Multilevel optimal distinctiveness: Examining the impact of within- and between-organization distinctiveness of product design on market performance

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Forthcoming at ***Strategic Management Journal***

Acknowledgement: We greatly appreciate the excellent editorial guidance by Professor Rudy Durand and two anonymous reviewers. We also thank Tyler Wry and Trent Williams for their helpful comments and suggestions on an early version of this paper. Eric acknowledges the financial support provided by the IECE Faculty Fellowship.

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ABSTRACT

Research summary: This research develops a multilevel framework to study optimal distinctiveness (OD) at two levels. We distinguish between *within-organization distinctiveness* and *between-organization distinctiveness* of product design and examine how they independently and interactively influence performance. Analyzing a unique data set of 2,203 model-year observations for automobiles sold in the U.S. market from 2001 to 2016, we found that while within-organization distinctiveness of product design hurts market performance, between-organization distinctiveness of product design increases market performance. Moreover, when between-organization distinctiveness of product design is high, the negative impact of within-organization distinctiveness of product design on performance is weakened. These findings contribute to OD research by improving the understanding of OD as a multilevel construct and elaborating on its contextual contingency.

Managerial summary: How should multiproduct organizations design their products to achieve better performance? This article provides a multilevel perspective that encourages managers of multiproduct organizations to consider different frames of references when designing products. We suggest that a product's design should be consistent with the prototypical design of its organization, whereas the prototypical design of this organization should be different from the average design in the industry. We also found that an atypical design is more desirable if it is from an organization known for distinctive designs in its industry. Our findings help managers of multiproduct organizations achieve the optimal levels of design distinctiveness at both the product and organizational levels.

KEYWORDS
optimal distinctiveness, within-organization distinctiveness, between-organization distinctiveness, product design, market performance

1 INTRODUCTION

"To be different, or to be the same" has long puzzled managers in their strategic decisions (Deephouse, 1999). Strategy scholars have emphasized how differentiation helps organizations establish competitive advantages and reduce competition (Barney, 1991; Hoopes, Madsen, & Walker, 2003; Porter, 1987), while institutional theorists have stressed how conformity enables organizations to achieve legitimacy and avoid penalties caused by deviance in behavior (DiMaggio & Powell, 1983; Durand & Kremp, 2016; Zucker, 1977). In response, a robust body of work has emerged in strategy and organization research around the notion of "optimal distinctiveness" (OD), which focuses on identifying the optimal level of distinctiveness that positively shapes stakeholder perceptions and enhances performance (Boulongne & Durand, 2021; Haans, 2019; Navis & Glynn, 2011; Semadeni, 2006; Zhao, Fisher, Lounsbury, & Miller, 2017; Zuckerman, 2016). To date, most OD research has focused on the organizational level by examining what constitutes an optimal level of distinctiveness of an organization as compared to its peers in terms of organizational level attributes such as strategies (Deephouse, 1999; McNamara, Deephouse, & Luce, 2003), innovation activities (Jennings, Jennings, & Greenwood, 2009; Roberts & Amit, 2003), business models (Zott & Amit, 2007), and organizational narratives (Haans, 2019; Taeuscher, Bouncken, & Pesch, 2021).

Although achieving OD is important in an inter-organizational context, the need to balance the competing demands for differentiation and conformity has become increasingly imperative in an intra-organizational context as many organizations expand their product lines and develop a variety of products to increase competitiveness and consumer loyalty (Anand & Shachar, 2004; Li & Liu, 2019). However, little research has been devoted to understanding how organizations simultaneously balance the tensions between differentiation and conformity in inter- and intra-organizational contexts. Understanding OD in both contexts is important because multiproduct organizations constantly face the challenge of managing and orchestrating differentiation across different levels: First, to what extent should their products be distinct from those of other organizations? Second, to

what extent should their products be distinct from other products within their own organization? Third, how can organizations effectively orchestrate the distinctiveness at multiple levels?

To answer these questions and address recent calls for a more nuanced and comprehensive understanding of OD (Durand & Haans, 2021; Zhao et al., 2017; Zhao, 2021), this study develops a multilevel framework to study OD across two different levels. Specifically, we define and examine *within-organization distinctiveness* and *between-organization distinctiveness*. The former refers to product-level distinctiveness in how a product is distinct from the product prototype of its organization; the latter captures organization-level distinctiveness in how an organization's product prototype is distinct from that of the entire industry.[1] We propose that the extent to which distinctiveness benefits or hinders performance depends on the level at which distinctiveness is conceptualized. In particular, we focus on the distinctiveness of product design, or the visual form of a product, which is increasingly recognized as one of the most important drivers of a product's market performance (Bloch, 1995; Chan, Lee, & Jung, 2021; Chan, Mihm, & Sosa, 2018; Radford & Bloch, 2011).

According to research on categorization and competition (e.g., Cattani, Porac, and Thomas, 2017; Durand and Paolella, 2013; Rosch, 1978), the distinctiveness of product design can lead to both illegitimacy costs by impeding categorization and competitive benefits by reducing competition. Thus, the relative strengths of these two countervailing mechanisms determine the net benefit and performance impact of distinctiveness (Durand, Hawn, & Ioannou, 2019; Haans, 2019). Specifically, we argue that the illegitimacy costs overwhelm the competitive benefits when within-organization distinctiveness of product design increases. This is because the legitimacy pressure is more salient than competitive pressure within an organization. In contrast, between-organization distinctiveness of product design generates greater competitive benefits than illegitimacy costs because the competitive

[1] In this study, organization refers to an organization with a distinct brand. For firms that own multiple brands, we consider each division with a unique brand name as an organization.

pressure is more important than legitimacy pressure in the inter-organizational context. Therefore, within-organization distinctiveness has an overall negative impact on performance while between-organization distinctiveness exerts a positive effect on performance.

Furthermore, the impacts of within- and between-organization distinctiveness of product design on performance are not independent but interactive because a product's identity in one category (e.g., being prototypical or not) influences the perception and evaluation of its identity in another category (Crisp, Hewstone, & Rubin, 2001; Deschamps & Doise, 1978). We predict that the negative impact of within-organization distinctiveness on performance weakens when between-organization distinctiveness is high because of the "vantage-of-atypicality" mechanism (Parker, Mui, & Titus, 2020; Purdie-Vaughns & Eibach, 2008; Smith, 2011); that is, high between-organization distinctiveness of product design makes the organization non-prototypical and thus contributes to an identity of "being unconventional". As a result, high within-organization distinctiveness of product design is consistent with this unconventional identity and will cause less illegitimacy costs.

We found strong support for these predictions by analyzing 2,203 model-year observations and images of automobiles sold in the U.S. market from 2001 to 2016. Our study makes several contributions to research. First, we advance OD research by simultaneously investigating distinctiveness at both intra- and inter-organizational levels. Traditional OD research tends to conceptualize distinctiveness on a single level and focus primarily on organizational level distinctiveness. We extend the idea that OD is a multilevel construct (Gupta, Crilly, & Greckhamer, 2020; McKnight & Zietsma, 2018; Zhao et al., 2017) by investigating the performance implications of distinctiveness at two different levels. Second, we contribute to OD research by demonstrating the contextual contingency of OD (Gehman & Grimes, 2017; Haans, 2019; Taeuscher et al., 2021; Zhao & Glynn, 2021). Our research suggests that identifying an optimally distinct competitive positioning in product design requires simultaneous attention to multiple contexts and to the effects of their interaction. Third, our research addresses the call for a more thorough integration of visual data into

organizational research (Boxenbaum, Jones, Meyer, & Svejenova, 2018; Meyer, Höllerer, Jancsary, & van Leeuwen, 2013). With the unprecedented rise in the use of visuals, we constructed the design distinctiveness variable using the morphing technology and visual data of car designs, demonstrating the potential of such novel methods in management studies. All of these contributions also have clear practical implications for competitive positioning of multiproduct organizations.

2 THEORETICAL BACKGROUND

Integrating strategic management and institutional theories, OD research strives to find the optimal level of distinctiveness, which not only increases competitive advantage through differentiation but also reduces illegitimacy due to deviance from existing norms (Zhao et al., 2017). To balance the contrasting effects of distinctiveness on competitive benefits and illegitimacy costs, organizations are advised to adopt a moderately distinctive position to attain OD that maximizes performance (Deephouse, 1999). The proposition of strategic balance theory has been confirmed in multiple contexts. Prior research has shown that organizations achieve their highest performance when they adopt moderate strategic distinctiveness in asset strategies (Deephouse, 1999), strategic group positioning (McNamara et al., 2003), and innovative activities (Roberts & Amit, 2003). In contrast, other studies have found performance is worse with moderate distinctiveness than with strong differentiation and strong conformity strategies, leading to a U-shaped relationship between strategic distinctiveness and performance (Cennamo & Santalo, 2013; Jennings et al., 2009; Zott & Amit, 2007). These contradictory findings challenge strategic balance theory and its implications for business practice.

To address these challenges and advance OD research, Zhao and colleagues (2017) called for a renewed research agenda on OD. They encouraged scholars to go beyond strategic balance to embrace the ideas of (1) OD as a multidimensional construct, (2) OD as contextually contingent, and (3) OD as temporally dynamic (also see Durand & Haans, 2021; Zhao, 2021; Zhao & Glynn, 2021). Recent works have built on these ideas and significantly extended OD research. For example, rather

than assuming a single point of OD, McKnight and Zietsma (2018) adopted a configurational approach and examined how firms combined various dimensions of strategies and conditions to achieve successful commercialization. Haans (2019) demonstrated that what constitutes an optimally distinctive position is contingent on whether the overarching market category is homogeneous or heterogeneous. Similarly, Gupta, Crilly, and Greckhamer (2020) showed that stakeholder engagement strategies associated with high performance vary according to the local institutional context and firm characteristics. Barlow and colleagues (2019) compared prototype- and exemplar-based strategic positioning models and found that the optimal entry into a platform market is at a high level of exemplar similarity and a low level of prototype similarity. Addressing the temporal dynamic of OD, Zhao and colleagues (2018) found optimally distinctive positioning shifts as the market evolves and as the strengths of legitimacy and competitive pressures change.

Despite these significant developments in recent years, blind spots that limit the understanding of OD remain. For example, OD studies in the strategy and organization literature have primarily focused on organizational level distinctiveness and its impact on organizational outcomes (Deephouse, 1999; Haans, 2019; Taeuscher & Rothe, 2021). As such, they have overlooked the need to achieve OD within an organization. In an organization that produces multiple products, competition and legitimacy pressures exist not only with other organizations but also among different products within the same organization. Distinctiveness across products under the same brand is important to enhance each product's competitiveness, mitigate consumer satiation, and avoid being perceived as boring (Hasegawa, Terui, & Allenby, 2012; Liu, Li, Chen, & Balachander, 2017). On the other hand, distinctiveness may reduce a product's legitimacy because being different from other products within the same organization impedes consumers' recognition and thus hurt product desirability among consumers (Creusen & Schoormans, 2005; Park, Milberg, & Lawson, 1991). However, the performance implications of distinctiveness among multiple products within the same organization remain largely unexplored in OD research. To address this lacuna, this study

attends to the multilevel nature of OD. Specifically, we conceptualize and distinguish between within- and between-organization distinctiveness of product design and examine how organizations can optimally manage their products' design distinctiveness at these two levels.

3 WITHIN- AND BETWEEN-ORGANIZATION DISTINCTIVENESS OF PRODUCT DESIGN: A MULTILEVEL FRAMEWORK

A product combines elements of both function and design (Chan et al., 2018). Function refers to how a product works based on technology (Chan et al., 2018; Henderson & Clark, 1990), and design captures how a product looks visually (Bloch, 1995; Ulrich, 2011). While product function has long been considered a major determinant of a product's success, recent research has increasingly recognized design as a critical element of new product development strategy and an important source of competitive advantage (Bloch, 1995; Radford & Bloch, 2011; Xia, Singhal, & Zhang, 2016).

Similar to other strategic dimensions (e.g., business model design, innovation strategy, etc.), product design is subject to the contrasting pressures of conformity and differentiation. Research has shown that the success of a product design depends not only on its typicality with other product designs to increase consumer familiarity but also on its differentiation from other designs to enhance its novelty and uniqueness (Askin & Mauskapf, 2017; Chan et al., 2021; Liu et al., 2017; Zhao et al., 2018). Moreover, product design differs from other firm-level strategic dimensions because it faces a unique twofold challenge: first, it needs to manage the conformity–differentiation tension vis-à-vis other organizations' product design, and second, for organizations with multiple products, managing the same tension among these multiple products within the same organization is also necessary. However, a comprehensive understanding of how multiproduct organizations simultaneously manage the competing pressures in both inter- and intra-organizational contexts is still lacking.

In this study, we develop a multilevel framework and examine how the distinctiveness of product design at different levels influence market performance differently. We define two types of distinctiveness—*within-organization distinctiveness* and *between-organization distinctiveness*—of

product design in line with the level at which distinctiveness is gauged. The simultaneous attention to two unique levels of design distinctiveness is important because these two levels entail different benchmarks for comparison and evoke different frames of references in consumer evaluations. In the following sections, we develop theoretical arguments regarding the effects of within- and between-organization distinctiveness of product design as well as their interactions on market performance.

3.1 Within-organization distinctiveness of product design and performance implications

Within-organization distinctiveness of product design refers to the extent to which a focal product's design is distinct from the prototypical design of all products produced by the same organization. It captures the product-level distinctiveness of design in an intra-organizational context. Applying the OD theory to the intra-organizational context, we argue that within-organization distinctiveness simultaneously exerts two opposing mechanisms on a product's competitiveness and legitimacy within its organization. As illustrated in Figure 1(a), within-organization distinctiveness can generate both *competitive benefits* derived from the increase of a product's competitiveness and *illegitimacy costs* due to the loss of legitimacy. We next explain and compare the relative strengths of these two mechanisms, which determine the performance implications of within-organization distinctiveness.

Within-organization distinctiveness of product design can reduce a product's legitimacy because it impedes the process through which consumers can categorize a product into its specific brand. Categorizing a product as a member of an organization is primarily based on visual similarity and requires sophisticated visual processing (Jolicoeur, Gluck, & Kosslyn, 1984; Rosch, Mervis, Gray, Johnson, & Boyes-Braem, 1976). Prototypicality—the extent to which a product's design is similar to the typical or average design of the organization—is important to reduce the burden of information processing (Veryzer & Hutchinson, 1998; Winkielman, Halberstadt, Fazendeiro, & Catty, 2006), enable consumers to identify a product as belonging to its brand (Bloch, 1995), and transfer brand-related positive affect to the focal product (Boush & Loken, 1991; Creusen & Schoormans, 2005; Sujan, 1985). For example, the consistent exterior design of Absolut Vodka

products, which all used the signature clear bottle and printed brand name in capitalized letters, invokes the brand image of being pure and high-end (Simonson & Schmitt, 1997). In contrast, distinctiveness within an organization makes the categorization process difficult and frustrating for consumers, leading to negative attitudes toward this product (Cox & Locander, 1987). For instance, a BMW car model without the iconic twin-kidney grille can hardly be recognized as a BMW and is less likely to gain consumers' favor compared to a BMW model with such attribute.

