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Working Paper 17-091



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THE ROLE OF COGNITIVE AND EMOTIONAL FRAMING
IN INNOVATION ADOPTION BY INCUMBENT FIRMS**

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WORKING PAPER
September 2018

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ABSTRACT

Why do incumbent firms frequently reject non-incremental innovations? Beyond technical, structural, or economic factors, we propose an additional factor: the degree of the top management team's (TMT) frame flexibility, i.e., their capability to perceptually expand an innovation's categorical boundaries and to cast the innovation as emotionally-resonant with the organization's identity, competencies, and competitive boundaries. We argue that forces of inertia generally constrict how TMTs perceive innovations, but that frame flexibility can overcome these constraints, increasing the likelihood of adoption and broadening the organization's innovation practices. We advance a theoretical model that relaxes the assumption that cognitive frames are static, showing how they become flexible via categorical positioning, and introduce a role for emotional frames that appeal to organizational sentiments and aspirations in innovation adoption.

Keywords: innovation adoption, framing, cognition, emotional resonance, incumbent inertia

Innovations are the lifeblood of organizations and yet their adoption poses considerable challenges to incumbent firms (Christensen and Bower, 1996; Gans, 2016; Henderson, 1993). By definition, non-incremental innovations are inconsistent with an organization's current product portfolio and business model (Smith and Tushman, 2005); thus, they trigger perceived threats that often hold the incumbent organization hostage to its prior success (e.g., Vuori and Huy, 2016). Moreover, top management teams (TMTs) often become mired in framing innovations in terms of the organization's past, rather than its possible future (Gilbert, 2006; Hambrick, 2007; Rumelt, 1979; Tripsas and Gavetti, 2000). Because of these inertial forces, incumbents frequently fail to adapt even as product classes evolve (Benner and Tushman, 2003).

Scholars have documented numerous challenges to innovation adoption, including resource allocation, technological demands, and business model incompatibilities (e.g., Anderson and Tushman, 1990; Henderson and Clark, 1990; Sull, 1999). However, an additional factor – the process by which TMTs frame innovations – has received less attention, in spite of the recognized need for such work (see calls from Eggers and Kaplan, 2013; Helfat and Peteraf, 2015). We propose that the TMT's framing, i.e., the interpretation, packaging, and “organizing of information” (Giorgi, 2017: 712) related to a focal innovation, plays a pivotal role in their decision to adopt an innovation (e.g., Eggers, 2016; Tripsas and Gavetti, 2000). The divergent fates of two firms, Blockbuster and Netflix, provide a useful illustration of the power of framing.

Prior to going bankrupt in 2010, Blockbuster's TMT framed the then-novel innovation of online streaming in ways that conflicted with the company's legacy strategy as a brick-and-mortar video rental service. In 2000, Netflix's CEO had approached Blockbuster about forming a partnership to pursue an online streaming platform. However, he “got laughed out of the room” (Satell, 2014:1) and the innovation was rejected by Blockbuster's TMT in part because they

perceived it to be strategically incongruent with their existing business model (Newman, 2010).

By contrast, Netflix's TMT framed online streaming more flexibly, as an extension of their current "entertainment subscription services;" thus, they were able to see this innovation as compatible with their current capabilities in DVD rentals. The TMT broadened their framing, cognitively aligning the innovation and the organization's business model, and emotionally linking the innovation with the organization's aspirations to provide consumers with even greater "value, convenience, and selection" (O'Reilly and Tushman, 2016: 6). Such flexibility in framing abetted Netflix's adoption of online streaming services and content production; by comparison, Blockbuster's more inflexible framing of the innovation hampered adoption.

Blockbuster's TMT framing focused on affirming its perceived legacy strategy, even as this strategy was becoming less competitively advantageous (c.f., Rothaermel, 2001). In hindsight, Blockbuster's former CEO expressed regret at the inflexible framing: "I firmly believe that if our online strategy had not been abandoned, Blockbuster Online would have 10 million subscribers today, and we'd be rivaling Netflix for the leadership position in the internet downloading business" (Antioco, 2011: 1). As Eggers and Kaplan (2013: 317) have observed, incumbent TMT's cognitive frames "are frequently stuck in an old understanding of the environment." The contrast between Blockbuster and Netflix highlights how some (but not all) TMTs are able to reframe target innovations more flexibly so as to enhance their suitability with the organization's strategy and, in turn, the likelihood of their adoption. We seek to explain such variations in TMT framing in this paper.

We theorize and develop a process model that depicts the ways in which TMTs create, maintain, and modify their framing of potential innovations, in both cognitive and emotional terms; and in turn, how such framing affects an organization's adoption decision. We focus on

non-incremental innovations, as opposed to more incremental ones, because they present a greater disruption and challenge to existing TMT framing and organizational functioning. Our model theorizes that organizational adoption of a non-incremental innovation pivots on the TMTs' framing of that innovation relative to the incumbent organization's legacy strategy. Our conceptualization goes beyond existing work which has focused primarily on cognitive biases (Kaplan and Tripsas, 2008; Tripsas and Gavetti, 2000), to consider a second aspect of framing: emotional. While cognitive framing is a process of *thinking*, providing the "mental templates that individuals impose on the information environment to give it meaning" (Walsh, 1995: 281), emotional framing is a process of *feeling*, providing "a felt alignment of a frame with the audience's passions, desires, or aspirations" (Giorgi, 2017: 717). We view each frame as somewhat distinct from the other.

Cognitive frame flexibility, we argue, functions to categorize a seemingly incompatible innovation as complementary with the organization's existing identity, competencies, and competitive boundaries, as the TMT re-classifies the innovation and/or re-interprets the firm's legacy strategy to bring them into greater alignment. Emotional frame flexibility enables an innovation to be seen as resonant, with a felt positive, emotionally engaging connection to the firm's strategy. We propose that flexibility in both cognitive and emotional framing of an innovation leads to perceptions of greater strategic alignment and, consequently, increases the likelihood of its adoption. As well, we posit the reverse to be true: Fixed cognitive and emotional framing of an innovation will be associated with threat resistance and decrease the likelihood of adoption. Finally, we propose that a TMT's capacity to flexibly frame an innovation in adoption decisions accumulates over time and affects their ability to attend to future non-incremental innovations.

We seek to make several contributions related to innovation adoption and strategic framing. First, we reconceptualize cognitive framing, which has been theorized as relatively static and immutable (Benner and Tripsas, 2012; Danneels, 2011) or trapped by a TMT's extant cognition (Tripsas and Gavetti, 2000; Vergne and Wry, 2014). This theorization is largely refuted by social movement studies which allow for flexibility and adaptation in framing (Benford and Snow, 2000). Our theoretical model focuses on frame flexibility as an expansion or contraction of the TMT's strategic categorization of the innovation and is influenced by their understanding of its impact on the firm's capabilities, identity, and competitive boundaries.

Second, we extend current notions of strategic framing beyond cognition to include emotions (Giorgi, 2017; Voronov and Vince, 2012; Voronov and Weber, 2016). Incorporating the role of emotions offers a way of addressing gaps at the intersection of strategy and cognition, which has been faulted for its compartmentalization and lack of a unified theory (Eggers and Kaplan, 2013; Helfat and Peteraf, 2015; Huff and Huff, 2000; Walsh, 1995). Accounting for emotional framing allows the possibility of contrasting sets of innovation capabilities to remain coupled (or uncoupled) to an emotionally engaged narrative among members of the leadership team and the organization (Battilana and Dorado, 2010; Gardner, Anand, and Morris, 2008; Raisch and Tushman, 2016). We suggest the likelihood of innovation adoption is accentuated if expanded cognitive frames emotionally resonate with the TMT, as well as with members of the extended team that includes direct reports of the TMT and other upper-level middle managers influential to the innovation adoption process (e.g., Vuori and Huy, 2016). Although not all innovations may flourish, we argue that TMTs who build flexible cognitive frames, and couple these frames with emotional engagement among members of their team, will increase the likelihood of innovation adoption.

