

Frame flexibility: The role of cognitive and emotional framing in innovation adoption by incumbent firms

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Research Summary: Why do incumbent firms frequently reject nonincremental 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 cognitively 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 inertial forces 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 members' sentiments and aspirations in innovation adoption.

Managerial Summary: Confronting a technological change is one of the most difficult challenges facing any incumbent firm. Technological transitions create pressure for leaders to reframe their mental models while continuing to develop existing capabilities and product category variants. Yet at key junctures in a product class and during technological change, a concrete definition of the firm's innovation boundaries and identity hold a firm hostage to its past. We show how a flexible cognitive frame—coupled with emotional framing—helps leaders and organization members become emotionally engaged in transformation efforts and, in turn, learn about executing nonincremental innovation over time. At technological transitions, perhaps there is no more important role for

leaders than to expand their cognitive frames and to infuse these expanded frames with emotion.

KEY WORDS

cognition, emotion, framing, incumbent inertia, innovation adoption

Innovations are the lifeblood of organizations and yet their adoption poses considerable challenges to incumbent firms (Christensen & Bower, 1996; Gans, 2016; Henderson, 1993). By definition, non-incremental innovations are inconsistent with an organization's current product portfolio and business model (Smith & Tushman, 2005); they trigger perceived threats that often hold the incumbent organization hostage to its prior success (e.g., Vuori & 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 & Gavetti, 2000). Because of these inertial forces, incumbents frequently fail to adapt as product classes evolve (Benner & Tushman, 2003).

Scholars have documented numerous challenges to innovation adoption, including resource allocation, technological demands, and business model incompatibilities (e.g., Anderson & Tushman, 1990; Henderson & Clark, 1990; Sull, 1999). However, an additional factor—the process by which TMTs frame innovations—has received less attention, despite of the recognized need for such work (see calls from Eggers & Kaplan, 2013; Helfat & Peteraf, 2015). We propose that the TMT's framing, i.e., the interpretation, packaging, and “organizing of information” (Giorgi, 2017, p. 712) related to a focal innovation, plays a pivotal role in their decision to adopt an innovation (e.g., Eggers, 2016; Tripsas & 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, p. 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 & Tushman, 2016, p. 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, p. 1).

As Eggers and Kaplan (2013, p. 317) have observed, incumbent TMTs' 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 nonincremental innovations, as opposed to more incremental ones, because they present a challenge to existing TMT framing and organizational functioning. Although cognitive and emotional frames can be conceptualized only for the CEO (or the general manager), innovation decisions and adoption are the responsibility of a firm's entire senior team. The involvement of the senior team becomes particularly salient in the case of emotional framing, due to processes of emotional contagion (e.g., Barsade, 2002). Accordingly, we also consider how emotional frames influence the TMT's extended team, which includes direct reports of the TMT and other upper-level managers influential to the adoption process (e.g., Vuori & Huy, 2016).¹

Our model theorizes that organizational adoption of a nonincremental innovation pivots on the TMT's 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 & Tripsas, 2008; Tripsas & 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 an information environment to give it form and meaning" (Walsh, 1995, p. 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, p. 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 reclassifies the innovation and/or reinterprets 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 adoption decision accumulates over time and affects the ability to attend to future 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 & Tripsas, 2012; Danneels, 2011) or trapped by a TMT's extant cognition (Tripsas & Gavetti, 2000; Vergne & Wry, 2014). This theorization is largely refuted by social movement studies which allow for flexibility and adaptation in framing (Benford & 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.

¹We appreciate there is an extensive literature on leaders and their teams' processes and demographics that shape TMT and organizational responses to innovation challenges (e.g., Eggers & Kaplan, 2013; Hambrick, 2007). We address the relevancy of this work to our model in the discussion section.

Second, we extend current notions of strategic framing beyond cognition to include emotions (Giorgi, 2017; Voronov & 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 & Kaplan, 2013; Helfat & Peteraf, 2015; Huff & 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 & Dorado, 2010; Gardner, Anand, & Morris, 2008; Raisch & Tushman, 2016). We suggest that 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. 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 extended 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 & Tripsas, 2012; Gilbert, 2006), we theorize how frames can bend, flex, and be more supple, such that competence-destroying technical innovations (Tushman & Anderson, 1986) can be hosted within the organization's architecture (Gulati, Puranam, & 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 frames help resolve complex, internally inconsistent aspects of nonincremental innovation adoption (e.g., Raisch & Birkinshaw, 2008).

We begin by developing a conceptual process model that explains how TMT frames—both cognitive and emotional—affect the likelihood of nonincremental innovation adoption in incumbent firms. The model advances a series of propositions that illuminate dimensions of TMT frames 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.

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

We advance a theoretical model addressing the relationship between the TMT's framing of nonincremental innovations and their adoption in incumbent firms. These frames 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, & Huff, 1992; O'Reilly & Tushman, 2016; Tripsas, 2009; Weick, 1990). It is this context in 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, Tushman, Smith, & Anderson, 2002), and architectural (Henderson & Clark, 1990). Incremental innovations necessitate minimal strategic or organizational change, and thus, the need for TMT reframing 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 & Pellegrini, 2007) and with them, initiate deep-seated strategic and organizational change (Adner, 2012; Schilling, 2005; Tushman & 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 & Clark, 1990). 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 nonincremental innovations.