Within-organization distinctiveness of product design can also create benefits because it enhances a product's competitiveness within its organization. A distinctive position generates competitive benefits because it differentiates an organization from competitors (Taeuscher & Rothe, 2021). Similarly, a product's distinctive design can help differentiate it from other products within the same organization, thus increasing the perceived novelty and attractiveness and leading to enhanced competitiveness (Radford & Bloch, 2011; Rindova & Petkova, 2007). However, the competitive pressure of product design within an organization is lower than it is across organizations because products of the same organization tend to be endowed with different attributes to avoid cannibalization (i.e., competition within an organization's own products) (Moorthy, 1984). Given that products within an organization are partial substitutes, the sales of one product of a multiproduct organization may lead to a loss in sales of its other products (Chandy & Tellis, 1998; Mason & Milne, 1994). To reduce cannibalization, multiproduct organizations have long used quality-based segmentation to distinguish among their products (Desai, 2001; Moorthy & Png, 1992). For example, car manufacturers offer compact, mid-size, and large sedans that differ in not only size but also quality and price levels to target different market segments. Sony produces TVs in different sizes (e.g., 55-, 65-, and 75-inch models) and offers different features such as voice control, smart remotes, and phone connections for TV models in each size. Apple's MacBook products differ in display sizes, processors, memory, and storage. The widespread use of different product attributes—

including quality, features, and functions—is important to differentiate products within an organization, thus alleviating competition among them.

Figure 1(a) illustrates the two mechanisms with the solid line representing the effect of within-organization distinctiveness on illegitimacy—expressed as the *illegitimacy costs* mechanism—and the dashed line representing the effect of within-organization distinctiveness on competitiveness—expressed as the *competitive benefits* mechanism.[2] As show in the left side of Figure 1(a), for a product with a low level of within-organization distinctiveness of product design, it does not suffer from illegitimacy because prototypicality facilitates categorization within an organization; on the other hand, this prototypical product still have a certain level of competitiveness within its organization because it is differentiated from other products of the same organization along multiple functional dimensions. More importantly, when within-organization distinctiveness shifts from the low level to the high level, the increase of illegitimacy (i.e., illegitimacy costs) outweighs the increase of competitiveness (i.e., competitive benefits). This is because the competitive pressure is lower than the legitimacy pressure within an organization. The imperfect competition within an organization alleviates the importance of distinct design in increasing a product's competitiveness because products are already differentiated by functions. For example, Absolut Vodka's products adopt consistent designs but are differentiated by flavors. Similarly, although Audi car models look alike, they have unique competitive advantage within Audi family because they are differentiated by other attributes such as powertrain, engine, comfort, size. In contrast, the legitimacy pressure of design within an organization is strong because an organization needs to facilitate the categorization of its products as members of this organization (Rosch & Lloyd, 1978) and to develop an identity to

[2] Specifically, the solid line indicates the level of illegitimacy at each level of within-organization distinctiveness of product design, and the dashed line represents the level of competitiveness at each level of within-organization distinctiveness of product design.

signal alterity relative to other organizations (Czarniawska, 2008; Levinas, 1999). As such, adopting a distinct design within an organization will lead to a significant loss of legitimacy.

Following the cost-benefit analysis used in prior research (Durand et al., 2019), we calculate the net benefit of within-organization distinctiveness as competitive benefits minus illegitimacy costs. As shown in Figure 1(b), the net benefit of within-organization distinctiveness diminishes as within-organization distinctiveness increases. We argue that the performance implication of within-organization distinctiveness of design is negative because the increase of within-organization distinctiveness generates greater costs than benefits. Accordingly, we propose the following:

> **Hypothesis 1.** *A product's within-organization distinctiveness of design has a negative impact on its market performance.*

[Insert Figure 1 about here]

3.2 Between-organization distinctiveness of product design and performance implications

Between-organization distinctiveness of product design refers to the extent to which a focal organization's prototypical product design is distinct from the prototypical design of the industry. It reflects the organizational level distinctiveness of product design in an inter-organizational context. Between-organization distinctiveness can enhance an organization's competitive advantage via differentiation, but it can also reduce this organization's legitimacy by impeding consumers' recognition. We next delineate the two mechanisms of how between-organization distinctiveness produces competitive benefits and illegitimacy costs and compare their relative strengths.

Between-organization distinctiveness of product design enables an organization to gain competitive advantage over competing organizations in an industry. Strategy scholars have emphasized that an organization must select a position distinct from its rivals to reduce competition (Baum & Singh, 1994; Porter, 1991) and accumulate competitive resources that are valuable, rare, non-substitutable, and inimitable (Barney, 1991). We argue that distinctive product designs represent important strategic resources that are difficult to imitate because they are protected by copyrights. As

discussed earlier, products compete based on both design (i.e., how they look) and function (i.e., how they work) (Chan et al., 2018). However, organizations are increasingly capable of developing product functions similar to those of external competitors because they can acquire the underlying technologies of these functions through technology licensing (WIPO, 2015), talent mobility (Edler, Fier, & Grimpe, 2011), and innovation collaboration (Love, Roper, & Vahter, 2014). For example, smart TV technology and its related features can be offered by many TV brands, including Hisense, LG, Samsung, Sony, TCL, and so forth. Electric vehicle technology is owned not only by Tesla and other electric cars startups, but also by some traditional automakers. Therefore, distinct product design has become extremely important in differentiating organizations. Today, design is not merely the look of things, but rather the core to business success (Bloomberg, 2014). Taking Apple as an example, its unique design focused on simplicity is a key driver of its success (Segall, 2013). Similarly, Harley-Davidson's highly distinct and recognizable design based on its unique shape grammar has contributed to the competitive advantage of this established motorcycle brand (Pugliese & Cagan, 2002). As the market is filled with an increasing number of brand options in each product category, having a distinct and novel visual design is crucial to attract consumers' attention and stand out from competitors (Radford & Bloch, 2011).

Between-organization distinctiveness of product design also leads to legitimacy loss by making it difficult to categorize an organization's distinctively designed product into its industry. However, the legitimacy pressure in an inter-organizational context is less salient than in an intra-organizational context because categorization at the industry level is relatively easier than it is within an organization. This is because industry-level categorization only requires categorizing an organization's prototypical design as a member of its industry category, which can be quickly identified based on a holistic shape mechanism or an analysis of basic functions (Rosch et al., 1976; Tversky & Hemenway, 1984). First, recognizing an organization's product as a product of its industry is simple because it only requires the cognitive processing of a product's general shapes,

rather than finer visual details, in comparison with the industry prototype (Collin & McMullen, 2005). For example, consumers can easily identify a product as "a car" if it has a closed body with four wheels. Second, it is straightforward to recognize the industry category of a product if its functions meet the basic consumer needs. Research suggests that audiences can categorize a product according to their needs and goals (Barsalou, 1983; Durand & Paolella, 2013). Therefore, even an ambiguous product can receive a relatively positive evaluation if it serves certain functions and fulfills the goals of consumers (Boulongne & Durand, 2021). Taking the furniture industry as an example, although furniture produced by different manufacturers has distinct design styles (e.g., modern, country, traditional, etc.), an item such as chair, bed, or table can be recognized quickly as furniture by its holistic look and basic functions, no matter which distinct design it adopts.

As illustrated in Figure 2(a), an organization with a low level of between-organization distinctiveness of product design does not suffer from illegitimacy but is subject to the lack of competitiveness. When between-organization distinctiveness shifts into a higher level, the increase of competitive benefits (dashed line) exceeds the increase of illegitimacy costs (solid line). This is because the competitive pressure overwhelms the legitimacy pressure in an inter-organizational context. Organizations face severe competition from other organizations that can offer similar product functions, and thus must heavily rely on distinct product designs to differentiate themselves and boost market performance (Xia et al., 2016). Therefore, distinct design is effective in increasing an organization's competitiveness. On the other hand, distinct design may not significantly reduce an organization's legitimacy because an organization's highly distinct design can still be considered appropriate and desirable as long as its general shapes and basic functions meet the expectations of the industry. The smooth categorization process at the industry level can protect organizations from triggering significant illegitimacy costs even when they adopt a design distinct from the prototypical design of the industry. Therefore, as shown in the right side of Figure 2(a), the illegitimacy costs incurred by high between-organization distinctiveness are lower than the competitive benefits.

Figure 2(b) illustrates the net benefit of between-organization distinctiveness using competitive benefits minus illegitimacy costs. We argue that, as between-organization distinctiveness increases, the gains derived from the increase of competitiveness exceed the costs due to legitimacy loss, thus leading to an overall positive effect on performance. Therefore, we predict:

> **Hypothesis 2.** *An organization's between-organization distinctiveness of design has a positive impact on its products' market performance.*

[Insert Figure 2 about here]

3.3 Joint considerations of within- and between-organization distinctiveness of product design

Although within- and between-organization distinctiveness represent distinctiveness of product design at different levels, they are not mutually independent but rather interactive. The phenomenon that an object is identified by two orthogonal category dimensions is called crossed categorization (Deschamps & Doise, 1978). For example, a person can be identified by both gender (male vs. female) and race (white vs. black), which can cross to form four new crossed category groups (i.e., white male, white female, black male, and black female) (Beal, 2008; Purdie-Vaughns & Eibach, 2008; Rosette & Livingston, 2012). Research on crossed categorization suggests that two crossed categories can interact with each other in a way that an object's identity in one category influences the perceptions and evaluations of this object's identity in another category (Crisp et al., 2001).

We argue that within- and between-organization distinctiveness provide two crossed dimensions for categorization. These two dimensions are interrelated in such a way that categorization in one dimension may affect categorization in another dimension, thereby exerting a joint influence on categorizing a product. Specifically, a product's identity in between-organization distinctiveness dimension could influence the perception of this product's identity in within-organization distinctiveness dimension through the "vantage-of-atypicality" mechanism. Vantage of atypicality refers to the advantage of an entity that has intersecting atypical identities in both constituent categories. In this case, atypicality in one category, if valued by consumers as a distinct

identity, can help build an image of unconventionality, which in turn shields the entity from the potential penalty associated with it being atypical in another category (Purdie-Vaughns & Eibach, 2008). Several studies have demonstrated the vantage of atypicality. For example, unconventionality has a *distancing* mechanism that weakens the prejudice against female leaders when their projects are unconventional (Parker et al., 2020). Unconventionality also has a *buffering* effect, in that unconventional funds are less severely penalized for recent poor performance (Smith, 2011).

Building on these logics, we argue that when between-organization distinctiveness is high, the illegitimacy costs of atypical design within an organization are attenuated by the vantage-of-atypicality effect, as illustrated in the red line in Figure 3(a). This is because when an organization is well-known for having distinct designs that distinguish it from other organizations (i.e., high between-organization distinctiveness), consumers will identify this organization as an "organization with non-prototypical design". In this case, consumers may not be surprised when this organization develops a product that is distinct from its other products because "being unconventional" is part of the legitimacy evaluation of this organization's products. For example, BMW 2021 4 Series adopt a distinct design by reshaping the twin-kidney grilles from horizontal to vertical. For BMW brand that has distinguishable design, the distinct design of new 4 series could still be considered legitimate and desirable by BMW fans who really wanted to stand out (Bigg, 2021; Pattni, 2021).

In contrast, as illustrated in the grey line in Figure 3(a), the less atypical an organization is, the more likely it will suffer from the illegitimacy costs of atypical design within an organization because prototypical organizations are not protected by the vantage-of-atypicality mechanism. If an organization focuses on producing products similar in appearance to the average look of products in the industry (i.e., low between-organization distinctiveness), consumers tend to perceive this organization as prototypical and conventional. When a conventional organization provides a highly distinct design that deviates from other products within this organization (i.e., high within-organization distinctiveness), such design deviation violates this organization's identification as

"being conventional". As a result, consumers will find it contradictory and frustrating to categorize an unconventional design into a conventional organization, thus reducing the desirability of this distinct design due to the inconsistencies experienced in categorization. For example, the Toyota Supra is a "halo car" with a distinct design that distinguishes it from other ordinary Toyota models. However, the Supra was discontinued in the United States in 1998 due to declining sales that were partly because of the mismatch between the distinct design of this model and the brand image of the automaker as a producer of bland products.

In summary, we argue that organizations must strategically orchestrate the two competing effects of between- and within-organization distinctiveness to benefit from the vantage of atypicality and avoid contradictions in categorization. Figure 3(b) illustrates the net benefit of within-organization distinctiveness after accounting for the varying illegitimacy costs moderated by between-organization distinctiveness. Overall, the negative performance implication of within-organization distinctiveness is weakened when between-organization distinctiveness is high due to the reduced illegitimacy costs, but is enhanced when between-organization distinctiveness is low because of the increased illegitimacy costs. Thus, we propose the following:

> **Hypothesis 3.** *The negative effect of a product's within-organization distinctiveness of product design on its market performance will be weakened if its organization's between-organization distinctiveness of product design is high.*

[Insert Figure 3 about here]

4 METHODS

4.1 Data and sample

In this study, we chose the automotive industry as the research setting to test our theoretical arguments and hypotheses. Automotive industry serves as an appropriate context because automakers must deal with design distinctiveness in both intra- and inter-organizational contexts. In line with prior research on the automotive industry (Haunschild & Rhee, 2004; Rhee & Haunschild, 2006; Rhee & Kim, 2015), we focused on the "automaker" (e.g., Buick, Lexus), rather than the "auto firm"

(e.g., General Motors Company, Toyota Motor Corporation), as the unit of analysis. Automaker represents an organization with a unique car brand that is owned by its parent auto firm (e.g., both Lexus and Toyota are the automakers/brands of their parent auto firm – Toyota Motor Corporation). Research suggests that the automaker brand (e.g., Buick) is a more important category than the auto firm (e.g., General Motors Company) in consumers' evaluations (Rhee & Haunschild, 2006; Sullivan, 1998). Automakers produce multiple models within the same organization; for example, Toyota brand has many car models including Avalon, Camry, Corolla, Prius, and Yaris, allowing us to simultaneously study both within- and between-organization distinctiveness of product design.