Third, we bring to the literature on innovation adoption a deeper understanding of strategic framing. Innovations trigger framing contestation and resistance (Lavie, 2006; Weick, 1990). Building on existing cognitive framing research in the context of innovation (e.g., Benner and Tripsas, 2012; Gilbert, 2006), we theorize how frames can bend, flex and be more supple, so as to consider how competence-destroying technical innovations (Tushman and Anderson, 1986) can be hosted within existing organizational capabilities and the formal and informal systems that form the organization's architecture (Gulati, Puranam, and Tushman, 2012). Essentially, this issue involves a question of whether the TMT is capable of thinking about innovations that are seemingly contradictory or paradoxical (e.g., Smith, 2014). We address how flexible TMT cognitive and emotional framing helps resolve complex, internally inconsistent aspects of non-incremental innovation adoption in incumbent firms (e.g., Raisch and Birkinshaw, 2008).

The paper is organized as follows. We begin by developing a conceptual process model that explains how TMT framing – both cognitive and emotional – affects the likelihood of non-incremental innovation adoption in incumbent firms. The model advances a series of propositions that illuminate dimensions of TMT framing and their influence on adoption. We extend these effects over time, mapping the cyclical nature of this process, and conclude by discussing the implications of our conceptual model for theory, research, and practice.

TMT FRAMING AND INNOVATION ADOPTION IN INCUMBENT FIRMS: A CONCEPTUAL MODEL

We advance a theoretical model of the role of framing in the TMT's adoption decisions of non-incremental innovations in incumbent firms. These decisions are important but problematic in that they challenge the TMT's existing mental models and necessitate fundamentally different framing and conceptualizations of the organization's capabilities, competitive boundaries, and identity (e.g., Barr, Stimpert, and Huff, 1992; O'Reilly and Tushman, 2016; Tripsas, 2009;

Weick, 1990). It is in this context which framing becomes especially salient and where its effectiveness has the potential to reshape the firm's strategic focus (Huff, 1982; Rumelt, 1979).

Innovations fall into three distinct types: incremental (Dosi, 1982), discontinuous (Gatignon *et al.*, 2002), and architectural (Henderson and Clark, 1990). Incremental innovations necessitate minimal strategic or organizational change, and thus, the need for TMT re-framing is of little relevance. Discontinuous innovations, by contrast, are challenging to adopt because they require new frames, processes, and knowledge that radically redefine and extend existing competencies (Corso and Pellegrini, 2007) and with them, initiate deep-seated strategic and organizational change (Adner, 2012; Schilling, 2005; Tushman and Anderson, 1986). Architectural innovations are also difficult to adopt because they reconfigure existing organizational components and frames while leaving core design concepts and the basic knowledge underlying the components untouched (Henderson and Clark 1991). Because their adoption presents the most significant tensions for adopting firms, our model focuses on discontinuous and architectural innovations, which we group together under the umbrella of non-incremental innovations.

Our primary unit of analysis is the TMT because they are charged with reviewing and evaluating innovations, as well as addressing the challenges of, and making strategic choices about, innovation adoption (e.g., Danneels, 2011; Gilbert, 2005; Sull, 1999). Upper echelons theorists have shown that a TMT's response to a strategic shift in its environment is based on cognitive construals anchored in members' past experience and values (Bromiley and Rau, 2016; Finkelstein, Hambrick, and Cannella, 2009; Hambrick and Mason, 1984). This is especially true in incumbent firms where organizational inertia can plague long-tenured TMTs who "tend to grow 'stale in the saddle,' ceasing to make adaptive changes" (Hambrick, 2007: 337; see also

Hambrick and Fukutomi, 1991; Henderson, Miller, and Hambrick, 2006). Moreover, a TMT’s “metacognitive” processes, defined as the accumulation of its past cognitive and affective experience, can have a significant impact on strategic decision-making (Mitchell, Shepherd, and Sharfman, 2011: 686). Thus we theorize that TMT framing within the context of non-incremental innovation adoption occurs via two main pathways: cognitive, through claimed categorization of innovations, and emotional, through claimed appeals to feelings, desires or aspirations. The first pathway – cognitive – has been recognized as important in the strategic management literature (Bromiley and Rau, 2016; Eggers and Kaplan, 2013); however, the latter – emotive – has been relatively neglected but is gaining attention (Giorgi, 2017; Voronov and Weber, 2016; Vuori and Huy, 2016).

We offer a model to articulate our core arguments, presented in the Figure. To summarize, the model theorizes that the TMT’s perceptions about an incumbent firm’s legacy strategy generates a set of strong inertial forces – associated with the organization’s capability development, identity, and competitive boundaries – that impel TMTs to maintain a contracted cognitive frame associated with how they perceive the firm’s innovation agenda. To overcome these inertial forces in order to adopt a non-incremental innovation, we elaborate processes by which TMTs acquire the capability to develop more flexible and expansive cognitive and emotional frames that, in turn, affects how the TMT (and its extended leadership team) perceives the strategic alignment of the focal innovation and the propensity to adopt a non-incremental innovation. Below, we detail the processes underlying our model and advance propositions for testing its core tenets.

Insert Figure (Theoretical Model) About Here

The incumbent firm's perceived legacy strategy

Our starting point is the occasion when the TMT is presented with a decision about whether (or not) to adopt a non-incremental innovation. Their initial deliberation takes place in the context of the how the TMT perceives and interprets the organization's legacy strategy and business model (Hambrick and Mason, 1984). The TMT's perception of its existing strategy is the result of a socially constructed process influenced by multiple internal and external actors (Kaplan and Tripsas, 2008). For non-incremental innovation adoption, history matters (Raffaelli, 2018); a TMT evaluates whether the adoption of the target innovation could facilitate competitive advantage over existing market opportunities (Gavetti and Levinthal, 2000; Gopalakrishnan and Damanpour, 1997; Levinthal and March, 1993). However, some successful incumbents may fail to consider changing their innovation strategy in the absence of a perceived threat to their existing competitive position (Christensen and Bower, 1996; Kiesler and Sproull, 1982; Nadkarni and Barr, 2008).

Regardless of whether the innovation emerges from within (e.g., Eggers, 2016) or outside the firm (e.g., Sull, 1999), non-incremental innovations are challenging for incumbents to adopt. They require processes and knowledge that redefine and extend existing know-how and technologies (Corso and Pellegrini, 2007), and with them, the ability to mobilize strategic and organizational change (Adner, 2012; Schilling, 2005). Firms that dominate a prior technological or institutional order are less likely to successfully adopt non-incremental innovations because of incumbent inertia that constrains action (Fuentelsaz, Garrido, and Maicas, 2015; Henderson, 1993). For example, incumbents like Firestone (Sull, 1999), Smith Corona (Danneels, 2011), and Polaroid (Tripsas and Gavetti, 2000) struggled to manage non-incremental innovations because their TMTs initially failed to perceive how a shift in strategy could provide "options either to

reinforce or destabilize a [current] technological regime” (Benner and Tushman, 2003: 242). In addition, external audiences play a significant role in reinforcing a TMT’s commitment to their existing strategy (e.g., Benner, 2010; Giorgi and Weber, 2015) thereby thwarting TMT flexibility to consider innovations that deviate from the current course. As a result, for most firms exploitation trumps exploration (March, 1991), especially when it comes to strategic adaptation.

Cognitive framing: lenses and filters

Innovations do not simply present themselves to organizations; rather, the TMT must recognize and interpret the value of a potential innovation to the firm as a first step in making adoption decisions (Ocasio and Joseph, 2005). In other words, the TMT needs to cognitively frame the focal innovation in terms of its relevance to the firm.

A cognitive frame refers to the managerial mental maps (Barr *et al.*, 1992) and thought structures (Reger, 1990) that shape interpretation (Gavetti and Rivkin, 2007). Cognitive frames have been shown to be influential in several aspects of strategic decision-making, including search (Gavetti and Levinthal, 2000), information processing (Cornelissen and Werner, 2014), and organizational change (Tushman and Anderson, 1986). Because TMTs process information collectively (Weick, 1993), cognitive frames help them aggregate interrelated information (O'Keefe & Nadel, 1978) when faced with ambiguity (Barr *et al.*, 1992); moreover, these frames are tied to the TMT's perception of the organization's legacy strategy (Adner, 2012; Dosi, 1982) and its past performance (Greve and Taylor, 2000).

