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THE ELEPHANT IN THE ROOM OF DYNAMIC CAPABILITIES: BRINGING TWO DIVERGING CONVERSATIONS TOGETHER

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A critical issue has been absent from the conversation on dynamic capabilities: the two seminal papers represent not only different but contradictory understandings of the construct's core elements. Here, we explore the reasons for this, using author cocitation analysis to inform our analysis. Our findings suggest that the field is being socially constructed on the basis of two separate domains of knowledge and that underlying structural impediments have impeded dialog across the domains. In light of this evidence, then, we take up the challenge to find a solution to this dilemma. By employing a contingency-based approach, we show that there are ways to unify the field that rely, paradoxically, on integrating the two contradictory views, while still preserving the assumptions that led to their differences. Copyright © 2013 John Wiley & Sons, Ltd.

INTRODUCTION

Much has been written about dynamic capabilities, with more than a thousand articles published on this topic over the last ten years, according to the ISI Web of Science database. One topic, however, has been missing from this research conversation. It is a topic that is both weighty and notable, yet it has gone unremarked and unexplored, despite its obvious significance for the development of the field. In this respect, it is the "elephant in the room" of research on dynamic capabilities.

We are referring to the fact that the field has developed under the strong influence of two papers (i.e., Eisenhardt and Martin, 2000, and Teece, Pisano, and Shuen, 1997) that, while complementary in many respects, represent not only differing but contradictory views of dynamic capabilities. The dimensions over which these papers differ concern how dynamic capabilities can help firms to achieve and sustain a competitive advantage, including the relevant boundary conditions for the framework. The differences between the two papers are such that, in essence, they represent two mutually exclusive approaches for framing dynamic capabilities, each with its own internally consistent logic. The two approaches have different theoretical underpinnings, make different assumptions about the nature of dynamic capabilities, employ different types of reasoning, and reach different conclusions.

The fact that there are two opposing approaches to the dynamic capabilities framework, taking contradictory positions with respect to the framework's core elements, is not in and of itself problematic, since the framework is still under development. Under the normal course of paradigm development, such differences might

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be resolved through debate and other forms of scholarly interaction as the field is socially constructed (Pfeffer, 1993). What is concerning is the absence of such a debate, despite the fact that it will be difficult for the field to move forward productively without a resolution of these issues. In this paper, we explore the question of why this conversation has been missing from the discourse on dynamic capabilities, using author-based bibliometrics to search for structural impediments to the exchange of ideas within the field's knowledge base. Our hope is that a better understanding of the source of the problem may enable a more effective search for its resolution.

Our findings indicate that the missing conversation may be attributed to the social structure of the communities of scholarship giving rise to the construct. They reveal a field that is sharply divided into two clusters of authorship, separated from one another but linked in the minds of citing scholars to either Teece's work or Eisenhardt's, but not to both. This suggests that the field is being socially constructed, simultaneously, by two different author groups, each with their own worldview regarding the construct and its workings (Mizruchi and Fein, 1999). Furthermore, other structural factors may be limiting and filtering the flow of information across these two domains. We find that the cluster of authorship surrounding Teece represents a "closed world" (Burt, 2005), making it difficult for new ideas to enter. On the other side of the divide, a different structural mechanism may be obstructing the ready exchange of ideas. The positioning of the work of Eisenhardt in the knowledge network suggests that it may play the role of a gatekeeper (Burt, 1992), selectively admitting ideas from the Teecian side of the divide, acting as a lens through which they are viewed, and shaping their interpretation to more closely match the worldview represented by the community of scholarship more closely tied to Eisenhardt's work.

Our analysis of the source of this problem suggests that, while it is structural, it is not insurmountable. To jump start the missing conversation and demonstrate that there are potential ways to resolve the differences, despite the apparent incompatibilities, we offer a contingency-based approach toward integrating the two different framings of dynamic capabilities. We find, paradoxically, that a reconciliation of these mutually exclusive and seemingly irreconcilable positions is not only possible, but can be achieved without violating the basic assumptions of either view or the VRIN (value, rareness, inimitability, and nonsubstitutability) conditions of sustainable competitive advantage (Barney, 1991). While our efforts represent only one of several possible roads toward theoretical reconciliation, they demonstrate that even if dynamic capabilities take the form of best practices or simple rules, as Eisenhardt and Martin (2000) posit, they may yet explain the sources of a firm's sustainable competitive advantage under certain conditions, consistent with Teece *et al.* (1997). In this respect, our paper answers the call for efforts to increase theoretical precision in organizational research by reconciling differing conceptual views (Edwards, 2010; Leavitt, Mitchell, and Peterson, 2010).

The paper proceeds as follows: We begin by constructing a historiograph to illustrate the dual influence of the two seminal papers on scholarship concerning dynamic capabilities. We then compare how these two papers have framed dynamic capabilities, highlighting the particular ways in which their differing visions represent alternative understandings. After explaining the importance of the missing conversation, we search for a structural cause for its absence, using author-based bibliometric tools as a basis for our analysis. Our findings suggest that structural features within the knowledge network underlying the dynamic capabilities research domain may be inhibiting, rather than encouraging, fruitful conversation and productive development of the field. This implies that, without concerted efforts to bridge this underlying divide, the field is likely to develop along lines that are increasingly divergent. In light of this evidence, then, we take up the challenge to find a solution to this dilemma. By employing a contingency-based approach, we show that there are ways to unify the field that rely, paradoxically, on integrating the two contradictory views, while preserving the assumptions that led to their differences.

TWO SEMINAL PAPERS: TWO CONTRADICTORY CONCEPTUALIZATIONS

Dual spheres of influence within the research domain

The dynamic capabilities construct was designed originally to answer the question of how firms

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can achieve and maintain competitive advantage in contexts of rapid technological change (Teece *et al.*, 1997, referred to from here on as TPS). While TPS originated this construct (in a 1990 working paper), Eisenhardt and Martin (2000) (from here on EM) has come to be regarded as a second seminal contribution, in large part because it reconceptualized dynamic capabilities, challenging the purpose and mechanisms of the TPS framework and delimiting its boundary conditions.

Before taking a deeper look at the differences between these two papers, we examine first their influence on scholarship concerning dynamic capabilities. Citations of both papers exceeded 1,600 as of November 2012 according to the ISI Web of Science, with no other papers on the topic approaching this level. But while citation rates are indicators of general recognition and influence, our more specific concern is with the extent to which these two papers have influenced the development of the dynamic capabilities research domain.

To investigate this question, we performed a historiograph analysis (Garfield, 2004), based on citation relationships among those papers that arguably constitute the domain's knowledge core. By restricting our attention to the knowledge core, we focus on those patterns of influence that are most critical for shaping the development path of the construct itself. Historiograph analysis generates a graphical representation (called a historiograph) of the network among articles based on the citation relationships among the articles analyzed (Garfield, 2004). In a historiograph, each analyzed document is represented by a symbol varying in size according to the number of times the document was cited by the other analyzed documents. The citation relationships between documents are depicted by connecting lines, with arrowheads showing who cited whom. Finally, the symbols are arranged over a timeline of the publication dates of the documents. We conducted the analysis using HistCite software (Garfield, 2004).

Our historiograph analysis is focused on the most influential contributions to the body of research on dynamic capabilities (its knowledge core). In order to identify them, we look at the most cited papers, based on the standard assumption that citation counts are a valid measure of prominence and influence (Garfield, 1979; Ramos-Rodríguez and Ruíz-Navarro, 2004). From the Social Science Citation Index of the ISI Web of Science database, we retrieved a listing of management articles published on the topic of dynamic capabilities, along with relevant citation data, beginning with the year 1990. Our starting point reflects the year that Teece *et al.*'s (1997) seminal article was first available in working paper form (Teece, Pisano, and Shuen, 1990)—a date that marks the initiation of research on the topic of dynamic capabilities. This search yielded an initial set of 592 articles. We identified the most influential papers in this listing as those published prior to 2009, with citation scores higher than the average citation score of our panel, i.e., 27 citations. This procedure led to the identification of 61 leading articles, listed in Table 1.

The results of our analysis are shown in the historiograph depicted in Figure 1. This figure provides a citation-based graphical representation of how the core papers in the dynamic capabilities research domain have influenced one another. Since the historiograph represents how each paper has influenced other papers included in the panel, the figure includes only the papers that received at least one citation *within* the panel. These 32 contributions—which are extensively cited by other leading articles on dynamic capabilities—are identified at the bottom of the figure. We removed self-citations (links between two papers where at least one author is on both papers), since self-references are less indicative of influence on others (Baumgartner and Pieters, 2003).