TMTs are charged with reviewing and evaluating innovations, as well as addressing the challenges of, and making strategic choices about, innovation adoption (e.g., 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 & Rau, 2016; Finkelstein, Hambrick, & Cannella, 2009; Hambrick & Mason, 1984). This is especially true in incumbent firms where organizational inertia plagues long-tenured TMTs who "tend to grow 'stale in the saddle,' ceasing to make adaptive changes" (Hambrick, 2007, p. 337). 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, & Sharfman, 2011, p. 686). Thus we theorize that framing in the context of nonincremental innovation adoption occurs via two main pathways: cognitive, through the TMT's claimed categorization of innovations; and emotional, through the TMT's claimed appeals to feelings, desires, or aspirations that diffuse through processes of emotional contagion to members of the extended management team. The first pathway—cognitive—has been recognized as important in the strategic management literature (Bromiley & Rau, 2016; Eggers & Kaplan, 2013); however, the latter—emotive—has been relatively neglected but is gaining attention (Giorgi, 2017; Vuori & Huy, 2016).

We articulate our core arguments in the model presented in Figure 1. 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, we theorize the processes by which TMTs acquire the capability to develop more flexible and expansive cognitive and emotional frames that, in turn, affect how the TMT (and its extended leadership team) perceives the strategic alignment of the focal innovation with the firm. We detail these processes and advance propositions for testing our model below.

1.1 | TMT perceptions of the firm's legacy strategy

Our starting point is the occasion when the TMT is presented with a decision about whether (or not) to adopt a nonincremental innovation. Their deliberation occurs in the context of how the TMT perceives and interprets the organization's legacy strategy and business model (Hambrick & Mason, 1984), which is a process of social construction influenced by multiple internal and external forces (Kaplan & Tripsas, 2008) as well as the firm's own history (Raffaelli, 2018). Under consideration as well is whether the adoption of the target innovation could facilitate competitive advantage over existing market opportunities (Gavetti & Levinthal, 2000; Gopalakrishnan & Damancour, 1997; Levinthal & March, 1993). However, successful incumbents often fail to consider changing their innovation strategy in the absence of a perceived threat to their existing competitive position (Christensen & Bower, 1996; Kiesler & Sproull, 1982; Nadkarni & Barr, 2008).

Regardless of whether the innovation is internal (e.g., Eggers, 2016) or external (e.g., Sull, 1999) in origin, nonincremental innovations are challenging for incumbents to adopt. They require processes and knowledge that redefine and extend existing know-how and technologies (Corso & Pellegrini, 2007), as well as the ability to mobilize strategic and organizational change