Cognitive frames serve as ‘interpretive lenses’ that shape TMTs perceptions of their environment and how they respond (Eggers and Kaplan, 2013). According to Hambrick and Mason (1984: 195), senior teams bring “a cognitive base and values to a decision, which create[s] a screen between the situation and [their] eventual perception of it.” Akin to lenses on a

camera, the TMTs of incumbent firms develop and maintain interpretive filters that offer more or less variety in the composition and perspective through which the TMT cognitively frames innovations. A contracted cognitive lens is one that narrows the TMT's ability to consider innovation options by hewing closely to its existing technical or market trajectory. Contracted cognitive lenses create strategic blind spots that reinforce extant and/or overly-confident views of the firm's existing strategy and innovation agenda. Our model of cognitive framing depicts a two-step process. First, because incumbent inertia plays a critical role in technology change (Hill and Rothaermel, 2003), we identify how three filters – capability development, organizational identity, and competitive boundaries – push incumbent TMTs to maintain a contracted cognitive lens when they evaluate non-incremental innovations. Second, we theorize how and why frame flexibility enables TMTs to expand their cognitive lens to overcome these forces of inertia.

Capability development filter: consistency vs. co-existence orientations

Innovations vary in the extent to which they build on, fit with, and are commensurable with the firm's existing capabilities (e.g., Andriopoulos and Lewis, 2009; Cho and Hambrick, 2006; Raisch and Birkinshaw, 2008). By definition, non-incremental innovations involve inconsistencies with the firm's existing capabilities (e.g., Kaplan and Tripsas, 2008; O'Reilly and Tushman, 2013) and can be perceived as contradictory to the exploitation of existing capabilities and technologies, whereas other innovations can be associated with the exploration of new capabilities (Raisch and Birkinshaw, 2008). Scholars highlight how the process of matching old and new capabilities with competing framings creates cognitive complexity and dissonance (Festinger, 1957; Tripsas, 2009).

Over time, TMTs develop orientations that shape how they perceive capability development in the face of non-incremental innovation decisions. TMTs that adopt a

co-existence orientation are more likely to embrace contradictory capabilities and innovation agendas within the firm: a co-existence orientation is facilitated by “frames and processes that recognize and embrace contradiction” (Smith and Tushman, 2005: 523). For instance, the senior team at Ciba’s Crop Protection Division adopted an expanded cognitive frame that allowed the co-existence of its traditional chemical capabilities along with new molecular biology capabilities (O’Reilly and Tushman, 2008).

However, inertial forces on incumbent firms push TMTs toward a *consistency-orientation* that privileges uniformity with the firm’s existing capabilities. According to Smith and Tushman (2005: 525), consistency-orientations “stem from a fundamental epistemological belief of a unitary truth (Ford and Backoff, 1988; Voorhees, 1986) [that]… inconsistencies fundamentally cannot co-exist.” The innovation adoption decision triggers capability tensions, and as a result, TMTs who embrace consistency-orientations are more likely to see non-incremental innovations as contradictory (e.g., Smith, 2014) by using a contracted cognitive lens. Several empirical examples illustrate this. Danneels’ (2011) account of Smith-Corona showed how the company transitioned from mechanical to electric typewriters to personal word processors by maintaining a consistent focus on word processing, but was unable to adopt additional capabilities related to the production of other office supplies that would have allowed the company to transition into much needed new product categories. A consistency-orientation that favored typewriters helped sustain a contracted frame through which the TMT viewed the company’s potential for growth. Similarly, in the 1960s, incumbent Swiss watchmaking executives held a consistency-orientation that pitted the integrated circuitry found in quartz watches against nearly 300 years of mechanical watchmaking prowess (Raffaelli, 2018). Many Swiss executives were unable to reconcile inconsistencies among the organizational capabilities

needed to produce both quartz and mechanical watches, and thus struggled to perceive a useful role for quartz technology within their existing operations. Likewise, in response to the emergence of online news, many newspaper TMTs were unable to shift to a co-existence orientation that could have expanded their cognitive frame to allow journalism capabilities to sit alongside those needed to produce digital media (Gilbert, 2006).

An especially important context where consistency and co-existence orientations toward capability development is visible is in the distinct products or outputs produced by innovations (Sujan, 1985). Across the portfolio, an organization's products or services may share few or many capabilities in common. Because the adoption of a non-incremental innovation, by definition, permits radically new capabilities to penetrate the firm, adoption decisions force debates about whether or not the innovation is reconcilable with existing capabilities.

Alternatively, a co-existence orientation serves to bundle or “match” (Eggers and Kaplan, 2013) inconsistent organizational capabilities, permitting the TMT to reconcile incremental as well non-incremental innovations via simultaneous exploitation and exploration (March, 1991; O'Reilly and Tushman, 2008). We theorize that organizational inertia will push incumbent firms toward a consistency-orientation, making it more difficult for the TMT to reconcile inconsistent capabilities within the firm (Benner and Tushman, 2002). More formally, we posit:

Proposition 1a: TMTs who maintain a consistency-orientation toward capability development are more likely to cognitively frame a non-incremental innovation through a contracted framing lens.

Organizational identity filter: less vs. more elastic

Organizational identity is the collectively agreed upon set of central, distinctive, and enduring characteristics that define an organization (Albert & Whetten, 1985). Organizational identity, because it is socially constructed and affects the meaning systems that TMTs use to maintain an organization's core purpose, has the potential to shape the TMTs cognitive frame toward

innovations (e.g., Tripsas, 2009). We theorize that the manner by which identity shapes a cognitive frame can be attributed to the degree of its elasticity, i.e., “the tensions that simultaneously stretch, while holding together, social constructions of identity” (Kreiner *et al.*, 2015: 981). In the context of innovation adoption, we posit that the elasticity (or inelasticity) of an organization’s identity is rooted in two basic elements: “who we are” and “what we do” (Ashcraft, 2013; King and Whetten, 2008; Navis and Glynn, 2010, 2011; Nelson and Irwin, 2014). Prior work has tended to treat this coupling as unproblematic, generally assuming a fairly tight pairing between these two elements (e.g., Navis & Glynn, 2010). Relaxing this assumption, however, allows a consideration of how elasticity holds these two elements together and affects the nature of a TMT’s cognitive frame toward innovation.

At one extreme, an inelastic identity offers little interpretive variation between the conceptualization of “who we are” and the meanings of the organization’s core activities and products, or “what we do.” For instance, Polaroid maintained a tightly coupled, inelastic identity until its demise. Even after substantial investment in digital innovation, Polaroid’s TMT was unable to decouple its sense of “who we are” from the type of film it produced (Gavetti, 2005; Tripsas and Gavetti, 2000). Similarly, although Kodak developed some of the first digital cameras (Lucas and Goh, 2009), the Kodak engineer who invented one of the first digital cameras recalled: “It was filmless photography, so management’s reaction was, ‘that’s cute—but don’t tell anyone about it.’” (Deutsch, 2008: C1). More broadly, Kogut and Zander (1996: 502) theorized that organizational identities can lead firms to “rule out potentially interesting avenues for innovation” because organizational identity reinforces the firm’s existing products and internal coordinating structures. Thus when a firm’s core products are too tightly coupled to “who we are,” the identity remains inelastic and the TMT’s cognitive frame is contracted.

Alternatively, when an organization's identity is more elastic, "who we are" and "what we do" are more loosely coupled. Weick (1976: 3) described loose coupling as "a situation in which elements are responsive, but retain evidence of separateness and identity." The contrast between an inelastic and an elastic identity filter is evident in the contrasting decisions made by Blockbuster and Netflix when both were confronted with online streaming technology. As illustrated in our earlier example, Blockbuster persistently defined itself ("who we are") as a 'brick-and-mortar video rental service' ("what we do"), proudly citing the number of stores located across the United States as a core performance metric. In contrast, Netflix caught criticism for having "a bit of an identity crisis" (Reisinger, 2012) when it expanded its identity to be an 'entertainment subscription service' while many users still saw it as a DVD rental company. However, by treating the identity elements of "who we are" and "what we do" as related but not interchangeable, Netflix capably expanded how it framed new non-incremental innovations, while Blockbuster's tight coupling of these two elements reinforced a contracted lens.

