables to combine measures of multiple qualities or attributes into matrices that capture how cases are distributed in an n-dimensional property space defined by these attributes. In set theoretic terms, data about the distribution of membership across various sets yields a map showing which regions of a classification system are densely versus sparsely packed. It is rare to find empirical instances in every possible configuration of a multi-category space, a phenomenon known as limited diversity (Ragin, 2000). This limited diversity can be used to identify unexplored configurations that may be valuable or to better understand the landscape of features that tend to co-occur. In addition to applications in strategy, this kind of analysis also holds the promise of enabling detailed examination of changes to classification systems over time.

A second research front where QCA can yield new insights involves exploring how membership in multiple categories affects various outcomes of interest, including category emergence and dissolution and the population dynamics of categories. QCA is suited to this line of investigation because it employs Boolean algebra and a language that is half verbal-conceptual and half mathematical-logical (Ragin, 2000). In a study that relates firm membership in five different categories to a particular outcome, for example, a researcher might find that firms having membership in categories A, B, and C but not E exhibit the outcome of interest, thus supporting deeper theorization about potentially complex consequences of membership in multiple categories. Much more could be said about why and how set-theoretic analysis of categories is well suited to advancing categories research, but we trust that this brief outline of what might be possible makes it evident that set-theoretic methods such as QCA are a toolkit well suited for studying categories that – after all – are sets.

Networks and Category Dynamics

As the rise of the internet has provided social science with a vast new source of data suitable for studying category emergence and dissolution, advances in social and computer science are opening up new possibilities for studying the dynamics of categories and, more fundamentally, of meaning as it is being made – or unmade. In particular, we see promise in integrating theoretical insights from relational approaches to cultural sociology (Emirbayer and Mische, 1998; Mische, 2011; Mohr, 1998; Pachucki and Breiger, 2010) and socio-cognitive approaches to categories (Porac and Rosa, 1996; Porac et al., 1989, 1995; Rosa et al., 1999) with key imports from computer science – namely, techniques for search, pattern recognition, and knowledge representation coming from information science and artificial intelligence. In particular, the Semantic Web[3] project of computer science (Berners-Lee et al., 2001) has been a prolific incubator of techniques and standards for understanding and accessing the vocabularies or 'ontologies' appearing in various corners of the internet's vast quantities of natural language. While our call for an 'ontological' turn in categories research echoes the aims and spirit of this ambitious undertaking, it builds more directly on the broad family of methods for content analysis (Krippendorf, 2004) and, in particular, relational variants of content analysis (Carley, 1999; Carley and Palmquist, 1992; Franzosi, 2004) and relational strategies for measuring meaning (Mohr, 1998).

We sketch several relational analyses useful for studying not only category emergence and dissolution, but also the more general notion of category currency (Kennedy et al., 2010), which is the idea that categories rise and fall in the degree to which they are seen as apt or useful ways of describing social realities worth recognizing and naming. Drawing on Mohr's (1998) framework for capturing and measuring meaning in networks, we suggest category dynamics can be seen in the structural features of a longitudinal panel of networks, or graphs, based on patterns of association among potential instances and attributes of a nascent category. One relatively straightforward way of finding such patterns is to analyse public discourse about a nascent category for co-mentions of instances in time periods that make sense for that context (see Kennedy, 2008). To illustrate, we briefly describe analyses that address three fundamental research topics using data based on the co-mentions of category instances.

Emergence. Evidence of emergence can be seen in the changing distributions of links in a time-series panel of graphs (networks) built by linking potential instances of the category based on their perceived similarities. Because emergence requires interpretations of a nascent category to stabilize around a commonly recognized prototype (Rosa et al., 1999), links in such graphs are distributed rather randomly, with the pattern tending towards the scale-free distributions found in many social networks (Barabási, 2002; Barabási and Bonabeau, 2003). When links are distributed more evenly, however, this suggests that the competition to define the category has not yet been resolved, or may not be – a factor that limits demand in nascent product market categories (Rosa et al., 1999). A focus on emergence also underlies the concept network approach described by Fiss et al. (2012), who trace variation in the diffusion of a controversial practice.

Prototype. Additionally, such graphs can be used to assess whether a clear prototype is emerging within a nascent category, losing its status as a prototype, or more generally, how instances of a category are dispersed in its feature space. Analyses like these begin by using a data reduction technique such as multi-dimensional scaling (MDS) to model a category's feature space and identify relative locations of instances within it. In such a space, solving for the point that minimizes Euclidean distance to all other instances identifies the category's prototype. That is, the instances nearest to this point – effectively the category ideal – are the ones that best fit the emerging category prototype.