We compiled a data set from multiple sources that previous studies of the automotive industry have used (Haunschild & Rhee, 2004; Landwehr, Labroo, & Herrmann, 2011; Li & Liu, 2019; Rhee & Haunschild, 2006; Rhee & Kim, 2015). For example, we downloaded from Edmunds.com pictures used to measure car design variables and gathered data on annual sales, manufacturer's suggested retail price (MSRP), and cash rebates for each car model from the *Automotive News Market Data Book* (www.autonews.com). We collected information on other car attributes such as horsepower, energy efficiency (i.e., miles per dollar), energy source (i.e., electric vs. gas-powered), length, width, height, and market segment (i.e., luxury vs. economy) from *Ward's Automotive Yearbook* (wardsauto.com/wards-automotive-yearbook) and cross-validated this information using the official website of each car model. In addition, we obtained car safety and car reliability ratings from the Insurance Institute for Highway Safety (www.iihs.org) and *Consumer Reports* (www.consumerreports.org), respectively. Last, we obtained annual advertising expenditure data for each car model from the Ad$pender data set (www.kantarmedia.com).

According to the classifications of the U.S. Department of Transportation, light-duty vehicles can be generally classified into two groups: *passenger cars* and *light trucks* (Kockelman & Zhao, 2000; Stone & Hamilton, 2017). In this study, we focused on passenger cars and excluded light trucks, a category that includes pickup trucks as well as sport utility vehicles (SUVs) and minivans,

because of their different designs and purposes such as hauling things in addition to people. Therefore, all vehicles in our sample belong to the passenger car category.

Our final sample consisted of 34 automakers (e.g., Audi), 246 car models (e.g., Audi A4), and 2,203 model-year observations (e.g., 2016 Audi A4) for passenger cars sold in the U.S. from 2001 to 2016. Each automaker has a unique brand (e.g., Audi) for all passenger car models it produces. The 34 automakers (e.g., Audi) in our sample belong to 16 auto firms (e.g., Volkswagen Group). Of the car models, 97 are luxury, and 149 are economy models; 61 are made by European automakers, 87 are made by Asian automakers, and 98 are made by American automakers.

4.2 Dependent variable

We focused on the market performance of the car models as the dependent variable. Specifically, we measured *unit sales* as the number of units (in thousands of units) of each car model sold in the U.S. market in each year of the sample period. We further used *market share* and *sales revenue* as two alternative variables of market performance in robustness checks.

4.3 Independent variables

We measured the two independent variables, *within-* and *between-organization distinctiveness* of car design, using the morphing technology (Landwehr et al., 2011; Li & Liu, 2019; Liu et al., 2017) that requires the following three steps to create the morphs.[3] First, we collected standard frontal pictures of all models in our sample. We focused on the frontal design of cars because it is the most recognizable design for consumers (Ranscombe, Hicks, Mullineux, & Singh, 2012).

Second, we used image-processing software to locate 50 design points in the frontal design of each car model.[4] Specifically, we placed each car's frontal image into the Cartesian coordinate system and set the lowest point in the middle of the car's front as the origin of the system. The image of each car was normalized by setting the width of a car as one unit without changing the relative

[3] A step-by-step guideline of the morphing technology is provided in the online appendix S1.
[4] A detailed description of these 50 points is provided in the online appendix S2.

height-to-width ratio. We then extracted the 50 most recognizable design points, such as grille, headlights, bumper, side mirrors, windshield, and body shape, to represent the key elements of a car's frontal design. We used a vector (*x,y*) of coordinate values to represent the locations of these 50 design points.

Third, we created the morph for each automaker (i.e., automaker morph) and the morph for the automotive industry (i.e., car morph). Specifically, the automaker morph represents the average design of all car models produced by an automaker, and the car morph represents the average design of all car models in the automotive industry. We computed the mean position of each of the 50 design points across all car models by the same automaker in each year. Thus, these 50 mean positions defined an automaker's morph. Similarly, the car morph was computed by the mean position of each design point across all car models in the automotive industry in each year.

According to our theory, *within-organization distinctiveness* is calculated as the extent to which a car model's design differs from its automaker's morph (i.e., the average design of all car models of an automaker). We adopted the Euclidean distance formula to calculate the within-organization distinctiveness, as follows:

$$\text{Within-organization distinctiveness}_{ijt} = \sum_{p=1}^{50} \sqrt{(x_{ijt}^{p} - x_{jt}^{p})^2 + (y_{ijt}^{p} - y_{jt}^{p})^2},$$

where x_{ijt}^{p} and y_{ijt}^{p} represent the two-dimensional coordinate values of design point *p* (*p* = 1, 2, 3, …, 50) of car model *i* of automaker *j* in year *t*, and x_{jt}^{p} and y_{jt}^{p} represent the corresponding coordinate values of design point *p* of the morph of automaker *j* in year *t*.

Using an automaker, Hyundai, as an example, Figure 4 illustrates the automaker morph of Hyundai in 2016 and the comparisons between two Hyundai models with the Hyundai morph. Specifically, the 2016 Hyundai Sonata had a lower within-organization distinctiveness than the 2016 Hyundai Accent. Compared with the Accent, the Sonata is more like the Hyundai morph.

[Insert Figure 4 about here]

Between-organization distinctiveness refers to the extent to which an automaker's average design is distinct from the car morph (i.e., the average design of all car models in the automotive industry). We calculated the Euclidean distance between an automaker's morph and the car morph as between-organization distinctiveness, as follows:

$$\text{Between-organization distinctiveness}_{jt} = \sum_{p=1}^{50} \sqrt{(x_{jt}^{p} - x_{t}^{p})^{2} + (y_{jt}^{p} - y_{t}^{p})^{2}} ,$$

where x_{jt}^{p} and y_{jt}^{p} represent the two-dimensional coordinates of design point p (p = 1, 2, 3, …, 50) of automaker j's morph in year t, and x_{t}^{p} and y_{t}^{p} represent the coordinates of design point p of the car morph in year t.

Figure 5 shows the car morph of the automotive industry in 2016 and compares two automaker morphs with the car morph. Specifically, the 2016 Chevrolet morph had a lower between-organization distinctiveness than the 2016 Acura morph; in other words, the Chevrolet automaker's design was more prototypical of the automotive industry, but the Acura automaker's design was more distinctive.

[Insert Figure 5 about here]

4.4 Control variables

We controlled for various factors that could affect the market performance of car models. Price setting is an important capability that determines a firm's value creation (Dutta, Zbaracki, & Bergen, 2003). Therefore, we controlled for a model's *price* (in thousands of U.S. dollars) in a given year by using MSRP less cash rebates (Zettelmeyer, Morton, & Silva-Risso, 2006). Because advertising intensity affects market performance (Bettis, 1981), we controlled for annual *advertising expenditures* (in millions of U.S. dollars) of each brand in a given year. Following prior research (Berry, Levinsohn, & Pakes, 1995; Sudhir, 2001), we also controlled for a set of car attributes

considered important in influencing auto market performance: *horsepower-to-weight ratio*, which measures a car's power; *miles per dollar*, which measures energy efficiency; *safety ratings*, which is measured on a four-point scale by the Insurance Institute for Highway Safety rating; *reliability ratings*, which is measured on a five-point scale by Consumer Reports; and a car's *length*, *width*, and *height*, which measure a model's size. In addition, we included car classification to account for the influence of different market segments on car sales. Specifically, we controlled for whether a car falls in the luxury segment by including a dummy, *luxury segment*, coded as 1 if a car is a luxury car and 0 otherwise. We also controlled for *battery electric vehicle* to indicate if a model is a fully electric vehicle with a rechargeable battery and no gasoline engine (1 = yes, 0 = no). New car models may suffer from the "liability of newness" (Freeman, Carroll, & Hannan, 1983; Singh, Tucker, & House, 1986) and face a greater risk of failure than established models. As such, we controlled for *model age* as measured by the number of years elapsed since the year of a car model's introduction. Last, we included the automakers' country-of-origin dummies (i.e., Europe, Japan, and Korea), auto-firm dummies, and year dummies to account for country, auto firm, and year fixed effects, respectively.

4.5 Estimation methods

Our data are structured at two levels: The car model-level data are nested in the organizational (i.e., automaker) level. We also measured the two independent variables at two levels: within-organization distinctiveness, which is a car model-level predictor, and between-organization distinctiveness, which is an organizational level predictor. Given the multilevel structure of our data, we adopted multilevel modeling, a recommended method to increase precision in analyzing nested data structures (Peterson, Arregle, & Martin, 2012). We estimated the intraclass correlations (ICC) at the organizational level as 0.27, accounting for 27% of the variance in unit sales. According to Hox (2010), ICCs exceeding 0.10 and 0.15 are deemed as medium and large, respectively. We therefore used a two-level random intercept model that allows the constant term (intercept) to vary randomly at the organizational level.

The multilevel model has three advantages over the traditional single-level regression analysis. First, it accounts for the nonindependence of observations within the same organization. Second, it acknowledges the existence of multiple levels of predictor variables and partitions multiple levels of variance in the outcome variable (Hofmann, Griffin, & Gavin, 2000). Third, it enables researchers to simultaneously estimate fixed coefficients and random intercept, which are parameter estimates that are allowed to vary across groups/organizations.

We reported the robust standard errors derived from the robust variance estimator (White, 1980), which produces consistent standard errors and yields asymptotically consistent estimates even when the errors are heteroskedastic. We mean-centered the predictors in generating the interaction terms, as suggested by Aiken and West (1991). For all models, the variance inflation factor (VIF) ranges from 1.13 to 2.97, indicating no threat of multicollinearity (Gujarati, 2003).

5 RESULTS

5.1 Results of hypotheses testing

Table 1 displays descriptive statistics and Pearson correlation coefficients for all the variables used in this study. Table 2 reports the results of the multilevel models in analyzing the hypothesized effects. In Table 2, Model 1 introduces all the control variables; Model 2 and Model 3 add the main effects of within-organization distinctiveness and between-organization distinctiveness, respectively. Model 4 includes both independent variables, and Model 5 is the full model that includes the two independent variables and their interaction term.

Hypothesis 1 predicted within-organization distinctiveness impacts market performance negatively. In support of Hypothesis 1, in Table 2, Model 5 shows within-organization distinctiveness has a significant and negative effect on unit sales ($\beta = -11.251$, $p = 0.006$). This implies that if a car model's within-organization distinctiveness of product design increases by one standard deviation, its annual sales will decrease by 9,563 units. Model 2 and Model 4 also show

similar results (Model 2: $\beta = -10.752$, $p = 0.021$; Model 4: $\beta = -10.973$, $p = 0.017$), lending further support to Hypothesis 1.

Hypothesis 2 proposed that between-organization distinctiveness positively affects market performance. We found a positive and significant effect of between-organization distinctiveness on unit sales in Model 5 ($\beta = 10.860$, $p = 0.003$), in support of Hypothesis 2. This result suggests a one standard deviation increase in between-organization distinctiveness of product design leads to the annual sale of 6,407 more units for a car model. Similarly, Model 3 and Model 4 also show a significant and positive coefficient of between-organization distinctiveness (Model 3: $\beta = 9.227$, $p = 0.011$; Model 4: $\beta = 10.229$, $p = 0.006$).

Hypothesis 3 predicted between-organization distinctiveness positively moderates the effect of within-organization distinctiveness on performance by weakening the negative impact of within-organization distinctiveness. In support of Hypothesis 3, Model 5 shows that the interaction between within-organization distinctiveness and between-organization distinctiveness is positive and significant ($\beta = 13.029$, $p = 0.027$), indicating the negative effect of within-organization distinctiveness of product design on unit sales is attenuated if an automaker's between-organization distinctiveness of product design is high.

[Insert Table 1 and Table 2 about here]

Figure 6 plots the interaction effect of within- and between-organization distinctiveness on unit sales. In line with our predictions, within-organization distinctiveness negatively affects unit sales, and the negative slope of within-organization distinctiveness becomes less steep when between-organization distinctiveness is high. Moreover, the average level of unit sales is higher when between-organization distinctiveness is high rather than low. Overall, the interaction plot provides further support for all three proposed hypotheses.

In addition, we found that when within-organization distinctiveness is low, both high between-organization distinctiveness and low between-organization distinctiveness have similarly

high levels of unit sales. However, when within-organization distinctiveness is high, the unit sales of high between-organization distinctiveness are significantly higher than those of low between-organization distinctiveness. These findings suggest that if an organization positions itself as having prototypical product design in its industry, it should avoid introducing a non-prototypical product that is significantly distinct from its other products.

[Insert Figure 6 about here]

5.2 Supplementary analyses and robustness checks

We conducted a series of supplementary analyses to ensure that our results are robust and reliable. The results of all these analyses are reported in the online appendix.

Organization fixed-effects models. Organizations (i.e., automakers) may have unobserved and unmeasured factors (e.g., historical reputations) that influence their product design and market performance. To alleviate potential endogeneity concerns due to omitted variables, we included organizational level fixed effects to control for unobserved, time-invariant heterogeneity of organizations. The fixed-effects models have similar results with those of the multilevel models.

Testing the mechanisms. To provide evidence that our clarified mechanisms (competitive benefits vs. illegitimacy costs) exist, we studied the influence of an event—the introduction of new car models by an automaker—which may influence both mechanisms. We argue that when an automaker introduces new model(s) in a given year, the competitive benefits derived from within-organization distinctiveness are greater because the competitive pressure within an automaker becomes higher after having new model(s). In contrast, the illegitimacy costs of within-organization distinctiveness are reduced because an automaker's newly added car model(s) are less familiar to consumers and thus blur consumers' perceptions of the average design of this automaker. Therefore, the illegitimacy costs derived from being different from an automaker's average design is reduced because the benchmark to gauge distinctiveness becomes less clear. In line with these arguments, we found that the introduction

of new model(s) by an automaker in a given year indeed alleviates the negative effect of within-organization distinctiveness on market performance.

Examining a four-fold typology. We classified car models into four categories based on the levels of within- and between-organization distinctiveness and used a dummy variable to represent each category.[5] We included three dummies in the models except the dummy of high within- and high between-organization distinctiveness, which serves as the baseline category. We found that car models with low within- and high between-organization distinctiveness have the highest market performance compared with car models with both low within- and low between-organization distinctiveness as well as car models with both high within- and high between-organization distinctiveness. Car models with high within- but low between-organization distinctiveness have the lowest performance. These results lend further support to the main effects of within- and between-organization distinctiveness.

Accounting for the level of exposure. We further controlled for the level of exposure of each car model because higher exposure may reinforce consumers' perception of the distinctiveness of the car model. Because our sales data are only available since 2001, we constructed a subsample consisting of car models introduced in or after 2001 so that the sales data of these models are complete. According to *Ward's Automotive Yearbook*, the average life-span period of a car in the U.S. was about 11 years (Liu et al., 2017). We then calculated the total number of a model in circulation in the observed year as the cumulative sales of this model during the past 11 years. The results of models controlling for this variable using the subsample remained consistent.