A key indicator of influence in a historiograph is relative circle size, which in this case reflects the extent of an article's influence over the development of the core body of knowledge concerning dynamic capabilities. The relative circle sizes in this historiograph provide striking visual evidence of the existence of *dual* spheres of influence within the top-cited research on dynamic capabilities, with TPS and EM far surpassing any other articles in terms of their influence and recognition. While TPS's within-group citation count greatly exceeds that of EM, the within-group counts of the two papers are far more comparable on a per-year basis. No other paper approaches the per-year within-group citation counts of these two, confirming that even among the most influential papers on dynamic capabilities, these two stand out as the focal points of the research domain. This lends credence to the view that, along with TPS, EM has also played a seminal role in shaping the development of the dynamic capabilities research domain.

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Table 1. The most cited papers in the dynamic capabilities research domain (1990–2008)

Paper	Total citations	Paper	Total citations
Teece *et al.* (1997)	1,721	King and Tucci (2002)	49
Eisenhardt and Martin (2000)	671	Williams (1992)	49
Zahra and George (2002)	358	Ireland, Hitt, and Sirmon (2003)	45
Zollo and Winter (2002)	320	Agarwal *et al.* (2004)	44
Dyer and Nobeoka (2000)	288	Jarzabkowski (2004)	44
Amit and Zott (2001)	206	Uhlenbruck, Meyer, and Hitt (2003)	44
Helfat and Peteraf (2003)	148	Rai, Patnayakuni, and Seth (2006)	43
Makadok (2001)	141	Vohora, Wright, and Lockett (2004)	43
Benner and Tushman (2003)	139	Adner and Helfat (2003)	43
Winter (2003)	137	Jacobides and Winter (2005)	42
Sambamurthy, Bharadwaj, and Grover (2003)	130	Malhotra, Gosain, and El Sawy (2005)	42
Helfat (1997)	128	Becker (2004)	42
Wright, Dunford, and Snell (2001)	103	Jarvenpaa and Leidner (1998)	42
Melville, Kraemer, and Gurbaxani (2004)	101	Rosenbloom (2000)	40
Danneels (2002)	97	Zollo and Singh (2004)	39
Wade and Hulland (2004)	91	Zhu (2004)	39
Zhu and Kraemer (2002)	91	Tushman and Murmann (1998)	38
Hitt *et al.* (2001)	76	Jansen, Van den Bosch, and Volberda (2005)	35
Knight and Cavusgil (2004)	72	Miller (2003)	34
Rindova and Kotha (2001)	72	Zahra, Sapienza, and Davidsson (2006)	33
Teece (2000)	68	Lockett and Wright (2005)	32
Aragon-Correa and Sharma (2003)	64	Luo (2002)	32
Galunic and Eisenhardt (2001)	64	Rugman and Verbeke (2002)	30
Carpenter, Sanders, and Gregersen (2001)	63	Bhatt and Grover (2005)	29
Barua *et al.* (2004)	62	Newbert (2007)	28
Zott (2003)	55	Colbert (2004)	28
Dutton *et al.* (1997)	53	Teece (2007)	27
Subramaniam and Youndt (2005)	51	Garud and Kumaraswamy (2005)	27
Madhok (2002)	50	Vassolo, Anand, and Folta (2004)	27
Helfat (2000)	50	Ahuja and Katila (2004)	27
Wheeler (2002)	49	—	—

Contradictory conceptions of dynamic capabilities

In many ways, the two treatments of dynamic capabilities in TPS and EM are in agreement. For example, both focus on the role of organizational routines, both concern managerial as well as organizational processes, and both portray the dynamic capabilities framework as an extension of the resource-based view. In other ways, they offer different but complementary views of dynamic capabilities. EM's discussion of alliancing, product development, and decision making as specific types of dynamic capabilities rounds out TPS's more general discussion, for example. But in one key respect, they differ in ways that are not so easily reconciled. This is with respect to the central issue of whether or not dynamic capabilities have the potential to explain sustainable competitive advantage in rapidly changing environments—the very heart of the framework, according to the concept's originators (Teece, 2007; Teece *et al.*, 1997). Here, we call attention to the differences between these two papers concerning this issue, focusing on the ways in which their treatments not only differ but also represent opposing points of view.

As conceived by TPS, the dynamic capabilities construct was designed to answer the question of "how firms achieve and sustain competitive advantage" when "operating in environments of rapid technological change" (TPS: 509). This central objective can be broken down into three component questions: (1) how a firm can achieve a competitive advantage, (2) how it can sustain that advantage in the face of competition, and (3) whether it can accomplish these aims under conditions of rapid environmental change (which speaks to the framework's boundary conditions). As TPS acknowledges, this framing effort is

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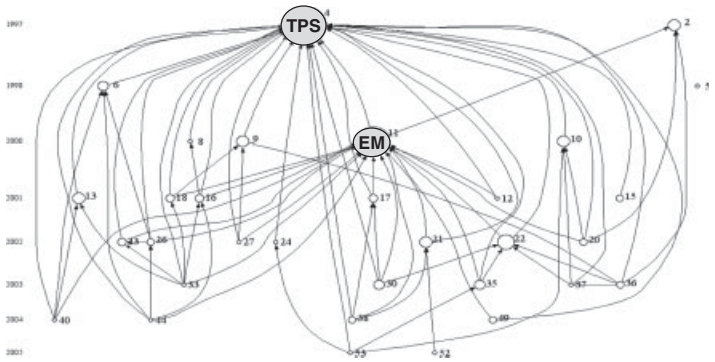

	TC	TC/Y		TC	TC/Y		TC	TC/Y		TC	TC/Y
4 Teece *etal.* 97	*51*	*4.6*	*6* Jarvenpaa and Leidner 98	*4*	*0.4*	*20* King and Tucci 02	*2*	*0.3*	*52* Malhotra *et al.* 05	*1*	*0.3*
11 Eisenhardt and Martin 00	*32*	*4*	*30* Zott 03	*4*	*0.8*	*23* Wheeler 02	*2*	*0.3*	*33* Sambamurthy *et al.* 03	*1*	*0.2*
22 Zollo and Winter 02	*8*	*1.3*	*17* Galunic and Eisenhardt 01	*3*	*0.4*	*37* Adner and Helfat 03	*1*	*0.2*	*5* Tushman and Murmann 98	*1*	*0.1*
13 Makadok 01	*5*	*0.7*	*18* Rindova and Kotha 01	*3*	*0.4*	*27* Danneels 02	*1*	*0.2*	*38* Vohora *et al.* 04	*1*	*0.3*
10 Rosenbloom 00	*5*	*0.6*	*35* Winter 03	*3*	*0.6*	*8* Dyer and Nobeoka 00	*1*	*0.1*	*40* Wade and Hulland 04	*1*	*0.3*
21 Zahra and George 02	*5*	*0.8*	*16* Amit and Zott 01	*2*	*0.3*	*15* Hitt *et al.* 01	*1*	*0.1*	*12* Wright *et al.* 01	*1*	*0.1*
2 Helfat 97	*4*	*0.4*	*49* Barua *et al.* 04	*2*	*0.5*	*53* Jacobides and Winter 05	*1*	*0.3*	*26* Zhu and Kraemer 02	*1*	*0.2*
9 Helfat 00	*4*	*0.5*	*36* Helfat and Peteraf 03	*2*	*0.4*	*24* Madhok 02	*1*	*0.2*	*44* Zhu 04	*1*	*0.3*

Legend: TC refers to the number of times cited within the panel of 61 top papers in dynamic capabilities research, excluding self-citations made an author to his/her own papers. *TC/Y* is TC divided by the number of years since the year of publication of the paper. The figure shows only papers with at least 1 citation within the panel. Numbers on the graph identify the papers and correspond to the number listed beside each paper in the table below.

Figure 1. Historiograph of the core papers within the dynamic capabilities research field

not unique in its focus on the first two issues. What distinguishes it from other approaches to these "fundamental" strategy questions is that this construct was designed to be applicable "in regimes of rapid change" (TPS: 509), where other approaches have fallen short. Indeed, it is this attribute of dynamic capabilities that scholars have likely found most compelling, since so many firms in our globalized economies operate under technology-driven, high-velocity conditions (Bourgeois and Eisenhardt, 1988).

EM's approach to addressing each of these three central issues is dramatically different from that of TPS. Theirs represents a thorough "reconceptualization of dynamic capabilities," as they demonstrate by comparing their "contrasting conception" with that of TPS in table format (EM: 1111). Below, we describe the differences between EM and TPS with respect to each of the three central issues. We discuss these issues in an order that corresponds to their relative significance (in our eyes), which is the reverse of the listing above. We highlight the essence of the contrasting positions between EM and TPS concerning these three central elements in Table 2.