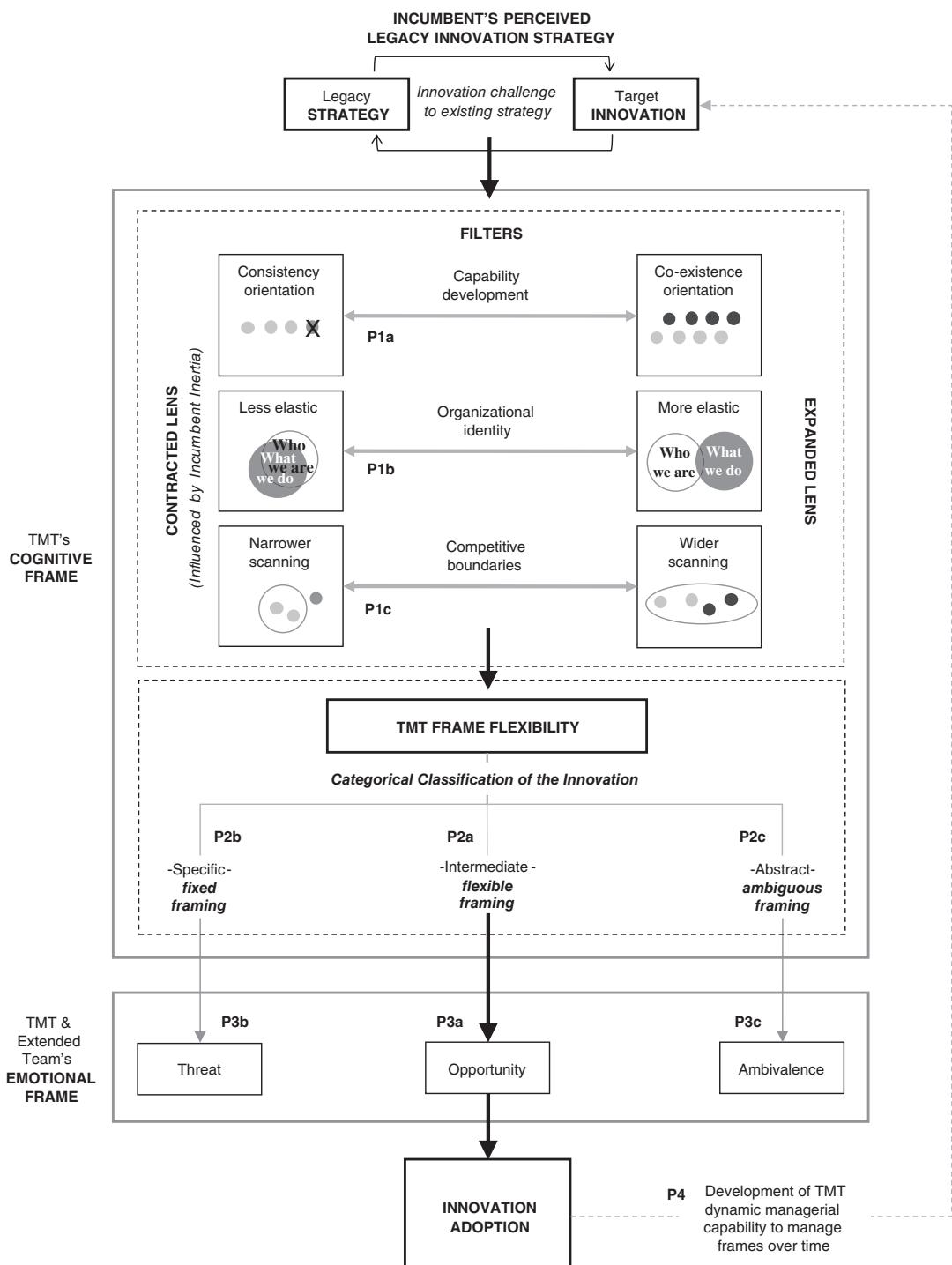


FIGURE 1 Top management team frame flexibility and innovation adoption

(Adner, 2012; Schilling, 2005). Firms that dominate a prior technological or institutional order are less likely to successfully adopt nonincremental innovations because of incumbent inertia that constrains action (Fuentelsaz, Garrido, & Maicas, 2015; Henderson, 1993). For example, incumbents like Firestone (Sull, 1999), Smith Corona (Danneels, 2011), and Polaroid (Tripsas & Gavetti, 2000) struggled to manage nonincremental 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 & Tushman, 2003, p. 242). In addition, extant structures, resource allocation mechanisms, and external audiences reinforce a TMT’s commitment to their existing strategy (e.g., Benner, 2010; Giorgi & 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).

1.2 | Cognitive framing: Lenses and filters

As a first step in making an adoption decision, the TMT must consider the potential value of a focal innovation, cognitively framing the innovation in terms of its relevance to the firm. A cognitive frame refers to the managerial mental maps (Barr, Stimpert, & Huff, 1992) and thought structures (Reger, 1990) that shape interpretation (Gavetti & Rivkin, 2007). Cognitive frames are influential in several aspects of strategic decision-making, including search (Gavetti & Levinthal, 2000), information processing (Cornelissen & Werner, 2014), and organizational change (Tushman & Anderson, 1986). Because TMTs process information collectively (Weick, 1995), cognitive frames help them aggregate interrelated information (O’Keefe & Nadel, 1978) when faced with ambiguity (Barr, Stimpert, & Huff, 1992); moreover, these frames are tied to the TMT’s perception of the organization’s past, including its legacy strategy (Adner, 2012; Dosi, 1982) and prior performance (Greve & Taylor, 2000).

Cognitive frames are “interpretive lenses” that shape TMT’s perceptions of their environment and their responses (Eggers & Kaplan, 2013). According to Hambrick and Mason (1984, p. 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, TMTs develop and maintain interpretive filters that offer more or less variety in the composition and perspective through which they frame potential 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 blind spots that reinforce extant or overly confident views of the firm’s existing strategy and innovation agenda.

Building on this stream of research, our model of cognitive framing depicts a two-step process. First, because incumbent inertia plays a critical role in technology change (Hill & 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 nonincremental innovations. Second, we theorize how and why TMTs expand their cognitive lens to overcome these forces of inertia through frame flexibility.

1.2.1 | Capability development filter: Consistency versus coexistence 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 & Lewis, 2009; Cho & Hambrick, 2006; Raisch & Birkinshaw, 2008). By definition, nonincremental innovations involve inconsistencies with the firm’s existing capabilities and technologies (e.g., Kaplan & Tripsas, 2008; O’Reilly & Tushman, 2013) and can be contradictory to their exploitation. By contrast, incremental innovations can be associated with a

logical expansion of existing capabilities (Raisch & Birkinshaw, 2008). The process of matching old and new capabilities with competing frames creates cognitive complexity and dissonance (Festinger, 1957; Tripsas, 2009) that can function to expand or contract a frame; however, the TMT's orientation toward capability development and their cognitive frames are conceptually distinct and not always logically connected.

TMT orientations develop over time to shape how they perceive capability development in making nonincremental innovation decisions. We focus on two of these: a coexistence orientation and a consistency orientation. A *coexistence orientation* expands the TMT's cognitive frame because it embraces incongruous capabilities and innovation agendas within the firm; it is facilitated by "frames and processes that recognize and embrace contradiction" (Smith & Tushman, 2005, p. 523). This was evident, for instance, when the senior team at Ciba's Crop Protection Division allowed the coexistence of its traditional chemical capabilities along with new molecular biology capabilities (O'Reilly & Tushman, 2008), thereby expanding their cognitive frame.