Alternative measure of independent variable. We adopted an alternative measure of between-organization distinctiveness by calculating the Euclidean distance of a focal automaker's average design from the average design of all car models produced by other automakers. This new measure

[5] The four categories/dummies are (1) low within- and high between-organization distinctiveness, (2) low within- and low between-organization distinctiveness, (3) high within- and high between-organization distinctiveness, and (4) high within- and low between-organization distinctiveness. We define the value of within- or between-organization distinctiveness as low/high if it is less/greater than the mean of this variable.

avoids the possibility that the *x* and *y* averages (i.e., coordinate values of the car morph) could be biased depending on the number and typicality of the focal automaker's own car models present in the market. The results of models using this new measure remained robust.

Alternative measures of dependent variable. We adopted two alternative dependent variables—*market share* and *sales revenue*—to capture the market success of each car model. Following prior research (Sudhir, 2001), we defined the potential market size in each year as the number of consumers considering a car purchase in a particular year *t* and calculated it using the following equation: potential market size $_t$ = (number of households $_t$ × average number of cars per household $_t$)/average age of car. We then used the annual unit sales of each car model divided by the potential market size in each year to obtain annual market share data in the U.S. Moreover, we used the annual sales revenue data (in billions of U.S. dollars) of each car model in each given year as the second alternative variable of market performance. We found consistent results using *market share* and *sales revenue* in both the multilevel and fixed-effects models.

Use a sample of automakers that have at least three car models. The number of car models within an automaker may influence the value of within-organization distinctiveness.[6] In our sample, the number of car models owned by an automaker in a year ranges from 1 to 10, with an average of 5.36. To avoid a situation in which an automaker's morph is dominated by one or two car models, we removed the automakers that had only one or two car models in a single year. As a result, 124 model-year observations were removed. The results remained consistent with our main analysis.

Exemplar-based approach. In addition to the prototype-based approach adopted in our analysis, which uses the average design of each category as the benchmark to measure distinctiveness (Barsalou, 1985; Rosch et al., 1976; Veryzer & Hutchinson, 1998; Winkielman et al., 2006), we

[6] If an automaker has only one car model, within-organization distinctiveness of this model would be 0 because this model represents the morph of this automaker. If an automaker has two car models, within-organization distinctiveness of these two car models would be equal because the Euclidean distance from these two models' designs to their average design are the same.

further adopted an exemplar-based approach that uses the best-selling cars as the benchmark (Cohen & Basu, 1987; Smith & Medin, 1981) because the exemplars or market leaders may influence consumers' judgments and evaluations of other car models. We found very similar results using the two new independent variables calculated based on the exemplar-based approach.[7]

Split-sample analyses. We performed split-sample analyses to account for the potential influence of different subsets in our data. Specifically, we divided the sample into two groups—new car models (i.e., car models introduced in the past three years) and old car models (i.e., car models introduced more than three years ago). Compared to old models, new models are less likely to suffer from illegitimacy costs caused by design distinctiveness because their identities of "being new" make the novel and distinct design more desirable and aligned with consumers' expectations. Therefore, we expect that the negative impact of within-organization distinctiveness on performance is weaker for new models than it is for old models. The results of split-sample analyses supported our expectations.

Check on a potential curvilinear relationship. Because some prior research on organization-level distinctiveness has found a curvilinear relationship with performance (see Haans, 2019 for a review), we tested if there exists a curvilinear relationship between our organizational level predictor (i.e., between-organization distinctiveness of product design) and market performance. However, the squared term of between-organization distinctiveness of product design is not significant. The lack of empirical evidence of a curvilinear effect is probably because extremely distinctive and unrecognizable designs are lacking in our research context of a well-established industry (e.g., automotive industry). We have discussed in detail the boundary conditions of our findings in Section 6.

[7] Using the exemplar-based approach, we measured within-organization distinctiveness as the Euclidean distance of a car model's design from the design of the best-selling car of this model's automaker, and between-organization distinctiveness as the Euclidean distance of an automaker's average design from the design of the best-selling car in the industry. Over the 16 years from 2001 through 2016, the Toyota Camry has ranked 15 times as the industry's best seller and the Honda Accord once.

Qualitative evidence. To complement the quantitative analyses presented above, we conducted additional analyses, including an online survey and a text analysis of car reviews, to obtain qualitative evidence that further validate our findings and confirm the underlying mechanisms. We provided the details and results of these analyses in the online appendix.

6 DISCUSSION AND CONCLUSION

6.1 Theoretical contributions

In this study, we built on contemporary OD research and contributed to this conversation by advancing the notion of OD as a multilevel construct. Recent studies have identified institution- and firm-level factors that influence OD choices (Gupta et al., 2020; McKnight & Zietsma, 2018). However, this research is still focused on achieving organization-level optimal strategic positioning. Our study further extends this research by developing a multilevel framework and simultaneously investigating OD at both product- and organization-levels. We suggest that organizations can strategize the levels of distinctiveness of product design both across their different products and across organizations within the same industry. This is because consumers' evaluation of distinctiveness at the two levels entails distinct categorization processes using different benchmarks and with different information processing intensity. Moreover, producers tend to differentiate their own products among multiple features, thus alleviating competition within their organizations. As a result, the legitimacy and competitive pressures vary across the two levels. Therefore, organizations need to carefully manage their distinctiveness at both levels to be considered optimally distinct.

Recent research on OD has also increasingly recognized that what constitutes an optimally distinct positioning varies across contexts and has set out to examine different contextual contingencies of the strategic differentiation–performance relationship (see Zhao & Glynn, 2021 for a review). The contextual contingencies investigated to date are quite diverse and cover factors ranging from individual characteristics such as status (Prato, Kypraios, Ertug, & Lee, 2019), to organizational level identity (Syakhroza, Paolella, & Munir, 2019), ownership, and governance

structures (Ge & Micelotta, 2019; Miller, Breton-Miller, & Lester, 2013; Zhang, Wang, & Zhou, 2020), to broader structures and types of market categories (Barlow et al., 2019; Gehman & Grimes, 2017; Haans, 2019). Our study adds to this conversation by identifying OD in both intra- and inter-organizational contexts. Moreover, we find that the illegitimacy costs caused by distinctiveness in one context change depending on the identity the organization projects at the other context.

In terms of a theoretical foundation, our study further furnishes the theoretical grounding of OD research in the categorization literature. Zuckerman's (1999) pioneering research on market categories emerged around the same time as the strategic balance perspective (Deephouse, 1999) and has similarly influenced subsequent studies on OD. Specifically, Zuckerman proposed a two-stage valuation approach for addressing the conformity versus differentiation tension. According to the two-stage valuation model, organizations need first to exhibit certain common characteristics so as to be readily compared with others and then stand out from all legitimate competitors to gain positive evaluations. Many scholars have interpreted this two-stage model to imply that organizations need to first cross a certain legitimacy threshold and become part of the consideration set before they can benefit from differentiation. Our research expands Zuckerman's model by suggesting that this legitimacy threshold is not fixed but varies across levels. Compared with the organizational level categorization, the legitimacy threshold of the industry level categorization is lower and easier to meet, imposing less pressure to conform while leaving more room for differentiation. As such, attending to the categorization processes at both the organizational and industry levels allowed us to make divergent predictions about how strategic differentiation affects market performance.

It is also important to note that our theoretical arguments have been developed primarily based on product design in established industries (e.g., the automotive industry), which sets boundary conditions for our findings. In established industries, the legitimacy threshold of a product's exterior design is low because both producers and consumers are familiar with the core elements in terms of attributes and functions that define the product prototype at the industry level (Rosa, Porac, Runser-

Spanjol, & Saxon, 1999). Therefore, a producer's novel design is still considered acceptable by consumers if this product's functions meet consumers' expectations in this industry. For example, Porsche is one of the automakers with the highest between-organization distinctiveness of product design in our sample, but its unique and iconic design serves as its competitive advantage rather than as a cause of legitimacy loss. In well-established industries such as automotive, consumers even expect automakers to promote disruptive changes in design and technologies to transform the whole industry (McKinsey, 2016).

Moreover, in an established industry setting (e.g., the automotive industry) characterized by maturity and institutionalization, product designs have been vetted over the years. Therefore, the range of distinctiveness of product design is relatively limited and extremely distinctive product designs are rare. This may explain why we did not find an inverted U-shaped relationship between between-organization distinctiveness of product design and market performance. However, researchers studying other contexts such as nascent industries may need to use our arguments with caution because there may be more experimentation with product attributes and wider ranges of differentiation among product offerings (Durand & Khaire, 2017; Zhao et al., 2018).

6.2 Managerial implications

Our findings have important managerial implications for multiproduct organizations. In today's business world, almost no organization produces only one product (Anand & Shachar, 2004). However, the question of how multiproduct organizations achieve OD in both within- and between-organization contexts remains largely unexplored. Our research provides evidence that the effective orchestration of distinctiveness of product design at different levels leads to superior market performance. First, organizations should increase between-organization distinctiveness to differentiate themselves in the market to gain competitive advantage. Second, they should also be careful to avoid developing a product too different from their other products. This is especially true if the organization has already adopted a prototypical design strategy. Therefore, the optimal design

strategy is to create designs different from those of other brands but maintain design consistency within the same brand, while the worst scenario is to launch a design that departs too drastically from the brand's existing designs when their brand is known in the industry as having average designs.

While obtained from the U.S. automotive industry, these findings may provide insights to companies in other industries where product design plays an important role. For example, in the fashion industry, a fashion brand should consider developing a signature style that differs from other brands but is consistent throughout every fashion item of this brand to both stand out and create consistent brand awareness (Bonigala, 2018). Illustrating this, a British fashion brand, Burberry, uses the tan, black, white, and red "house check" tartan pattern as its signature design in most of its products, which are successfully differentiated from other brands. In the consumer electronics industry, the success of Apple serves as another good example, as its success could be largely attributed to its unique design that is consistently adopted by all Apple products (Belyh, 2019).

6.3 Methodological implications

Crucial to our analysis is the introduction of the morphing technique that creates an image-based measure of product distinctiveness. The use of computerized technique of mathematically averaging images of objects was first established to generate a prototypical facial image using several individual facial images (Langlois & Roggman, 1990). Since its inception, this technique has been widely adopted in psychological research (Benson & Perrett, 1993; Steyvers, 1999), and has been recently applied to measure typicality in marketing research (Landwehr et al., 2011; Landwehr, Wentzel, & Herrmann, 2013), but to our knowledge, it has yet to be applied in organizational studies. On the other hand, scholars have made efforts to advance organizational research by leveraging the increasing availability of novel image-based data (George, Osinga, Lavie, & Scott, 2016) using computational techniques such as convolutional neural network (Choudhury, Wang, Carlson, & Khanna, 2019) and facial expression recognition software (Jiang, Yin, & Liu, 2019). We join these efforts by introducing the morphing technique as an alternative tool for image-processing. Moreover,

we suggest that the morphing technique – created based on the logic of mathematical average – is uniquely suited for OD research, as prototype is often regarded as the default benchmark with which a product or firm's similarity is compared (Zhao, 2021). We encourage future research to further leverage this novel technique to advance our understanding of OD.

6.4 Limitations and future research

This study has limitations that open avenues for future research. First, although the underlying mechanisms of competitive benefits and illegitimacy costs constitute the core of our theoretical arguments, we are not able to empirically separate these two mechanisms and test them respectively. Instead, we theoretically compared the relative strengths of these two mechanisms and empirically tested the "net benefit" (Durand et al., 2019), which represent competitive benefits minus illegitimacy costs. We encourage future research to directly test these two mechanisms individually to further advance our understanding of the performance implications of distinctiveness. Second, although we envision our theoretical framework to be broadly applicable, our empirical analysis is situated in the well-established automotive industry, which serves as the boundary conditions of our findings. Future OD research could expand this boundary and test the external validity of our theoretical framework by contextualizing the multilevel framework in other industries or countries to find the optimal levels of strategic positioning. Finally, because OD is a temporally dynamic construct (Zhao & Glynn, 2021; Zhao et al., 2018), it is important to study how the temporality of categorization influences the optimal levels of distinctiveness. For instance, a recent research (Chan et al., 2021) examined how a product design's similarity to past designs versus contemporary peers influence performance in different ways. We believe it is valuable to further explore the temporality of within- and between-organization distinctiveness in future research.

REFERENCES

Aiken, L. S., & West, S. G. 1991. *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage.

Anand, B. N., & Shachar, R. 2004. Brands as beacons: A new source of loyalty to multiproduct firms. *Journal of Marketing Research*, 41(2): 135–150.

Askin, N., & Mauskapf, M. 2017. What makes popular culture popular? Product features and optimal differentiation in music. *American Sociological Review*, 82(5): 910–944.

Barlow, M. A., Verhaal, J. C., & Angus, R. W. 2019. Optimal distinctiveness, strategic categorization, and product market entry on the Google Play app platform. *Strategic Management Journal*, 40(8): 1219–1242.

Barney, J. B. 1991. Firm resources and sustained competitive advantages. *Journal of Management*, 17(1): 99–120.

Barsalou, L. W. 1983. Ad hoc categories. *Memory & Cognition*, 11(3): 211–227.

Barsalou, L. W. 1985. Ideals, central tendency, and frequency of instantiation as determinants of graded structure in categories. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 11(4): 629–654.

Baum, J. A. C., & Singh, J. V. 1994. Organizational niches and the dynamics of organizational mortality. *American Journal of Sociology*, 100(2): 346–380.

Beal, F. M. 2008. Double jeopardy: To be black and female. *Meridians: Feminism, Race, Transnationalism*, 8(2): 166–176.

Belyh, A. 2019. *Why the Apple design is so successful*. https://www.cleverism.com/why-apple-design-successful/.

Benson, P. J., & Perrett, D. I. 1993. Extracting Prototypical Facial Images from Exemplars. *Perception*, 22(3): 257–262.

Berry, S., Levinsohn, J., & Pakes, A. 1995. Automobile prices in market equilibrium. *Econometrica*, 63(4): 841–890.

Bettis, R. A. 1981. Performance differences in related and unrelated diversified firms. *Strategic Management Journal*, 2(4): 379–393.

Bigg, M. 2021. BMW Says Criticism of 4 Series Design Has Been Brutal. *CarBuzz*. https://carbuzz.com/news/bmw-says-criticism-of-4-series-design-has-been-brutal.

Bloch, P. H. 1995. Seeking the ideal form: Product design and consumer response. *Journal of Marketing*, 59(3): 16–29.

Bloomberg. 2014. Bloomberg Businessweek's 2014 Design Issue. *Bloomberg Businessweek*. https://www.bloomberg.com/news/articles/2014-03-20/businessweeks-2014-design-issue-what-cant-design-do.

Bonigala, M. 2018. *Why your fashion brand needs a signature style*. https://www.spellbrand.com/why-your-fashion-brand-needs-a-signature-style.