Segmentation, dissolution. Furthermore, category segmentation and dissolution can be assessed by examining shifts in the distributions of distances between instances and a category ideal point computed as just described. As such instance-to-ideal distance distributions go from being relatively Gaussian, or normal, to being more bi- or multi-modal, this suggests fragmentation of the category. On the other hand, of course, seeing distributions shift from being relatively flat towards normal is another indicator that a category is emerging, for this shows that the meaning of the category is stabilizing around a clear prototype.

Similarly, the role that cognitive limits play in categorization (Rosch, 1978) suggests strategies for linking category dynamics to data based on patterns of association among a nascent category's potential attributes. If unfolding distributions of attribute co-mentions are not increasingly concentrated on a stable and smallish collection of attributes, this indicates a lack of agreement about what the category means. Going one step further, Kennedy et al. (2012) adapt these ideas to account for and illustrate the emergence of new criteria for corporate reputation. Using attribute-based models of category meaning, they theorize that convergence of rivals' interpretations of a nascent category should contribute to its acceptance as a new reality to contend with, and they illustrate this process in the context of what it means for corporations to be green by using data on corporate press releases and assessments by media critics.

Other methods are likely to be useful, too. Because they allow researchers close access to the causal processes underlying category emergence, use, and dissolution, we expect case studies to continue to play a key role in research on category dynamics (e.g. Nigam and Ocasio, 2010). Furthermore, because of their ability to model patterns across populations, we expect event history analysis to continue to be important to empirical studies of emergence and dissolution, just as they have been in institutional theory and ecology.

Discourse analysis, especially as employed in organization studies (Grant et al., 2011; Phillips and Hardy, 2002, 2004), would also seem to be well aligned with an ontological turn in categories research. This growing literature offers perspective and methods for studying categories that are either (a) important only to a very small group or (b) as they were (or are) in very early stages of emergence, when pivotal players, themes, and events were (or are) not yet clear. In either case, discourse analysis offers the advantage of accessing the unfolding meaning of categories before they became prevalent enough to make them amenable to large-N type analysis. While discourse analysis in organization studies is best known as a method for exploring the process of institutionalization, we believe it is equally applicable to a more ontological focus on category emergence and

dissolution. In discourse analysis, scholars identify, assemble, and analyse a discourse, or coherent collection of texts to reveal prevailing views of social realities either present in the discourse or emerging from it (Phillips and Hardy, 2004). As evidenced by the spread of administrative practices later found to be corporate chicanery, however, not all that emerges becomes fully legitimate. Discourse analysis is useful for studying the unfolding meaning and significance of emerging social realities regardless of whether they acquire the widespread social approval typically associated with institutionalization and legitimation.

Finally, and in view of ever-growing volumes of discursive data, we expect a growing appetite for new techniques that translate text into data useful for both qualitative exploration and quantitative analysis. In particular, we expect to see more papers building on successful efforts to use multi-dimensional scaling and latent semantic analysis (Ruef, 1999a, 1999b), semiotics (Weber, 2005; Weber et al., 2008), vocabularies (Loewenstein et al., 2012), and rhetorical theory (Green, 2004; Green et al., 2009; Suddaby and Greenwood, 2005) in organization studies.

CONCLUSION

Categories are both the building blocks of social reality and mirrors of it. Since the ontologies constructed from these building blocks include both legitimate and illegitimate phenomena, an ontological turn in categories research opens up new lines of theory and inquiry. Compared to organization theory of the last generation or so, it beckons attention to a broader range of mechanisms and motivations behind organizational behaviour.

Specifically, the ontological turn we call for means looking not only at the conformity pressures central to seminal papers in institutional theory (DiMaggio and Powell, 1983; Meyer and Rowan, 1977; Zucker, 1977, 1983) and organizational ecology (Carroll and Hannan, 1989a, 1989b; Hannan, 1986), but also at the broader set of motivations and mechanisms behind the emergence and dissolution of categories for classifying the whole range of organizational forms, practices, and strategies – from the legitimate to the illicit. This wider scope of study follows from the simple fact that ontologies include categories for describing the fully legitimate, the thoroughly illicit, and everything in between.

Thus, the ontological turn in categories research also holds a twin promise. As it pushes scholars to develop theory that accounts for a wider array of organizational behaviour, it may well yield insights of value to managers, regulators, and society more broadly.

NOTES

[1] Note we are careful here not to refute the idea that business and social entrepreneurs face long odds when seeking to reengineer social structures by pioneering new categories or reinterpreting existing ones (Marx, 1978; Tilly, 1998). Instead, we argue merely that such challenges can and do occur, and that they are worth studying.

[2] Searle's (1995) approach to social reality features recognition and acceptance, but not the inability to eliminate it.

[3] For a comprehensive source on developments in this vast collaborative project, see the Semantic Web and vocabularies pages at http://www.w3.org/standards/semanticweb/.

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