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The innovator's media dilemma: How journalists cover incumbents' adoption of discontinuous technologies

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Abstract

We offer a new vantage to the literature on the role of infomediaries in incumbent firms' struggles to adopt discontinuous technologies: the perspective of news media. Specifically, we combine the discontinuous technology literature with studies on news media journalism to theorize that journalists cover an incumbent's new product introductions differently, depending on whether a given new product builds on a discontinuous technology or on the respective established, continuous technology. First, discontinuous-technology-based product introductions receive a greater volume of coverage than continuous-technology-based product introductions because journalists prefer covering issues that are novel, deviate from the conventional, and potentially strongly impact society. Second, the coverage of discontinuous-technology-based product introductions is more divergent in tenor than the coverage of continuous-technology-based product introductions, as journalists seek to present opposing and thus more engaging opinions. Our analyses of unique archival data from two samples of product introductions in the automotive and photography industries, respectively, support our hypotheses. We also find intriguing indications that news media coverage of new products introductions using hybrid technologies is significantly context-dependent. Overall, our study points to so-far undescribed, media-related dilemmas for incumbent firms that aim to adopt discontinuous technologies.

KEYWORDS

discontinuous technological change, incumbent, social evaluations

1 | INTRODUCTION

A key question in innovation management research is why incumbent firms often struggle to adopt discontinuous technologies—that is, novel, path-divergent, paradigm-challenging concepts of value creation and value capture (Christensen, 1997, 2006; Tushman & Anderson, 1986; for overviews, see Ansari & Krop, 2012; Christensen et al., 2018; Eggers & Park, 2018; Hopp et al., 2018). Indeed, numerous hurdles make it difficult for incumbents to acquire and assimilate the necessary resources and to reconfigure structures and processes to

embrace discontinuous technologies (Danneels, 2002; Hill & Rothaermel, 2003). Many of these hurdles lie inside the firm, such as formalization (Hannan & Freeman, 1984) and decision makers' bounded cognition and emotional resistance (Kaplan, 2008; König et al., 2020; Vuori & Huy, 2016; Weber et al., 2019). Other constraints on incumbents' responses to discontinuous technologies stem from outside the firm, for instance, from powerful customers, investors, suppliers, and industry associations (Christensen, 1997; Kaplan & Tripsas, 2008; König et al., 2012).

Over the past decade, scholarship on such external constraints has increasingly focused on one particularly influential group of external constituents—infomediaries. Infomediaries are professional third-party observers who mediate and broker between firms and their external audiences by gathering, interpreting, and disseminating firm-related information (Deephouse & Heugens, 2009). Researchers have, for example, shown how securities analysts, viewing incumbents as providers of predictable dividends, disregarded incumbents' attempts to adopt discontinuous digital technologies, and encouraged them to "stick to their trade" by cutting costs and reinvesting in products based on established analog technology (Benner, 2007b, 2010; Benner & Ranganathan, 2017). The key idea of this research stream is that, as infomediaries are constituent-minded (Wiesenfeld et al., 2008), they evaluate an incumbent's adoption activities not only through their own mental schemas but also through those of their audiences. Moreover, given the importance of their opinions for the discourse within their respective audiences, infomediaries might strongly influence incumbents' adoption behaviors, partially in ways that undermine their attempts to embrace discontinuous technologies (Benner, 2007a).

While this research has generated a wealth of insights, it has devoted little attention to one of the most influential types of infomediaries—news media journalists (Deephouse, 2000). Journalists are important given their strong influence on public attention (Hilgartner & Bosk, 1988) and social evaluations of firms (Pollock et al., 2019; Westphal & Deephouse, 2011), and they play a particularly important role in the emergence of discontinuous technologies because news media coverage can shape the collective understanding of technologies (Garud & Rappa, 1994). However, although studies indicate that incumbents' adoption of discontinuous technologies might be particularly affected by news media coverage (Gerstner et al., 2013; Schneidmüller, 2020), no research we are aware of examines how the media reports about such initiatives. In fact, neither the recent reviews on incumbent firms' responses to discontinuous technologies (Ansari & Krop, 2012; Christensen et al., 2018; Eggers & Park, 2018; Kurzhals et al., 2020) nor Graf-Vlachy et al.'s (2020) review of research on firms' media coverage mentions a specific study on the role of news media in this context. This is especially concerning in light of research suggesting that insights from related studies on better-understood infomediaries, such as analysts, are unlikely to generalize to journalists because journalists have idiosyncratic cognitive schemas and conventions that differ markedly from those of analysts (König et al., 2018).

Practitioner points

- New products that rely on discontinuous technologies receive greater and more controversial coverage by news media than new products that rely on continuous technologies
- Top executives and decision makers in R&D thus need to expand their understanding of the innovation process to incorporate the effect of a firm's innovation activity and innovation portfolio on news media coverage
- Policy makers who may rely on news media content when shaping legislation around emerging discontinuous technologies must similarly be aware of such differential coverage

We aim to help fill this gap by addressing the focal research question of *How and why does journalists' coverage of new products that are based on a discontinuous technology differ from their coverage of new products that are based on the respective continuous technology*? In particular, we focus on two key dimensions of news media coverage: *volume*, that is, the number of times the news media mentions a newly launched product (Gerstner et al., 2013), and *tenor divergence*, that is, the degree to which journalists' evaluations of new products differ in terms of whether they are positive or negative (Guo et al., 2021). Both dimensions are considered particularly consequential for audiences' evaluations (Graf-Vlachy et al., 2020; Guo et al., 2021), and are likely to differ systematically depending on the (dis)continuous nature of the technology.

Specifically, we fuse literature on incumbent responses to discontinuous technologies (Eggers & Park, 2018) and scholarship on journalists as socially situated arbiters (Graf-Vlachy et al., 2020; König et al., 2018) to hypothesize that new products receive more media coverage if they are based on a discontinuous, rather than a continuous, technology. Our central idea is that discontinuous technologies, in comparison to continuous technologies, cater more to the news media's interest in

attention-grabbing stories (Shoemaker & Reese, 1996). Yet, we also argue that new discontinuous-technology-based products trigger greater tenor divergence, as they spark both stronger hopes and stronger concerns for broader society (Ansari et al., 2016; Brynjolfsson & McAfee, 2014; Carter & Bélanger, 2005; Hill & Rothaermel, 2003; Kaplan & Murray, 2009). We test our hypotheses using a rich dataset of media coverage in two well-established settings of discontinuous technological change, specifically the media coverage of 155 product launches during the emergence of electric mobility in the automotive industry (Adner & Lieberman, 2021) and 197 product launches during the transition to digital imaging in the photography industry (Benner, 2010; Tripsas & Gavetti, 2000).

Our study makes contributions to the literature on incumbent firms' responses to discontinuous technologies (Eggers & Park, 2018), especially to the ongoing conversation on the role of infomediaries in that context (e.g., Benner, 2007a, 2010; Seidel et al., 2020). First, we introduce a news media perspective to this conversation—a perspective that considers the specific context of journalists and their work as well as the resulting tendencies in their coverage (König et al., 2018). Notably, despite the news media's influence on meaning construction in the context of discontinuous technological change (Garud & Rappa, 1994; Gerstner et al., 2013; Hargadon & Douglas, 2001), research on incumbent firms' responses to discontinuous technologies has basically ignored potential tendencies or biases in media coverage. This is problematic for the broader scholarly conversation on discontinuous technologies because these technologies create exactly the "contested" (Kaplan, 2008, p. 729) contexts in which journalists' coverage affects the interpretations of key stakeholders.

Second, we reveal specific tendencies in two central dimensions of news media coverage that are likely to shape both audiences' and the focal incumbent's behaviors—volume and tenor divergence. Our findings hint at new, thus far undocumented challenges for incumbents that aim to embrace a new technology that is discontinuous relative to their established innovation trajectories (Benner, 2007a). Although these firms can attract disproportionally greater attention from journalists when they launch discontinuous-technology-based products, they are also subject to highly divergent and, thus, potentially dysfunctional evaluations when doing so. Executives in incumbent firms might thus deem it preferable to focus on continuous technologies, although that focus might ultimately imperil these firms' long-term prosperity—an "innovator's media dilemma" that adds to incumbents' existing adoption challenges (Christensen, 1997).

Third, post hoc analyses reveal interesting findings on hybrid products, which combine elements of the continuous and discontinuous technology (Benner, 2010). Given the ubiquity of hybrid technologies in technology evolution and the fact that discontinuous technology research is only beginning to study them (Furr & Snow, 2015), our findings highlight an important additional gap in the literature.

2 | INCUMBENT RESPONSES TO DISCONTINUOUS TECHNOLOGIES AND THE ROLE OF INFOMEDIARIES

2.1 | Inertia in response to technological discontinuities

Discontinuous technologies have long garnered scholarly attention, largely because they constitute an extraordinary kind of highly consequential change. In particular, discontinuous technologies—such as biotechnology (Gerstner et al., 2013) and digital-platform-based smartphone technologies (Vuori & Huy, 2016)—are "non-paradigmatic" (Dosi, 1982; König et al., 2012). In other words, they depart from the traditional innovation trajectory in a non-linear manner, and they challenge existing mental models and activity patterns regarding value creation and value capture that are "rooted in deeply embedded shared principles, beliefs, and norms [in a given industry]" (König et al., 2020, p. 4; Anderson & Tushman, 1990). Also, although the final success of a discontinuous technology cannot be known beforehand, discontinuous technologies can engender substantive improvements (Hill & Rothaermel, 2003). Thus, failure to adopt a discontinuous technology may ultimately lead to a firm's demise (Christensen, 1997).

The literature highlights three characteristics of discontinuous technologies (Kammerlander et al., 2018; Weber et al., 2019). First, they introduce new combinations of customer benefit dimensions. Typically, new products that employ a discontinuous technology initially underperform new products that employ the continuous technology in terms of traditional benefits. However, products based on a discontinuous technology may outperform in terms of new benefit dimensions or old, previously less important benefit dimensions (Christensen, 1997). Second, discontinuous technologies introduce new processes and structures for transforming inputs into benefits (Christensen & Bower, 1996). As such, they are competence-destroying for established firms in the affected industry (Anderson & Tushman, 1990; Sosa, 2011) and require "fundamentally new skills and

competences" (Tushman & Anderson, 1986, p. 444). Third, discontinuous technologies include different ways of appropriating value, especially in terms of revenue and pricing structures (Christensen, 2006; Markides, 2006).