Boulongne, R., & Durand, R. 2021. Evaluating Ambiguous Offerings. *Organization Science*, 32(2): 257–272.

Boush, D. M., & Loken, B. 1991. A process-tracing study of brand extension evaluation. *Journal of Marketing Research*, 28(1): 16–28.

Boxenbaum, E., Jones, C., Meyer, R. E., & Svejenova, S. 2018. Towards an Articulation of the Material and Visual Turn in Organization Studies. *Organization Studies*, 39(5–6): 597–616.

Cattani, G., Porac, J. F., & Thomas, H. 2017. Categories and competition. *Strategic Management Journal*, 38(1): 64–92.

Cennamo, C., & Santalo, J. 2013. Platform competition: Strategic trade-offs in platform markets. *Strategic Management Journal*, 34(11): 1331–1350.

Chan, T. H., Lee, Y. G., & Jung, H. 2021. Anchored Differentiation: The Role of Temporal Distance

in the Comparison and Evaluation of New Product Designs. *Organization Science*. https://doi.org/10.1287/orsc.2021.1454.
Chan, T. H., Mihm, J., & Sosa, M. E. 2018. On styles in product design: An analysis of U.S. design patents. *Management Science*, 64(3): 1230–1249.
Chandy, R. K., & Tellis, G. J. 1998. Organizing for radical product innovation: The overlooked role of willingness to cannibalize. *Journal of Marketing Research*, 35(4): 474–487.
Choudhury, P., Wang, D., Carlson, N. A., & Khanna, T. 2019. Machine learning approaches to facial and text analysis: Discovering CEO oral communication styles. *Strategic Management Journal*, 40(11): 1705–1732.
Cohen, J. B., & Basu, K. 1987. Alternative models of categorization: Toward a contingent processing framework. *Journal of Consumer Research*, 13(4): 455–472.
Collin, C. A., & McMullen, P. A. 2005. Subordinate-level categorization relies on high spatial frequencies to a greater degree than basic-level categorization. *Perception & Psychophysics*, 67(2): 354–364.
Cox, D. S., & Locander, W. B. 1987. Product novelty: Does it moderate the relationship between ad attitudes and brand attitudes? *Journal of Advertising*, 16(3): 39–44.
Creusen, M. E. H., & Schoormans, J. P. L. 2005. The different roles of product appearance in consumer choice. *Journal of Product Innovation Management*, 22(1): 63–81.
Crisp, R. J., Hewstone, M., & Rubin, M. 2001. Does multiple categorization reduce intergroup bias? *Personality and Social Psychology Bulletin*, 27(1): 76–89.
Czarniawska, B. 2008. Alterity/identity interplay in image construction. *The Sage handbook of new approaches in management and organization*: 49–62. Thousand Oaks, CA: Sage.
Deephouse, D. L. 1999. To be different, or to be the same? It's a question (and theory) of strategic balance. *Strategic Management Journal*, 20(2): 147–166.
Desai, P. S. 2001. Quality segmentation in spatial markets: When does cannibalization affect product line design? *Marketing Science*, 20(3): 265–283.
Deschamps, J.-C., & Doise, W. 1978. Crossed category memberships in intergroup relations. In H. Tajfel (Ed.), *Differentiation between social groups*. Cambridge, UK: Cambridge University Press.
DiMaggio, P. J., & Powell, W. W. 1983. The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, 48(2): 147–160.
Durand, R., & Haans, R. F. J. 2021. Optimal distinctiveness, seriously? Unanswered questions-theoretical and methodological hints. *Organization Theory*, forthcoming.
Durand, R., Hawn, O., & Ioannou, I. 2019. Willing and Able: A General Model of Organizational Responses to Normative Pressures. *Academy of Management Review*, 44(2): 299–320.
Durand, R., & Khaire, M. 2017. Where do market categories come from and how? Distinguishing category creation from category emergence. *Journal of Management*, 43(1): 87–110.
Durand, R., & Kremp, P.-A. 2016. Classical deviation: Organizational and individual status as antecedents of conformity. *Academy of Management Journal*, 59(1): 65–89.
Durand, R., & Paolella, L. 2013. Category stretching: Reorienting research on categories in strategy, entrepreneurship, and organization theory. *Journal of Management Studies*, 50(6): 1100–1123.
Dutta, S., Zbaracki, M. J., & Bergen, M. 2003. Pricing process as a capability: A resource-based perspective. *Strategic Management Journal*, 24(7): 615–630.
Edler, J., Fier, H., & Grimpe, C. 2011. International scientist mobility and the locus of knowledge and technology transfer. *Research Policy*, 40(6): 791–805.
Freeman, J., Carroll, G. R., & Hannan, M. T. 1983. The liability of newness: Age dependence in organizational death rates. *American Sociological Review*, 48(5): 692–710.
Ge, J., & Micelotta, E. 2019. When does the family matter? Institutional pressures and corporate philanthropy in China. *Organization Studies*, 40(6): 833–857.

Gehman, J., & Grimes, M. 2017. Hidden badge of honor: How contextual distinctiveness affects category promotion among certified B corporations. *Academy of Management Journal*, 60(6): 2294–2320.
George, G., Osinga, E. C., Lavie, D., & Scott, B. A. 2016. Big Data and Data Science Methods for Management Research. *Academy of Management Journal*, 59(5): 1493–1507.
Gujarati, D. N. 2003. *Basic Econometrics*. New York, NY: McGraw-Hill.
Gupta, K., Crilly, D., & Greckhamer, T. 2020. Stakeholder engagement strategies, national institutions, and firm performance: A configurational perspective. *Strategic Management Journal*, 41(10): 1869–1900.
Haans, R. F. J. 2019. What's the value of being different when everyone is? The effects of distinctiveness on performance in homogeneous versus heterogeneous categories. *Strategic Management Journal*, 40(1): 3–27.
Hasegawa, S., Terui, N., & Allenby, G. M. 2012. Dynamic brand satiation. *Journal of Marketing Research*, 49(6): 842–853.
Haunschild, P. R., & Rhee, M. 2004. The role of volition in organizational learning: The case of automotive product recalls. *Management Science*, 50(11): 1545–1560.
Henderson, R. M., & Clark, K. B. 1990. Architectural innovation: The configuration of existing product technologies and the failure of established firms. *Administrative Science Quarterly*, 35: 9–30.
Hofmann, D. A., Griffin, M. A., & Gavin, M. B. 2000. The application of hierarchical linear modeling to organizational research. In K. J. Klein & S. W. J. Kozlowski (Eds.), *Multilevel theory, research, and methods in organizations: Foundations, extensions, and new directions*: 467–511. San Francisco, CA: Jossey-Bass.
Hoopes, D. G., Madsen, T. L., & Walker, G. 2003. Guest editors' introduction to the special issue: Why is there a resource-based view? Toward a theory of competitive heterogeneity. *Strategic Management Journal*, 24(10): 889–902.
Hox, J. 2010. *Multilevel analysis: Techniques and applications*. London: Routledge.
Jennings, J. E., Jennings, P. D., & Greenwood, R. 2009. Novelty and new firm performance: The case of employment systems in knowledge-intensive service organizations. *Journal of Business Venturing*, 24(4): 338–359.
Jiang, L., Yin, D., & Liu, D. 2019. Can Joy Buy You Money? The Impact of the Strength, Duration, and Phases of an Entrepreneur's Peak Displayed Joy on Funding Performance. *Academy of Management Journal*, 62(6): 1848–1871.
Jolicoeur, P., Gluck, M. A., & Kosslyn, S. M. 1984. Pictures and names: Making the connection. *Cognitive Psychology*, 16(2): 243–275.
Kockelman, K., & Zhao, Y. 2000. Behavioral distinctions: The use of light-duty trucks and passenger cars. *Journal of Transportation and Statistics*.
Landwehr, J. R., Labroo, A. A., & Herrmann, A. 2011. Gut liking for the ordinary: Incorporating design fluency improves automobile sales forecasts. *Marketing Science*, 30(3): 416–429.
Landwehr, J. R., Wentzel, D., & Herrmann, A. 2013. Product design for the long run: Consumer responses to typical and atypical designs at different stages of exposure. *Journal of Marketing*, 77(5): 92–107.
Langlois, J. H., & Roggman, L. A. 1990. Attractive Faces Are Only Average. *Psychological Science*, 1(2): 115–121.
Levinas, E. 1999. *Alterity and transcendence*. New York: Columbia University Press.
Li, K. J., & Liu, Y. 2019. Same or different? An aesthetic design question. *Production and Operations Management*, 28(6): 1465–1485.
Liu, Y., Li, K. J., Chen, H. (Allan), & Balachander, S. 2017. The Effects of Products' Aesthetic Design on Demand and Marketing-Mix Effectiveness: The Role of Segment Prototypicality and

Brand Consistency. *Journal of Marketing*, 81(1): 83–102.
Love, J. H., Roper, S., & Vahter, P. 2014. Learning from openness: The dynamics of breadth in external innovation linkages. *Strategic Management Journal*, 35(11): 1703–1716.
Mason, C. H., & Milne, G. R. 1994. An approach for identifying cannibalization within product line extensions and multi-brand strategies. *Journal of Business Research*, 31(2–3): 163–170.
McKinsey. 2016. *Automotive revolution – perspective towards 2030*.
McKnight, B., & Zietsma, C. 2018. Finding the threshold: A configurational approach to optimal distinctiveness. *Journal of Business Venturing*, 33(4): 493–512.
McNamara, G., Deephouse, D. L., & Luce, R. A. 2003. Competitive positioning within and across a strategic group structure: The performance of core, secondary, and solitary firms. *Strategic Management Journal*, 24(2): 161–181.
Meyer, R. E., Höllerer, M. A., Jancsary, D., & van Leeuwen, T. 2013. The Visual Dimension in Organizing, Organization, and Organization Research: Core Ideas, Current Developments, and Promising Avenues. *Academy of Management Annals*, 7(1): 489–555.
Miller, D., Breton-Miller, I. Le, & Lester, R. H. 2013. Family firm governance, strategic conformity, and performance: Institutional vs. strategic perspectives. *Organization Science*, 24(1): 189–209.
Moorthy, K. S. 1984. Market segmentation, self-selection, and product line design. *Marketing Science*, 3(4): 288–307.
Moorthy, K. S., & Png, I. P. L. 1992. Market segmentation, cannibalization, and the timing of product introductions. *Management Science*, 38(3): 345–359.
Navis, C., & Glynn, M. A. 2011. Legitimate distinctiveness and the entrepreneurial identity: Influence on investor judgments of new venture plausibility. *Academy of Management Review*, 36(3): 479–499.
Park, C. W., Milberg, S., & Lawson, R. 1991. Evaluation of brand extensions: The role of product feature similarity and brand concept consistency. *Journal of Consumer Research*, 18(2): 185–193.
Parker, O., Mui, R., & Titus, V. 2020. Unwelcome voices: The gender bias-mitigating potential of unconventionality. *Strategic Management Journal*, 41(4): 738–757.
Pattni, V. 2021. BMW design boss: 'it's not our goal to please everyone.' *TopGear*. https://www.topgear.com/car-news/bmw-design-boss-its-not-our-goal-please-everyone.
Peterson, M. F., Arregle, J.-L., & Martin, X. 2012. Multilevel models in international business research. *Journal of International Business Studies*, 43(5): 451–457.
Porter, M. E. 1987. From competitive advantage to corporate strategy. *Harvard Business Review*, 65(3): 43–59.
Porter, M. E. 1991. Towards a dynamic theory of strategy. *Strategic Management Journal*, 12(S2): 95–117.
Prato, M., Kypraios, E., Ertug, G., & Lee, Y. G. 2019. Middle-status conformity revisited: The interplay between achieved and ascribed status. *Academy of Management Journal*, 62(4): 1003–1027.
Pugliese, M. J., & Cagan, J. 2002. Capturing a rebel: Modeling the Harley-Davidson brand through a motorcycle shape grammar. *Research in Engineering Design*, 13(3): 139–156.
Purdie-Vaughns, V., & Eibach, R. P. 2008. Intersectional invisibility: The distinctive advantages and disadvantages of multiple subordinate-group identities. *Sex Roles*, 59(5–6): 377–391.
Radford, S. K., & Bloch, P. H. 2011. Linking innovation to design: Consumer responses to visual product newness. *Journal of Product Innovation Management*, 28(s1): 208–220.
Ranscombe, C., Hicks, B., Mullineux, G., & Singh, B. 2012. Visually decomposing vehicle images: Exploring the influence of different aesthetic features on consumer perception of brand. *Design Studies*, 33(4): 319–341.
Rhee, M., & Haunschild, P. R. 2006. The liability of good reputation: A study of product recalls in

the U.S. automobile industry. *Organization Science*, 17(1): 101–117.
Rhee, M., & Kim, T. 2015. The role of experience in a governmental regulatory investigation in the US automobile industry: organizational learning versus reputational dynamics. *Socio-Economic Review*, 13(2): 285–308.
Rindova, V. P., & Petkova, A. P. 2007. When is a new thing a good thing? Technological change, product form design, and perceptions of value for product innovations. *Organization Science*, 18(2): 217–232.
Roberts, P. W., & Amit, R. 2003. The dynamics of innovative activity and competitive advantage: The case of Australian retail banking, 1981 to 1995. *Organization Science*, 14(2): 107–122.
Rosa, J. A., Porac, J. F., Runser-Spanjol, J., & Saxon, M. S. 1999. Sociocognitive dynamics in a product market. *Journal of Marketing*, 63(4_suppl1): 64–77.
Rosch, E. 1978. Principles of Categorization. In E. Rosch and B. B. Lloyd (Ed.), *Cognition and Categorization*: 27–47. Hillsdale, NJ: Erlbaum.
Rosch, E., & Lloyd, B. B. 1978. *Cognition and categorization.* Hillsdale, NJ: Lawrence Erlbaum Associates.
Rosch, E., Mervis, C. B., Gray, W. D., Johnson, D. M., & Boyes-Braem, P. 1976. Basic objects in natural categories. *Cognitive Psychology*, 8(3): 382–439.
Rosette, A. S., & Livingston, R. W. 2012. Failure is not an option for Black women: Effects of organizational performance on leaders with single versus dual-subordinate identities. *Journal of Experimental Social Psychology*, 48(5): 1162–1167.
Segall, K. 2013. *Insanely simple: The obsession that drives Apple's success*. Portfolio.
Semadeni, M. 2006. Minding your distance: How management consulting firms use service marks to position competitively. *Strategic Management Journal*, 27(2): 169–187.
Simonson, A., & Schmitt, B. H. 1997. *Marketing Aesthetics: The Strategic Management of Brands, Identity, and Image.* United Kingdom: Free Press.
Singh, J. V., Tucker, D. J., & House, R. J. 1986. Organizational legitimacy and the liability of newness. *Administrative Science Quarterly*, 31(2): 171–193.
Smith, E. B. 2011. Identities as lenses: How organizational identity affects audiences' evaluation of organizational performance. *Administrative Science Quarterly*, 56(1): 61–94.
Smith, E. E., & Medin, D. L. 1981. *Categories and concepts*. Cambridge, MA: Harvard University Press.
Steyvers, M. 1999. Morphing techniques for manipulating face images. *Behavior Research Methods, Instruments, & Computers*, 31(2): 359–369.
Stone, D., & Hamilton, M. 2017. Crossover utility vehicles blur distinction between passenger cars and light trucks. *Today in Energy*. https://www.eia.gov/todayinenergy/detail.php?id=31352#.
Sudhir, K. 2001. Competitive Pricing Behavior in the Auto Market: A Structural Analysis. *Marketing Science*, 20(1): 42–60.
Sujan, M. 1985. Consumer knowledge: Effects on evaluation strategies mediating consumer judgments. *Journal of Consumer Research*, 12(1): 31–46.
Sullivan, M. W. 1998. How brand names affect the demand for twin automobiles. *Journal of Marketing Research*, 35(2): 154–165.
Syakhroza, M. A., Paolella, L., & Munir, K. 2019. Holier than thou? Identity buffers and adoption of controversial practices in the Islamic banking category. *Academy of Management Journal*, 62(4): 1252–1277.
Taeuscher, K., Bouncken, R., & Pesch, R. 2021. Gaining legitimacy by being different: Optimal distinctiveness in crowdfunding platforms. *Academy of Management Journal*, 64(1): 149–179.
Taeuscher, K., & Rothe, H. 2021. Optimal distinctiveness in platform markets: Leveraging complementors as legitimacy buffers. *Strategic Management Journal*, 42(2): 435–461.
Tversky, B., & Hemenway, K. 1984. Objects, parts, and categories. *Journal of Experimental*