When a TMT's sense of "who we are" is less elastic, a narrower set of alternatives will be perceived as legitimate and the incumbent firm's TMT will view the innovation through a more contracted cognitive frame. The Figure's concentric circles illustrate the varying degrees of elasticity between these elements and illustrate how identity filters the incumbent TMT's cognitive framing lens. We propose:

Proposition 1b: TMTs who view their organization's identity as less elastic are more likely to cognitively frame a non-incremental innovation through a contracted framing lens.

Competitive boundary filter: narrower vs. wider scanning

Finally, a TMT's cognitive framing of a non-incremental innovation is filtered by its conceptualization of the firm's competitive boundaries. Competitive boundary scanning affects

the TMT's search for strategic growth opportunities (Gavetti and Levinthal, 2000; Hambrick, 1982; Miles and Snow, 1978). TMTs who scan a wider landscape of their competitive environment develop a more expansive cognitive frame; alternatively, those who scan a narrower competitive landscape have a more contracted frame. According to Peteraf and Bergen (2003: 1028), incumbent TMTs face cognitive limitations that constrict their ability to expand the notions of their competitive terrain:

When it comes to recognizing rivals, managers are notoriously myopic (Levitt, 1960). Left to their own devices, they notice only competitors that are relatively close in terms of product type, geography, and other salient characteristics (Porac and Thomas, 1990). They pay attention to a few close rivals, but ignore others only barely more distant (Lant and Baum, 1995). As a consequence, they are likely to be blindsided by rivalry coming from unexpected quarters (Zajac and Bazerman, 1991).

The implications of competitive boundary scanning on TMT cognitive framing are most noticeable when TMTs scan their competitive environment for common innovation adoption decisions within their field of reference (Raffaelli and Glynn, 2014; Westphal, Gulati, and Shortell, 1997). Competitors perceived to be consistent or aligned with the firm's competitive boundaries are favored, while those that lie outside the perceived boundaries tend to be de-legitimated, de-valued, or rejected (Benner, 2010; Porac and Thomas, 1990). A TMT's perception of membership in larger categories of meaning is dependent on their ability to scan and then associate competition within an industry or field as being "of a particular type" (e.g., Hsu and Hannan, 2005; Navis and Glynn, 2010; Porac, Thomas, and Baden Fuller, 1989; Zuckerman, 1999). For example, Benner and Tripsas's (2012) work in the nascent digital camera industry showed how prior industry affiliation constrained incumbents' ability to strategically move into a related strategic space. Thus TMTs who view the field through more "focused scanning techniques" (Peteraf and Bergen, 2003: 1029) are more likely to approach non-incremental innovations through a contracted cognitive framing lens. We propose:

Proposition 1c: TMTs who narrow their competitive boundary scanning are more likely to cognitively frame a non-incremental innovation through a contracted framing lens.

In all, a TMT's cognitive framing of a non-incremental innovation is filtered through three distinct, but nonetheless related elements: capability development, organizational identity, and competitive boundary scanning. Because internal and external inertial forces on incumbent firms push TMTs toward more contracted framing lenses, TMTs are more likely to perceive and conceptualize non-incremental innovations as being misaligned with their current business model. The TMT's decision to adopt non-innovations is dependent on their ability to shift an initial contracted cognitive frame and expand it to accommodate non-incremental innovations. To accommodate shifts toward a more expanded frame, we theorize the need for *frame flexibility* in order to host non-incremental innovations.

TMT frame flexibility

Whereas the three filters discussed above often contract framing, our model points to the possibility of flexible framing. Frame flexibility, we argue, is the TMT's ability to reframe an innovation's categorical classification relative to those three preexisting filters typically used to evaluate innovations. Prior models of strategic choice have limited the classification of non-incremental innovations to a simple binary determination of whether (or not) a target innovation is consistent (or inconsistent) with an established cognitive frame (e.g., Sull, 1999; Tripsas and Gavetti, 2000). Innovation choices perceived to be aligned with the current organizational model are favored, while those that lie outside tend to be rejected. We suggest that framing shifts are made possible by the TMT's ability to categorize and label the non-incremental innovation within a classification system that accommodates the innovation in the firm's historical context. Frame flexibility is a process facilitated by the TMTs ability "to locate, perceive, identify, and label" events or choices (Goffman, 1974: 21) and guide decision-making (Huff, 1982).

In the section that follows, we suggest that the TMT's categorical classification of a non-incremental innovation is a critical element linking a more expanded cognitive frame to innovation adoption. Such TMT frame flexibility informs and realigns their interpretation of the innovation within the firm's existing organizational architecture and past strategic decisions (e.g., Greenwood and Hinings, 1988; Gulati *et al.*, 2012; Schreyögg and Sydow, 2010).

Categorical classification of the non-incremental innovation

Categorical classification schemes shape how novel objects of interest (e.g., non-incremental innovations) fit within an existing cognitive frame (Mervis and Rosch, 1981) and provide a bandwidth of “acceptable” variation. Classification boundaries, defined by prototypical representativeness, set up the rules for categorical inclusion and exclusion at different categorization levels in a classification hierarchy. These classifications make the implications of adopting a non-incremental innovation clearer for the strategic positioning of the firm. Such bandwidth affords more or less latitude in claiming organizational membership categories (e.g., Glynn and Abzug, 2002) and furnishes the parameters for the ways in which a cognitive frame can be stretched legitimately.

Mervis and Rosch (1981) defined three key levels of vertical inclusion that describe classification hierarchies: (1) a *specific*, subordinate level, having more domain specificity and concreteness (e.g., a dining room table; a bedside table; a coffee table); (2) an *intermediate* level, consisting of the most typical and most used categories (e.g., a table); and (3) an *abstract* superordinate level, located above the intermediate level and having lower domain specificity and greater abstractness (e.g., a piece of furniture). In construing a cognitive frame related to innovation adoption, the TMT makes two assessments: one, determining where the salient category is in the hierarchy, i.e., specific, intermediate, or abstract; and two, assessing the fitness

of the firm as a prototype for that category. At higher taxonomic levels, cognitive frames tend to be less domain-specific than at lower ones; this was illustrated, for instance, in Fuji's shift from the subordinate category of film to the superordinate category of "imaging and information" (Tripsas, 2009: 455), as well as IBM's ability to embrace LCD flat panel technology after shifting to a superordinate "flexible, business-case oriented framing" (Eggers, 2016: 1590). As an organization moves its understanding of the firm up the classification hierarchy, from a more specific (subordinate) to a more abstract (superordinate) categorization, prototype representativeness widens to encompass the subordinate categories that sit below it. Doing so allows more diversity in prototypicality at higher levels (e.g., Netflix's aim to produce 'online entertainment' evoked a more abstract classification than 'DVD-by-mail subscription services').

TMTs who engage in more specific framing position the firm at a more subordinate level and take a more limited (or narrow) view of what constitutes appropriate membership. Under this condition, cognitive frames become fixed when the TMT construes the frame in terms of a subordinate level of classification. As a result, the TMT is less likely to expand the initially contracted lens through which it perceived the firm's capabilities, identity, and competitive boundaries. This was evident, for instance, at Kodak where the TMT struggled to move beyond a specific classification as 'a film company' (rather than imaging) because they perceived digital film production as unassociated with chemical film processing (Swasy, 1997). Likewise, Blockbuster's TMTs deferred to a specific classification as a 'brick-and-mortar video retailer' and were unable to embrace the capabilities and organizational architectures required to deliver the same content to their existing customers across multiple distribution channels (O'Reilly and Tushman, 2016). At these lower taxonomic hierarchies, a TMT's cognitive frame for innovation tends to be more domain specific, more concrete, and less flexible. Prototypes narrow as a TMTs

cognitive frame moves down the hierarchy to more specific subordinate levels, such as sailboat maker Linjett's decision to shift from a 'boat manufacturer' to focusing more specifically on 'custom sailing yacht' production (Adner and Snow, 2010). Thus specific subordinate classifications embody fixed, domain-specific, cognitive frames.