A broad stream of research has highlighted that incumbents[1] face numerous intra-organizational hurdles that may cause them to react with inertia to discontinuous technologies (Ansari & Krop, 2012; Bockmühl et al., 2011; Danneels, 2006; Hill & Rothaermel, 2003; König et al., 2013; Kumaraswamy et al., 2018). According to this literature, adopting a discontinuous technology requires decision makers and their firms to recognize the emerging technology, acquire and assimilate previously unimportant and often unfamiliar resources, and fundamentally reconfigure organizational structures and processes (Eggers & Park, 2018). Yet, cognitive, strategic, and socio-political forces render incumbents slow to recognize discontinuous technologies, hesitant to invest in them, and adherent to established routines (König et al., 2013; Leonard-Barton, 1992). For example, Weber et al. (2019) showed that decision makers in hotel companies cognitively marginalized businesses like Airbnb because those businesses contradicted deeply institutionalized rules, norms, and assumptions. Christensen (1997) emphasized that discontinuous technologies may be economically unattractive because their adoption implies cannibalizing existing sales, their initial markets are often small, and their potential for growth and profit are uncertain. Gilbert (2005) showed how some traditional newspaper companies invested in online news but failed to adopt new, adequate routines (König et al., 2020).

Intriguingly, some firms are able to overcome these internal hurdles but still face pressures from *outside* the firm (Adner, 2013; Benner, 2007a, 2010). Indeed, scholarship on discontinuous technology adoption has increasingly shifted toward a more "relational perspective" (Kumaraswamy et al., 2018, p. 1027), emphasizing that discontinuous technologies disequilibrate the ecosystem surrounding an incumbent, for instance, by endangering ties with business allies and rendering complementors' capabilities obsolete (Adner, 2013). Mounting evidence indicates that incumbents' external constituents react negatively to a discontinuous technology. For example, industry associations in retailing tried to prevent their members from adopting digital technologies that would undermine the brick-and-mortar business model (König et al., 2012). Recently, scholars have begun to focus on the role of one powerful group of external constituents whose activities in the context of incumbents' attempts to embrace discontinuous technologies seem to be particularly influential: *infomediaries* (e.g., Benner, 2007a).

[1]We use "incumbents" to refer to those established firms for which the adoption of a discontinuous technology constitutes a non-paradigmatic shift from their innovation trajectories. For instance, digital imaging was a discontinuous technology for incumbent firms in the photography industry, but a continuous technology from the perspective of established firms in the computer industry (Benner, 2007b).

2.2 | Infomediaries as evaluators of discontinuous technology adoption

Infomediaries, such as analysts, consumer-advocacy groups, and bloggers, are boundedly rational social arbiters who collect, interpret, and disseminate firm-related information on behalf of their respective audiences (Deephouse & Heugens, 2009; Pfarrer et al., 2010). In other words, they are sensemakers *and* sensegivers (Gioia & Chittipeddi, 1991) in that they (re)construct meaning regarding firm-related issues and influence the sensemaking of their audiences (König et al., 2018). Infomediaries are "constituent minded" because they evaluate a firm's actions relative to their audiences' established expectations and preferences (Wiesenfeld et al., 2008, p. 232). This is important because infomediaries tend to apply their audiences' established cognitive schemas when they collect and interpret information on new products and technologies as well as the firms introducing those products and technologies (Benner, 2010; Rindova & Petkova, 2007). In turn, as discontinuous technologies challenge established cognitive schemas and the social and technological status quo—especially when introduced by incumbent firms—infomediaries might be biased when reacting to an incumbent's discontinuous technology initiatives.

For example, Benner (2007a) suggested that because securities analysts socially construct and specialize in categories of firms they deem comparable (e.g., Litov et al., 2012; Zuckerman, 2000), they view an incumbent's adoption of a discontinuous technology as illegitimate because it challenges the norms and expectations investors associate with that firm's category. Correspondingly, Benner (2010) found that analysts might have played a part in the demise of Kodak and Polaroid in the face of digital imaging. Analysts paid substantially less attention to incumbents' new products that incorporate the discontinuous technology (i.e., digital imaging) than to those that incorporate the continuous technology (i.e., analog imaging). Moreover, analysts believed that the discontinuous technologies could not provide the predictable returns and growth expected from income stocks (Litov et al., 2012).

Benner's work (e.g., Benner, 2007a; Benner, 2007b; Benner, 2010; Benner & Ranganathan, 2012; Benner & Ranganathan, 2017), as well as other related work on infomediaries, such as technology bloggers (e.g., Seidel

et al., 2020), strongly suggests that to better understand heterogeneity in incumbent responses to discontinuous technologies (Eggers & Park, 2018), it is worthwhile to study infomediaries' coverage of discontinuous technology adoption by incumbents. In this quest, our research focuses on one group of infomediaries that has been described as highly influential (Graf-Vlachy et al., 2020), but whose tendencies have thus far received little attention in the literature on incumbent inertia—*news media journalists*.

2.3 | News media journalists' role in the emergence of discontinuous technologies

News media journalists (hereafter "journalists") are those professional generalist infomediaries who work for (online and offline) television, magazines, newspapers, and radio stations, where they cover issues on behalf of a "Main Street" audience (Lamin & Zaheer, 2012, p. 47). They are widely seen as the key infomediaries at the interface between the firm and broader society (Deephouse, 2000). As Graf-Vlachy et al. point out, the "inner workings of a firm" are opaque to outsiders, such that "media coverage is often the main legitimate source for reducing information asymmetries about a firm's actions" (Graf-Vlachy et al., 2020, p. 36). More specifically, journalists—especially those employed by "prestige media" outlets (Deephouse et al., 2017, p. 10) like the *New York Times*—steer public attention (Petkova et al., 2013). Thus, journalists co-determine which issues and actors receive attention (Hilgartner & Bosk, 1988), and they shape social evaluations of firms, their leaders, and their strategic initiatives (Bundy & Pfarrer, 2015; Pollock et al., 2008).

Journalists are particularly important infomediaries during discontinuous technological change (Garud & Rappa, 1994; Kaplan & Tripsas, 2008). First, discontinuous technologies are inherently associated with uncertainty and ambiguity (Kaplan, 2008). Specifically, constituents struggle to make sense of the implications of a discontinuous technology and are unclear as to which viable approaches might exist to leverage the technology or to prevent negative externalities that may arise from it. One of a journalist's key social roles is to construct meaning out of uncertain issues (Deephouse & Heugens, 2009; König et al., 2018). In turn, public audiences strongly rely on them when making sense of discontinuous technologies (Kaplan & Tripsas, 2008). Second, discontinuous technologies typically co-emerge with social change and challenge the respective extant ecosystem and its institutions (Adner & Kapoor, 2010; Ansari et al., 2016; Hargadon & Douglas, 2001; Kaplan & Tripsas, 2008). In other words, although they hold the promise of tremendous benefits, they also carry heightened risks of potentially adverse consequences for journalists' audiences, for example, job losses and social decline (Brynjolfsson & McAfee, 2014; Carter & Bélanger, 2005; Weber et al., 2019). Therefore, journalists' sense-giving about discontinuous technologies is critical for broader audiences.

In fact, studies have revealed specific consequences of news media coverage of discontinuous technologies. For instance, Hargadon and Douglas (2001) described how the coverage of Thomas Edison's innovations in electric lighting contributed to the "creative destruction" of large gas monopolies in the United States, and Garud and Rappa (1994) studied the emergence of cochlear implants and showed how media reports fostered shifts in audiences' beliefs and evaluations and, ultimately, policymakers', physicians', and customers' behaviors.

Notably, research also shows that incumbent firms actively engage journalists as part of their adoption of discontinuous technologies (Pollock & Rindova, 2003). Firms not only try to attract journalists' attention in general and attempt to control audiences' "strategic projections" (Rindova & Fombrun, 1999, p. 695), but also they specifically engage the media in "technological dramas" to sway perceptions of new (discontinuous) technologies (Kaplan & Tripsas, 2008; Lampel, 2001, p. 30). These dramas often take the form of theatrical product announcements or demonstrations, such as the speed-typing contests that aimed to draw attention to the QWERTY keyboard design (David, 1986). The head of global communications of one of the world's largest automotive OEMs, whom we interviewed as part of our investigation, affirmed this notion when he explained how he engaged with journalists as part of the company's electric vehicle adoption initiative:

> [Journalists are] the classic intermediaries besides marketing [specialists] that I have around me to get my topics across. [...] I am in constant, small-scale, communicative contact with them and offer them new angles on the story from different sides in what is more or less a constant stream of information.

The importance of journalists' coverage in the context of discontinuous technologies has long been recognized. Interestingly, research has not yet transferred the notion of potentially biased coverage of discontinuous technology adoption by infomediaries (e.g., Benner, 2010) to journalists. This is an important gap because, just as the idiosyncratic nature of discontinuous technologies affects other infomediaries' coverage of those technologies, so

too might it affect and bias journalists' coverage. We attempt to fill this void by studying how journalists' coverage differs depending on whether a new product introduced by an incumbent represents a continuation of the established technological trajectory or a discontinuation of that trajectory (i.e., an attempt to adopt a technological discontinuity). Our inquiry focuses on two of the most important characteristics of news media coverage: volume and tenor divergence.

2.4 | (Dis)continuity-based product introductions and news media coverage volume

Our first proposition is that the volume of journalists' coverage of an incumbent's newly introduced product differs depending on whether that product builds on a discontinuous technology or the respective continuous technology. Coverage volume refers to the amount of media coverage an issue receives (e.g., Bushee et al., 2010; Dai et al., 2015). It is widely seen as the most basic characteristic of media coverage (Graf-Vlachy et al., 2020).