Differences over boundary conditions

The divergence between the two theoretical treatments is most evident with respect to the conditions under which the dynamic capabilities construct is applicable. These are the boundary conditions that describe when and where dynamic capabilities has utility as an approach toward answering the first two questions of how a firm can attain and sustain a competitive advantage. In TPS, the phrase "in environments of rapid technological change" (TPS: 509) sums up these "when and where" conditions. These conditions are an integral part of their conceptualization of dynamic capabilities—so much so that they enter into their definition of dynamic capabilities, as "the firm's ability ... to address *rapidly changing environments*" [italics added] (TPS: 516).

In contrast, EM argues that the resource-based logic behind TPS's framing of dynamic capabilities "encounters a boundary condition in high-velocity markets" (EM: 1118). This follows from the observation that "effective patterns of dynamic capabilities vary with market dynamism" (EM: 1106). As the paper explains, TPS's depiction of dynamic capabilities may hold true "when markets are moderately dynamic": but in high-velocity markets, where the strategic imperatives are speed and adaptability, "dynamic capabilities take on a different character" (EM: 1106). There, dynamic capabilities are not "complicated, detailed, analytic processes," but rather "simple, experiential, unstable processes" with "unpredictable outcomes" (EM: 1106). Because they are

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Table 2. Critical differences between Teece *et al.* (1997) and Eisenhardt and Martin (2000)

		TPS	EM
Dynamic capabilities and the question of:	Boundary conditions	The framework applies to environments of rapid technological change *The "approach is especially relevant in a Schumpeterian world" (TPS: 509)*	The framework encounters a boundary condition in such environments *The TPS logic "encounters a boundary condition in high-velocity markets" (EM: 1118)*
	Sustainable advantage	Dynamic capabilities can be a source of sustainable advantage under certain conditions *Sustainability depends on "how readily a [dynamic] capability can be cloned by competitors" (TPS: 518)*	Dynamic capabilities cannot be a source of sustainable advantage under any conditions *As simple rules, dynamic capabilities "are themselves unstable" (EM: 1118);* *As best practices, "dynamic capabilities are substitutable" (EM: 1110), thus violating a key VRIN condition*
	Competitive advantage	Dynamic capabilities can be a source of competitive advantage *"Dynamic capabilities . . . reflect an organization's ability to achieve new and innovative forms of competitive advantage" (TPS: 516)*	Dynamic capabilities can be a source of only limited competitive advantage *Dynamic capabilities are "more homogeneous . . . than is usually assumed" (EM: 1116)*

in a "continuously unstable state" and subject to "potential collapse," "dynamic capabilities themselves become difficult to sustain in high-velocity markets" (EM: 1113). The clear implication is that dynamic capabilities cannot provide the basis for a theory of sustainable competitive advantage in markets subject to rapid environmental change. Thus, "in high-velocity markets where the duration of competitive advantage is inherently unpredictable, time is central to strategy, and dynamic capabilities are themselves unstable" (EM: 1118), the logic of TPS breaks down.

This argument speaks to the very heart of the TPS framework, questioning its applicability in the very sorts of settings for which it was originally designed.[1] In questioning the framework's relevance in rapidly changing environments, EM casts doubt upon its most attractive feature—that which most distinguishes it from other theories of sustainable competitive advantage. In restricting its applicability to moderately dynamic environments, EM thereby reduces the practical significance of TPS's contribution and limits its potential for impact on management practice and scholarship.

Differences over sustainability

The separation between the views of EM and TPS over boundary conditions is obviously a large and important one. But the differences in these two conflicting conceptualizations of dynamic capabilities do not end there. Even in moderately dynamic environments, where EM is more accepting of the relevance of TPS's framework, EM provides contradictory answers to the first two questions posed by TPS concerning how a firm can attain and sustain a competitive advantage.

In this type of environment, it is with respect to the second question of how a firm can sustain a competitive advantage in the face of competition that the views of EM and TPS differ most sharply. TPS characterizes dynamic capabilities as an "ability to achieve new forms of competitive advantage" (TPS: 515), suggesting that dynamic capabilities can be a source of competitive advantage per se. The authors maintain that "the durability of [an] advantage" depends on "how readily

[1] EM (1111) describe high-velocity markets as "ones in which market boundaries are blurred, successful business models are unclear, and market players . . . are ambiguous and shifting"—characteristics that also describe the "Schumpeterian world" for which TPS (509) say their approach is "especially relevant."

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a competence or capability can be cloned by competitors" (TPS: 518). This implies that if a firm's dynamic capabilities cannot be readily imitated by rival firms, they may be a source of sustainable competitive advantage.

EM takes issue with this, arguing that "dynamic capabilities per se can be a source of competitive, but not sustainable advantage" (EM: 1110). The reasoning flows from the fact that EM characterizes dynamic capabilities in moderately dynamic markets as "best practices," a representation that Teece (2007: 1321) disputes, asserting that a "well-understood and replicable 'best' practice" is not "likely to constitute a dynamic capability." As EM describes, best practices are equifinal, exhibiting "significant commonalities across firms" even though they may be "idiosyncratic in their details" (EM: 1105). This implies that dynamic capabilities are substitutable, thus violating a key VRIN condition (Barney, 1991) that must be satisfied for a capability to provide a sustainable advantage. While TPS argues that "it is the ease of imitation that determines the sustainability of competitive advantage" (TPS: 526), EM observes that in the case of dynamic capabilities, "equifinality renders inimitability ... irrelevant to sustained advantage" (EM: 1110).

Differences over competitive advantage

In moderately dynamic markets, the difference between the positions of TPS and EM on the question of how firms attain a competitive advantage is more subtle but no less significant. The difference is subtler because EM is not explicit in its disagreement with TPS over the question of competitive advantage. Rather, this comes through as a clear and obvious implication of the way that the paper portrays dynamic capabilities in moderately dynamic markets.

TPS and EM are in general agreement that dynamic capabilities can be a source of competitive advantage. However, by depicting dynamic capabilities as "best practices," EM effectively implies that any competitive advantage that is attributable to dynamic capabilities is likely to be rather small and insignificant. Because best practices are commonly available, they are only "somewhat rare" (EM: 1111). Because they exhibit commonalities in key features, "they are also more homogeneous ... than is usually assumed" (EM: 1116). Unless capabilities are rare (scarce or unique), they cannot provide a firm with a competitive advantage (Amit and Schoemaker, 1993; Barney, 1991). Further, unless capabilities are heterogeneously distributed across firms, they cannot be a source of competitive advantage (Barney, 1991; Mahoney and Pandian, 1992). And, as TPS point out, any capability that is "homogeneous ... cannot be all that strategic" (TPS: 517).

While commonalities among the features of best practices provide one reason why they cannot provide more than a small competitive advantage, equifinality and substitutability among best practices provide another reason. This point is brought home by Peteraf and Bergen (2003), who contend that the equifinality of resource substitutes blunts not only their potential for sustainable advantage, but their contribution to competitive advantage as well. The reason for this is that resources that have the same functionality as a unique or rare resource can achieve the same end, thus eliminating the advantage that scarcity would otherwise confer. Thus, best practices that have equifinal outcomes cannot contribute meaningfully to competitive advantage, even if they have relatively few process elements in common. Indeed, Teece (2007: 1321) supports this point in asserting that "best practices cannot by themselves in a competitive market situation enable an enterprise to ... outperform its competitors."

In sum, there are substantive differences between the two foundational papers concerning each one of the three questions that are at the core of TPS's initial framing of dynamic capabilities. Whereas TPS argues that their framework for dynamic capabilities is applicable in rapidly changing environments, EM questions this claim, arguing that TPS's framework meets a boundary condition in such environments. Whereas TPS claims that dynamic capabilities can explain the sustainability of competitive advantages, EM disputes this claim not only with respect to high-velocity markets, but with respect to moderately dynamic markets as well. Whereas TPS suggests that dynamic capabilities may be a source of competitive advantage, EM's portrayal of dynamic capabilities implies that any such advantage is likely to be relatively small. While the differences between the two papers are not extensive in number, they are critical in nature. They concern the very heart of the matter behind TPS's approach to dynamic capabilities and include the framework's boundary conditions.

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They pertain to the pivotal questions of what dynamic capabilities are, what effects they have, and under what conditions they operate. Moreover, direct bearing on whether the dynamic capabilities construct can fulfill TPS's stated ambition of providing an explanation of "how firms achieve and sustain competitive advantage" in "regimes of rapid change" (TPS: 509).