By contrast, a *consistency-orientation* contracts the TMT's cognitive frame because it privileges a focal innovation's uniformity with, or similarity to, the firm's existing capabilities. According to Smith and Tushman (2005, p. 525), consistency-orientations "stem from a fundamental epistemological belief of a unitary truth (Ford and Backoff, 1988; Voorhees, 1986) [that] ... inconsistencies fundamentally cannot coexist." The innovation adoption decision triggers capability tensions, and TMTs who embrace consistency-orientations are more likely to see nonincremental innovations as contradictory (e.g., Smith, 2014). Several empirical examples illustrate this. Smith Corona transitioned from mechanical to electric typewriters and then to personal word processors by maintaining a steadfast consistency-orientation on word processing; however, a consistency-orientation hampered its capabilities to develop additional, unrelated products that were needed for new product growth (Danneels, 2011). Similarly, in the 1970s, incumbent Swiss watchmaking executives held a consistency-orientation favoring traditional mechanical watchmaking, even when quartz technology threatened to dominate the market. This adversely affected their ability to reconcile inconsistencies in organizational capabilities needed to produce quartz watches (Raffaelli, 2018). Likewise, in response to the emergence of online news, many newspaper executives continued to emphasize a consistency-orientation, rendering them unable to allow traditional journalism capabilities to coexist alongside those capabilities for digital media (Gilbert, 2006).

An especially important context where TMT consistency and coexistence orientations come into play is in the adoption of innovations. Across the portfolio, an organization's products or services may share few or many capabilities in common. Because the adoption of a nonincremental innovation requires radically new capabilities in the firm, adoption decisions force debates about whether or not the innovation is reconcilable, or consistent, with existing capabilities. A coexistence orientation serves to bundle or "match" (Eggers & Kaplan, 2013) seemingly inconsistent organizational capabilities, permitting the TMT to reconcile incremental as well nonincremental innovations via simultaneous exploitation and exploration (March, 1991; O'Reilly & Tushman, 2008), thereby expanding the TMT's cognitive frame. By contrast, organizational inertia pushes incumbent firms toward a consistency-orientation, making it more difficult for the TMT to reconcile inconsistent capabilities within the firm (Benner & Tushman, 2003). We posit:

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

1.2.2 | Organizational identity filter: Less versus 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 encapsulates the meaning systems by which TMTs define an organization's core purpose, can shape the TMT's cognitive framing of innovations (e.g., Tripsas, 2009). We theorize that the manner by which identity shapes a cognitive frame is a function of the degree of its elasticity, i.e., "the tensions that simultaneously stretch, while holding together, social constructions of identity" (Kreiner, Hollensbe, Sheep, Smith, & Kataria, 2015, p. 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" (Navis & Glynn, 2010, 2011; Nelson & Irwin, 2014). Prior work has tended to treat this coupling as unproblematic, presuming a fairly tight connection 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 the TMT's cognitive framing of innovations.

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 & Gavetti, 2000). Similarly, although Kodak developed some of the first digital cameras (Lucas & 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, p. 502) theorized that organizational identities can lead firms to "rule out potentially interesting avenues for innovation" because organizational identity reinforces the firm's existing product portfolio. 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, p. 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 decisions made by Blockbuster and Netflix from our earlier example. When confronted with online streaming innovations, Blockbuster persistently deflected this, defining itself ("who we are") as a 'brick-and-mortar video rental service' ("what we do"). In contrast, Netflix had "a bit of an identity crisis" (Reisinger, 2012) when it expanded its identity to be an 'entrainment subscription service' at the time when many still saw it as a DVD rental company. However, by loosening the connection between "who we are" and "what we do," treating them as related but not interchangeable, Netflix's TMT expanded their cognitive frame while Blockbuster's contracted theirs. When a TMT's sense of organizational identity is less elastic, a narrower set of innovation alternatives will be perceived as legitimate, contracting the frame. This is shown in Figure 1 (concentric circles illustrating varying degrees of identity elasticity and how this filters the TMT's cognitive frame). We propose:

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

1.2.3 | Competitive boundary filter: Narrower versus wider scanning

Finally, a TMT's cognitive frame is filtered by its conceptualization of the firm's competitive boundaries. Competitive boundary scanning affects the TMT's search for strategic growth opportunities (Gavetti & Levinthal, 2000; Hambrick, 1982; Miles & Snow, 1978): TMTs who scan a wider competitive landscape develop a more expansive cognitive frame, while those who scan a narrower competitive landscape have a more contracted frame. Peteraf and Bergen (2003, p. 1028) have shown how incumbent TMTs face cognitive limitations that constrict their ability to expand competitive scanning:

[M]anagers 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 & Thomas, 1990). They ... ignore others only barely more distant (Lant & Baum, 1995). ...[and] are likely to be blindsided by rivalry coming from unexpected quarters. (Zajac & Bazerman, 1991)

The implications of competitive boundary scanning on TMT cognitive frames are most noticeable when TMTs make innovation adoption decisions within their field of reference (Raffaelli & Glynn, 2014; Westphal, Gulati, & Shortell, 1997). Competitors' innovations that are perceived to be consistent or aligned with the firm's competitive boundaries are favored, while those outside the perceived boundaries tend to be de-legitimated, de-valued, or rejected (Benner, 2010; Porac & Thomas, 1990). 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 & Bergen, 2003, p. 1029) are more likely to approach nonincremental 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 nonincremental innovation through a contracted lens.*

In all, a TMT's cognitive framing of a nonincremental 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 nonincremental innovations as being misaligned with their current business model. The TMT's decision to adopt nonincremental innovations is dependent on their ability to shift an initial contracted cognitive frame to expand it to accommodate nonincremental innovations. To accommodate shifts toward a more expanded frame, we theorize the need for *frame flexibility* in order to adopt nonincremental innovations.