Prior research has highlighted the importance of coverage volume for firms (e.g., Liu et al., 2017). Media scientists and sociologists view a certain amount of news media coverage as a quasi-necessary condition for broader audiences to pay attention to an issue and, thus, for firms to gain access to this vital but scarce resource (Hilgartner & Bosk, 1988). As Petkova et al. indicate, although the implications of extremely high levels of news media coverage are unclear, little news is generally "bad news" for firms (Petkova et al., 2013, p. 865). More specifically, scholars have emphasized that a high volume of news media coverage fosters a firm's organizational reputation and its ability to charge price premiums (Rindova et al., 2005). In fact, a firm's capacity to attract news media coverage and, thereby, to focus public attention and engage audiences has been described as a critical strategic capability (Deephouse, 2000; Pollock & Rindova, 2003).

An understanding of news media coverage of newly introduced products seems particularly important for research on incumbents' adoption of discontinuous technologies. Media coverage moves initially obscure new technologies and the products that use them into the audience's consideration set, affording them salience and a certain level of cognitive legitimacy (e.g., Berger et al., 2010; Kennedy, 2008; Petkova et al., 2013; Rindova & Petkova, 2007). Notably, media coverage also puts a technology on the cognitive agenda of regulators and politicians—vital stakeholders in the emergence of technological discontinuities (Garud & Rappa, 1994). Moreover, managers may generally pursue initiatives with the intent of attracting news media coverage. Consequently, if journalists ignore a firm's initiatives, managers might feel pressured to change course (Gerstner et al., 2013). Therefore, when deciding on their firms' innovation trajectories, managers of incumbent firms might focus their product-innovation strategies on those products that are based on technologies that journalists cover with greater volume, and abandon the development of other products and technologies. For instance, Gerstner et al. (2013) showed that in phases of high media coverage of biotechnology, pharmaceutical incumbents accelerated their adoption of biotechnology.

Integrating our conceptualization of discontinuous technologies and research on the news media's institutionalized practices and idiosyncratic conventions, heuristics, and biases (König et al., 2018), we propose two reasons for why news media coverage volume is greater for introductions of products based on discontinuous technologies than for introductions of products based on continuous technologies. First, as shown in sociological studies of journalism, journalists tend to prefer covering issues that are novel, deviate from the conventional, and have uncertain ultimate implications—in other words, issues that are interesting (Deephouse & Heugens, 2009; Gans, 1979; Shoemaker et al., 1991). As evident in the criteria for important journalism awards, journalists also gain reputation and professional status by uncovering new, unfamiliar topics, putting them on the public agenda, and explaining them for the broader society (Tuchman, 1972). We argue that because discontinuous technologies are, by definition, novel, uncertain, and ambiguous, they are inherently newsworthy for journalists (Gans, 1979). This is particularly true for *incumbents'* discontinuous-technology-based product introductions because these products contradict not only previous assumptions and beliefs regarding the technology itself (Garud & Rappa, 1994; Kaplan & Tripsas, 2008), but also audiences' perceptions and expectations of what an incumbent inherently stands and *should* stand for—that is, the established technology (Hargrave & van de Ven, 2006; König et al., 2012). In short, compared with a continuous innovation—that is, a new product that does not challenge established paradigms—an incumbent's attempt to embrace a discontinuous technology might make for a better story.

Second, journalists dedicate more coverage to issues they deem relevant for the wider public. Journalists are socially situated, constituent-minded social arbiters (Wiesenfeld et al., 2008), and they can expect a larger audience if they cover issues that matter for audience members. As Deuze put it, many journalists want to give "legitimacy and credibility to what they do" (Deuze, 2005, p. 446), which is primarily a function of the relevance of

the issues they cover. As noted above, discontinuous technologies might strongly affect many people and cause profound positive and negative externalities (Brynjolfsson & McAfee, 2014; Carter & Bélanger, 2005; Christensen, 1997). This is particularly likely to be true when an *incumbent* adopts a discontinuous technology because doing so undermines the future of the existing technology (Suddaby & Greenwood, 2005). For instance, in a panel organized by one of the authors at the time of this study, the chairman of the board of a world-leading incumbent automotive OEM pointed to a specific difficulty his firm faced because, in contrast to players like Tesla, the firm's decision to shift to battery-powered electric vehicles was viewed by the public and policy makers as directly endangering the jobs of 21,000 employees in the firm's hometown. All in all, an incumbent's discontinuous technology adoption and its introduction of products that build on that technology are likely to have a higher news value than that firm's continuation of the historical technological path in the form of new products based on an old technology. In formal terms, we propose:

> **Hypothesis 1.** News media coverage volume is higher for discontinuous-technology-based product introductions than for continuous-technology-based product introductions.

2.5 | (Dis)continuity-based product introductions and tenor divergence

Research has noted that, apart from coverage volume, content-related aspects of news media coverage also have important implications (Graf-Vlachy et al., 2020). We focus on one content-related aspect of coverage that is both highly consequential and particularly likely to be affected by the (dis)continuity of the technology of a newly introduced product: tenor divergence of news media coverage (Guo et al., 2021). It refers to the degree to which journalists' evaluations of an issue are neither uniformly positive nor uniformly negative but instead vary in their positivity or negativity—in mathematical terms, the standard deviation of media tenor (Fanelli et al., 2009).

From a firm's perspective, tenor divergence is generally an important dimension of news media coverage (Guo et al., 2021). The more the news media's tenor regarding a strategic issue diverges, the harder it is for the news media's audiences to make sense of that issue or form a coherent opinion about it. Tenor divergence, by design, also conveys ambiguity and uncertainty regarding the ultimate implications of an issue. Given that audiences tend to avoid ambiguity (Ellsberg, 1961), tenor divergence might not only engender cognitive overload but also, more importantly, disengagement. In turn, higher degrees of tenor divergence could lead to less favorable evaluations of an issue among important external stakeholders. Tenor divergence might also have a polarizing effect given that a greater tenor divergence implies more opinionated rather than neutral evaluations. At the same time, such divergence also indicates a certain level of audience engagement with an issue (Gerstner et al., 2013), which might be beneficial for a firm.

An understanding of tenor divergence seems particularly important for inquiries into incumbents' adoptions of discontinuous technologies. In the early stages of a discontinuous technology, ambiguity regarding the technology is high (Anderson & Tushman, 1990). Tenor divergence in the media might amplify such perceptions, rendering important constituents, such as consumers, policy makers, or workers, undecided or even antagonistic with respect to the discontinuity. In fact, the undecided majority (Rogers, 2003) is likely to be particularly large during the early diffusion phases of a technological discontinuity (Christensen, 1997). Thus, the cognitive overload and potential disengagement triggered by high degrees of tenor divergence might exacerbate the difficulty of achieving mainstream adoption of the discontinuous technology (Moore, 1991). Decision makers in incumbent firms might anticipate such audience responses and, in turn, focus their innovation strategies on products with less tenor divergence. Thus, the potential systematic effects of the nature of the technology in a new product on tenor divergence might be key to explaining incumbents' responses to discontinuous technologies.

We hypothesize that tenor divergence in news media coverage is greater for discontinuous-technology-based product introductions than for continuous-technology-based product introductions. In this regard, our major premise stems from the sociology of journalism, which emphasizes that because of social norms in their field, journalists strive to be impartial and engaging at the same time (Shoemaker & Reese, 1996; Tuchman, 1972). Specifically, the journalistic norm of impartial reporting dictates that journalists ideally reflect multiple opinions and viewpoints they deem relevant for their target audience and, "whenever feasible, report opposing hypotheses in a manner that does not favor any one of them" (Gerken, 2020, p. 3122). As Entman notes, throughout their training, journalists learn to "present the views of legitimate spokespersons of the conflicting sides in any significant dispute, and provide both sides with roughly equal attention" (Entman, 1989, p. 30). At the same time, journalists aim to engage their audiences and, in this

quest, to juxtapose strong opinions—hopes and fears—that directly relate to and potentially affect their audiences' lives and personal circumstances (Deuze, 2005). In other words, tenor divergence is, in many ways, in journalists' innate institutionalized interests.

We argue that discontinuous technologies—and incumbents' new products that embrace them—provide journalists with a better opportunity to present opposing, strong and, thus, engaging opinions than new products that continue the firm's traditional technological trajectory. As we outlined above, discontinuous technologies involve inherently conflicting opinions given the uncertainties involved, and they carry ambiguous but potentially substantive economic and societal implications (Gerstner et al., 2013). In particular, discontinuous technologies introduce major modifications in underlying technological components and the links between them (Henderson & Clark, 1990), thereby altering product definitions and the configuration of product attributes (Kennedy, 2008; Navis & Glynn, 2011). Consequently, constituents are often unable to make sense of the novel products with their established mental schemas, leading to incongruity and more intense and controversial reactions, which journalist integrate into their coverage (Rindova & Petkova, 2007). Divergent opinions are also likely to emerge because discontinuous-technology-based products do not, on average, directly compete with the technological status quo, but offer new benefits (e.g., Christensen, 1997; Cooper & Smith, 1992). For example, early versions of digital cameras cost more than USD 20,000 and had inferior image quality when compared with analog 35-mm film cameras (Benner, 2010). Early versions of electric cars offered significantly lower fuel consumption, but had a driving range of <60 miles and had a higher price tag than gasoline-fueled cars (Department of Energy, 2014). Reports in the news media are likely to reflect such controversies, which are more likely in the context of discontinuous rather than continuous technological development.