A missing conversation

In the normal course of theory building, contradictory positions such as these would command considerable attention, spark a set of spirited debates, and ultimately be worked out in some form or another. This is all the more to be expected when the differences concern matters that are central to the conceptualization of a construct, including its purpose, explanatory mechanisms, and scope of applicability. Researchers might question, for example, whether the two views lead to competing hypotheses about dynamic capabilities; if so, they could be pitted against one another using, say, a "strong inference" approach (Leavitt *et al.*, 2010; Platt, 1964). Attempts might be made to examine whether the varying assumptions underlying each of the two views can explain their differences and lead to a reconciliation of the differences. Greater attention to the problem of competing hypotheses might motivate stronger efforts to develop a more comprehensive or integrative explanatory framework.

At the least, one would expect some discussion of what EM's contrasting views mean for the further development of the dynamic capabilities construct. If, for example, dynamic capabilities cannot explain sustainable competitive advantage (or even competitive advantage), what can they explain? Are there some alternative organizational outcome variables that we can associate with the construct and, if so, by what means? Can a search for auxiliary mechanisms or perhaps a set of mediating or moderating variables provide a way to bring the two views of dynamic capabilities into closer alignment (Colquitt and Zapata-Phelan, 2007; Leavitt *et al.*, 2010)? Is there a road toward a more general reconciliation of the two views of the dynamic capabilities framework?

Without some attention to the inconsistencies between TPS's and EM's views of the dynamic capabilities construct concerning the framework's purpose, its associated outcomes, its underlying mechanisms, and its boundary conditions, it will be difficult for the field to move forward (Simon and Burstein, 1985). In the theoretical arena, confusion over these core issues can hamper future progress and retard if not prevent the development of this promising construct into a fully developed theoretical model. Numerous complaints about the degree of confusion in the dynamic capabilities research domain and the slow rate of progress attest to the existence of this problem (e.g., Arend and Bromiley, 2009; Wang and Ahmed, 2007; Winter, 2003). Recent bibliometric results reveal a field that remains tightly focused on foundational issues, the extensive research effort notwithstanding (Di Stefano, Peteraf, and Verona, 2010).

A similar inhibiting effect is likely to cause difficulties in the empirical arena. Without a clear understanding and general agreement over the framework's core, its purpose, and its scope, what guidance is there for conducting empirical research? In the face of such divisions over basic understandings, how can research findings cumulate in any meaningful way? Without greater clarity over the nature of the construct and its effects on organizational outcomes, how can empirical testing proceed? And indeed, as Zahra *et al.* (2006), Ambrosini and Bowman (2009), Wu (2010), and others have noted, empirical work on dynamic capabilities remains sparse, with uneven and disjointed findings.

Despite the obvious importance of a dialog over these alternative views, to our knowledge, no such conversation has taken place in print, or at least to any meaningful degree. Teece (2007) has contested EM's depiction of dynamic capabilities as best practices, but has not responded to their more fundamental challenge to what the TPS framework can explain and under what conditions. Helfat *et al.* (2007) have developed some performance yardsticks for dynamic capabilities, but without taking into account the explanatory and scope limitations suggested by EM. Work has proceeded on the process side of dynamic capabilities (e.g., Martin, 2011; O'Reilly and Tushman, 2008; Taylor and Helfat, 2009), but without giving attention to the uncertainties on the content side. Yet, without a resolution of this debate on the content side, it is not likely that the theory will ever achieve the purpose for which it was originally conceived, nor is it likely to reach its full potential in terms of impact on scholarship and practice. The lack

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of dialog over these matters is both concerning and puzzling. Why is this critical conversation absent from the burgeoning literature on dynamic capabilities? Why there has been no debate or other attempt to resolve these important issues? The reasons are unclear, but are worth exploring in their own right. If we can uncover a reason for the missing conversation, then we may also discover some possible ways to resolve the problem.

In the following section, we take up this challenge. Since the development path of a theoretical construct may depend on how it has been socially constructed (Mizruchi and Fein, 1999; Pfeffer, 1993), we turn to author-based cocitation analysis to examine the underlying social structure of the dynamic capabilities research domain. We hope to ascertain whether the structure of the knowledge base giving rise to the construct may, in part, explain the missing conversation.

A SEARCH FOR STRUCTURAL IMPEDIMENTS TO DIALOG

Author-based cocitation analysis is an analytical technique that can be used to examine the structure of the knowledge pool giving rise to a particular research domain (McCain, 1990; White and Griffith, 1981). It is often used to investigate the way in which a given research field has evolved and to trace its path of development (e.g., Culnan, O'Reilly, and Chatman, 1990). It can also be used to uncover the hidden patterns of influence and knowledge diffusion across the scholarly communities contributing to the field's development. Because these patterns derive from numerous citing scholars' perceptions of a field, cocitation analysis may also shed light on the way the field has been socially constructed by its members (Nerur, Rasheed, and Natarajan, 2008).

Our interest is in examining the foundational structure of the dynamic capabilities research domain in terms of its social construction. Our objective is to ascertain whether there are any underlying structural impediments to the diffusion of knowledge across the dynamic capabilities research domain. A finding of structural impediments to the flow of information across the domain may suggest an explanation for the lack of dialog noted above. An understanding of the source of the problem may also point the way toward its resolution.

Method

To analyze the perceived ties among the ideational realms contributing to the construct's development, we employ Pathfinder analysis, which generates a network structure highlighting the strongest cocitation relationships between units of analysis (Schvaneveldt, 1990; White, 2003). We restrict our analysis to the cocitation linkages connecting core contributors within the dynamic capabilities research domain, since these authors arguably have the greatest effect on the domain's development. Note, however, that the cocitation linkages derive from the perceptions of *all* scholars writing about dynamic capabilities and not only this group of authors. Thus, they reflect the overall social construction of the field (Nerur *et al.*, 2008).

In order to identify the core contributors to the body of research on dynamic capabilities, we look at the most cited authors (Garfield, 1979; Ramos-Rodríguez and Ruíz-Navarro, 2004). We started from the same set of 592 contributions on dynamic capabilities that we retrieved for the historiograph analysis. To obtain a rank ordering of authors, we aggregated citations to dynamic capability papers by author, so that each author who was the first author on at least one paper received a citation score equal to the sum of all the citations attributed to the publications in which he or she was first author.[2] To determine the most influential authors from this rank ordering, we selected only those authors who received a citation score higher than the average citation score of our panel, i.e., 32 citations. This procedure led to the identification of the 50 most influential first authors carrying out research on dynamic capabilities, shown in Table 3.

Next, we retrieved the list of works citing all the papers published by each core contributor to dynamic capabilities research. We then compiled a matrix of cocitation frequencies for each pair of authors in our panel, i.e., a matrix whose cells represent the number of times *any* work by the author in the row is cited together with *any* work of the author in the column. We retrieved these

[2] The focus on lead authors only is standard procedure for author cocitation analysis, and is necessitated by the need to capture the effect of cocitations due to similarity of work, rather than coauthorship (White and Griffith, 1981). To ensure that our conclusions were not skewed by this omission, we performed the same analyses on a panel including coauthors. The results of this robustness check were consistent with the ones presented in this study, after discounting persistent coauthorship relationships.

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Table 3. The most cited first authors in the dynamic capabilities research domain (1990–2008, alphabetical listing)

Author	*Citations*	Author	*Citations*
Adner, R	*43*	Madhok, A	*67*
Agarwal, R	*44*	Makadok, R	*143*
Amit, R	*206*	Malhotra, A	*45*
Aragon-Correa, JA	*65*	Melville, N	*101*
Barua, A	*62*	Miller, D	*34*
Becker, MC	*51*	Newbert, SL	*39*
Benner, MJ	*145*	Rai, A	*43*
Carpenter, MA	*63*	Rindova, V	*72*
Danneels, E	*98*	Rosenbloom, RS	*40*
Dutton, JE	*62*	Rothaermel, FT	*37*
Dyer, JH	*294*	Sambamurthy, V	*130*
Eisenhardt, KM	*671*	Subramaniam, M	*51*
Galunic, DC	*64*	Teece, DJ	*1,829*
Gavetti, G	*33*	Tushman, ML	*38*
Helfat, CE	*326*	Uhlenbruck, K	*68*
Hitt, MA	*76*	Vohora, A	*43*
Ireland, RD	*45*	Wade, MR	*91*
Jacobides, MG	*75*	Wheeler, BC	*49*
Jansen, JJP	*35*	Williams, JR	*49*
Jarvenpaa, SL	*43*	Winter, SG	*137*
Jarzabkowski, P	*44*	Wright, PM	*103*
King, AA	*49*	Zahra, SA	*411*
Knight, GA	*72*	Zhu, K	*130*
Lavie, D	*43*	Zollo, M	*359*
Luo, YD	*55*	Zott, C	*60*

citations through the cited reference search in the ISI Web of Science database. This allows us to include references to any work published by the authors, including articles, monographs, books, chapters, and working papers.