1.3 | TMT frame flexibility

Our model points to the possibility of flexible framing, which we define as the TMT's ability to reframe an innovation's potential fit with the firm relative to three cognitive filters: consistency/coexistence orientation; elasticity of organizational identity; and, the wideness/narrowness of competitive boundary scanning. Existing models of strategic choice have limited the classification of nonincremental 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 & Gavetti, 2000). Innovation choices perceived to be aligned with the current organizational model are favored, while

those that lie outside are rejected. We argue that innovation decisions are a more complex process, not limited to binary considerations. Rather, innovation adoption is enabled (or thwarted) by the TMT's ability to modify their cognitive frame, to a greater or less extent, in ways that can accommodate the innovation. Frame flexibility is a process facilitated by the TMTs ability "to locate, perceive, identify, and label" events or choices (Goffman, 1974, p. 21) in broad and pliable ways that guide decision-making (Huff, 1982) about innovation adoption so as to realign their interpretation of the relevance of the innovation to the firm. We theorize that frame flexibility is related to the TMT's categorical classification of a nonincremental innovation.

1.3.1 | Categorical classification of the nonincremental innovation

Categorical classification schemes shape how novel objects of interest, such as nonincremental innovations, fit within an existing cognitive frame (Mervis & 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 nonincremental innovation clearer for the strategic positioning of the firm. Such bandwidth affords more or less latitude in claiming organizational membership categories (e.g., Glynn & Abzug, 2002) and furnishes the parameters for the ways in which a cognitive frame can be stretched legitimately.

There are three key levels of vertical inclusion that describe classification hierarchies: (a) a *specific*, subordinate level, having more domain specificity and concreteness (e.g., a dining room table; a bedside table; a coffee table); (b) an *intermediate* level, consisting of the most typical and most used categories (e.g., a table); and (c) an *abstract* superordinate level, located above the intermediate level and having lower domain specificity and greater abstractness (e.g., a piece of furniture) (Mervis & Rosch, 1981; Wiesenfeld, Reyt, Brockner, & Trope, 2017).

In construing a cognitive frame related to innovation adoption, the TMT makes two assessments: one, determining the salient level of category classification in the hierarchy (specific, intermediate, or abstract); and two, assessing the resemblance of the firm to the prototype for that category. At higher taxonomic levels, cognitive frames tend to be less domain-specific and more abstract 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, p. 455). Similarly, IBM stretched its ability to embrace LCD flat panel technology after shifting to a superordinate "flexible, business-case oriented framing" (Eggers, 2016, p. 1590). As an organization construes 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 (Wiesenfeld, Reyt, Brockner, & Trope, 2017). Doing so allows more diversity in prototypicality at higher levels (e.g., Netflix as "online entertainment" versus "DVD-by-mail subscription services").

Construing the firm's products or services at a specific or concrete level positions the firm at a more subordinate level of categorization and a more contracted, limited (or narrow) view of what constitutes appropriate innovations for adoption. This was evident, for instance, when Kodak's TMT struggled to move beyond the specificity of the firm as 'a film company' (rather than imaging) because they initially perceived digital film production as unassociated with chemical film processing (Swasy, 1997). Likewise, Blockbuster's TMT deferred to a specific classification as a "brick-and-mortar video retailer" and was unable to more flexibly see that the same content could be delivered to their customers across multiple distribution channels (O'Reilly & Tushman, 2016). At these lower levels in taxonomic hierarchies, a TMT's cognitive frame for innovation is more domain specific, more concrete, and less flexible.

Alternatively, intermediate levels of categorization, because they are “both rich enough to provide useful information and distinct enough to be nonredundant” (Porac & Thomas, 1990, p. 232), tend to offer more flexibility. TMTs who engage in flexible framing position the firm at an intermediate, but relatively more abstract level, allowing a wider set of organizational offerings (or potential innovations) to fit within the category. Rather than being too specific (i.e., fixed) or too abstract (i.e., ambiguous), intermediate claims allow for greater flexibility, allowing the TMT to re-position the firm by moving it up or down in a taxonomic classification hierarchy (Delmestri & Greenwood, 2016; Mervis & Rosch, 1981).