Alternatively, prior research has shown that intermediate levels of categorization classification are the most effective in helping organizations adapt to environmental change because they are "both rich enough to provide useful information and distinct enough to be nonredundant" (Porac and Thomas, 1990: 232). By adopting an intermediate classification, TMTs re-position the firm, moving it up or down in the taxonomic classification hierarchy (Mervis and Rosch, 1981). This makes frame flexibility possible. TMTs who engage in flexible framing categorically position the firm at an intermediate, but relatively more abstract level, allowing them to view a wider set of organizational offerings (or potential innovations) as fitting within the category. Rather than being too specific (i.e., fixed) or too abstract (i.e., ambiguous), intermediate claims to the classification taxonomy allow for flexibility in the hands of the TMT.

The TMT accomplishes frame flexibility by matching the innovation to a cognitive referent that they, as well as customers, partners, analysts, and employees come to "automatically recognize" as being the epitome of a category in which the firm operates (Santos and Eisenhardt, 2009: 649). This involves associating the firm with prototypes or exemplars that best represent the category identified. Prototypes are more than lists of particular framing attributes, but rather, "fuzzy sets" that encapsulate the key features of group membership (Hogg and Terry, 2000: 123). Well-known examples of prototypical representatives are Corning in glass manufacturing and, at one time, IBM in computing, software, and services. Both firms expanded

upon an initial product offering (e.g., glass light bulbs, mainframes) to later serve as a representative of much larger category.

We propose that the expansion of a cognitive framing lens must, in turn, be coupled with a classification of the non-incremental innovation in a way that is neither too specific nor too abstract. Such intermediate classifications permit the non-incremental innovation to be connected to, but different from, extant innovation. For instance, Amazon was founded in 1995 as an online bookstore, but in the decade that followed, the TMT adopted a flexible frame that helped justify an expansion into a variety of retail goods, internet streaming services, eBooks, tablet hardware production, and cloud computing. During each shift, Amazon's flexible frame never anchored the TMT's view of the organization on one specific good or service (i.e., bookselling), but rather on a primary goal of creating a highly customer-centric and low-cost online commerce platform. Similarly, post 9/11, the Federal Bureau of Investigation (FBI) reclassified its hierarchical frame away from "law enforcement" and, instead, to a "threat-based, intelligence-led" agency. To complement this intermediate categorical framing, the FBI Director embedded new capabilities and an identity into local field offices that allowed for law enforcement and cyber-terrorism capabilities to coexist (Gulati *et al.*, 2016). And Martha Stewart claimed a more flexible frame in naming her business Martha Stewart Living Omnimedia to reflect a focus on "lifestyle" that could transcend specific domains of life and be disseminated across multiple media channels that each required novel capabilities to grow (e.g., magazines, books, television and radio programming, and online activities) (Glynn, 2011; Glynn and Dowd, 2008). In these and other cases (e.g., Eggers, 2016), TMTs are shown to have flexibly expanded their cognitive frames to embed new innovations in an intermediate classification. Doing so blanketed an array of products and offerings that actors inside and outside the firm could interpret as consistent with

the TMT's stated strategy. However, TMTs must also set cognitive boundaries to avoid too much abstraction so as to prevent ambiguity or confusion about how to categorize the organization.

Frame flexibility occurs when the TMT holds a cognitive frame that includes an intermediate level of classification that reconciles preexisting cognitive inconsistencies about the firm's existing capabilities, organizational identity, and competitive boundaries. While each dimension ascribes meaning to a cognitive frame, a flexible frame allows for an interpretation of innovations that can be held together under a cohesive intermediate classification that is neither too specific (i.e., fixed) nor too abstract (i.e., ambiguous). We propose:

Proposition 2a: TMTs who classify a non-incremental innovation as a representative prototype of an intermediate hierarchical category are more likely to develop a flexible cognitive frame.

Proposition 2b: TMTs who classify a non-incremental innovation as a representative prototype of a specific hierarchical category are more likely to develop a fixed cognitive frame.

Proposition 2c: TMTs who classify a non-incremental innovation as a representative prototype of an abstract hierarchical category are more likely to develop an ambiguous cognitive frame.

Emotional framing

In addition to cognitive framing, a TMT's decision to adopt a new innovation also involves emotional framing (e.g., Vuori and Huy, 2016). In studying social movements, Robnett (2004: 195) identified a key role for emotions and, especially emotional resonance, i.e., “the degree of ‘emotional harmony’ between ideology, practices...or frames.” This line of research has shown that emotional arousal, displays, and identification are critical to organizational change (Davis *et al.*, 2008). Giorgi (2017: 724) theorized that framing needs to achieve “emotional embeddedness in its institutional or organizational setting...[to] evoke emotions that are in line with a predominant institutional ethos...or an organization’s culture.” As such, emotional framing involves alignment between symbols and more enduring themes (Gamson, 1988) that make a

non-incremental innovation feel emotionally engaging and sensible. Social movement research has shown how cognitive frames elicit positive emotions when they resonate with participants' values, beliefs, and ideas and reinforce existing cultural narratives and understandings (e.g., Robnett, 2004; Thoits, 1989). Likewise, when TMTs link non-incremental innovations to extant organizational values and beliefs, they tap into existing emotional aspirations (Voronov and Vince, 2012; Voronov and Weber, 2016) and increase the likelihood of innovation adoption.

Emotional framing helps resolve inconsistent organizational capabilities, identities, and competitive membership associated with inflexible cognitive frames (e.g., Gilbert, 2006; Gupta, Smith, and Shalley, 2006; Tripsas, 2009) by linking a non-incremental innovation with an emotionally engaging vision (e.g., Rotemberg and Saloner, 2000; Van den Steen, 2005). Building on Selznick's (1957: 17) notion of "infusing the organization with value," emotional framing enables the positioning of the non-incremental innovation within the context of the firm's history and normative values. Likewise, Ravasi and Schultz (2006) and Rindova, Dalpiaz and Ravasi (2011) demonstrated how framing anchored in opportunity narratives facilitates positive emotional responses to organizational change. For example, Fuji's TMT was able to articulate an emotionally-resonant vision of change rooted in a set of values associated with being a world-class 'imaging and information' company (Tripsas, 2013).

When individuals are exposed to novelty, they assign "affective tags" to their evaluative appraisals (Fiske and Pavelchak, 1986: 171). Dutton and Jackson (1987: 82) demonstrated the relevance of such evaluative appraisals to strategic issue responses, observing that "evaluative appraisals are the affective components of cognitions...[and] may attract people to become associated with an opportunity and repel people from becoming involved with an issue labeled a threat." Alternatively, Gilbert (2005) observed how incumbent print media firms failed to change

strategies in response to web media because of emotionally resonant threat perceptions that emerged from individual self-narratives. Such threat narratives trigger affective responses of avoidance (Hodgkinson and Healey, 2011). Thus striking a responsive chord, or being emotionally resonant (Giorgi, 2017; Snow *et al.*, 1986), we argue, is key for effective framing by the TMT and, in turn, their strategic decision to adopt a non-incremental innovation.

A decision to adopt a non-incremental innovation, with its associated capability, identity, competitive boundary challenges, depends on whether the cognitive frame resonates emotionally as an opportunity with the TMT (Gilbert, 2005; Tripsas, 2009), as well as with members of the extended leadership team consisting of the TMT's direct reports and other upper-level middle managers. We include the extended team in our theorizing because their emotional responses and interactions with the TMT are critical to innovation adoption decisions (Garud, Tuetscher, and Van de Ven, 2013; Tripsas and Gavetti, 2000; Vuori and Huy, 2016). If a non-incremental innovation is coded as a threat by the extended team, threat-rigidity dynamics (Staw, Sandelands, and Dutton, 1981) sabotage adoption. Danneels' (2011) account of how Smith-Corona's failure to adapt to the rise of desktop computing illustrated how its members were unable shift resources toward new capabilities because of an entrenched cognitive frame anchored to typewriters and an emotional resistance to selling other office supplies. And Gilbert (2006) showed how competing cognitive frames of threat and opportunity led to the collapse of several newspapers in the wake of online news. Thus we argue that the emotional framing associated with a non-incremental innovation affects how the TMT and its extended team will resonate with a non-incremental innovation.