We used Pathfinder analysis to generate a network structure from the matrix of cocitation frequencies (Schvaneveldt, 1990; White, 2003). This network is derived from proximities between pairs of entities, where cocitations represent proximities and authors are the entities. Since cocitations are symmetrical for every pair of authors (i.e., the number of times author A is cited together with author B is equal to the number of times B is cited together with A), the links in our network are undirected.

One limitation of Pathfinder analysis comes from noise in the data due to author homonymity, which is of particular concern with common last names (White and Griffith, 1981). To limit the impact of this issue, we used both the first and middle initials in retrieving data on authors. In cases where authors publish under a single initial, we eliminated authors with the same last name who use a second initial (thus distinguishing Danny Miller, for example, from D. T. and D. P. Miller). While this does not fully eliminate the problem, the cocitation method itself minimizes the extent of mistaken identities (Nerur *et al.*, 2008).[3]

Findings

The resulting Pathfinder network is shown in Figure 2. Authors' names stand in for the content of their entire body of work; links between authors indicate significant connections between their areas of expertise, while clusters of authors represent topical realms that are relatively more homogeneous than that of unconnected authors. The results of the analysis can be interpreted as uncovering the most significant perceived linkages between the various knowledge domains contributing to the development of the dynamic capabilities construct, as well as the position and roles of particular author nodes within the network. They thus shed light on both the construct's development path and its social construction.

The most apparent structural feature of this network is that it is a sharply divided field. We observe a dense cluster of scholarship linked to Teece's work and another more loosely connected group tied to Eisenhardt's. But the two sets of author nodes surrounding Teece and Eisenhardt are separated from one another, forming two separate communities of authorship, each more closely associated with the scholarship of either Eisenhardt or Teece, but not both. (See the light gray area linked to Eisenhardt versus the dark gray area tied to Teece in Figure 2.)

The two communities also appear to differ markedly in their worldview, which may reflect two different but coexisting social constructions of the dynamic capabilities construct (e.g., Mizruchi and Fein, 1999). The authors represented in each group are distinguished both by their training and disciplinary orientation as well as by their research interests. For example, 50 percent of the authors linked to Teece have advanced degrees

[3] One identity problem that we could not adequately control for is that of Agarwal, which conflates the work of Ritu Agarwal in information systems with that of Rajshree Agarwal, whose work is more economically oriented and is likely closer to that of Teece. See Figure 2.

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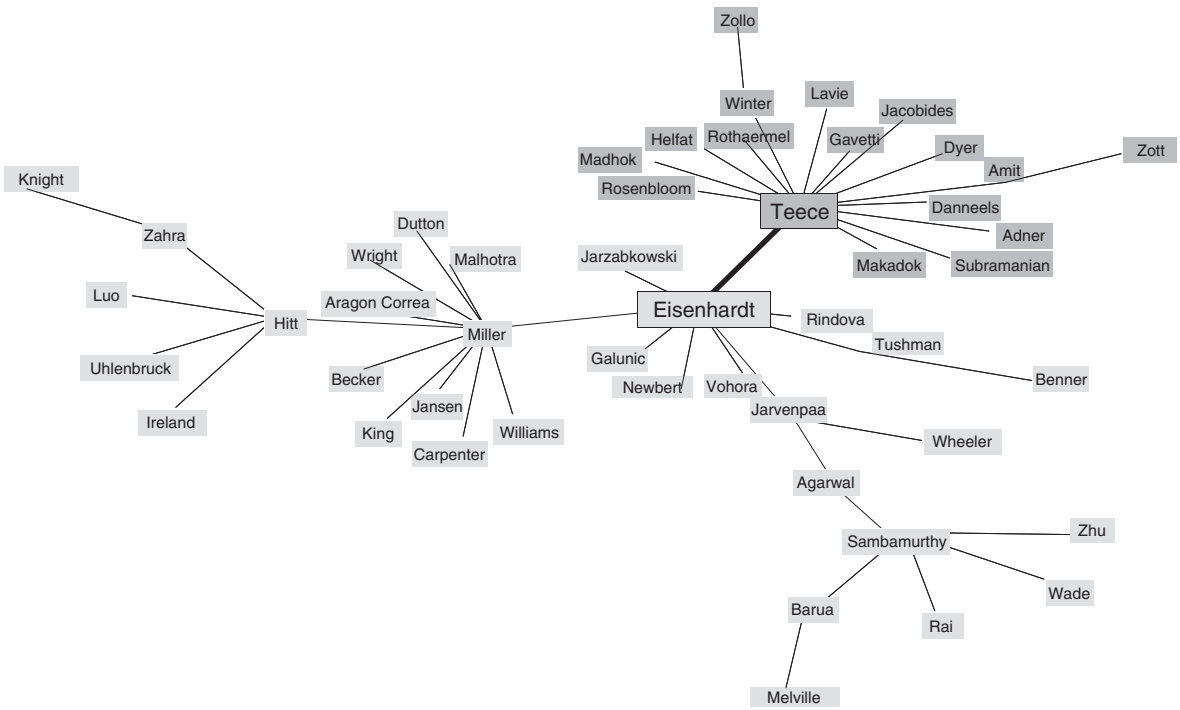

Legend: Authors' names stand in for the content of their entire body of work.

Figure 2. Pathfinder analysis of core first authors of dynamic capabilities research

in economics, compared with only 9 percent of those linked to Eisenhardt. In contrast, 22 percent of the Eisenhardt group is trained in organizational theory, science, or behavior, compared with 0 percent in the group surrounding Teece. Similarly, 19 percent of the Eisenhardt group has a background in information systems, while none of those tied to Teece do. There is a similar disconnect with respect to the research interests of the two groups. The authors connected to Teece self-report stronger interests in technology, firm performance, and strategy, while those linked to Eisenhardt are relatively more interested in internal organizational issues, processes, and information systems. [4]

The fact that there are two disparate communities of authors contributing to the development of an important strategic concept may not in itself be surprising, since the strategy field is multidisciplinary in nature. What is concerning is the lack of apparent integration or brokerage across the two arenas of knowledge undergirding dynamic capabilities. This suggests that the two communities may be socially constructing dynamic capabilities independent of one another, without regard for whether the two different views of the framework's core are mutually consistent.

While this sheds some light on the problem, the question remains as to why the two communities haven't come together to resolve their differences, given the importance of this for the field's future development, as explained earlier. Might some additional facet of the network's social structure be responsible for inhibiting fruitful conversation across the two realms of knowledge? In this regard, it is clear that the nodes occupied by the work of Teece and Eisenhardt bear further investigation, since they provide the only connecting link between the two otherwise disconnected domains of scholarship.

[4] This information was collected through an Internet search of the 50 authors included in our analysis. For each of them, we manually coded information about background and research interests on their personal website or on their web page on the website of the university to which they are affiliated. The statistics reported with respect to backgrounds are computed based on the graduate degrees only. Data about research interests are based on a count of the keywords mentioned in the description of each author's research interests. Further details are available from the authors upon request.

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Table 4. Centrality scores for three types of centrality

	Centrality measures		
Author	Degree	Closeness	Betweenness
Eisenhardt, KM	0.1837	0.4537	0.7568
Teece, DJ	0.3061	0.3920	0.5493

Numbers highlighted in gray are the highest figures, indicating the most central author for each type of centrality. Centrality scores are reported in normalized form. Author names stand in for their entire body of work.

Centrality score differences and their implications

To gain some insight into how the structural positioning of these two nodes might impact the field's development, we computed how each scored on the three most widely used measures of centrality: degree, closeness, and betweenness (Freeman, 1977, 1979).[5] These three scores serve as indicators of the differing structural positions of the two authors' work within this knowledge network, their impact on knowledge transfer and development, and the implications for the social construction and development path of the dynamic capabilities construct. Table 4 reports normalized results for the three centrality scores, each of which reflects a particular aspect of the influence of each author's body of work within this network of scholarship.

Teece's high-degree centrality score (0.3061 vs. Eisenhardt's 0.1837) means that his work has the greatest "local centrality" (Scott, 2005: 83), with direct ties to the most authors (those grouped around Teece in Figure 2). This suggests a potential for encouraging a strong and integrated cluster of knowledge, based on taken-for-granted assumptions, shared tacit knowledge, and common ways of thinking (Burt, 2005). This might encourage a concentrated effort among those with similar approaches and tool sets to develop a deeper and more rigorous theoretical foundation for dynamic capabilities research, building on Teece's seminal work. Yet the fact that this cluster of authors around Teece represents a relatively "closed" world (Burt, 2005) suggests that their developmental efforts may take place independent of other efforts within the network. This may sharpen the divisions with the field and limit the influence of divergent ways of thinking.