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 & Eisenhardt, 2009, p. 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 & Terry, 2000, p. 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 nonincremental innovation in a way that is neither too specific nor too abstract. Such intermediate classifications permit the nonincremental 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. Likewise, Martha Stewart named her business Martha Stewart Living Omnimedia, reflecting a flexible frame that could transcend specific domains of life and be disseminated across various media channels that each required novel capabilities to grow (e.g., magazines, books, television and radio programming, and online activities) (Glynn, 2011; Glynn & Dowd, 2008). In these and other cases (e.g., Eggers, 2016), TMTs have flexibly expanded their cognitive frames to embed new innovations in an intermediate level of classification. However, this must be curbed by 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 comprises an intermediate level of classification that reconciles preexisting cognitive inconsistencies about the firm's capabilities, organizational identity, and competitive boundaries. In turn, a flexible frame allows for an interpretation of innovations under a cohesive intermediate level of classification that is neither too specific (i.e., fixed) nor too abstract (i.e., ambiguous). We propose:

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

1.4 | Emotional framing

In addition to cognitively framing a target innovation, TMTs engage in emotional framing (e.g., Vuori & Huy, 2016) that spreads via emotional contagion (Barsade, 2002) to affect members of their extended teams. Giorgi (2017, p. 724) theorized that framing needs to “evoke emotions that are in line with a predominant institutional ethos … or an organization's culture.” 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). Emotional arousal, displays, and identification are critical to organizational change (Davis, Morrill, Rao, & Soule, 2008) and, we argue, innovation adoption. When TMTs link nonincremental innovations to extant organizational values and beliefs, they tap into emotional aspirations (Voronov & Weber, 2016) and increase the likelihood of innovation adoption among the TMT, as well extended team members and middle managers who may resist changes that stem from nonincremental innovation adoption (e.g., Piderit, 2000; Tripsas & Gavetti, 2000).

Emotional framing helps resolve inconsistent organizational capabilities, identities, and competitive membership associated with cognitive frames (e.g., Gilbert, 2006; Gupta, Smith, & Shalley, 2006; Tripsas, 2009) by linking the nonincremental innovation with an emotionally engaging vision (e.g., Rotemberg & Saloner, 2000; Van den Steen, 2005). Building on Selznick's (1957, p. 17) notion of “infusing the organization with value,” emotional framing enables the positioning of the nonincremental innovation within the context of the firm's history and normative values more broadly throughout the firm. 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). 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.

When individuals are exposed to novelty, they assign “affective tags” to their evaluative appraisals (Fiske & Pavelchak, 1986, p. 171). Dutton and Jackson (1987, p. 82) demonstrated the relevance of such evaluative appraisals to strategic issue responses, observing that “evaluative appraisals are the affective components of cognitions.” 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, which triggered affective responses of avoidance (Hodgkinson & Healey, 2011). Thus striking a responsive chord, or being emotionally resonant (Giorgi, 2017; Snow, Rochford, Worden, & Benford, 1986), we argue, is key for effective framing by the TMT and decision to adopt a nonincremental innovation.

A decision to adopt a nonincremental innovation, with its associated capability, identity, and competitive boundary challenges, also depends on whether the cognitive frame resonates emotionally as an opportunity with the TMT, as well as with members of the extended leadership team consisting of the TMT's direct reports and other upper-level middle managers (Tripsas, 2009). We include the extended team in our theorizing because their emotional responses and interactions with the TMT are critical to innovation adoption decisions in the firm (Garud, Tuetscher, & Van de Ven, 2013; Tripsas & Gavetti, 2000; Vuori & Huy, 2016). If a nonincremental innovation is coded as a threat by the extended team, threat-rigidity dynamics (Staw, Sandelands, & Dutton, 1981) sabotage adoption. For

example, Danneels's (2011) account of Smith Corona's failure to adapt to desktop computing illustrated how its members were unable to shift resources toward new capabilities because of an entrenched cognitive frame anchored to typewriters and an emotional resistance to selling other office supplies.

1.4.1 | Emotional frames and innovation adoption

Emotional frames associated with a nonincremental innovation affect how the TMT and members of its extended team will resonate with the innovation. Attaching an emotionally engaging aspiration to a nonincremental innovation permits, justifies, and contextualizes a more flexible cognitive frame. Relatedly, Rindova and Petkova (2007, p. 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, beyond external audiences, we also include 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 plastic containers over time. Across these different businesses, the TMT adopted a more flexible cognitive frame as a "world-class container company." And, by pairing it with an emotionally resonant slogan, "We Can!," the TMT helped its extended team members interpret technological transitions as opportunities rather than as threats (Tushman & O'Reilly, 2002). Alternatively, negative emotional frames are likely to overpower positive ones (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001) and discourage innovation adoption. For instance, Vuori and Huy (2016) illustrated how internally focused fear left Nokia unable to innovate in response to Apple's iPhone. Especially during periods of technological ferment, emotional frames are attached to the organization's past 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 its extended team members. Because nonincremental innovations are laden with uncertainty and potentially affect, positively or negatively, various aspects of an organization's existing social systems (Henderson & Clark, 1990; Kanter, 1988), adoption decisions can trigger emotional ambivalence (Ashforth, Rogers, Pratt, & Pradies, 2014; Merton & Barber, 1976). In fact, the anticipated prospect of change in the wake of nonincremental innovation adoption may leave some organizational members with "a fundamental ambivalence about what is often called 'innovation' or even 'progress'" (Eisenhardt, 2000, p. 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, & Kraatz, 2014; Piderit, 2000; Smith, Binns, & Tushman, 2010) that will impede adoption. In sum, innovation adoption is influenced by both cognitive and emotional framing. Absent framing that fosters emotional engagement, the TMT and its extended leadership team is less likely to engage in the work necessary to execute a more flexible cognitive frame. We propose:

Proposition 3a: *Nonincremental 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: *Nonincremental 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: *Nonincremental innovations that emotionally resonate as ambivalent among the TMT and members of the extended management team are less likely to be adopted.*

1.5 | How frame flexibility affects innovation adoption decisions over time

TMTs can learn from prior successes and failures in making adoption decisions (Hambrick & Mason, 1984; Levitt & March, 1988; Starbuck & Milliken, 1988). Over time, they develop their capabilities for cognitive and emotional framing (and reframing). Like other forms of capability development, we argue that TMTs develop, manage, and hone their ability to develop more flexible frames 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 & Peteraf, 2015, p. 835). Likewise, we posit that TMTs utilize feedback from previous experience to inform current options for innovation adoption over time (March & 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 & Clark, 1991; Argote, McEvily, & Reagans, 2003; Argyris, 1976). Weigelt and Sarkar (2009, p. 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 to construe an organizational identity that is 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 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. Such examples suggest that, 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, p. 6) work on

accumulated learning highlights 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 nonincremental innovation adoption decisions that emotionally resonate throughout the organization as an opportunity are likely to engender support for future innovations. Fiske and Pavelchak (1986, p. 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, p. 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 frames allow novelty to penetrate the organization and are likely to promote experimentation (Thomke, 1998; Weigelt & 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, p. 2). As the extended team continues to experiment, effective TMTs engage in flexible (re)framing based on performance feedback from these experiments. Thus when a TMT fosters flexible cognitive and emotional 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 frames 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 learn from their prior nonincremental innovation adoption experiences.*

2 | DISCUSSION AND IMPLICATIONS

Organizations continuously face decisions about whether or not to adopt nonincremental innovations. As technologies evolve, failing to innovate has a significant impact on a firm’s ability to compete (Nelson & Winter, 1982; O’Reilly & 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 & 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 & Goh, 2009) or embedded institutional norms (Fox-Wolfgramm, Boal, & Hunt, 1998).

Although these factors are important, we have argued that a distinct source of incumbent inertia (Hill & Rothaermel, 2003) is rooted in the TMT’s cognitive and emotional frames. This interplay of

cognitive and emotional framing has largely been omitted in accounts related to nonincremental innovation adoption in incumbent firms (Vuori & Huy, 2016). To address this theoretical gap, we advanced a model revealing the role of framing in nonincremental innovation adoption, exploring how TMT frames affect the perceived goodness-of-fit (Siggelkow, 2001) and emotional resonance (Giorgi, 2017) of innovations, which ultimately affect 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.

2.1 | Theoretical implications

Our primary goal 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 and, in particular, we contribute to a rich stream of research on innovation adoption and TMT decision making by theorizing how frame 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 & Rau, 2016; Hambrick, 2007, p. 337) and organizational outcomes.

First, at key junctures in product class evolution, the movement toward more flexible frames 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 nonincremental technical change, the ability to develop a flexible frame relative to the 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 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; McDonald & Gao, *in press*; Sull, 1999).

Second, our treatment of framing affords new insights for TMT cognition scholarship. We theorize how cognitive frames may not be fixed, but instead, may be flexible and mutable. Prior research has focused on cognitive frames “as ‘things,’ rather than on the dynamic processes associated with their social construction, negotiation, contestation, and transformation” (Benford, 1997, p. 415, in Croteau & Hicks, 2003). Our theorization, and especially that 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 (Helfat & Peteraf, 2015; Livengood & 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 an 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, p. 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 frame flexibility extends Smircich and Stubbart's (1985) classic work that prescribed a firm's environment as socially constructed and enacted,

rather than objective. Similarly, we imply that strategic capabilities are also 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 also theorize that more flexible TMT cognitive framing must be coupled with emotional engagement among members of the extended team. Because multiple cognitive frames coexist when incumbent firms execute nonincremental innovation, this emotional engagement helps organizational members make sense of the innovation in the context of the firm's history. Such emotional engagement is a critical aspect of the adoption process because it helps the extended leadership team and employees take pride in the past even as they begin to envision 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, 2018). Thus our model addresses how "thinking" (cognitive framing) and "feeling" (emotional framing) facilitate 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, Smith, & Shalley, 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 throughout the firm (Benner & 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 & 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).

2.2 | 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 adoption. Structural factors, such as functional differentiation and team size, have been shown to influence adoption decisions (Kimberly & Evanisko, 1981). And institutional factors related to the "increased density of interaction, information flows, and membership identification" (DiMaggio & Powell, 1983, p. 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 & Fiss, 2009; Scott, 2008). Parsing out how these factors are related to frame flexibility could lead to promising theoretical and empirical pathways for future research. We outline several of these possibilities below.

An organization's performance context is likely to affect the nature of frame flexibility. 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 & Tushman, 2013); alternatively, firms must sometimes move reactively, under performance shortfall conditions, to address their competitors' strategic moves (e.g., Rosenbloom & Christensen, 1994; Siggelkow,

2001). The ordering of cognitive and emotional framing (e.g., Fiske & 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.