Equally important is the fact that discontinuous technologies provide substantially greater leeway for engaging reporting. As we noted earlier, discontinuous technologies—such as artificial intelligence (Phan et al., 2017), digital platform approaches (Khanagha et al., 2020), and de-professionalizing innovations in health care (Galperin, 2020)—trigger high hopes, as they often hold great promise of positive social change, sustained economic growth (Solow, 1956), and employment in new lines of work (Tewksbury et al., 1980). At the same time, they challenge the extant ecosystem and its institutions (Adner & Kapoor, 2010; Ansari et al., 2016; Hargadon & Douglas, 2001; Kaplan & Tripsas, 2008), with social decline and significant ethical, cultural, and ecological ramifications as potential consequences (Brynjolfsson & McAfee, 2014; Carter & Bélanger, 2005). Thus, even though a discontinuous technology might gain an increasing audience over time, it endemically causes institutional and social "frictions" (Eggers & Park, 2018, p. 360), leading to a broad spectrum of potentially conflicting interpretations that go beyond standard assumptions regarding the 'liability of newness' of innovations (Aldrich & Fiol, 1994; Dougherty & Heller, 1994). As we noted above, these frictions might be particularly strong when a discontinuous technology is adopted by an incumbent rather than by an entrant (Sosa, 2013). An incumbent that steps out of the socially construed boundaries and structures of its field and, thus, violates its essential role as a high-status representative and protector of the status quo (Giddens, 1984; Navis & Glynn, 2011) makes a particularly interesting case for engaging news media journalism, especially for the inherently culturally conservative prestige media (Deephouse & Suchman, 2008).

In summary, we conclude that, compared with products based on a continuous technology, products based on a discontinuous technology trigger more divergent news media coverage:

> **Hypothesis 2.** The tenor divergence of news media coverage is higher for discontinuous-technology-based product introductions than for continuous-technology-based product introductions.

3 | METHODS

3.1 | Empirical settings

Our study involves two empirical settings, which are well-established instances of discontinuous technological change: the automotive industry during the emergence of electric mobility (Adner & Lieberman, 2021; Christensen, 1997; Klenner et al., 2013; Pinkse et al., 2014) and the photography industry during the shift from analog to digital imaging (Benner, 2010; Benner & Tripsas, 2012; Tripsas & Gavetti, 2000). Our approach of investigating the same phenomenon in two different empirical settings is in line with related extant research (Benner & Ranganathan, 2012; Tushman & Anderson, 1986). Similarly, the use of historical cases has ample precedent in the innovation literature (Anderson & Tushman, 1990; Burgelman & Chesbrough, 2001; Christensen & Bower, 1996; Danneels, 2004; Vuori & Huy, 2016), as it allows for the study of completed, long-term innovation processes and the use of archival data over extended periods

of time instead of having to rely on the ongoing and potentially biased sensemaking of selected informants.

We selected the chosen empirical settings for two reasons. For one, both settings provide archetypal examples of emerging discontinuous technologies (Markides, 2006). First, both technologies introduced new performance metrics for products, such as charging speed for electric vehicles and compatibility with different file formats for digital cameras. These new criteria went beyond existing performance criteria, such as driving range or image quality (Christensen, 1997; Klenner et al., 2013). Second, both technologies introduced new paradigm-challenging processes and structures of value creation, undermining the value of incumbents' existing competences (Benner, 2010; Pilkington & Dyerson, 2004; Tushman & Anderson, 1986). For example, as Adner and Lieberman noted, incumbent car manufacturers' "vehicle designs have been optimized for internal combustion engines, and they own and operate many specialized internal combustion engine and transmission plants, which are virtually useless for making electric vehicles" (Adner & Lieberman, 2021, p. 101). Third, both technologies introduced new ways of value capture. For example, Tripsas and Gavetti (2000) showed how the razor-blade profit model of Polaroid was jeopardized by digital imaging; and strategy consultancies warned early on that electric mobility would shift profit pools in the car industry, for example, among car dealers, given the greater simplicity of electric vehicles (BCG, 2018).

For another, and critical for our selection of sampling time frames, the emergence of both technologies triggered an extended era of ferment (Tushman & Anderson, 1986). In other words, in both settings, we were able to observe varying response strategies from incumbents to the emerging technologies (Anderson & Tushman, 1990). This is important for our research design, as we can only compare journalists' reactions to continuous and discontinuous technological innovations when the old and new technologies coexist for an extended period of time. Correspondingly, following the examples of prior research (e.g., Kammerlander et al., 2018; König et al., 2020), we chose to observe the two discontinuous technologies within a similar stage in the technology life cycle—from the technology's emergence until at least the establishment of a dominant design.

The automotive and photography cases enabled us to compare cases of discontinuous technological change that differed in interesting ways. Particularly, the discontinuities differed as to possible effects on society at large. Unlike digital cameras, electric vehicles promised significant environmental benefits through reduced emissions. Also, the development of electric vehicle technology during our sample period was strongly encouraged by regulators, for example, through the introduction of increasingly strict emissions targets and subsidies for electric cars (Augenstein & Palzkill, 2016; Department of Energy, 2014). In contrast, the introduction of digital cameras was an endogenous shock to the industry (Benner, 2010). These differences seemed important because journalists tend to view themselves as advocates for the average consumer (Donsbach, 2008; Weaver & Willnat, 2012); thus, the societal benefits of new products could considerably impact journalists' reporting. Finally, our samples cover different time periods. This allowed us to assess—at least to a certain extent—whether trends in journalism may affect our findings. Overall, testing our hypotheses in two contexts seemed beneficial as it bolstered the contextual and temporal generalizability of our findings.

3.2 | Sample

We manually gathered and coded an exhaustive dataset of 352 new product introductions by incumbents during a timeframe that includes the eras of ferment in the respective industries.

3.2.1 | Automotive industry

We collected data from 2010 to the end of Q1 in 2016 because this time frame can be considered the era of ferment within the technology life cycle of electric vehicles (Sierzchula et al., 2012, 2015). The U.S. Department of Energy considered 2010 the "new beginning for electric cars," as it included the introduction of the Chevrolet Volt and the Nissan Leaf as the first incumbent-introduced mass-market electric cars in the United States (Department of Energy, 2014). At the end of Q1 2016, Tesla announced the mass-market Model 3, which is the most commercially successful mass-market electric vehicle in the world as of 2021 (Morris, 2021) and marks the establishment of a dominant design and the transition of electric vehicles into an established technology. Importantly, during this era of ferment, interpretations of the new technology differed widely and the non-paradigmatic nature of the discontinuous technology was still highly salient (Christensen, 1997; Tushman & Rosenkopf, 1992). For example, powertrain and battery thermal management approaches varied extensively across different firms (Erriquez et al., 2017; Moulière et al., 2018). This time frame was also characterized by increased technological variation and experimentation (Anderson & Tushman, 1990). In particular, incumbent adopters faced genuine uncertainty about the odds of success for their interpretations of the new technology (Magnusson & Berggren, 2011). For instance, in a widely

watched video for his employees in 2016, Daimler CEO Dieter Zetsche compared the future of electric mobility with getting ketchup out of a bottle: "You know that something is coming, but not when or how much" (Wirtschaftswoche, 2016).

To construct our sample, we first identified the relevant incumbents, which we defined as all firms with a market share of more than 1% in the U.S. light-vehicles market in the year before the start of our sampling period (Cain, 2010). We individually considered sub-brands in conglomerates, such as Audi within the Volkswagen Group, as journalists likely perceive these brands as distinct from the parent conglomerates. We arrived at a set of 20 incumbents.

We then identified all products introduced by these incumbents. To do so, we examined press statements released by the incumbents on their (archived) websites. We had no reason to believe that the incumbents would not announce all of their products and, thus, we assumed our initial list of products to be exhaustive and not affected by any type of bias. To be able to estimate within-firm differences in journalists' coverage, we then excluded seven incumbents that did not introduce any products related to electric mobility in the United States in the sampling period. Of these seven incumbents, only Chrysler and Mazda were parent companies, while the other five were brands owned by Chrysler and General Motors. In the end, we could analyze 13 incumbent firms.

To ensure the comparability of press coverage, we only retained genuinely new models and new model generations, and excluded "facelifts" of the vehicles' chassis and minor technical model variations of, for instance, a vehicle's engine. Such facelifts and variations are barely discernible from the previous generation and including them would likely distort our findings. This left us with 161 new products introduced in the relevant period. As we had to remove six products due to missing data for control variables, our final sample comprised 155 products.

3.2.2 | Photography industry

In line with prior research, we set our sample period for the photography sample based on the introduction of the first commercially available digital single-lens reflex camera, the Kodak DCS 100, in 1991, and the bankruptcy of Polaroid in 2001, at which point over 50% of the introduced digital cameras adhered to one product configuration, marking the dominant design (Benner & Tripsas, 2012). Similar to the situation in the automotive sample, this period includes the era of ferment of digital imaging, in which there were still significant differences in product designs, for example, the inclusion of optical zoom functionality, removable storage, or LCD displays (Benner & Tripsas, 2012).

As in the automotive sample, we first identified an exhaustive list of relevant incumbents in the photography industry. No comprehensive market data was available for the camera industry to allow us to identify relevant incumbents during this period. Therefore, we consulted the academic literature (Benner, 2010; Benner & Tripsas, 2012) and news coverage (e.g., The Economist, 2012), and interviewed professional photographers to confirm that we covered all major incumbents offering both cameras and films in the United States. In the end, like prior research, we only focused on the three firms that offered both cameras and films because the disruption through digital photography mostly threatened the business models of these firms (Benner, 2010).

We then identified all products introduced by these incumbents during the focal period. We identified newly introduced digital cameras and analog cameras separately. First, we gathered details on all digital camera models from scholarly articles that featured exhaustive product data on digital cameras from this era (Benner, 2010; Benner & Tripsas, 2012) and verified the sources used within those articles. Second, we compiled an exhaustive list of analog cameras that the focal incumbents introduced by examining press releases and archived versions of firm websites, online photography forums, and photography magazines (e.g., *Popular Photography Magazine*), and verified those with broad searches across news articles. We have no reason to believe that the resulting combined sample of 276 products introduced in the focal period is incomplete. For the same reasons as in the automotive sample, we did not record minor product innovations, such as the addition of a flash, as separate products. We removed 79 products due to missing data for our control variables, which resulted in a final sample of 197 products.

3.3 | Dependent variables

To compute our dependent variables—volume and tenor divergence—we conducted a content analysis of news articles about the product introductions. In line with prior research (Gerstner et al., 2013; Hoffman & Ocasio, 2001), we focused on articles in the arguably most prominent newspapers in the United States—the *New York Times* and the *Wall Street Journal*. In addition, we extended our sample by including the widely circulated newspapers *Washington Post* and *Daily News New York* to achieve broader representation of the general media landscape (Carroll, 2004).