Emotional frames and innovation adoption

When TMTs attach an emotionally engaging aspiration to a non-incremental innovation, doing so permits, justifies, and contextualizes a more flexible cognitive frame. We theorize that cognitive and emotional frames are inextricably related to innovation adoption decisions. Relatedly, Rindova and Petkova (2007: 220) found that both emotional and cognitive factors influence how consumers perceive the potential value of novel products and innovations, noting that cognition and emotion are “intertwined in the process of forming perceptions of the value of a product innovation.” We posit a similar cognitive and emotional interaction, but, rather than only considering external audiences, our model also takes the perspective of key organization members inside the firm. For example, the Ball Corporation, which started as a bucket company in 1880, innovated into glass, aluminum, and plastics containers over time. Across these different businesses the TMT adopted a more flexible intermediate cognitive frame as a “world-class container company.” And by touting an emotionally resonant slogan, “We Can!”, the TMT’s cognitive and emotional frames helped its extended team members interpret technological transitions as opportunities rather than as threats (Tushman and O'Reilly, 2002). Alternatively, negative emotional frames are likely to overpower positive ones (Baumeister *et al.*, 2001). For instance, Vuori and Huy (2016) illustrated how internally-focused fear left Nokia’s TMT and its middle managers unable to innovate in response to Apple’s iPhone. Especially during periods of technological ferment, emotional frames are attached in the organization’s past strategy and, as a result, push organizational members to revert to overlearned behaviors (e.g., Siggelkow, 2001).

Emotional frames, however, may not always initially resonate as a threat or opportunity among the TMT and their extended team members. Because non-incremental innovations are laden with uncertainty and have the potential to positively or negatively affect various aspects of an organization’s existing social systems (Henderson and Clark, 1990; Kanter, 1988), adoption

decisions can trigger emotional ambivalence (Ashforth *et al.*, 2014; Merton and Barber, 1976).

In fact, the anticipated prospect of change in the wake of non-incremental innovation adoption may leave some organizational members with “a fundamental ambivalence about what is often called ‘innovation’ or even ‘progress’” (Eisenhardt, 2000: 703). If the TMT fails to cultivate an emotionally resonant frame, ambivalence will trigger undesirable emotional responses from members of the extended team (e.g., Huy, Corley, and Kraatz, 2014; Piderit, 2000; Smith, Binns, and Tushman, 2010) that will impede adoption.

In sum, innovation adoption is influenced by both cognitive and emotional framing.

Absent TMT framing that fosters emotional engagement, the extended leadership team is less likely to engage in the work necessary to execute a more flexible cognitive frame. We propose:

Proposition 3a: Non-incremental innovations that emotionally resonate as an opportunity among the TMT and members of the extended management team are more likely to be adopted.

Proposition 3b: Non-incremental innovations that emotionally resonate as a threat among the TMT and members of the extended management team are less likely to be adopted.

Proposition 3c: Non-incremental innovations that emotionally resonate as ambivalent among the TMT and members of the extended management team are less likely to be adopted.

How frame flexibility affects innovation adoption decisions over time

TMTs can learn from prior successes and failures in making adoption decisions (Hambrick and Mason, 1984; Levitt and March, 1988; Starbuck and Milliken, 1988). Over time, senior teams develop their capabilities for cognitive and emotional framing (and re-framing). Like other forms of capability development, we suggest that TMTs develop, manage, and hone their ability to develop more flexible frames over time as one cycle affects the next. Helfat and Peteraf (2015) explicate how cognition serves as an important microfoundation of dynamic capabilities. They suggest that processes of sensing, seizing and reconfiguring dynamic capabilities are associated

with a managerial cognitive capability – defined as “the capacity of an individual manager to perform one or more of the mental activities that comprise cognition” (Helfat and Peteraf, 2015: 835). Likewise, we posit that TMTs utilize feedback from previous experience to consider current options for innovation adoption over time (March and Olsen, 1976).

Developing the TMT’s capability to manage the work of framing – and ultimately, the potential to effectively expand frames cognitively and emotionally – provides strategic flexibility for the firm. Such processes occur when TMTs leverage past experience to develop strategic capabilities and learn (e.g., Adler and Clark, 1991; Argote, McEvily, and Reagans, 2003; Argyris, 1976). Weigelt and Sarkar (2009: 52) argued that firms “face knowledge hurdles when adopting certain types of innovation, partly because adoption-enabling knowledge is experiential and based on learning.” For example, they found that the adoption of e-banking solutions among credit unions was facilitated by learning to exploit external knowledge through marketing efforts.

We argue that a TMT’s ability to engage in more flexible framing is contingent on adaptive learning processes that foster TMT experimentation with more abstract cognitive frames and are anchored on an emotionally engaging aspiration. These processes are dependent upon the TMT’s ability to develop capabilities and construe an organizational identity that are perceived to be consistent with the organization’s competitive boundaries. For example, Tushman and O’Reilly (2002) illustrated how USA Today’s TMT, after several attempts to implement digitized content in the context of print content, was able to articulate an intermediate frame for their organization (e.g., “the world’s leading news organization”) and create a set of processes that permitted the organization to leverage its content across platforms in a way to enhance its brand. Alternatively, Time Warner’s TMT held a contracted cognitive frame that was unable to reconcile inconsistent capabilities and identities required to develop TIME magazine’s

print and digital news content. As a result, the TMT was unable to develop a flexible categorization frame that might have engendered a more intermediate superordinate level classification for TIME magazine alongside Time Warner's other television and online media offerings. TIME magazine was eventually spun-off, turning the magazine back into an independent property (Smith, 2016). The effect of this inconsistency was to embrace new capabilities but without an intermediate cognitive frame. As such, the TMT was unable to embrace an overarching identity and clear definition of their competitive boundaries. Consequently, without TMT learning, cognitive and emotional frames are likely to be reinforced and unchanged over time.

In addition, a TMT's ability to engage in frame expansion is related to its ability to reach consensus on the appropriateness of adopting an innovation. Because frame flexibility furnishes a reference for adoption decisions, TMT consensus is more achievable. Attewell's (1992: 6) work on accumulated learning highlighted how TMTs develop knowledge contingent on "individual insights and skills becom[ing] embodied in organizational routines, practices, and beliefs that outlast the presence of the originating individual." Past non-incremental innovation adoption decisions that emotionally resonate throughout the organization as an opportunity are likely to engender support for future innovations. Fiske and Pavelchak (1986: 196) illustrate how such recursive patterns reinforce group consensus building over time:

When certain decisions are made regularly, groups may develop consensual ways to categorize the entity.... Consensus on categorization may or may not emerge as a result of group interaction, but lack of consensus would be most problematic if alternative views were evaluatively (rather than descriptively) inconsistent.

Alternatively, if the TMT maintains a fixed or ambiguous frame over time, individual members are likely to retrench into their individual interpretive schemes, akin to the separate and distinct

“thought worlds” that have been shown to prevent consensus on innovation adoption decisions (Dougherty, 1992: 179).

Not only does frame flexibility contribute to organizational learning that accumulates across cycles of innovation adoption, it can also provide immediate performance benefits to the TMT within each cycle. For instance, flexible framing allows novelty to penetrate the organization and is likely to promote experimentation (Thomke, 1998; Weigelt and Sarkar, 2009). Effective experimentation encompasses both near-term success and failure as “equally important for [organizational] learning” in the context of innovation adoption (Thomke, 2003: 2). As the extended team continues to experiment, effective TMTs will engage in flexible (re)framing based on performance feedback from these experiments. Thus when a TMT fosters flexible cognitive and emotion frames that resonate with extended team members, both groups are more likely to engage in productive and straightforward dialogue about the intermediate challenges and opportunities that may come from integrating the innovation into the organization’s existing processes, structures, and value systems.

To summarize, we posit that TMTs who develop the capability for flexible framing in innovation decisions over time will learn from their experiences. This learning is associated with consensual mental models that positively emotionally resonate in the organization. We propose:

Proposition 4: Over time, TMTs who develop flexible frames with positive emotional resonance are more likely to successfully learn from their prior non-incremental innovation adoption experiences.