Eisenhardt's centrality scores and structural position in this knowledge network have other meanings. Her high score on betweenness centrality (0.7568 vs. Teece's 0.5493) indicates that her work plays an important bridging (or brokerage) role, connecting parts of the network that would otherwise remain separated (Burt, 2005; Kilduff and Tsai, 2003). This is reflected in the fact that her work sits at the nexus of the three major branches of the knowledge network shown in Figure 2, spanning the "structural holes" that otherwise keep these knowledge arenas apart (Burt, 1992). Her high closeness score (0.4537 vs. Teece's 0.3920) reflects the accessibility of her work and its importance in conveying information across the knowledge network (Kilduff and Tsai, 2003; Wasserman and Faust, 1994). Together, these results suggest that Eisenhardt's work occupies a critical intermediary position within this scholarly domain that can affect the transmission of information across the network.

If EM's framing of dynamic capabilities was consistent with that of TPS, the implications of this underlying structure for the development of the field might be strictly beneficial. [6] But, as we have shown from our discussion of these seminal contributions, EM's understandings of dynamic capabilities are not merely inconsistent with those of TPS, but are seemingly incompatible on several critical theoretical dimensions, representing opposite positions. And it is that fact that makes for a less sanguine interpretation of these results. In this regard, Eisenhardt's high betweenness score and position astride key structural holes are most concerning. High betweenness centrality implies not only a capacity for facilitating information flows by bridging disconnected domains—it also implies a potential for control over the information flow through "brokerage" or gatekeeping (Burt, 1992; Gould and Fernandez, 1989). Because the network describes linkages among knowledge domains rather than personal ties and because

[5] Degree centrality is a count of the direct ties to a given actor, while closeness centrality is the inverse of the number of links from that actor to all others in the network (Freeman, 1979). Betweenness centrality assesses the extent to which other actors must go through a given actor to reach any other node by the shortest path (Freeman, 1977).

[6] As an important conduit of information, Eisenhardt's work has likely encouraged both the importation of a richer variety of approaches and topical knowledge to dynamic capabilities research and a wider diffusion of the dynamic capabilities construct.

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authors' names are only standing in for their body of work, this does not suggest that Eisenhardt (the individual) has any personal power or control within this network. [7] It does suggest, however, that Eisenhardt's work may serve to filter out certain viewpoints on dynamic capabilities or shape the way in which research generated by Teece's cluster is interpreted or received by authors on the other side of the structural holes that her work spans. In this case, the efforts of Teece's cohort to take his framing of dynamic capabilities to the next level could become "lost in translation," limiting their impact beyond their cluster or causing confusion.

At the same time, there is also limited opportunity for Eisenhardt's viewpoint to influence the authors tied to Teece, due to the controlling position of Teece's work in the network and the incompatibilities between EM's and TPS's views on dynamic capabilities. Just as Eisenhardt's work may filter, shape, or distort views on dynamic capabilities coming from Teece's domain in the network, so the reverse is true, since Teece's work spans the structural hole separating Eisenhardt's work from his author cluster. The fact that the work tied to Teece represents a "closed world" makes it even less likely that it will be penetrated by worldviews that differ.

Given the underlying structure of this knowledge domain, the contradictory nature of TPS's and EM's views on dynamic capabilities may present a formidable barrier to unifying research on dynamic capabilities. Given the inconsistencies between their approaches, the underlying structural impediments here exposed suggest that there may be few opportunities for bridging the disciplinary divide unless this obstacle can be overcome. Moreover, without resolving the (barely acknowledged) theoretical contradictions between EM and TPS, it may be difficult to realize some of the beneficial effects of the network on the development of the dynamic capabilities construct. For example, while Eisenhardt's work has opened up the field to greater variety and more creativity, some valuable work may get selected out in trying to navigate past two influential but dissonant "knowledge brokers" within the network.

Overall, the implications of this analysis for the development path of dynamic capabilities reinforce some of those drawn earlier. They suggest that there may be a serious obstacle to the unification and advancement of the field due to the existence of two influential but inconsistent views on critical aspects of the framework. Without agreement over basic theoretical points, it may be difficult for the field to move beyond the foundational stage. In the next section, we turn our attention to the question of how to overcome the problems that our analysis has uncovered and how to further the conversation on dynamic capabilities.

BRIDGING THE THEORETICAL DIVIDE

Despite the existence of structural impediments to a socially constructed resolution of the differences, we believe that these problems are not insurmountable. We find, paradoxically, that there may be ways to integrate across the two contrasting frameworks despite what appears to be the irreconcilable nature of their differences. Moreover, we find that there are ways to accomplish this objective without violating the underlying assumptions of either paper. What may have been preventing a socially constructed reconciliation of views may simply be due to a lack of attention and facilitated conversation.

Below, we illustrate one such approach. While there may well be other means of reconciling the differing positions of the seminal papers, our objective is to demonstrate by example that this is possible and to point the way toward a potential path for harmonious resolution of the differences.

Assumptions about what constitutes a dynamic capability

We begin by noting that the alternative positions of the two seminal papers regarding sustainable competitive advantage can be traced back to a crucial set of differences in their assumptions about what constitutes a dynamic capability. TPS depicts dynamic capabilities in terms of large, complex organizational routines, while EM suggests that this holds true only in moderately dynamic markets. But even in moderately dynamic markets,

[7] Two authors are most likely to be cited together by many third parties when the two authors have written on the same general topic. As a result, a Pathfinder network derived from such data is reflective of ties between topical domains, rather than of personal ties or power relations (Garfield, 1979; Schvaneveldt, 1990; White and Griffith, 1981).

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EM's conception of dynamic capabilities varies from that of TPS, since they characterize dynamic capabilities as best practices in such contexts, while TPS sees them as more heterogeneously distributed. In high-velocity markets, where change is fast paced, EM's view of dynamic capabilities is even further from that of TPS; there they depict dynamic capabilities as taking the form of simple rules and unstable processes.

This is a pivotal set of contrasting assumptions. If TPS's assumption about the nature of dynamic capabilities holds true, there is no inherent logical contradiction about whether dynamic capabilities could possibly be a source of sustainable competitive advantage, although the details of the theory require further development (Helfat *et al.*, 2007). [8] In contrast, EM's assumptions provide the logical basis for their conclusion that dynamic capabilities cannot explain enterprise-level sustainable competitive advantage, regardless of the level of market dynamism (as we have described earlier). If dynamic capabilities are best practices, their equifinality makes them more homogenous and substitutable than dynamic capabilities are under TPS's conception. If dynamic capabilities are simple rules and experiential processes, their evanescence makes them more unstable and less sustainable than they are as depicted by TPS.

We take EM's assumptions, then, as our starting point, since their differing conclusions about the relationship between dynamic capabilities and sustainable competitive advantage follow from these assumptions. Our approach toward reconciling the two views is ask whether there could be exceptions to the conclusions drawn by EM regarding the potential for sustainable competitive advantage, even if they hold in most cases. This is, in essence, a contingency approach to the problem (Burns and Stalker, 1961; Thompson, 1967). A finding that there are conditions under which the TPS holds true even under EM's assumptions would enable us to conclude that the views advocated by both papers could coexist, in the sense that each view holds under certain conditions—EM in the general case and TPS in the special case. A reconciliation of this sort would not imply that EM's assumptions are necessary—only that, regardless of how one conceives of dynamic capabilities, they could under certain conditions provide an enterprise with a sustainable competitive advantage in contexts of rapid change.

To identify the specific conditions, we search for logical ways in which dynamic capabilities, as either best practices in moderately dynamic markets or simple routines in high-velocity markets, could still satisfy the VRIN tests for sustainable competitive advantage (Barney, 1991) and thereby serve TPS's original purpose for the construct. In the two sections that follow, we show by example that in either type of market environment, moderately dynamic or high velocity, there may well be ways to reconcile the two seminal framings, despite the seemingly irreconcilable nature of their differences.

Dynamic capabilities as best practices in moderately dynamic markets

Our approach to successful reconciliation of the two framing efforts in moderately dynamic markets rests on finding ways in which it is possible for dynamic capabilities to contribute to a firm's sustainable competitive advantage, even if they take the form of best practices. That is to say, it depends on determining if there is any way that best practices can ever satisfy the VRIN conditions on a contingent basis. Since EM's conclusion that this is not possible stems from their description of best practices as relatively homogeneous, equifinal, and substitutable, we focus our attention on the question of exactly *how* substitutable best practices are—looking for the conditional exception to the rule.