TABLE 1 Illustrations of statements with corresponding coding results

Industry	Model	Statement	Coding
Automotive	Chevrolet Volt 2011 (Discontinuous)	"When the Volt made its debut at the 2007 Detroit Auto Show as a design study and a technology showcase, it was hailed for its unconventional approach to green motoring. Later, as the economy slid into recession and GM went into bankruptcy, the Volt became a symbol of hope for the automaker's reinvention, a blueprint for a new approach to vehicle design" (New York Times, October 17, 2010).	Positive
Photography	Polaroid Captiva (Continuous)	"The bottom line? The Captiva is much more than a novelty, it is a finely made amateur camera that doubtless will find its niche in the marketplace. And with a suggested list price of only $129, that niche may be a big one" (The Washington Post, June 25, 1993).	Positive
Automotive	Volkswagen Passat NMS 2012 (Continuous)	"The Volkswagen diesel engines are marvels of fuel efficiency, but you pay a price in the form of engine noise, vibrations and truck-like feel in some respects" (The Wall Street Journal, September 28, 2011).	Ambiguous
Photography	Kodak Photo CD (Hybrid)	"The new system, called Photo CD, represents Kodak's effort to merge its standard film business with digital methods of storing images. People using Photo CD technology will still take their pictures using the same old cameras and film. Regular negatives and prints will still be available. But Kodak is gambling that amateur Photographers will be willing to radically change the way they store and view those pictures, and to pay more for the privilege" (The Wall Street Journal, May 21, 1992).	Ambiguous
Automotive	Chevrolet Volt 2011 (Discontinuous)	"This subsidized market niche is just one well-publicized malfunction away from disaster. Perhaps a Volt battery will overheat and burst into flames, as some computer batteries have been known to do. Or may be a Leaf driver will suffer frostbite while stuck in the next blizzard. Let us just hope one of his neighbors pulls over to help him out." (The Washington Post, January 28, 2011)	Negative
Photography	Kodak DC 20 (Discontinuous)	"Unfortunately, picture capacity is an issue that comes up often with the DC 20. You can take a maximum of 16 photos between visits to a computer for downloading. But if you want better-quality high-resolution pictures, and you probably will, once you see the low-res ones, you are limited to only eight shots at a time" (New York Daily News, August 4, 1996).	Negative
Automotive	BMW i8 2015 (Hybrid)	"BMW's i8 plug-in hybrid, which competes with the upper end of the Tesla Model S range, has a small gasoline engine that drives the rear wheels, and electric motor that drives the front wheels" (The Wall Street Journal, October 11, 2014).	Neutral

(Continues)

TABLE 1 (Continued)

Industry	Model	Statement	Coding
Photography	Fujifilm Finepix 1700 Zoom (Discontinuous)	"Not to be outdone, Fujifilm introduced the MX-1700 Zoom, which the company says is the first digital camera with an all-glass lens; and it is small, roughly the size of a deck of playing cards. It comes with an 8 MB card for storing images, a 1.5 million pixel imaging system, and a built-in flash. It is expected to retail for $599" (New York Daily News, January 9, 2000).	Neutral

We searched the two most widely used archives—Dow Jones Factiva and LexisNexis—for articles in the four newspapers that contained variations of the brand and the product name, in line with prior research using keyword searches (e.g., Lamin & Zaheer, 2012). We limited our data gathering to 60 days before and after each product introduction to be able to gauge the reaction to the product and to limit biases due to factors surfacing after a product introduction, such as commercial success. Subsequently, two of the authors and three trained coders manually checked the relevance of each article by determining that: (a) the focal product itself, and not another generation or derivative form, was specifically mentioned; and (b) the article was primarily concerned with the focal product (we excluded, e.g., articles in which a specific car model was mentioned as having been used in a crime). This procedure yielded 854 articles.

3.3.1 | Volume

In line with prior research (e.g., Kennedy, 2008; Petkova et al., 2013), we used the number of articles mentioning a focal product in the period between 60 days before and after the introduction date as an indicator of volume of news media coverage.

3.3.2 | Tenor divergence

To capture the tenor divergence of news media coverage, we computed the standard deviation of the tenor of all statements about a focal product (Fanelli et al., 2009). We extracted all statements referring to the focal product from each article to only include relevant content (Deephouse, 2000). This resulted in 1833 relevant statements. Following common practice in media research (e.g., König et al., 2018), we rated each statement as having positive (+1), negative (−1), or neutral (0) tenor. We treated ambiguous statements (i.e., those containing both positive and negative tenor) as the equivalent of one statement with positive tenor and one with negative tenor. The authors and three trained coders conducted the coding based on pre-specified coding guidelines (see Appendix A). Table 1 shows coded examples. Interrater reliability (Krippendorff's alpha) was 0.71 for the automotive and 0.88 for the photography sample, indicating sufficient to high reliability (Krippendorff, 2004).

3.4 | Independent variable and control for hybrid innovations

In line with our theoretical conceptualization—which is standard in our scholarly conversation—we distinguished discontinuous-technology-based product introductions dichotomously from continuous-technology-based product introductions. However, as an important element of our empirical study, following Benner's (2010) approach, we also aimed control for cases of intergenerational, or hybrid product launches (Furr & Snow, 2015)—that is, new products that employed (mixes of) both the continuous and the discontinuous technology.

Given this objective, we classified all products in our samples as products based on either continuous, discontinuous, or hybrid technological innovation. In the automotive sample, we followed the extant literature (Amsterdam Roundtable Foundation, 2014; Bohnsack et al., 2014; Gallagher & Muehlegger, 2011) for our classification. We classified: (1) internal combustion engines and mild hybrids (i.e., hybrids with a start-stop-system that cannot cover any distance on electric power alone) as continuous because they are essentially powered by fossil fuels; (2) full hybrids and plug-in hybrids as hybrids, as they can run only on electricity in some use cases (short distances), while they rely on fossil fuels in other use cases (extended distances); and (3) range extender and fully electric vehicles as discontinuous technologies, as they rely only on electric power for propulsion. Within the photography sample, we also followed the extant literature (Benner, 2010) for our

classification. We classified: (1) analog cameras, such as 35 mm film cameras, as continuous; (2) products showing both analog and digital characteristics, such as Kodak's PhotoCD or the Advanced Photo System, as hybrids; and (3) filmless digital cameras as discontinuous technologies. We tested our hypotheses with the independent variable being represented by a dummy variable for *discontinuous* products, with products relying on *continuous* technology improvements being our baseline. We include *hybrid* innovations as a control variable, for which we offer tentative interpretations in the discussion section (the baseline again being continuous-technology-based products).

3.5 | Further control variables

We control for an array of factors that may influence journalists' coverage beyond the effect of our explanatory variables. In both samples, we employed a dummy variable, *domestic incumbent*, to identify U.S. incumbents as a control for the fact that news media journalists may cover domestic incumbents differently (Gurun & Butler, 2012; Shoemaker & Reese, 1996). We also controlled for the *price* of products, taken as the logarithm of the product's price divided by 1000 to allow for an interpretation of the coefficient, as journalists might cover more affordable and, thus, broadly accessible products differently due to their increased relevance for their readership (McCombs, 2013). We collected prices at product introduction from several sources, including firm websites, press releases, and industry magazines. When testing our hypothesis about coverage volume, we included the *launch activity* in the respective industry, which we measured as the number of products introduced in the United States by incumbents in the 180 days prior to the introduction of a focal product. This control accounts for potentially increased competition for limited space in the news media (Gans, 1979; Hilgartner & Bosk, 1988). When testing our tenor divergence hypothesis (i.e., H2), we additionally controlled for the *share of articles* in each news outlet about every product introduction, as some news outlets might, on average, report with a higher tenor divergence than others. We also included *firm-fixed effects* and *year-fixed effects* to account for firm- and year-specific influences.[2]

We included several industry-specific controls in the automotive sample. As products based on popular predecessor models might be covered differently because of higher relevance (McCombs, 2013), we controlled for *predecessor sales* in the previous year (divided by 1000), which we collected from the Automotive News Data Center database. We also used a dummy to control for *new models* that did not have a predecessor because news media journalists might cover entirely new product lines (a new type of vehicle, e.g., the first SUV from an automotive incumbent) differently than a new version of an existing product (e.g., the new version of a Honda Civic; Gans, 1979; McCombs, 2013). Because car models that are only available as electric vehicles might receive different coverage than car models in which the electric version is a derivative of the same car model with an internal combustion engine, we also included a dummy for *derivative* models. In addition, as the aim of this study is to identify influences on news media journalists' coverage arising solely from the installation of different types of engines in vehicles, we controlled for overall quality differences among the observed products. More specifically, we computed a *quality* control variable by averaging the standardized ratings of three independent car-rating databases: U.S. News, CNET Roadshow, and The Car Connection.

Within the photography sample, we controlled for certain types of cameras, as they might be less relevant for consumers and, thus, receive different coverage (McCombs, 2013). Specifically, we included dummies for *professional cameras* (i.e., large cameras aimed at professional photographers), *instant cameras, disposable cameras*, and *non-cameras* (e.g., Kodak's You've Got Pictures or PhotoCD). We attempted to control for sales of preceding models and quality in a manner similar to what we did in the automotive sample, but data was not consistently available.

3.6 | Consideration of potential endogeneity and sample-selection bias

We suspected endogeneity issues due to omitted variables that were correlated with both our dependent and explanatory variables (Antonakis et al., 2010), for example, unobserved public-relations activities carried out by incumbents. A two-stage least squares regression analysis (Bascle, 2008) using instrumental variables considerably alleviated endogeneity concerns. Notably, the OLS model employed herein is methodologically applicable to our comparably small sample, and appropriate for estimating count outcomes and limited dependent variable models (Angrist, 2001). We used the *number of*

[2]As an additional robustness check, we carefully examined the data to test for trends in news media coverage over time. We found no clear patterns. There only seemed to be minute, negligible differences between the two samples. These observations bolstered our confidence that time trends do not threaten the validity of our findings.

patent applications and *R&D intensity lagged by 3 years* as instruments for our photography sample. We obtained the number of patent applications from the PATSTAT database. To compute R&D intensity, we sourced data on R&D spending and revenues from FactSet. Taken together, the two variables proved to be reasonably strong instruments (exceeding the Stock-Yogo weak identification test's critical value of 10% using the LIML estimator for small samples). As the Pagan-Hall test indicated heteroskedasticity at $p = 0.00$, we confirmed exogeneity using the Hansen J statistic, where the null hypothesis was not rejected at $p = 0.46$. Ultimately, both the Durbin chi-squared tests and the Wu–Hausman F-statistic failed to reject the null hypothesis of exogeneity in our model at $p = 0.51$ and $p = 0.52$, respectively.