Psychology: General, 113(2): 169–193.
Ulrich, K. T. 2011. *Design: Creation of Artifacts in Society*. University of Pennsylvania Press, Philadelphia.
Veryzer, R. W., & Hutchinson, J. W. 1998. The influence of unity and prototypicality on aesthetic responses to new product designs. *Journal of Consumer Research*, 24(4): 374–385.
White, H. 1980. A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity. *Econometrica*, 48(4): 817–838.
Winkielman, P., Halberstadt, J., Fazendeiro, T., & Catty, S. 2006. Prototypes are attractive because they are easy on the mind. *Psychological Science*, 17(9): 799–806.
WIPO. 2015. *Successful technology licensing*.
Xia, Y., Singhal, V. R., & Zhang, G. P. 2016. Product design awards and the market value of the firm. *Production and Operations Management*, 25(6): 1038–1055.
Zettelmeyer, F., Morton, F. S., & Silva-Risso, J. 2006. How the Internet lowers prices: Evidence from matched survey and automobile transaction data. *Journal of Marketing Research*, 43(2): 168–181.
Zhang, Y., Wang, H., & Zhou, X. 2020. Dare to be different? Conformity versus differentiation in corporate social activities of Chinese firms and market responses. *Academy of Management Journal*, 63(3): 717–742.
Zhao, E. Y. 2021 (in production). *Optimal Distinctiveness: A New Approach to the Competitive Positioning of Organizations and Markets*. Cambridge: Cambridge University Press.
Zhao, E. Y., Fisher, G., Lounsbury, M., & Miller, D. 2017. Optimal distinctiveness: Broadening the interface between institutional theory and strategic management. *Strategic Management Journal*, 38(1): 93–113.
Zhao, E. Y., & Glynn, M. A. 2021. Optimal distinctiveness: On being the same and different. *Organization Theory*, forthcoming.
Zhao, E. Y., Ishihara, M., Jennings, P. D., & Lounsbury, M. 2018. Optimal distinctiveness in the console video game industry: An exemplar-based model of proto-category evolution. *Organization Science*, 29(4): 588–611.
Zott, C., & Amit, R. 2007. Business model design and the performance of entrepreneurial firms. *Organization Science*, 18(2): 181–199.
Zucker, L. G. 1977. The role of institutionalization in cultural persistence. *American Sociological Review*, 42(5): 726–743.
Zuckerman, E. W. 1999. The categorical imperative: Securities analysts and the illegitimacy discount. *American Journal of Sociology*, 104(5): 1398–1438.
Zuckerman, E. W. 2016. Optimal distinctiveness revisited: An integrative framework for understanding the balance between differentiation and conformity in individual and organizational identities. In M. G. Pratt, M. Schultz, B. E. Ashforth, & D. Ravasi (Eds.), *Handbook of Organizational Identity*. Oxford University Press, Oxford, UK. Copyright.

TABLE 1 Descriptive statistics and Pearson correlations

	Variables	Mean	S.D.	Min	Max	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*
1	Unit sales	49.33	73.96	0.00	473.11																	
2	Within-organization distinctiveness	1.59	0.85	0.52	12.19	-0.09																
3	Between-organization distinctiveness	1.23	0.59	0.43	4.34	-0.10	-0.01															
4	Price	33.65	22.95	9.05	224.61	-0.33	0.17	0.15														
5	Advertising expenditures	30.67	23.40	0.00	127.73	0.22	0.06	-0.24	-0.07													
6	Horsepower-to-weight ratio	0.77	0.16	0.25	1.43	0.09	0.16	0.00	-0.01	0.10												
7	Miles per dollar	25.80	5.47	15.50	64.50	0.29	-0.03	0.07	-0.50	0.15	-0.11											
8	Safety ratings	3.66	0.37	1.00	4.00	-0.01	-0.01	-0.04	0.06	-0.02	-0.03	-0.07										
9	Reliability ratings	3.16	1.07	1.00	5.00	0.11	0.04	0.00	-0.04	0.17	0.14	0.15	0.06									
10	Length	183.12	13.70	120.10	216.20	0.10	-0.22	-0.16	0.25	-0.03	0.02	-0.43	0.07	-0.08								
11	Width	71.41	3.26	50.80	84.20	-0.13	-0.10	0.08	0.46	-0.07	0.01	-0.52	0.10	-0.12	0.62							
12	Height	56.19	3.17	44.00	76.50	0.17	-0.12	-0.01	-0.35	0.15	-0.08	0.26	0.13	0.05	0.19	-0.15						
13	Luxury segment	0.44	0.50	0.00	1.00	-0.37	-0.05	0.11	0.68	-0.13	-0.10	-0.46	0.11	0.00	0.24	0.40	-0.28					
14	Battery electric vehicle	0.02	0.14	0.00	1.00	0.09	0.03	-0.02	-0.09	0.06	-0.03	0.10	0.03	0.00	-0.15	-0.09	0.12	-0.10				
15	Model age	17.51	15.87	0.00	78.00	0.23	-0.03	-0.11	0.02	0.10	-0.04	-0.07	0.03	-0.06	0.18	0.14	0.00	-0.10	0.00			
16	Europe	0.30	0.46	0.00	1.00	-0.26	-0.16	0.24	0.44	-0.20	-0.43	-0.20	0.09	-0.21	-0.06	0.19	-0.14	0.46	0.04	0.07		
17	Japan	0.31	0.46	0.00	1.00	0.15	0.05	-0.08	-0.16	0.14	0.19	0.23	0.09	0.40	-0.14	-0.27	0.03	-0.13	-0.09	-0.08	-0.43	
18	Korea	0.07	0.26	0.00	1.00	0.04	-0.08	-0.18	-0.16	0.21	0.11	0.11	-0.14	0.01	-0.04	-0.09	0.08	-0.16	0.06	-0.10	-0.18	-0.19

Notes: $N = 2{,}203$. Correlation coefficients with absolute values greater than or equal to 0.04 are statistically significant at $p < 0.05$.

TABLE 2 Results of multilevel modeling

Dependent variable: Unit sales					
Variables	Model 1	Model 2	Model 3	Model 4	Model 5
Within-organization distinctiveness (X1)		-10.752		-10.973	-11.251
		[0.021]		[0.017]	[0.006]
Between-organization distinctiveness (X2)			9.227	10.229	10.860
			[0.011]	[0.006]	[0.003]
X1 × X2					13.029
					[0.027]
Price	-0.612	-0.390	-0.632	-0.407	-0.466
	[0.000]	[0.010]	[0.000]	[0.006]	[0.004]
Advertising expenditures	0.214	0.227	0.247	0.263	0.275
	[0.003]	[0.001]	[0.000]	[0.000]	[0.000]
Horsepower-to-weight ratio	32.402	36.325	32.373	36.409	35.495
	[0.231]	[0.174]	[0.229]	[0.171]	[0.188]
Miles per dollar	1.461	1.320	1.389	1.237	1.234
	[0.087]	[0.108]	[0.104]	[0.134]	[0.139]
Safety ratings	2.103	3.765	2.686	4.434	4.734
	[0.778]	[0.605]	[0.722]	[0.550]	[0.511]
Reliability ratings	-0.578	-0.432	-0.664	-0.530	-0.552
	[0.817]	[0.856]	[0.785]	[0.818]	[0.808]
Length	1.780	1.566	1.804	1.587	1.518
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Width	-1.514	-1.825	-1.677	-2.007	-1.768
	[0.090]	[0.122]	[0.060]	[0.089]	[0.102]
Height	-0.995	-0.760	-1.100	-0.866	-1.075
	[0.357]	[0.444]	[0.310]	[0.384]	[0.241]
Luxury segment	-37.401	-37.268	-37.320	-37.149	-35.410
	[0.001]	[0.000]	[0.001]	[0.000]	[0.001]
Battery electric vehicle	49.742	49.990	49.442	49.630	49.472
	[0.173]	[0.190]	[0.175]	[0.193]	[0.200]
Model age	0.693	0.678	0.689	0.672	0.711
	[0.027]	[0.026]	[0.027]	[0.026]	[0.020]
Europe	5.257	-3.416	0.592	-8.890	-5.710
	[0.748]	[0.840]	[0.971]	[0.603]	[0.729]
Japan	52.153	47.632	64.420	61.180	67.557
	[0.050]	[0.089]	[0.014]	[0.026]	[0.011]
Korea	-35.477	-44.446	-41.970	-51.916	-46.008
	[0.018]	[0.008]	[0.006]	[0.003]	[0.005]
Constant	-129.950	-85.908	-111.374	-64.733	-63.582
	[0.198]	[0.394]	[0.264]	[0.517]	[0.514]
Year fixed effects	YES	YES	YES	YES	YES
Auto firm fixed effects	YES	YES	YES	YES	YES
Number of groups	34	34	34	34	34
Log pseudolikelihood	-11984.55	-11966.02	-11981.31	-11962.00	-11953.63
R-squared	0.342	0.353	0.344	0.355	0.360

Notes: N = 2,203. Two-tailed tests; p-values are shown in brackets.

FIGURE 1 Effect of within-organization distinctiveness of product design on performance [8]

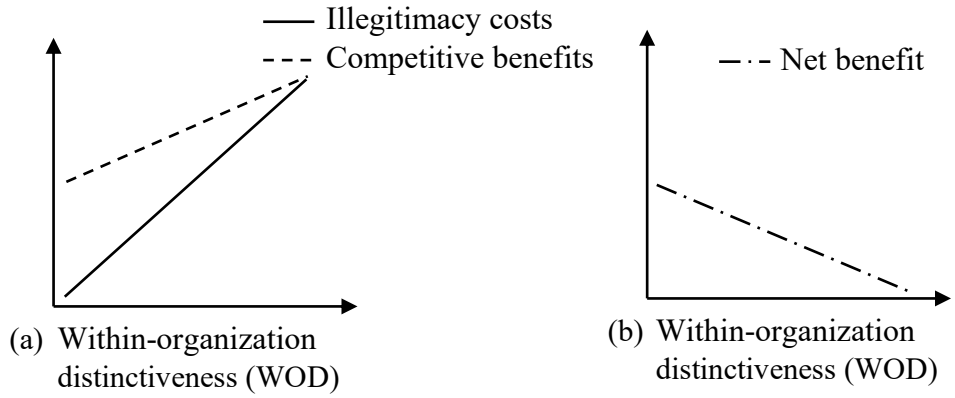


FIGURE 2 Effect of between-organization distinctiveness of product design on performance

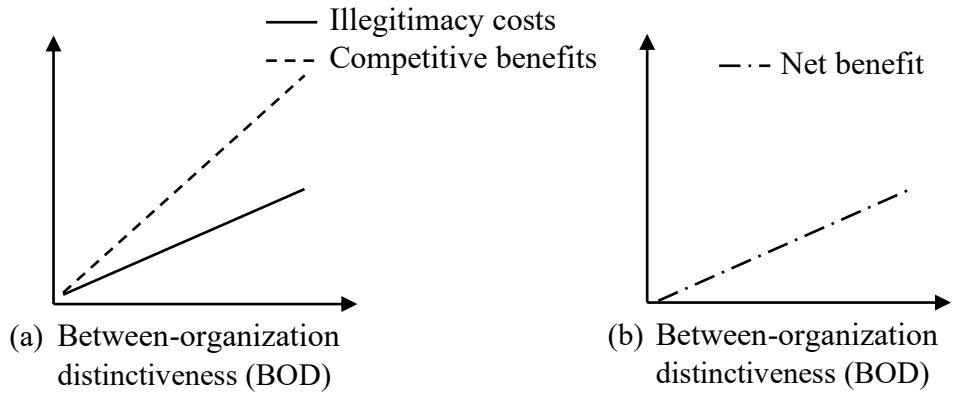
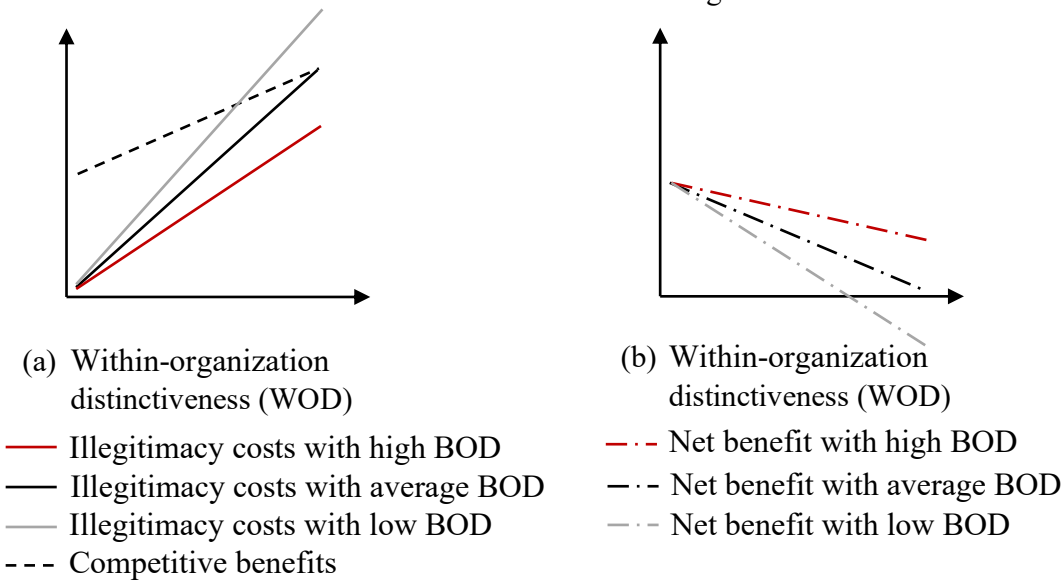


FIGURE 3 Interaction effect of within- and between-organization distinctiveness



[8] Figures 1, 2 and 3 illustrate the general shape and slope of each mechanism. However, we are agnostic as to the absolute levels of these mechanisms and leave those to empirical analyses.