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. In addition, delving into the group processes and negotiations that enable the TMT and extended team members to change orientations and alter these factors could be especially promising.

Frame flexibility opens up several new avenues to extend research on senior team decision making (Finkelstein, Hambrick, & Cannella, 2009; Hambrick & Mason, 1984). We foresee empirical work that tackles how senior team heterogeneity (Hambrick, Cho, & Chen, 1996), team knowledge diversity (Fichman & Kemerer, 1997), participative decision-making cultures (Hurley & Hult, 1998), and prior experience with strategic contradiction (Smith, 2014), interact with TMT framing. Similarly, exploring relationships among TMT composition, tenure, and frame flexibility would be especially worthy of investigation (e.g., Pfeffer, 1981). Although scholars have argued that TMTs with longer tenures are less likely to promote organizational adaption (Hambrick & Fukutomi, 1991), TMTs with greater frame flexibility may overcome or prolong some of these challenges.

Informational exchange and collaboration among TMT members have been shown to have positive effects on senior team product development decisions, but are moderated by TMT diversity (Boone & Hendriks, 2009). We propose similar aspects will affect TMT framing. Understanding how these and other TMT demographics (see Carpenter, Geletkanycz, & Sanders, 2004) might expand or contract TMT frame flexibility would be a useful way to extend research on upper echelons theory.

Future researchers might explore how frame flexibility and emotional resonance interact with different forms of organizational structures and architectures (Burns & Stalker, 1961; Galbraith, 1995; Nadler & Tushman, 1997). For instance, because matrixed organizations require higher levels of functional and divisional integration, TMT frame flexibility may help innovations diffuse more readily. Relatedly, research on structural ambidexterity suggests that contradictory or competing frames are best managed and housed within the TMT (Smith & Tushman, 2005). But scholars also have proposed contextual ambidexterity as a solution to encourage exploitation and exploration at the individual or business-unit level (Gibson & Birkinshaw, 2004). Although our model has theorized a role for flexible frames at the TMT level, it would be worth considering what frame flexibility might look in an environment where contextual ambidexterity throughout an entire business unit 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 & 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 choose *not* to adopt a nonincremental 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 nonincremental 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,

which we believe 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, & Baden-Fuller, 2011). Building on this tradition, we see value in studies that use nonparticipant 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 & Glynn, 2017). For example, scholars might pair field observations with surveys to evaluate patterns of TMT frame flexibility over time. Surveys that evaluate how individual TMT members' perceptions of an innovation converge (or diverge) from those of the CEO could open up new pathways to test how internal TMT team dynamics (Wageman, Hackman, & Lehman, 2005) are related to frame flexibility.

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 & Kaplan, 2013). Using methods such as linguistic category modeling (Semin & 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 & Wiesenfeld, 2015). Alternatively, data related to the products and technologies categorized as 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 R&D allocations may also prove suitable, especially for evaluating how frame 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 overlap between individual and organizational identity, showing a series of overlapping circles (e.g., Bergami & Bagozzi, 2000). Similar tools might capture the degree of intersection between the TMT's perception of a nonincremental innovation with the firm's existing innovations. Such perceptions could then be evaluated against other empirical measures or techniques associated with shifts in organizational identity and member identification (e.g., Brickson, 2007; Mael & Ashforth, 1992), perceptions of competitive boundaries (e.g., Kennedy, 2008; Whittington, Pettigrew, Peck, Fenton, & Conyon, 1999), or a willingness to entertain contradictory capabilities (e.g., Gatignon, Tushman, Smith, & Anderson, 2002; Schad, Lewis, Raisch, & Smith, 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 environments (Gavetti, Helfat, & Marengo, 2017). Of particular interest would be to test for shifts in cognitive and emotional frames in multiple firms by industry, moments in history, or a specific type of innovation challenge.

Finally, we believe the aspect of emotional framing in our paper holds great promise for future research on strategy formulation and innovation adoption. Drawing from Selznick's (1957) work on value infusion, emotional frame flexibility might be examined in normative value claims associated with the organization's character (e.g., Dutton & Dukerich, 1991), claims for consistency or continuity over time (e.g., Schultz & Hernes, 2013), and the collectivity or integrity of the organization as a whole (e.g., Raffaelli & Glynn, 2015). It is also worth exploring how a TMT's attention to emotional frames 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). Analyzing how and when a TMT's emotional frame impacts members of the extended leadership team offers yet another promising frontier for future research.

2.3 | Managerial implications

Ever more frequently, dominant designs shift and technological discontinuities require firms to adopt innovations (Benner & Tripsas, 2012). Product or service modularization, decreasing information processing costs, and digitization (Altman, Nagle, & Tushman, 2015; Lakhani et al., 2013; Seidel, Hannigan, & Phillips, in press) accentuate these dynamics and create pressure 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 & 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 its TMT. But occasionally incumbent firms do successfully host nonincremental innovations (e.g., Boumgarden, Nickerson, & Zenger, 2012; Eggers, 2016; Eisenhardt & 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 nonincremental innovation over time. At technological transitions, perhaps there is no more important role for the TMT than to collectively expand its cognitive frames and to infuse these expanded frames with emotion. This ability to initiate, shape, and execute such cognitive and emotional transitions has important strategic ramifications.

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