It is clearly the case that if best practices are perfect substitutes, they cannot satisfy the VRIN conditions: if perfect substitutes are on the horizon, they threaten the sustainability of an advantage, while if they are already at hand, there can be no competitive advantage (Barney, 1991; Peteraf and Bergen, 2003). But best practices are not perfect substitutes. As EM (1105) acknowledge, even as best practices, dynamic capabilities remain "idiosyncratic in their details."

A common saying suggests that "the devil is in the details." In the case of dynamic capabilities, the exception may be in the details. A particular type of best practice, such as those for acquisition integration, may have many elements that are

[8] While there was a question about whether TPS's conceptualization was tautological (Eisenhardt and Martin, 2000), this issue has since been answered satisfactorily (e.g., Helfat and Peteraf, 2009; Helfat *et al.*, 2007).

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widely shared by practitioners of this type of capability. But this does not necessarily mean that all such practitioners are equally adept at the practice. With respect to acquisition integration practices, research has shown that, after some initial learning period, firms that engage in mergers and acquisitions with greater frequency have better outcomes than other firms (Haleblian and Finkelstein, 1999). This suggests that experience matters, even for best practices. How much it matters will depend upon the particular context. If the best practice is widespread and all rivals are equally experienced, there may be no competitive advantage. But if the best practice is not widespread or if a firm's rivals do not engage regularly in the practice, there could be an appreciable competitive advantage for the most experienced firms. This may be the case in industries where large, sophisticated firms compete against many smaller rivals that do not have the wherewithal to hire consultants (to obtain the best practice) or that have little occasion to apply them, due to differences in scale or strategy. The restaurant industry or retailing may provide ready examples.

Beyond differences in experience and competitive context, there are other ways in which the "idiosyncratic details" can provide the conditional exception to the rule. In some cases, the idiosyncratic details may be the source of high added value, even though they occupy but a small proportion of the activities involved in executing a best practice. High added value relative to rivals implies a competitive advantage (Peteraf and Barney, 2003). But if these details are also proprietary to the firm and resistant to imitation, then they may support a sustainable advantage as well. A case example of this is the Lincoln Electric Company, which sustained their substantial competitive advantage over their rivals in arc welding, even after openly sharing nonproprietary aspects of their best practices with them (Berg, 1995).

Timing issues can also explain why best practices may be a source of competitive advantage or even sustainable advantage for some firms, on a contingent basis. Best practices are not born fully grown, like Athena from Zeus's head. They are developed over time by some innovator firm, for which they can provide an appreciable competitive advantage until they become more widely adopted (Dierickx and Cool, 1989). In the fashion industry, for example, Zara was the innovator, introducing the practice of fast fashion long before other firms were able to adopt such practices. How long a lead a firm may have depends on industry and situational specifics. For some first movers, their lead can be quite lasting, especially if follower firms are hamstrung by prior firm-specific investments (Leonard-Barton, 1992; Tushman and Anderson, 1986). In the case of Zara, firms that had made prior investments in retailing and design capabilities, such as Benetton, The Gap, and MaxMara, found it difficult to adopt practices that revolved around vertical integration and design copying.

Even after a best practice has become a widespread practice in one industry, it may still provide a competitive advantage in other industries, where the practice is unknown or uncommon. Thus, firms with expertise in the practice may extend their advantage after it has evaporated in their original industry by diversifying into new industries that can benefit from the use of the practice. An example of this is Porsche, which contributed to the development of lean production systems in the automotive industry, but has since diversified into consulting, spreading its lean training practices to industries as diverse as OEM and pharmaceuticals.

As these examples suggest, it is logically possible for dynamic capabilities in the form of best practices to give rise to a competitive advantage or even a sustainable advantage under contingent, exceptional circumstances, despite the fact that best practices are "more homogeneous, fungible, equifinal, and substitutable than is usually assumed" (EM: 1105). If they are less than perfectly substitutable, due to differences in idiosyncratic details such as experience, added value, timing, etc., then they may be a source of competitive advantage after all. How large an advantage will depend on the particular circumstances and is essentially an empirical question. But Zott's (2003) simulation results suggest that timing, cost, and other aspects can result in significant performance differences among firms with relatively homogeneous dynamic capabilities. Moreover, the large body of research on various types of identifiable processes that EM have described in terms of best practice, such as allianc-ing, product development, knowledge brokering, and decision making, suggests that such processes can at times be the drivers of significant performance differences and a substantial competitive advantage for some firms (e.g., Clark and Fujimoto, 1991; Martin and Eisenhardt, 2010).

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Dynamic capabilities as simple rules and processes in high-velocity markets

In high-velocity markets, the challenge of reconciling EM's and TPS's alternative conceptions of dynamic capabilities is more complex. EM's depiction of dynamic capabilities as simple rules and unstable processes leads them to conclude that any competitive advantage that is achieved in such settings is almost instantly eroded. Sustainable advantage is therefore untenable. But the fact that they argue that TPS's framing reaches a boundary condition in high-velocity markets makes for an even wider separation between their conceptualization of the dynamic capabilities construct and that of TPS. Our approach toward bringing these two views into alignment in this type of market setting is a two-part approach, since there are two aspects of EM's framing that need to be brought into harmony with that of TPS. In both parts, we seek exceptions to the general rule described by EM's logic, on a contingent basis, just as we did for moderately dynamic markets.

First, we look for ways in which dynamic capabilities in the form of simple rules and processes could lead to a sustainable advantage, despite the unstable nature of this type of dynamic capability. Achieving this objective would enable us to show that TPS's vision of dynamic capabilities as a theory of sustainable competitive advantage could still be realized, even if dynamic capabilities in high-velocity markets take the form suggested by EM.

Second, we seek to determine if there are any ways in which high-velocity markets might not set a limit for the boundary conditions of the TPS framework. In essence, this involves determining whether or not large, complex routines play a role in such settings and whether the resource-based theoretical foundation of TPS's conception of dynamic capabilities is still applicable. An affirmative answer to these questions would provide a road to a more integrative approach to framing dynamic capabilities that builds on both of the seminal efforts.

Can there be sustainable advantage in high-velocity markets?

One way to gain some insight as to whether a sustainable advantage in high-velocity markets can ever be realized is to address this question empirically. A finding that there are enterprises operating in high-velocity environments that maintain their lead over rivals for nontrivial periods of time would suggest that there might be a way to reconcile the views of TPS and EM, even in high-velocity environments. While we would encourage such an approach, here, we address the conceptual question of whether it is logically possible for dynamic capabilities in the form of simple rules and routines to provide a firm with a sustainable competitive advantage. We offer three possibilities and invite a search for other conditional exceptions to the EM rule.

First, it has been suggested that firms may maintain a leading position in hypercompetitive environments by attaining a series of short-lived competitive advantages (D'Aveni, 1994). Although some interpret this to mean that it is virtually impossible for a firm to gain a sustainable advantage in such settings, Barney (2007) has provided an alternative resource-based interpretation: firms that have capabilities in rapid and continuous product innovation could maintain their lead in such markets, even as product-level advantages are overturned. Apple Inc., with its capabilities in leading-edge design and game-changing product innovation, may provide an example. Such firms may have a resource-based sustainable competitive advantage if their innovation capabilities are not only valuable and rare, but are also resistant to imitation and substitution.

In parallel fashion, something analogous might be at work in high-velocity markets, where both dynamic capabilities and competitive advantages are depicted as short lived. EM's argument that competitive advantage cannot be sustained in such settings is supported if the locus of competitive advantage shifts from firm to firm as conditions change. But if some firms can maintain an advantaged position even as the source of advantage changes, then they may have a superior higher-order dynamic capability (Collis, 1994) that enables them to continuously craft superior simple rules and routines anew, as conditions warrant. That is to say, they may have a set of stable, superior capabilities to create and deploy lower-order dynamic capabilities in the form of simple rules and routines. The proposition that such higher-order capabilities exist should be tested empirically. But the possibility of more stable dynamic capabilities of this sort operating in high-velocity markets provides one logical path by which EM's

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conception of dynamic capabilities in such settings could be united with TPS's objective of explaining sustainable competitive advantage.

A second route to this objective stems from the possibility that simple rules and routines may vary in their level of specificity. The literature on the resource-based view describes resources and capabilities as ranging along a continuum from the general to the specific, where general resources have wide applicability while specific resources have only a narrow set of applications (Montgomery and Wernerfelt, 1988). It is conceivable that simple rules and processes may also vary in their specificity, in that some may have more general applicability and utility than others. Those that are highly specific would be applicable to only a narrow set of conditions; these would be replaced as conditions changed and not retained in organizational memory. They would conform to EM's description of dynamic capabilities in high-velocity environments. But the exception to this rule lies with those rules and processes that have more general applicability, such that they could remain useful to the firm even as conditions change. These would form a more stable set of dynamic capabilities although, as simple rules and processes, they would conform otherwise to EM's views. But because of their greater stability, there is also greater potential for them to support a sustainable competitive advantage. Hughes and Weiss (2007) provide a possible example in their description of a set of general simple rules for managing alliances that radically improve alliance performance, according to their evidence.