FIGURE 4 Examples of car models with low and high within-organization distinctiveness

a. Hyundai morph 2016

b. Hyundai Sonata 2016
Low within-organization distinctiveness

c. Hyundai Accent 2016
High within-organization distinctiveness

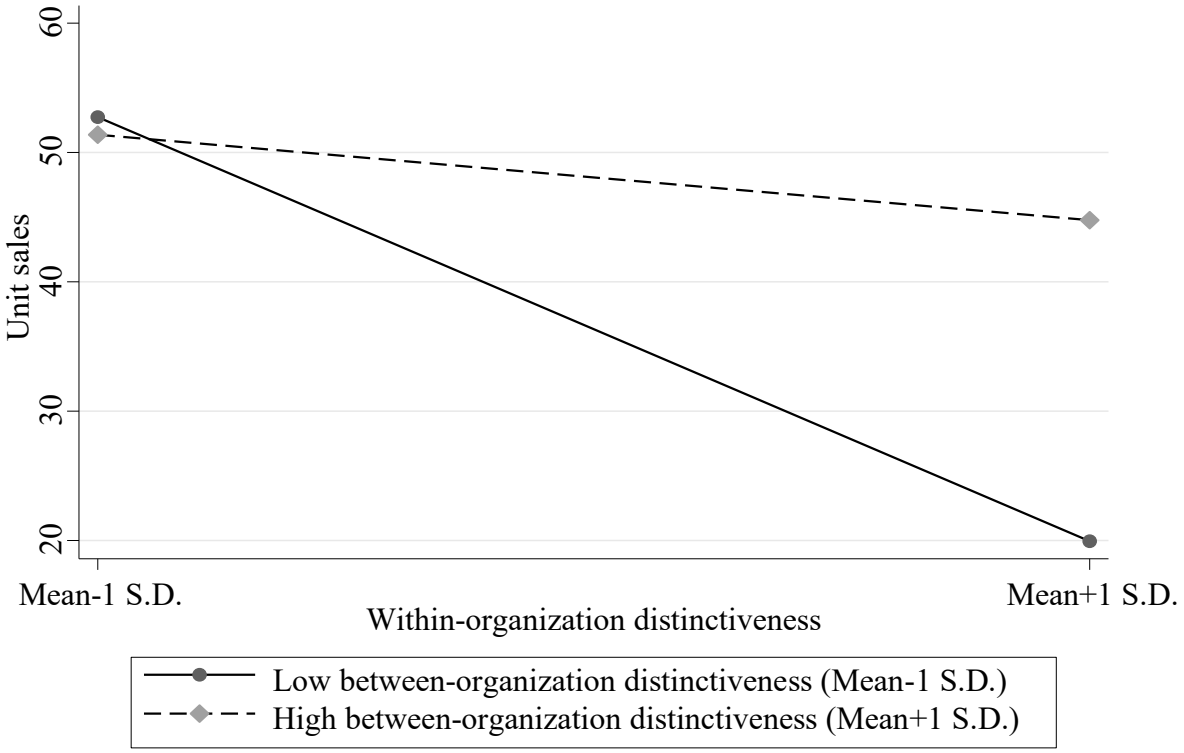
FIGURE 5 Examples of automakers with low and high between-organization distinctiveness

a. Car morph 2016

b. Chevrolet morph 2016
Low between-organization distinctiveness

c. Acura morph 2016
High between-organization distinctiveness

FIGURE 6 Interaction plot



Online Supplemental Appendices

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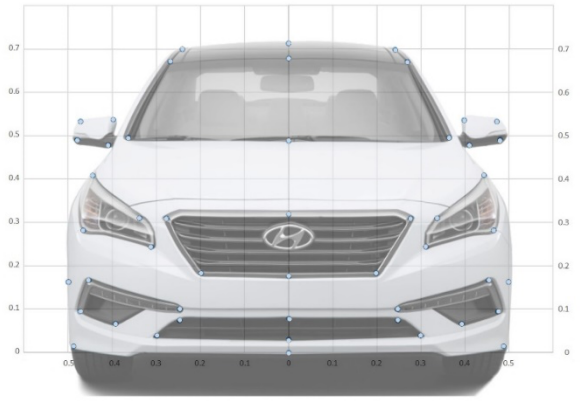
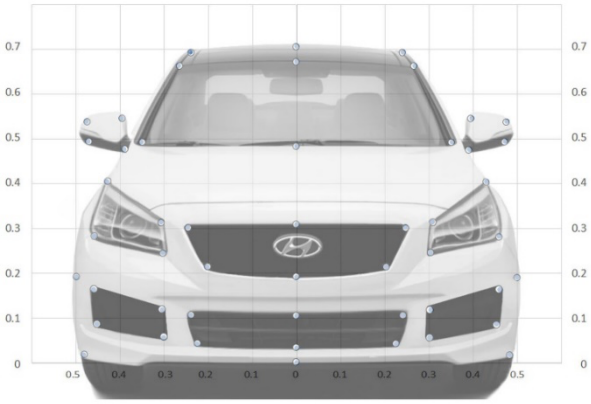
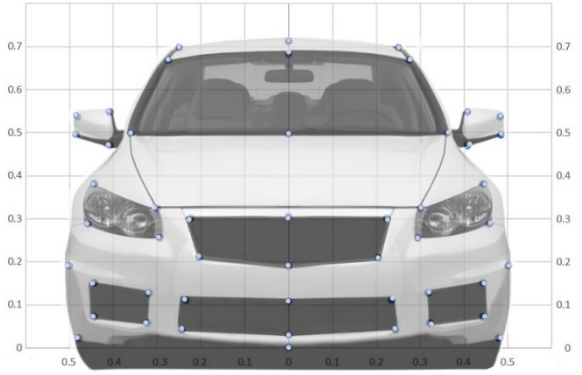
Appendix S1: The morphing methodology

Steps	Examples
Step 1: Collect standard frontal pictures of all car models.	
Step 2: Use image-processing software to locate 50 design points in the frontal design of each car model. • Place each car's frontal image into the Cartesian coordinate system. • Set the lowest point in the middle of the car's front as the origin of the system. • Normalize the image by setting the width of a car as one unit without changing the relative height-to-width ratio. • Extract the 50 design points.	 Hyundai Sonata 2016
Step 3: Create the morphs for each automaker (i.e., automaker morph) and the morph for the automotive industry (i.e., car morph). • Automaker morph Represented by the mean position of each of the 50 design points across all car models within the same automaker in a year.	 Hyundai morph 2016
• Car morph Represented by the mean position of each of the 50 design points across all car models in the automotive industry in a year.	 Car morph 2016

Notes: The morphing methodology is drawn from prior research (Landwehr, Wentzel, & Herrmann, 2013; Liu, Li, Chen, & Balachander, 2017).

Appendix S2: Description of the 50 car design points

Point #	Description	Point #	Description
1.	Intersection of the center line and the roof of a car	24.	Farthest right edge of the car at the same horizontal level of the upper edge of the bumper (the darker line)
2.	Intersection of the center line and the upper edge of the front windshield	25.	Left corner of the base
3.	Intersection of the center line and the lower edge of the front windshield	26.	Right corner of the base
4.	Intersection of the center line and the upper edge of the grille	27.	Upper left corner of the left headlight
5.	Intersection of the center line and the lower edge of the grille	28.	Upper right corner of the left headlight
6.	Intersection of the center line and the upper edge of the middle bumper box	29.	Lower left corner of the left headlight
7.	Intersection of the center line and the lower edge of the middle bumper box	30.	Lower right corner of the left headlight
8.	Intersection of the center line and the base of the car	31.	Upper left corner of the right headlight
9.	Upper left corner of the roof	32.	Upper right corner of the right headlight
10.	Upper right corner of the roof	33.	Lower left corner of the right headlight
11.	Upper left corner of the windshield	34.	Lower right corner of the right headlight
12.	Upper right corner of the windshield	35.	Upper left corner of the grille
13.	Lower left corner of the windshield	36.	Upper right corner of the grille
14.	Lower right corner of the windshield	37.	Lower left corner of the grille
15.	Upper left corner of the left mirror	38.	Lower right corner of the grille
16.	Upper right corner of the left mirror	39.	Upper left corner of the center bumper box
17.	Lower left corner of the left mirror	40.	Upper right corner of the center bumper box
18.	Lower corner of the connection of the left mirror with the car	41.	Lower left corner of the center bumper box
19.	Upper left corner of the right mirror	42.	Lower right corner of the center bumper box
20.	Upper right corner of the right mirror	43.	Upper left corner of the left bumper box
21.	Lower right corner of the right mirror	44.	Upper right corner of the left bumper box
22.	Lower corner of the connection of the right mirror with the car	45.	Lower left corner of the left bumper box
23.	Farthest left edge of the car at the same horizontal level of the upper edge of the bumper (the darker line)	46.	Lower right corner of the left bumper box
		47.	Upper left corner of the right bumper box
		48.	Upper right corner of the right bumper box
		49.	Lower left corner of the right bumper box
		50.	Lower right corner of the right bumper box

Notes: The locations of these 50 car design points are consistent with prior research (Landwehr et al., 2013; Liu et al., 2017).

Appendix S3: Organization fixed-effects models

	Dependent variable: Unit sales				
Variables	Model 1	Model 2	Model 3	Model 4	Model 5
Within-organization distinctiveness (X1)		-11.574		-11.838	-12.047
		[0.000]		[0.000]	[0.000]
Between-organization distinctiveness (X2)			9.213	10.568	11.184
			[0.002]	[0.000]	[0.000]
X1 × X2					13.436
					[0.000]
Price	-0.621	-0.382	-0.640	-0.398	-0.461
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Advertising expenditures	0.184	0.199	0.214	0.233	0.244
	[0.082]	[0.060]	[0.045]	[0.028]	[0.022]
Horsepower-to-weight ratio	32.941	37.202	33.082	37.462	36.269
	[0.002]	[0.000]	[0.002]	[0.000]	[0.000]
Miles per dollar	1.342	1.205	1.274	1.123	1.122
	[0.012]	[0.025]	[0.017]	[0.037]	[0.039]
Safety ratings	1.738	3.635	2.272	4.291	4.633
	[0.691]	[0.401]	[0.606]	[0.326]	[0.281]
Reliability ratings	-0.728	-0.569	-0.837	-0.691	-0.665
	[0.593]	[0.671]	[0.538]	[0.604]	[0.616]
Length	1.814	1.582	1.830	1.594	1.521
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Width	-1.592	-1.943	-1.720	-2.098	-1.810
	[0.001]	[0.001]	[0.000]	[0.000]	[0.001]
Height	-0.899	-0.638	-0.972	-0.716	-0.951
	[0.058]	[0.210]	[0.041]	[0.160]	[0.055]
Luxury segment	-35.911	-35.534	-35.765	-35.358	-33.235
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Battery electric vehicle	49.809	49.994	49.303	49.418	49.294
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Model age	0.675	0.661	0.670	0.654	0.689
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Constant	-150.280	-111.593	-140.142	-99.078	-93.175
	[0.001]	[0.016]	[0.002]	[0.034]	[0.047]
Automaker fixed effects	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES
R-squared	0.458	0.469	0.460	0.471	0.475
Model F	20.39	21.44	19.76	20.86	20.51
Prob > F	0.000	0.000	0.000	0.000	0.000

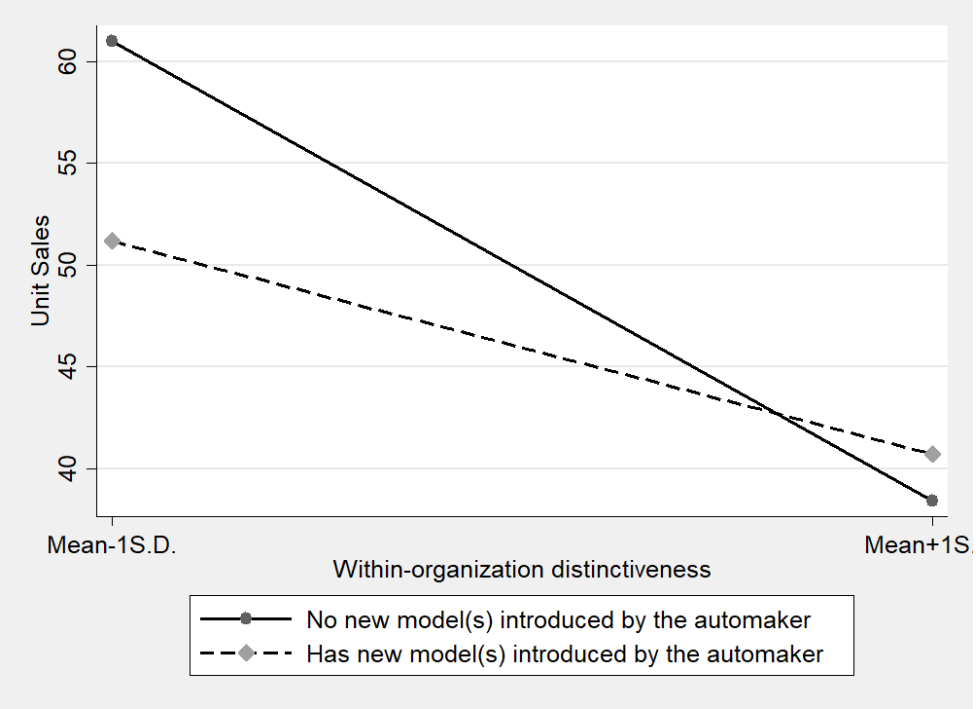
Notes: N = 2,203. Two-tailed p-values based on robust standard errors provided in brackets below coefficients.