DISCUSSION AND IMPLICATIONS

Organizations continuously face decisions about whether or not to adopt non-incremental innovations. As technologies evolve, failing to innovate has a significant impact on a firm’s ability to compete (Nelson and Winter, 1982; O'Reilly and Tushman, 2016). Often, however,

organizations do not adopt an innovation even when they have the organizational capacity to do so, or they develop innovations they cannot execute (e.g., Benner and Tushman, 2015; Christensen, 1997). These challenges are accentuated when the innovation violates a long-standing view of the organization's strategy (Sull, 1999), a prior history of success (Lucas and Goh, 2009) or embedded institutional norms (Fox-Wolfgramm, Boal, and Hunt, 1998).

Although these factors are important, we have argued that a distinct source of incumbent inertia (Hill and Rothaermel, 2003) is rooted in cognitive and emotional framing. Frames "shape the organization's dedication of scarce resources to one capability or another (Laamanen and Wallin, 2009),...[a] central task of strategic management (Bower, 1970)" (Eggers and Kaplan, 2013: 313). But the interplay of cognitive and emotional framing has largely been omitted in accounts related to non-incremental innovation adoption in incumbent firms (Vuori and Huy, 2016). To address this theoretical gap, we advanced a model revealing the role of framing in non-incremental innovation adoption, exploring how TMT frames affect the perceived goodness-of-fit (Siggelkow, 2001) and emotional resonance (Giorgi, 2017) of innovations, which ultimately affects innovation adoption decisions. Moreover, we proposed that the effects of these processes accumulate over time, as the TMT's attention to, and reflection on, individual adoption decisions build capabilities for effective cognitive and emotional framing and broaden the diversity of innovations adopted by an organization. Our model has implications for both theory and practice.

Theoretical implications

The primary goal of this article is to strengthen the theoretical bridges between the domains of strategy, innovation, and managerial framing. We believe our work advances theory in several significant ways. First, we contribute to a rich stream of research on innovation adoption and

TMT decision making by theorizing how framing flexibility (or contraction) informs managerial choices about whether (or not) to adopt an innovation. By explicating a theoretical model that attends to the process of framing, we answer calls to further open “the proverbial black box” that “still remain[s] largely a mystery” within the literature on TMT strategic decision making (Bromiley and Rau, 2016; Hambrick, 2007: 337) and several consequential effects on firms.

First, at key junctures in product class evolution, the movement toward a more flexible frame, and in turn, innovation adoption, may have significant survival value for the firm. For instance, at the closing of industry standards or at the initiation of non-incremental technical change, the ability to develop a flexible frame relative to a new innovation permits TMTs to more accurately understand strategic options and permits members of the firm and external constituents to better understand and execute strategic shifts. When such strategic junctures occur, the TMT’s ability to flexibly reframe the firm’s existing capabilities, organizational identity, and boundaries is particularly important because it helps those in the organization conceptualize and emotionally resonate with technological shifts as connected with opportunities (as opposed to threats) (e.g., Gilbert, 2006; Sull, 1999).

Second, our treatment of framing affords new insights for cognition scholarship. We theorize that cognitive frames not may be fixed, but instead, may be flexible and mutable over time. Prior conceptualizations of cognitive frames have focused on frames “as ‘things,’ rather than on the dynamic processes associated with their social construction, negotiation, contestation, and transformation” (Benford, 1997: 415 in Croteau & Hicks, 2003). Our theorization and application of cognitive flexibility attends to calls within the strategy literature to more fully account for how and why cognitive frames influence the competitive dynamics of strategic decision making within the firm (Helfat and Peteraf, 2015; Livengood and Reger,

2010). To this end, our work exposes how cognitive flexibility is influenced by three specific forms of TMT cognition related to capability development, organizational identity elasticity, and competitive boundary construction. Together, these aspects influence and shape how the TMT cognitively classifies the innovation. We theorize that cognitive framing, like other dynamic managerial capabilities, requires “managing, or ‘orchestrating,’ the firm’s resources to address and shape rapidly changing business environments” (Teece, 2014: 328). More specifically, we explicate how a TMT’s cognitive frame influences innovation decisions and how the active management of this process has substantial strategic value for the firm. Our notion of flexible framing extends Smircich and Stubbart’s (1985) classic work that prescribed a firm’s environment as socially constructed and enacted, rather than objective. Similarly, our paper implies strategic capabilities are socially constructed and enacted by the TMT, as opposed to current orthodoxy that often still casts them as purely objective.

Third, we extend current notions of strategic framing to include a role for emotions. While cognitive framing of innovations and organizational capabilities is necessary, we argue it is insufficient for TMT innovation adoption. We theorize that more flexible cognitive framing must also be coupled with emotional engagement among members of the extended team. Because multiple cognitive frames co-exist when incumbent firms execute non-incremental innovation, this emotional engagement helps organizational members make sense of the innovation in the context of the firm’s history. Such emotional engagement helps employees take pride in the past even as they help create a new future. For example, at NASA Life Sciences, the shift from “doing great research” to “keeping astronauts safe in space” helped scientists emotionally engage in open innovation as another tool to complement their traditional scientific methods (Lifshitz-Assaf, 2017). Thus our model addresses how “thinking” (cognitive framing)

and “feeling” (emotional framing) facilitate non-incremental adoption decisions. In doing so, we answer calls in the innovation literature to explore the underlying micro-mechanisms that underpin how individuals and teams balance decision-making processes related to exploration and exploitation (Gupta *et al.*, 2006). When TMTs are able to develop a flexible and emotionally engaging frame, it can guide proactive change in either shaping dominant technological designs or initiating competence destroying technical change (Benner and Tushman, 2015).

Under a range of conditions, the infusion of organizations with appropriate meaning and emotional resonance (Pfeffer, 1981; Selznick, 1957; Weick, 1979) may be as strategically important as the content of the strategy itself (e.g., Glynn, 2000). Recent work has exposed the salience of cognition and capability development (Eggers and Kaplan, 2013), highlighting the importance of aligning managerial beliefs with market opportunities. If so, those more traditional analytic strategic capabilities found within the TMT must be complemented with the ability to function as skilled cultural operators in managing cognitive framing, along with affect and emotion (e.g., Huy, 2002).

An agenda for future research

We seek to provoke new research that links cognition and emotion to innovation, especially from a strategy perspective. While our theorization focuses primarily on the relationship between innovation and framing, we do not mean to suggest that cognitive and emotional frames are the entire explanation for adoption. Technical factors, such as whether the innovation is competency-enhancing or competency-destroying (Tushman & Anderson, 1986), will certainly impact the TMT’s willingness to engage in explorative innovation activity and consider new adoptions. Structural factors, such as functional differentiation and team size, have been shown to influence adoption decisions (Kimberly and Evanisko, 1981). And institutional factors related to the

“increased density of interaction, information flows, and membership identification” (DiMaggio and Powell, 1983: 148) among actors within and outside the organization are likely to be influenced by various normative, regulative, and socio-cognitive aspects of innovation diffusion (Kennedy and Fiss, 2009; Scott, 2008). Parsing out how these factors are related to framing flexibility could lead to promising theoretical and empirical pathways for future research. We outline several possibilities below.

An organization’s performance context is likely to affect the nature of frame flexibility, and future research looking into proactive or reactive innovation adoption and TMT framing would be worthwhile. Organizations often proactively adopt innovations to initiate technological discontinuities for potential strategic gain before they are forced to (e.g., Adner, 2012; O'Reilly and Tushman, 2013); alternatively, firms must sometimes move reactively, under performance shortfall conditions, to their competitor’s strategic moves (e.g., Rosenbloom and Christensen, 1994; Siggelkow, 2001). The ordering of cognitive and emotional framing (e.g., Fiske and Pavelchak, 1986) and innovation adoption may be contingent on whether the shifts are initiated opportunistically or reactively. When there is no crisis, those more effective proactive technological transitions may be initiated by shifts in cognitive framing. In contrast, it may be that reactive crises, driven by technological transitions, are initiated by shifts in emotional frames (e.g., Gulati et al., 2016).

Research that explores the sequencing and interaction of cognitive and emotional framing in the context of innovation adoption could entice scholars from multiple domains to collaborate. For example, it would be useful to examine how cognitive and emotional frames spread or become shared among members of the TMT. Not all TMT members may initially agree on the organization’s capability orientation, degree of identity elasticity, or competitive landscape.