A third logical possibility is that while dynamic capabilities, as depicted by EM, may not be sufficient for sustainable competitive advantage in high-velocity environments, they may form a necessary part of a *dynamic bundle* of resources and capabilities that contains more stable elements. Although EM have placed the emphasis on the role of simple rules and routines in high-velocity markets, more complex routines such as those for product development, alliancing, knowledge brokering, and resource allocation also play a role. We posit here that they operate in conjunction with simple rules and routines, as the example above from Hughes and Weiss (2007) suggests. There may be a linked hierarchy of routines, whereby simple routines are used to manage more complex and more stable routines in high-velocity environments. Because a dynamic bundle linking routines of various types has greater stability overall than the simple routines involved (which may be switched in and out of the bundle as conditions change), there is the possibility that a bundle of this sort may support a sustainable advantage as well.

Can a resource-based conception of dynamic capabilities still have relevance in high-velocity markets?

To address the question of whether TPS's resource-based framing reaches a boundary condition in high-velocity markets, we ask first whether TPS's conception of dynamic capabilities as large, complex routines is still applicable and then whether the resource-based view is still relevant. Our answer to the first question should be clear from the discussion of dynamic bundles above. If, according to EM's (1107) definition of dynamic capabilities, they are "the firm's processes that use resources—specifically the processes to integrate, reconfigure, gain, and release resources—to match and even create market change," then surely they include not only simple rules and routines in high-velocity markets, but larger and more complex routines as well, which continue to play a role in these settings. If the question is where the locus of competitive advantage is found in such markets, we submit that it is found in neither simple routines nor complex routines in isolation, but rather in both, in the form of a dynamic bundle. And just as the resource-based view depicts resource bundles as playing an important role in the attainment of sustainable advantage, due to their complexity and resistance to imitation or substitution (e.g., Penrose, 1959; Rumelt, 1984), so this may be the case for dynamic bundles, made up of different kinds of dynamic capabilities, as well.

The question remains as to whether the resource-based view has any relevance in high-velocity environments (Bingham and Eisenhardt, 2008). We interpret this as a question about whether the VRIN model of sustainable advantage can still be usefully applied. Here, we argue that since any form of dynamic capability, whether a simple rule, an experiential process, a best practice, or a complex organizational routine, is by definition a type of capability, the VRIN tests for sustainable advantage may be employed (Helfat *et al.*, 2007). Whether or not a particular dynamic capability passes the tests is, of course,

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another matter. But a plausible argument may be made that passing these tests is not impossible, even in high-velocity environments. If a simple rule or routine provides an uncommon added-value advantage, then it can be the source of competitive advantage, however short-lived (Peteraf and Barney, 2003). It would meet the VRIN tests of value and rarity. If the simple routine is also a stable higher-order dynamic capability, a more generally applicable dynamic capability, or a necessary part of a dynamic bundle, then it will be more stable than has been recognized elsewhere. If, in addition, it is resistant to imitation and substitution, then it is likely to pass the remaining VRIN tests as well and be supportive of a sustainable competitive advantage.

As this discussion has illustrated, there are a variety of ways in which it is possible for dynamic capabilities, as best practices in moderately dynamic markets or as simple rules and experiential processes in high-velocity environments, to provide an enterprise with a competitive advantage or even a sustainable advantage under the right conditions. This demonstrates that, despite the differences in the assumptions of EM and TPS, there are logical ways to bring about reconciliation. Paradoxically, EM's differing conception of dynamic capabilities may well be compatible with TPS's objective of providing a theory of sustainable competitive advantage in various types of dynamic settings. While the logic of EM may hold in the general case, that of TPS may hold conditionally, contingent on specific circumstances as outlined above.

CONCLUSION

A critical issue has been absent from the conversation on dynamic capabilities: the two seminal papers represent not only different but contradictory viewpoints concerning the central tenets of the dynamic capabilities framework. Here, we address the questions of why this issue is important, why it has not been addressed in the literature, and how to resolve the differences, using bibliometric techniques to inform our analysis. Our findings suggest that the field is being socially constructed on the basis of two separate arenas of knowledge and that underlying structural impediments have impeded healthy dialog across the disparate domains. This in turn has prevented or retarded the unification of the field. Still, we show that there are ways to unify the field of dynamic capabilities that rely, paradoxically, on integrating the two contradictory views, while preserving the assumptions that led to their differences. Despite the seemingly mutually exclusive nature of the two approaches and despite the structural impediments within the underlying knowledge base, we have found logical ways around this impasse. Our method revolves around reconciling the two opposing views through the use of a contingency perspective.

In moderately dynamic settings, the conditional cases are drawn from a finer look at the nature of the idiosyncratic details, which distinguish the effectiveness of best practices of the same type from one another. More specifically, we suggest that despite the many commonalities among best practices, nontrivial competitive advantages may still be possible due to differences in experience, competitive context, added value, and timing.

In high-velocity cases, the contingencies arise from several sources. The first comes from observing that there may be a hierarchy of types of dynamic capabilities in such environments. Those that represent a higher-order capability—one that continuously manages to create lower-order simple rules and processes on an as-needed basis—may be the exception to the EM logic. A second type of contingency comes from the possibility that variation exists in the specificity of simple rules and processes. Those that are less specific (or more general) have a wider range of applicability and may be retained in organizational memory for more continual usage. Lastly, another exception to the rule that sustainable competitive advantage cannot be attained in high-velocity environments comes from recognizing that simple rules and unstable processes may form a part of a dynamic bundle of resources and capabilities. Each of these conditional cases shows that, although simple rules and processes may be unstable generally, there are contingent circumstances in which they have greater stability and more potential to satisfy the VRIN tests of sustainable competitive advantage than is commonly thought.

The difference between the logic of EM and that of TPS, then, can be seen as one of perspective: EM takes a high-level view of the general case, whereas TPS's logic holds in the exception, even under EM's assumptions about the changing nature of dynamic capabilities. By bringing these two perspectives together, we are able to unify our understandings of the construct with respect to

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its central theoretical elements. Regardless of the level of market dynamism or the nature of dynamic capabilities, dynamic capabilities may enable firms to attain a sustainable competitive advantage *in certain conditional cases*.

In this way, our study solves the riddle of how two conflicting versions of the dynamic capabilities framework can coexist logically and be integrated into a more complete predictive model. It not only removes much of the source of confusion over the dynamic capabilities construct, but it also suggests many avenues for future research. Starting from our finding about the existence of a structural divide within the knowledge core of the research domain, researchers could find logical solutions to this conundrum beyond those suggested here. For instance, scholars could facilitate theoretical progress by identifying the conditions under which each of the two theoretical approaches fail (Gray and Cooper, 2010), or they could adopt a theory pruning approach, with the aim of reducing the set of possibilities allowed by the different approaches (Leavitt *et al.*, 2010). Since our solutions are only in outline form, depth could be added to our proposals, with an ultimate goal of providing a fully integrated framework for dynamic capabilities.

On the empirical front, the clear implication of our work is that scholars need to take into account the relevant contingencies in their investigation before they can predict and test for particular outcomes of dynamic capabilities. This might involve assessing the level of dynamism in the environment, considering the idiosyncratic aspects of best practices, weighing the level of specificity of the simple rules managers employ, looking for the presence of higher order dynamic capabilities and dynamic bundles, etc.

Our investigation also raises questions about the existence of constructs or concepts that could bridge the two perspectives. With the resolution of this theoretical conundrum, other avenues toward unifying the field open up. One such avenue is suggested by our concept of dynamic bundles. The emphasis of TPS (and researchers aligned with them conceptually) is on complex routines and organizational mechanisms. The emphasis of EM (and those more aligned with them) is on simple routines and managerial mechanisms. Yet these differences are really just differences in perspective. Both levels of analysis and both types of mechanisms are important and both are at work within the firm, either sequentially or simultaneously. Focusing only on one type is a little like the blind men and the elephant, to put a twist on our metaphor.[9] Really understanding dynamic capabilities requires seeing the complete picture and exploring interlinked dynamic bundles as a whole.

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[9] See http://en.wikisource.org/wiki/The_poems_of_John_Godfrey_Saxe/The_Blind_Men_and_the_Elephant

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