We also investigated potential sample-selection bias in our analysis, as only products that received any news media coverage at all had observable values for tenor divergence. Such a bias could arise if an unobserved variable influenced both the likelihood of a product receiving news media coverage and the tenor divergence of its coverage (Certo et al., 2016). We suspected that such variables could exist in the form of, for instance, radical product appearance or unobserved public-relations activities. We identified *domestic incumbent* as a suitable exclusion restriction for the photography sample. This variable significantly influenced the probability of entering the sample (i.e., receiving any coverage) at $p = 0.00$ but proved to be insignificantly related to tenor divergence. In addition, the observed correlation between the inverse Mills ratio and our explanatory variables at 0.37 did not indicate multicollinearity problems (Certo et al., 2016). Estimating our model using the Heckman two-step approach yielded virtually unchanged coefficients and standard errors for our explanatory variable, and a rho close to zero as well as a statistically insignificant lambda at $p = 0.16$. While the latter does not prove the absence of sample-selection bias per se, the stability of the coefficients is a strong indicator of absence. We therefore used traditional regression methods (Certo et al., 2016).

Though we could find instrumental variables for the photography sample, we could not identify adequate instruments for our automotive sample. Moreover, as all discontinuity-based products in our automotive sample received media coverage, we could not repeat the Heckman two-stage approach in the automotive sample because our independent variables were redundant in the selection equation. However, we also performed the endogeneity and sample-selection bias checks in a combined sample of both industries and found consistent results.

3.7 | Estimation methods

We estimated our models with volume of news media coverage as the dependent variable using a negative binomial regression model, as this variable contained positive count data and because a likelihood-ratio test confirmed overdispersion in our data (Coxe et al., 2009). We estimated our models with tenor divergence as the dependent variable using a Tobit regression model because the variable's distribution was limited to an interval between zero and one, with many observations at the limits (e.g., Deephouse, 1996; Deephouse & Carter, 2005). We estimated all models using robust standard errors because the Breusch–Pagan test and visual inspection of the error terms indicated heteroscedasticity in our models.

4 | RESULTS

4.1 | Findings

Tables 2 and 3 show descriptive statistics for the automotive and photography samples, respectively. We determined that multicollinearity was not a concern, as the highest observed variance inflation factor (VIF) across our models was <5 and the highest average VIF for a model was <3, well under the recommended threshold of 10 (Wooldridge, 2013).

We summarize the results of our regressions in Table 4. Models 1–4 show the results for the automotive sample; Models 5–8 show the results for the photography sample. Models 1, 2, 5, and 6 show the results for volume as the dependent variable, and Models 3, 4, 7, and 8 depict the results for tenor divergence. For each dependent variable, we first show the results with our control variables only, and then include our hybrid and discontinuous technology variables.

Our results for the automotive and photography samples provide support for H1 and H2, which suggest that volume as well as tenor divergence of news media coverage is higher for introductions of discontinuous products than for continuous products. Specifically, we find support for H1 at $p < 0.001$ in the automotive sample (Model 2) and at $p < 0.05$ in the photography sample (Model 6). For H2, we find support at $p < 0.05$ in both samples (Models 4 and 8, respectively). The results are also meaningful and consistent in terms of effect size. Incidence rate ratios for the discontinuous variable of 4.707 in the automotive sample and 5.050 in the photography sample indicate an approximately five-fold increase in the volume of media coverage of discontinuous technological

TABLE 2 Descriptive statistics and correlations: Automotive sample

Variables	Mean	SD	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Volume	4.890	10.074										
(2) Tenor divergence	0.601	0.332	0.241*									
(3) Hybrid	0.213	0.411	−0.129	−0.358*								
(4) Discontinuous	0.355	0.611	0.260*	−0.021	0.551*							
(5) Launch activity	13.181	4.502	−0.041	−0.180*	0.246*	0.156						
(6) Price	−1.145	0.524	−0.085	−0.240*	0.206*	0.203*	0.079					
(9) Domestic incumbent	0.161	0.369	0.269*	0.102	−0.057	0.090	0.104	−0.189*				
(10) Quality	0.005	0.775	0.099	−0.025	0.138	0.072	−0.137	0.410*	−0.126			
(11) Predecessor sales	7.792	9.415	0.034	0.099	0.229*	0.084	0.232*	−0.300*	0.214*	0.032		
(12) New model	0.213	0.411	0.207*	−0.011	−0.155	−0.018	−0.088	0.154	−0.014	−0.091	−0.432*	
(13) Derivative model	0.252	0.435	−0.143	−0.184*	0.788*	0.638*	0.202*	0.233*	−0.052	0.078	0.265*	−0.265*

*$p < 0.05$.

TABLE 3 Descriptive statistics and correlations: Photography sample

Variables	Mean	SD	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Volume	0.348	1.106										
(2) Tenor divergence	0.395	0.370	0.455*									
(3) Hybrid	0.232	0.423	0.107	0.151								
(4) Discontinuous	0.986	0.878	0.035	0.336*	0.009							
(5) Launch activity	14.525	7.377	−0.056	−0.089	0.160*	0.145*						
(6) Price	0.992	1.924	−0.184*	0.261	−0.211*	0.671*	−0.087					
(7) Domestic incumbent	0.572	0.496	0.193*	0.267	0.128*	0.153*	0.067	0.011				
(8) Instant camera	0.076	0.266	0.071	0.042	−0.061	−0.276*	0.145*	−0.264*	0.248*			
(11) Disposable camera	0.069	0.254	0.044	−0.223	−0.082	−0.273*	−0.164*	−0.466*	−0.141*	−0.078		
(12) Professional camera	0.167	0.373	−0.088	0.081	−0.200*	0.207*	−0.148*	0.734*	0.013	−0.128*	−0.122*	
(13) Non-camera	0.018	0.134	0.597*	0.212	0.247*	0.002	−0.032	−0.221*	0.117	−0.039	−0.037	−0.061

*$p < 0.05$.

TABLE 4 Regression results

	Automotive sample				Photography sample			
	Volume		Tenor divergence		Volume		Tenor divergence	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Launch activity	−0.005 (0.021)	−0.012 (0.018)			−0.022 (0.031)	−0.023 (0.034)		
Price	−0.341 (0.236)	−0.547* (0.221)	−0.126 (0.131)	−0.168 (0.122)	0.372** (0.141)	0.088 (0.157)	0.196† (0.101)	0.107 (0.122)
Domestic incumbent	0.547† (0.318)	0.493† (0.271)	0.194 (0.215)	0.188 (0.177)	1.735** (0.599)	1.279† (0.677)	0.517 (0.320)	0.470 (0.292)
Quality	0.632*** (0.148)	0.575*** (0.141)	0.102 (0.067)	0.122* (0.059)				
Predecessor sales	0.019* (0.008)	0.025** (0.009)	−0.001 (0.004)	0.002 (0.004)				
New model	0.610** (0.220)	0.319 (0.194)	−0.043 (0.104)	0.004 (0.100)				
Derivative model	−0.568** (0.192)	−1.198*** (0.255)	−0.219* (0.107)	0.012 (0.129)				
Instant camera					0.976 (0.595)	2.002* (0.866)	0.353 (0.282)	0.870* (0.338)
Disposable camera					1.828*** (0.516)	1.716** (0.528)	0.603 (0.397)	0.996** (0.322)
Professional camera					−1.852* (0.742)	−1.333† (0.701)	−0.652 (0.445)	−0.431 (0.413)
Non-camera					4.023*** (0.575)	3.708*** (0.677)	1.023** (0.356)	0.304 (0.399)
Hybrid		0.549* (0.280)		−0.431** (0.134)		0.619 (0.662)		1.287** (0.428)
Discontinuous		1.549*** (0.292)		0.249* (0.100)		1.616* (0.700)		0.967* (0.439)
Share articles WSJ			−0.311 (0.665)	−0.233 (0.690)			0.830* (0.362)	0.783* (0.337)
Share articles NYT			−0.276 (0.642)	−0.143 (0.690)			0.680* (0.282)	0.428 (0.293)
Share articles WP			−0.420 (0.787)	−0.385 (0.794)			0.324 (0.364)	−0.095 (0.382)
Constant	−0.180 (0.739)	−0.416 (0.611)	0.325 (0.771)	0.212 (0.791)	−1.841† (0.957)	−2.039* (0.979)	−0.505 (0.345)	−0.504 (0.327)
N	155	155	124	124	197	197	52	52
Log (pseudo-) likelihood	−349.330	−333.577	−69.291	−59.326	−136.806	−133.567	−27.598	−23.614

Note: Robust standard errors are in parentheses. All models include firm-fixed effects and year-fixed effects.
***$p < 0.001$; **$p < 0.01$; *$p < 0.05$; †$p < 0.10$.

innovations compared with continuous product innovations. This translates into about 13 additional articles for purely electric new car models (3.5 articles for continuous versus 16.5 articles for discontinuous cars) and circa one additional article for purely digital cameras (0.3 articles for continuous versus 1.3 articles for discontinuous cameras), based on the predicted values for new products with continuous innovation. Regarding tenor divergence, we see a much higher divergence for both discontinuous vs. continuous cameras ($\beta = 0.967$) and discontinuous versus continuous vehicles ($\beta = 0.249$).