Delving into the group processes and negotiations that enable team members to change orientations and alter these factors could be especially promising.

Relatedly, framing flexibility opens up several new avenues to extend research on senior team decision making (Finkelstein *et al.*, 2009; Hambrick and Mason, 1984). We foresee empirical work that tackles how senior team heterogeneity (Hambrick, Cho, and Chen, 1996), team knowledge diversity (Fichman and Kemerer, 1997), participative decision-making cultures (Hurley and Hult, 1998), and prior experience dealing with strategic contradiction (Smith, 2014; Smith and Tracey, 2016), interact with TMT flexible framing. Exploring relationships among TMT composition, tenure, and frame flexibility would be especially worthy of investigation. For example, while scholars have argued that TMTs with longer tenures are less likely to make decisions that promote organizational adaption (Hambrick and Fukutomi, 1991), TMTs with more frame flexibility may be able to overcome or prolong some of these challenges in the context of innovation adoption.

Research on informational exchange and collaboration on TMT teams has shown to have positive effects on senior team product development decisions, but is moderated by TMT diversity (Boone and Hendriks, 2009). We anticipate similar aspects could affect the TMT's framing capabilities. Understanding how these and other TMT demographics (see Carpenter, Geletkanycz, and Sanders, 2004) might expand or contract TMT frame flexibility, and whether such interactions eventually reach optimal inflection points for effective decision-making, would be a useful way to extend research on upper echelons theory.

Another pathway for future research will be to explore how frame flexibility and emotional resonance interact with different forms of organizational structures and architectures (Burns and Stalker, 1961; Galbraith, 1995; Nadler and Tushman, 1997). For instance, because

matrixed organizations require higher levels of functional and divisional integration, TMT frame flexibility may help non-incremental innovations diffuse more readily to extended team members. Relatedly, research on structural ambidexterity suggests that contradictory or competing frames are best managed and housed within the TMT (Smith and Tushman, 2005). But scholars also have proposed contextual ambidexterity as a structural solution to encourage exploitation and exploration at the individual or business-unit level (Gibson and Birkinshaw, 2004). Although our model has theorized a role for flexible framing at the TMT level, it would be worth considering what framing flexibility might look like in an environment where contextual ambidexterity is the norm.

Finally, our conceptual model assumes that the adoption of an innovation is in the best interest of the adopting firm (e.g., Gopalakrishnan and Damanpour, 1997; Kimberly, 1981; Rogers, 1995), but this may not always be the case. Future empirical work could explore the conditions where a fixed or ambiguous cognitive frame might be a viable and appropriate response. For example, some successful incumbent firms chose *not* to adopt a non-incremental innovation (e.g., Henderson, 1995; Raffaelli, 2018). Our model is also agnostic about whether TMTs should manage cognitive and emotional frames differently depending on whether the non-incremental innovation originates from an exogenous or endogenous source.

Scholars will be tasked with operationalizing and testing the various aspects of our model. Here we offer some initial ideas to advance data collection and analysis related to TMT frame flexibility. We believe that the study of innovation and frame flexibility is well suited for both qualitative and quantitative methodological inquiry. To date, the bulk of innovation studies that have incorporated cognition has been qualitative in nature (e.g., Danneels, 2011; Gilbert, 2006; Porac, Thomas, and Baden-Fuller, 2011). Building on this tradition, we see value in

studies that use non-participant observation to follow how TMTs develop, maintain, or shift cognitive frames when making innovation adoption decisions. Alternatively, more research employing mixed methods would be beneficial (Tunarosa and Glynn, 2017). For example, scholars might pair field observations with surveys to evaluate patterns of TMT frame flexibility over time. Of particular interest would be to test for shifts in frames in multiple firms by industry, moments in history, or a specific type of innovation challenge.

We anticipate that the study of frame flexibility could rely on several forms of data collection. For instance, archival textual analysis of mission statements, company logos and annual reports will serve as viable sources of data (Eggers and Kaplan, 2013). Using methods such as linguistic category modeling (Semin and Fiedler, 1991) or topic modeling could be especially useful in tracking how the language in these data sources vary in level of abstraction (e.g., Reyt and Wiesenfeld, 2015). Alternatively, data related to the products and technologies that categorize legacy as well as the future may be most easily accessible through external company announcements of new products, services, patent filings, or alliance partnerships. Archival sources of company data that report early stage research and development allocations may also prove suitable, especially for evaluating how framing flexibility influences the adoption of innovations that are incubated within the organization, but are never fully adopted.

A helpful instrument to measure perceptions of the relationship between frame flexibility and strategy might be an adaptation of one used to assess the perceived degree of overlap between an individual's identity and that of the organization by using a series of overlapping circles (e.g., Bergami and Bagozzi, 2000). Similar tools might capture the degree of intersection between the TMT's perception of a new non-incremental innovation with the firm's existing innovations. Such perceptions could then be evaluated against other established empirical

measures or techniques associated with shifts in organizational identity and member identification (e.g., Brickson, 2007; Mael and Ashforth, 1992), perceptions of the firm's competitive boundaries (e.g., Kennedy, 2008; Whittington *et al.*, 1999), or a willingness to entertain contradictory capabilities (e.g., Gatignon *et al.*, 2002; Schad *et al.*, 2016).

Opportunities for longitudinal empirical work are especially plentiful should scholars follow the evolution of firms that have adopted multiple innovations over time. For example, Intel successfully moved from making memory to computer processors, and in doing so reshaped the performance landscape of the entire micro-computing industry. Such work would be especially relevant to recent calls for research on how senior teams search and shape performance outcomes in dynamic business landscapes (Gavetti, Helfat, and Marengo, 2017).

Drawing from Selznick's (1957) work on value infusion, emotional framing flexibility might be found in normative value claims associated with the organization's character (e.g., Dutton and Dukerich, 1991), claims for consistency or continuity over time (e.g., Schultz and Hernes, 2013), and collectivity or integrity of the organization as a whole (e.g., Raffaelli and Glynn, 2015). Scholars might also examine how TMTs sequence their attention to the central aspects of a specific cognitive frame compared to the innovation adoption decisions they have made in the past. Attention to frame flexibility at certain stages of a change effort may vary, for instance, depending on the stage of the organization's lifecycle or the type of technological shock the firm faces (e.g., discontinuous, architectural, or incremental).

Managerial implications

Ever more frequently, dominant designs shift and technological discontinuities require firms to adopt innovations (Benner and Tripsas, 2012). Product or service modularization and decreasing information processing costs accentuate these dynamics (Altman, Nagle, and Tushman, 2015;

Lakhani *et al.*, 2013), creating pressures for TMTs to redefine or reframe their mental models while continuing to develop capabilities and product category variants. Maintaining clearly defined boundaries for product category membership is often associated with efficiency, productivity, and short-term performance when conditions are relatively unchanging (March, 1991; O'Reilly and Tushman, 2013). Yet at key junctures of change in a product class, at the closure of industry standards, and at competence destroying technical transitions, a concrete definition of the firm's innovation boundaries holds firms hostage to their past (Sull, 1999). We have shown that at firms like Blockbuster and Kodak, the TMT's cognitive frame led organizational members to code these transitions and external changes as threats. Such interpretations stunt a firm's ability to adapt to technical transitions. In sharp contrast, if the TMT and its extended team are able to emotionally embrace and articulate a more flexible frame, they are likely to be more creative in attending to, and dealing with, these transitions. Confronting a technological discontinuity is one of the most difficult challenges facing any incumbent firm and TMT. But occasionally incumbent firms have been shown to successfully host non-incremental innovations (e.g., Boumgarden, Nickerson, and Zenger, 2012; Eggers, 2016; Eisenhardt and Martin, 2000). We suggest that an expanded TMT cognitive frame – coupled with emotional framing – will help organization members understand and become emotionally engaged in organizational transformation efforts and, in turn, learn about executing non-incremental innovation over time. This ability to initiate, shape, and execute such cognitive and emotional transitions has important strategic ramifications.

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Figure: TMT Frame Flexibility and Innovation Adoption