4.2 | Robustness tests

We conducted several robustness tests. First, we re-ran our analyses with variations in our variable and model specifications. We re-coded the dependent variables with a time frame of 30 days prior to and after the product introduction. For our independent variable, we employed different classifications of technology, including coding "mild hybrid" vehicles (i.e., vehicles with only a start-stop system) as hybrid rather than continuous innovations. We also ran our models using an ordinal independent variable *extent of technological discontinuity* (coded as 0 for products based on continuous technologies, 1 for those based on hybrid technologies, and 2 for those based on discontinuous technologies), rather than simultaneously employing the hybrid and discontinuous dummy variables. We also tested our models without firm- or year-fixed effects, and using a Poisson regression instead of a negative binomial model specification. Finally, to control for brand equity beyond the firm-fixed effects, we added market share (Aaker, 1996) to our analyses for the automotive sample (data from IHS Markit; corresponding data was not available for the photography sample). This control variable proved insignificant in all models. In all robustness tests, our results remained unchanged.

Second, to confirm that the products based on discontinuous technologies are not generally covered with a different tenor than those based on continuous technologies, we re-ran our analyses using the tenor of news media coverage (measured as the Janis and Fadner (1943) coefficient of imbalance) as our dependent variable using a Tobit model specification (e.g., Deephouse, 1996). We did not find a significant relationship between the hybrid or discontinuous dummy variables and the tenor of media coverage.

Third, to confirm that our analyses are not tainted by simultaneity, we ran an analysis that regressed the discontinuity dummy variable on the coverage volume and tenor divergence of the same firm's previous introduced product. The regression coefficients were insignificant.

Fourth, to address the concern that media coverage was influenced by marketing activities rather than the nature of the technology, we used a different research design to account for the effect of press releases on coverage volume. We conducted a panel analysis across products and dates relative to the product introduction date, using daily coverage volume as a dependent variable. We collected 897 and 812 press releases about the focal products issued by automotive and photography manufacturers, respectively, from newswire services. After controlling for the number of press releases issued in 30-, 90- or 180-day windows before the focal date, all of which had a significant effect, our independent variable remained highly significant.

Finally, we ran a robustness check on the model predicting tenor divergence in the photography sample. Since this sample likely extends beyond the technology's era of ferment and the establishment of a dominant design, and the results for hybrid products in this industry differed from those in the automotive sample, we truncated the photography sample at the year 1999, reducing the number of observations by about a third. All results are consistent with our main analysis, suggesting that the longer sampling timeframe does not drive the different results.

5 | DISCUSSION

Our key argument in this study was that because of their idiosyncratic audiences, preferences, and biases, as well as the nature of discontinuous technologies, journalists cover the introduction of products employing a discontinuous technology differently than the introduction of products employing the respective continuous technology. We hypothesized that both volume and tenor divergence of news media coverage are greater for products based on discontinuous technologies than for those based on the established technology. Our empirical data from two contexts that both feature the emergence of discontinuous technologies provide support for our theorizing.

5.1 | Theoretical implications

Our conceptual framework and empirical findings make substantial contributions to the literature on incumbents' responses to discontinuous technologies (Danneels, 2006; Eggers & Park, 2018; Weber et al., 2019), especially to the conversation on the role of infomediaries in that context (e.g., Benner, 2007b, 2010). First, as our overarching contribution, we introduce a news media perspective to this conversation. Notably, given their general influence on public meaning construction and social evaluations, the

news media has received substantial attention in other streams of management research (Deephouse, 2000; Graf-Vlachy et al., 2020). Yet, research on incumbent firms' responses to discontinuous technologies offers only scant descriptions of the media's influence on stakeholders' perceptions of nascent discontinuous technologies (Garud & Rappa, 1994; Gerstner et al., 2013; Hargadon & Douglas, 2001; Lounsbury & Rao, 2004). Findings on the effects of news media coverage on incumbents' adoption behavior are even more fragmented (Gerstner et al., 2013; Schneidmüller, 2020), and research on potential idiosyncrasies in news media coverage of incumbent firms' responses to discontinuous technologies is lacking entirely (Eggers & Park, 2018). As such, we view our conceptualizations, hypothesizing, and empirical analyses as theoretical groundwork—a necessary foundation for an extensive debate within the literature on incumbents' responses to discontinuous technologies, specifically around news media journalists as consequential actors. In particular, we open this debate by theoretically accounting for the specific characteristics and the context of journalists and their work, which differ substantially from those of other external stakeholders in general but also other infomediaries (Graf-Vlachy et al., 2020; König et al., 2018).

Second, our results are theoretically important in that they reveal hitherto undescribed tendencies in two central dimensions of news media coverage that prior literature suggested will shape both audiences' and the focal incumbent's behaviors—volume and tenor divergence. In particular, our findings highlight previously unstudied challenges for established firms that aim to adopt a new technology that is discontinuous relative to their established innovation trajectories (Benner, 2007a). As we show, these firms can generate a disproportionally high amount of attention among constituents—customers, competitors, complementors, policy makers, and others—when launching products based on a discontinuous technology because journalists cover those launches more than launches of products based on continuous technologies. In isolation, this may appear beneficial for incumbents, as attention is a valuable social resource (Hilgartner & Bosk, 1988), and media coverage can make consumers aware of an innovation (Rogers, 2003). Yet, products based on discontinuous technologies appear to create uncertainty and ambiguity among important audiences, reflected in the fact that the tenor of journalists' evaluations of these innovations is notably more divergent. As audiences avoid ambivalent, divergent issues (Guo et al., 2021), journalists' divergent coverage of incumbents' adoption of discontinuous technologies may negatively affect evaluations by the public, exacerbating incumbents' already strong tendency to stick to continuous technologies rather than adopting discontinuous technologies. Thus, by studying news media coverage of (dis)continuous product introductions, our research reveals a "media dilemma" that adds to incumbents' oft-lamented "innovator's dilemma" (Christensen, 1997; König et al., 2013).

Further exacerbating this media dilemma, journalists' coverage tendencies regarding discontinuous technology adoption appears to be diametrically opposed to those of other infomediaries, especially analysts (Benner, 2010; König et al., 2018). In this regard, as we investigate the same empirical setting as Benner (2007a, 2010)—the emergence of digital photography—we cautiously compared our findings with Benner's (Benner, 2010; summarizing the numbers from her Tables 1, 3, and 5) in a post hoc analysis. Intriguingly, while our data showed that journalists mentioned the discontinuous (i.e., digital camera) product launches almost five times more often than hybrid or continuous product launches, Benner's (Benner, 2010) data showed that analysts' reports mentioned hybrid and film products 20 times more often than digital cameras. Given the increasing research on heterogeneity among firm audiences (Falchetti et al., 2022; König et al., 2018; Lamin & Zaheer, 2012), this comparison hints at previously neglected tradeoffs in incumbents' strategic innovation management, as the same innovation strategy may receive advantageous coverage and evaluations from one audience but disadvantageous coverage and evaluations from another. Importantly, we must expect different incumbent adopters to deal differently with these kinds of dilemmas. Therefore, our study offers a new vantage to scholars' endeavor of explaining the phenomenon of heterogeneity in incumbent responses to discontinuous technological innovation (Eggers & Park, 2018; Gerstner et al., 2013).

Third, our unique empirical data hints at the importance of investigating technological hybrids in the context of discontinuous technological change (Benner, 2010; Furr & Snow, 2015). In this regard, our results from the two samples show an interesting difference (see Table 4, Models 4 and 8). Whereas tenor divergence for hybrid products is rather low in the automotive industry—lower, in fact, than for products based on continuous technologies—the opposite is true for camera hybrids, which exhibit much greater tenor divergence than new analog products. Of course, we can, for the most part, only speculate about the causes of these findings. Initially, one might suspect the explanation to lie in the difference in time frames we studied. While the automotive sample ended with the establishment of a dominant design, it is likely that we capture a longer timeframe in the photography sample. Consequently, our findings might be driven by the possibility that, on average over the entire sample, there was less uncertainty about the

ultimate success of digital imaging. Later media coverage might therefore have been directed distinctly at either laggards, for which hybrid products might be framed as a very positive "bridge" to the technology of the future, or directed at people ready to adopt, to whom hybrid products might be presented as already obsolete against the backdrop of the imminent dominance of fully digital cameras. However, neither replacing the year-fixed effects with a linear product introduction date variable in the regression analyses, nor running a simple correlation analysis between the product introduction date and tenor divergence for all hybrid products supports this idea. Further, our robustness check with a truncated sample also suggests that this explanation is unlikely to hold.

Alternatively, it is conceivable that, for the automotive sample, hybrid products (e.g., plug-in hybrid vehicles) relatively clearly addressed environmental concerns associated with conventional vehicles, while they unambiguously avoided the drawbacks of full electric mobility, for example, a shorter range and an insufficient charging infrastructure. Moreover, the higher prices associated with these products had been, to some degree, offset by governmental subsidies and reductions in ownership costs (Motavalli, 2010). In contrast, in the camera context, hybrid products may have been particularly difficult to assess, potentially even more than clearly path-divergent "pure" digital cameras. This might have been the case, for instance, with the Advanced Photo System technology, which seemed to position "film to play a role, regardless of the way digital evolves," as noted by the *New York Times* at the time (Holusha, 1995). Further potential explanations that cannot readily be reasonably tested with our current data set include structural market features such as the number of incumbents, the maturity of the markets overall, and the idiosyncratic histories of the respective discontinuous technologies. Nonetheless, given the ubiquity and importance of hybrid technologies in technological evolution as well as their relative neglect in discontinuous technology research (Furr & Snow, 2015), our findings shed light on the potential importance of contextualizing and differentiating hybrid technologies.

5.2 | Practical implications

Our research also contributes to practice. In particular, it indicates that top executives and decision makers in R&D need to expand their understanding of the innovation process to consider the effect of a firm's innovation activity and innovation portfolio (Kaufmann et al., 2021) on news media coverage. By showing that different types of technological innovations receive fundamentally different coverage from the news media, we remind practitioners that a firm's innovation trajectory carries important and potentially challenging paradoxical consequences beyond those traditionally considered in innovation management. Notably, just as it is important for executives to understand and respond to these complex pressures during discontinuous technological change, so too must journalists and those consuming news media content be aware of potential biases in the coverage of new technologies.

This is particularly important for policy makers, who often need to design new legislation around emerging discontinuous technologies and, in so doing, might rely on news media content, especially if the news media is central to discursive processes and emerging social debates among their audience (Ford & Baucus, 1987). Additionally, policy makers need to be aware of journalists' tendencies to cover discontinuous-technology-based products, and potentially discontinuous technologies overall, with a higher volume. Given the involved uncertainty and the fact that most discontinuous technologies do not actually pan out, journalists' reporting might thus overstate or "hype" a technology (Fenn & Raskino, 2008) in a manner that overemphasizes its actual importance and relevance for new policies.

6 | LIMITATIONS AND FUTURE RESEARCH

The limitations of this study point to promising avenues for future research. Most notably, given limitations regarding data availability, we could not control for all potentially confounding variables. First, we were unable to control for the content of a focal incumbent's media-directed communication. This would have been helpful for differentiating between the media's reactions to the technological nature of a new product and the corporate communication surrounding it. Future research could consider the nature of press releases or other incumbent communication that support new product introductions. It would also be interesting to examine if firms anticipate and purposefully influence social evaluations of their adoptions of discontinuous technologies (Elsbach et al., 1998), for example, through rhetorical framing (Hargadon & Douglas, 2001; Kaplan & Tripsas, 2008; Orlikowski & Gash, 1994; Solomon, 2012). Second, we could not obtain data on certain time-variant characteristics of the focal incumbents. We could imagine that, for instance, considering a firm's brand equity in even more detail than we did in our robustness checks (i.e., market share) might reinforce the internal validity of our findings because brand equity might significantly influence the news media's reactions to product introductions.

Our empirical investigation focused on two industries; yet, as virtually any empirical study, ours is limited in

terms of the heterogeneity of the empirical contexts, which naturally limits generalizability. First, in this regard, we encourage other scholars to test our ideas in business-to-business (B2B) contexts, such as the move from mechanical to electronic typesetters (e.g., Tripsas, 1997). We surmise that journalists in these industries might show different tendencies in their coverage than in the industries we studied, for example, due to different norms and values given that B2B contexts are less visible to the public. Second, studying a larger set of different industries might allow future studies to resolve our ambiguous findings regarding hybrid products. Specifically, they might find that structural market features such as the number of incumbents, market concentration, market maturity, as well as the idiosyncratic development histories of various discontinuous technologies might help explain media coverage of hybrid products. Third, we encourage scholars to compare our results with those of studies investigating news media reactions to start-up firms that introduce products based on discontinuous technologies. Anecdotal evidence suggests that start-ups begin with a clean slate in terms of their technological foundations (New York Times, 2022). We conjecture that start-ups also have a clean slate in terms of institutional norms and social expectations. Fourth, we imagine that it might be fruitful to broaden our focus to other forms of journalism. One option would be to include specialized industry media, whose target audience, albeit smaller, comprises key stakeholders for industry players (Petkova et al., 2013). In addition, digitalization in the form of blogs and social media has altered how individuals consume news (Xu et al., 2014) and how social evaluations come into being (Etter et al., 2019). Fifth, we envision scholars to more systematically investigate the differences in coverage for (dis)continuous technological product introductions between different types of infomediaries. Sixth, we see opportunities in studying the effects of discontinuous technology adoption on dimensions of social evaluations beyond tenor divergence. For example, it would be interesting to study whether journalists—attribute more or less charisma, celebrity, or status to firms and CEOs that engage in discontinuous technologies (Fanelli et al., 2009; Lovelace et al., 2018). Gerstner et al. (2013) suggest that narcissistic CEOs might expect such responses, and Chatterjee and Hambrick (2011) find that the media provides such adulation to CEOs when they engage in risky endeavors.

We also see several opportunities to expand the scope of our study. First, in this regard, our post hoc findings suggests that research on the role of hybrid technologies may prove more interesting than currently reflected in the scant extant research on hybrid technologies (e.g., Christensen & Raynor, 2013; Furr & Snow, 2015). In particular, we see promising avenues for research that offers typologies of different hybrid technologies and integrates research on such different forms of technological hybridity with classic approaches to discontinuous technological change. Second, for the sake of parsimony, we did not delve into the implications of certain characteristics or patterns of journalism. Future research could study whether between-context differences in certain journalistic trends—such as anchoring or priming effects that might differ depending on whether the initial coverage of a given discontinuous technology was positive or negative—interfere with the mechanisms we propose. We would encourage scholars to investigate these and other characteristics as potential moderators of our focal relationship. Third, journalists are likely to influence each other in their coverage (Shoemaker & Reese, 1996). Although we did not find significant differences in tenor divergence between early and later coverage in unreported analyses of our samples, we call for future research on journalists' routine reliance on other media and ensuing cascades of media coverage (Shaw & Sparrow, 1999) in the context of discontinuous technologies. Fourth, we recommend scholars investigate how news media coverage volume and tenor divergence could influence incumbents' subsequent strategies during discontinuous technological change. This could be particularly fruitful because, although research on social evaluations has established that the reactions of journalists and the general public can influence firms' strategies (e.g., Rindova et al., 2006), in the context of incumbent inertia, such an influence has only been systematically shown for stock market evaluations (Benner & Ranganathan, 2012). Fifth, our study does not explore outcomes of media coverage. Although prior research has already shown that media coverage has important downstream consequences (Graf-Vlachy et al., 2020), we encourage future researchers to specifically study the effects of media volume and tenor divergence on innovation performance and diffusion.

In conclusion, we hope that our study serves as a starting point for productive scholarly conversations on the idiosyncrasies and importance of the news media for discontinuous innovation in a wide range of domains and as a first step toward a more nuanced view of external influences on incumbent responses to discontinuous technologies.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

ETHICS STATEMENT

The authors have read and agreed to the Committee on Publication Ethics (COPE) international standards for authors.

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APPENDIX A

A.1 | Coding guidelines for automotive sample

Coding	Definition	Anchoring examples
Positive	Favorable portrayals of the focal product/technology	Growing concern about the environment, volatile gasoline prices and policies that promote renewable and other cleaner sources of energy have sparked interest in electric cars among governments and consumers (Wall Street Journal, 2009). When the Volt made its debut at the 2007 Detroit Auto Show as a design study and a technology showcase, it was hailed for its unconventional approach to green motoring. Later, as the economy slid into recession and G.M. went into bankruptcy, the Volt became a symbol of hope for the automaker's reinvention, a blueprint for a new approach to vehicle design (New York Times, 2010).
Negative	Unfavorable portrayals of the focal product/technology	Hybrids and electric cars typically cost at least several thousand dollars more than their conventional counterparts. BMW said Monday that its ActiveHybrid 5 would be priced at $8700 above the gas-powered 535i. The Volt costs nearly twice as much as the similarly sized Chevy Cruze, after a $7500 federal tax credit (New York Times, 2012). And many auto makers are reluctant to begin investing in electric-car technology before a recharging infrastructure is in place. Audi of America Inc. President Johan de Nysschen said Monday the U.S. car market will not be able to support plug-in all-electric vehicles on a mass scale for at least 20 years (Washington Post, 2009).
Ambiguous	Portrayals of the focal product/technology that contain both positive and negative evaluations of the product/technology, or where a positive and negative interpretation of the portrayal is possible	Electric vehicles, Mr. Molinaroli said, "will be an alternative. We just do not think it will happen as quickly as all the press releases out there would make you think" (Wall Street Journal, 2010). It is no sure bet that electric cars will displace internal-combustion cars on a mass scale, especially if oil stays cheap and abundant. But it is equally uncertain that the relatively slow pace of automotive innovation between 1950 and 2000 will be the norm going forward (Wall Street Journal, 2010).
Neutral	Portrayals of the focal product/technology that are not evaluative	The first Nissan Leaf, a pure electric car and a rival of the Volt, was delivered on Saturday (Washington Post, 2010). "Electric cars will have far less of the kind of parts that we have always manufactured," said Hirotoshi Harada, the parts maker's president. "But they may require parts that never existed before," he said. "That's what we want to find out" (New York Times, 2010).

A.2 | Coding guidelines for photography sample

Coding	Definition	Anchoring examples
Positive	Favorable portrayals of the focal product/technology	Typical of these cameras is Kodak's Digital Science DC20 camera, unveiled just this week. It is a Pocket-sized marvel that is expected to retail for under $350, a huge drop from the thousand-dollar price tags of similar, larger cameras of a year earlier (Washington Post, 1996). Digital imaging is a "tremendous growth area" for companies like Fuji and Kodak, said Andrew Libman, an analyst at Technomic Consultants International in Northbrook, Ill. He estimates that sales of digital cameras alone will grow to as much as $180 million in 1997 from about $35 million to $40 million last year (Wall Street Journal, 1994).
Negative	Unfavorable portrayals of the focal product/technology	Color reproduction is another issue. Most of the tested units failed to capture the vividness of flowers or other bright colors (Washington Post, 1998). Previous electronic cameras, such as Canon USA Inc.'s Xapshot, have flopped in the marketplace, mostly because the pictures were too fuzzy and the cameras and equipment to hook them up to computers cost roughly $1000 (Wall Street Journal, 1994).
Ambiguous	Portrayals of the focal product/technology that contain both positive and negative evaluations of the product/technology, or where a positive and negative interpretation of the portrayal is possible	"It is a cool product for the market it is trying to target," said Caroline Sabbagha, an analyst who follows Kodak for Lehman Bros. Her one quibble with the device is that "the storage is not up there enough to use all these functions really well" (Washington Post, 2001). As with most technology, you will pay a premium for the privilege of being first; digital cameras cost two to three times the cost of conventional cameras. That said, they are undeniably fun to use, and may find a place in many families' holiday gift plans (New York Times, 1995).
Neutral	Portrayals of the focal product/technology that are not evaluative	The DC50 is being displayed at the Mac World trade show that opened today in San Francisco (New York Times, 1996). If you are buying a digital camera for the first time, focus on cameras that cost less than $400 to $500 since price spikes now allow the average consumer to get a high-quality camera in this price range (Daily News, 2001).