Appendix S4: Testing the mechanisms: Moderating effect of the introduction of new model(s)

Variables	Dependent variable: Unit sales Model 1	 Model 2
Within-organization distinctiveness (X1)	-13.253	-12.470
	[0.000]	[0.000]
Introduction of new model(s) (M1)	-3.752	
	[0.191]	
X1 × M1	7.105	
	[0.016]	
Number of newly introduced model(s) (M2)		-3.808
		[0.084]
X1 × M2		3.444
		[0.008]
Between-organization distinctiveness (X2)	11.394	11.225
	[0.000]	[0.000]
X1 × X2	13.494	12.980
	[0.000]	[0.000]
Number of models discontinued	-2.409	-2.474
	[0.276]	[0.261]
Price	-0.474	-0.474
	[0.000]	[0.000]
Advertising expenditures	0.255	0.254
	[0.017]	[0.017]
Horsepower-to-weight ratio	36.385	36.502
	[0.000]	[0.000]
Miles per dollar	1.127	1.132
	[0.039]	[0.038]
Safety ratings	4.565	4.643
	[0.284]	[0.276]
Reliability ratings	-0.617	-0.585
	[0.642]	[0.659]
Length	1.518	1.507
	[0.000]	[0.000]
Width	-1.727	-1.650
	[0.002]	[0.005]
Height	-1.013	-1.052
	[0.044]	[0.039]
Luxury segment	-33.160	-33.221
	[0.000]	[0.000]
Battery electric vehicle	49.306	49.509
	[0.000]	[0.000]
Model age	0.687	0.684
	[0.000]	[0.000]
Constant	-94.632	-96.925
	[0.044]	[0.039]
Automaker fixed effects	YES	YES
Year fixed effects	YES	YES
R-squared	0.476	0.476
Model F	18.75	18.85
Prob > F	0.000	0.000

Notes: N = 2,203. Two-tailed p-values based on robust standard errors provided in brackets below coefficients. Introduction of new model(s) is a dummy coded as 1 if an automaker introduced new model(s) in a given year. Number of newly introduced model(s) measures the number of new models introduced by an automaker in a given year.

Appendix S4 (cont'd): Plotting the moderating effect of the introduction of new model(s)



Appendix S5: Examining a four-fold typology

Variables	Dependent variable: Unit sales
Low WOD & High BOD	9.991
	[0.027]
Low WOD & Low BOD	0.972
	[0.805]
High WOD & Low BOD	-12.804
	[0.004]
Price	-0.486
	[0.000]
Advertising expenditures	0.464
	[0.000]
Horsepower-to-weight ratio	33.227
	[0.000]
Miles per dollar	2.603
	[0.000]
Safety ratings	4.932
	[0.283]
Reliability ratings	0.234
	[0.864]
Length	1.443
	[0.000]
Width	-0.813
	[0.095]
Height	-1.807
	[0.000]
Luxury segment	-45.729
	[0.000]
Battery electric vehicle	46.041
	[0.000]
Model age	0.808
	[0.000]
Constant	-154.022
	[0.001]
Automaker fixed effects	YES
Year fixed effects	YES
R-squared	0.387
Model F	22.39
Prob > F	0.000

Notes: N = 2,203. Two-tailed p-values based on robust standard errors provided in brackets below coefficients. WOD stands for within-organization distinctiveness; BOD stands for between-organization distinctiveness.

Appendix S6: Accounting for the level of exposure

Variables	Dependent variable: Unit sales
Within-organization distinctiveness (X1)	-5.355
	[0.000]
Between-organization distinctiveness (X2)	5.924
	[0.061]
X1 × X2	7.422
	[0.003]
Cumulative sales in the past 11 years	0.081
	[0.000]
Price	-0.206
	[0.007]
Advertising expenditures	0.229
	[0.059]
Horsepower-to-weight ratio	8.822
	[0.288]
Miles per dollar	1.062
	[0.012]
Safety ratings	22.875
	[0.002]
Reliability ratings	-3.837
	[0.002]
Length	0.607
	[0.000]
Width	-1.702
	[0.025]
Height	0.245
	[0.692]
Luxury segment	-10.875
	[0.006]
Battery electric vehicle	36.039
	[0.020]
Model age	-2.645
	[0.000]
Constant	-63.975
	[0.284]
Automaker fixed effects	YES
Year fixed effects	YES
R-squared	0.682
Model F	10.72
Prob > F	0.000

Notes: $N = 616$. Two-tailed p-values based on robust standard errors provided in brackets below coefficients.

Appendix S7: Using an alternative independent variable

	Dependent variable: Unit sales	
	Model 1	Model 2
Variables	Multilevel model	Fixed-effects model
Within-organization distinctiveness (X1)	-11.506	-12.307
	[0.004]	[0.000]
Between-organization distinctiveness (X2)	10.452	10.647
	[0.003]	[0.000]
X1 × X2	12.741	13.146
	[0.026]	[0.000]
Price	-0.470	-0.465
	[0.004]	[0.000]
Advertising expenditures	0.276	0.244
	[0.000]	[0.021]
Horsepower-to-weight ratio	35.428	36.194
	[0.189]	[0.001]
Miles per dollar	1.236	1.125
	[0.139]	[0.039]
Safety ratings	4.773	4.669
	[0.507]	[0.277]
Reliability ratings	-0.544	-0.655
	[0.811]	[0.622]
Length	1.511	1.514
	[0.000]	[0.000]
Width	-1.725	-1.766
	[0.107]	[0.001]
Height	-1.090	-0.966
	[0.233]	[0.051]
Luxury segment	-35.295	-33.119
	[0.001]	[0.000]
Battery electric vehicle	49.496	49.327
	[0.201]	[0.000]
Model age	0.711	0.690
	[0.020]	[0.000]
Europe	-5.672	
	[0.731]	
Japan	67.075	
	[0.011]	
Korea	-45.565	
	[0.006]	
Constant	-65.024	-94.376
	[0.503]	[0.044]
Automaker fixed effects		YES
Auto firm fixed effects	YES	
Year fixed effects	YES	YES
R-squared	0.343	0.475
Log pseudolikelihood	-11953.44	
Model F		20.46

Notes: $N = 2{,}203$. Two-tailed p-values based on robust standard errors provided in brackets below coefficients. Between-organization distinctiveness is measured by the extent to which a focal automaker's typical design is different from the average design of all car models produced by other automakers in the automotive industry.

Appendix S8: Using alternative dependent variables

Variables	Dependent variable I: Market share Model 1 Multilevel model	 Model 2 Fixed-effects model	Dependent variable II: Sales revenue Model 3 Multilevel model	 Model 4 Fixed-effects model
Within-organization	-0.077	-0.083	-0.183	-0.197
distinctiveness (X1)	[0.005]	[0.000]	[0.017]	[0.000]
Between-organization	0.067	0.069	0.146	0.148
distinctiveness (X2)	[0.010]	[0.000]	[0.052]	[0.013]
X1 × X2	0.093	0.095	0.244	0.256
	[0.019]	[0.000]	[0.023]	[0.000]
Price	-0.003	-0.003	-0.013	-0.013
	[0.003]	[0.000]	[0.000]	[0.000]
Advertising expenditures	0.002	0.002	0.006	0.005
	[0.000]	[0.035]	[0.002]	[0.011]
Horsepower-to-weight ratio	0.250	0.256	0.674	0.687
	[0.171]	[0.000]	[0.109]	[0.000]
Miles per dollar	0.008	0.008	0.022	0.020
	[0.166]	[0.039]	[0.164]	[0.038]
Safety ratings	0.032	0.031	0.217	0.214
	[0.486]	[0.263]	[0.111]	[0.004]
Reliability ratings	-0.002	-0.003	-0.003	-0.005
	[0.901]	[0.763]	[0.945]	[0.843]
Length	0.010	0.010	0.035	0.035
	[0.000]	[0.000]	[0.000]	[0.000]
Width	-0.011	-0.011	-0.008	-0.009
	[0.151]	[0.003]	[0.653]	[0.398]
Height	-0.007	-0.006	-0.017	-0.015
	[0.240]	[0.053]	[0.326]	[0.111]
Luxury segment	-0.244	-0.230	-0.471	-0.440
	[0.001]	[0.000]	[0.017]	[0.000]
Battery electric vehicle	0.337	0.336	0.630	0.627
	[0.199]	[0.000]	[0.254]	[0.000]
Model age	0.005	0.005	0.018	0.018
	[0.019]	[0.000]	[0.002]	[0.000]
Europe	-0.034		-0.060	
	[0.764]		[0.841]	
Japan	0.463		1.211	
	[0.013]		[0.003]	
Korea	-0.297		-1.386	
	[0.008]		[0.000]	
Constant	-0.542	-0.734	-4.346	-5.279
	[0.414]	[0.020]	[0.017]	[0.000]
Automaker fixed effects		YES		YES
Auto firm fixed effects	YES		YES	
Year fixed effects	YES	YES	YES	YES
R-squared	0.344	0.479	0.355	0.457
Log pseudolikelihood	-930.73		-3289.02	
Model F		19.97		23.31

Notes: N = 2,203. Two-tailed p-values based on robust standard errors provided in brackets below coefficients.

Appendix S9: Using automakers that have at least three models in a year

	Dependent variable: Unit sales	
	Model 1	Model 2
Variables	Multilevel model	Fixed-effects model
Within-organization distinctiveness (X1)	-11.763	-12.543
	[0.005]	[0.000]
Between-organization distinctiveness (X2)	11.032	10.705
	[0.002]	[0.000]
X1 × X2	12.269	12.845
	[0.046]	[0.000]
Price	-0.445	-0.442
	[0.006]	[0.000]
Advertising expenditures	0.292	0.257
	[0.000]	[0.025]
Horsepower-to-weight ratio	38.261	38.740
	[0.165]	[0.000]
Miles per dollar	1.212	1.100
	[0.150]	[0.047]
Safety ratings	5.600	5.556
	[0.452]	[0.211]
Reliability ratings	-0.676	-0.781
	[0.781]	[0.584]
Length	1.533	1.544
	[0.001]	[0.000]
Width	-1.932	-1.975
	[0.107]	[0.001]
Height	-1.077	-0.979
	[0.257]	[0.055]
Luxury segment	-36.682	-34.422
	[0.001]	[0.000]
Battery electric vehicle	49.646	49.690
	[0.199]	[0.000]
Model age	0.726	0.701
	[0.020]	[0.000]
Europe	-6.116	
	[0.758]	
Japan	66.100	
	[0.011]	
Korea	-47.506	
	[0.015]	
Constant	-57.874	-87.327
	[0.582]	[0.080]
Automaker fixed effects		YES
Auto firm fixed effects	YES	
Year fixed effects	YES	YES
R-squared	0.314	0.474
Log pseudolikelihood	-11326.65	
Model F		20.17

Notes: N = 2,079. Two-tailed p-values based on robust standard errors provided in brackets below coefficients.

Appendix S10: Using the exemplar-based approach

	Dependent variable: Unit sales	
	Model 1	Model 2
Variables	Multilevel model	Fixed-effects model
Within-organization distinctiveness (X1)	-18.151	-18.419
	[0.000]	[0.000]
Between-organization distinctiveness (X2)	5.736	6.050
	[0.042]	[0.038]
X1 × X2	10.053	10.039
	[0.010]	[0.000]
Price	-0.031	-0.029
	[0.791]	[0.745]
Advertising expenditures	0.259	0.233
	[0.000]	[0.019]
Horsepower-to-weight ratio	32.290	32.684
	[0.204]	[0.001]
Miles per dollar	0.858	0.764
	[0.235]	[0.133]
Safety ratings	6.416	6.332
	[0.283]	[0.098]
Reliability ratings	-0.618	-0.722
	[0.755]	[0.552]
Length	1.018	1.024
	[0.002]	[0.000]
Width	-1.900	-1.943
	[0.228]	[0.022]
Height	-0.273	-0.164
	[0.769]	[0.784]
Luxury segment	-36.714	-34.766
	[0.000]	[0.000]
Battery electric vehicle	49.150	49.037
	[0.193]	[0.000]
Model age	0.678	0.660
	[0.023]	[0.000]
Europe	-17.184	
	[0.234]	
Japan	54.530	
	[0.093]	
Korea	-46.312	
	[0.002]	
Constant	-4.725	-39.962
	[0.954]	[0.378]
Automaker fixed effects		YES
Auto firm fixed effects	YES	
Year fixed effects	YES	YES
R-squared	0.405	0.549
Log pseudolikelihood	-11791.25	
Model F		29.08

Notes: N = 2,203. Two-tailed p-values based on robust standard errors provided in brackets below coefficients.

Appendix S11: Split-sample analyses – comparing new vs. old car models

	Subsample 1: New car models			Subsample 2: Old car models		
Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Within-organization	-3.108		-4.011	-18.308		-17.994
distinctiveness (X1)	[0.076]		[0.045]	[0.000]		[0.000]
Between-organization		9.922	11.057		7.430	9.814
distinctiveness (X2)		[0.010]	[0.004]		[0.056]	[0.010]
X1 * X2			7.784			9.229
			[0.016]			[0.019]
Price	-0.130	-0.229	-0.197	-0.670	-0.897	-0.707
	[0.168]	[0.006]	[0.039]	[0.000]	[0.000]	[0.000]
Advertising expenditures	0.287	0.307	0.349	0.183	0.166	0.217
	[0.060]	[0.038]	[0.021]	[0.131]	[0.178]	[0.076]
Horsepower-to-weight ratio	3.145	0.481	3.241	46.199	41.483	45.380
	[0.745]	[0.961]	[0.731]	[0.001]	[0.002]	[0.001]
Miles per dollar	0.584	0.624	0.489	1.845	2.036	1.780
	[0.185]	[0.139]	[0.259]	[0.009]	[0.004]	[0.012]
Safety ratings	13.620	14.072	12.315	3.278	0.386	4.214
	[0.054]	[0.054]	[0.087]	[0.497]	[0.937]	[0.381]
Reliability ratings	-1.964	-1.401	-1.379	-0.758	-1.274	-0.937
	[0.234]	[0.399]	[0.400]	[0.643]	[0.441]	[0.564]
Length	1.165	1.194	1.161	1.548	2.052	1.527
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Width	-2.625	-2.299	-2.808	-0.003	-0.904	-0.062
	[0.014]	[0.010]	[0.009]	[0.996]	[0.159]	[0.921]
Height	-0.622	-1.049	-1.108	-2.160	-2.025	-2.266
	[0.350]	[0.144]	[0.117]	[0.001]	[0.003]	[0.000]
Luxury segment	-25.970	-24.767	-24.460	-33.606	-35.276	-32.055
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Battery electric vehicle	57.146	55.548	56.395	51.229	51.427	51.353
	[0.015]	[0.017]	[0.014]	[0.000]	[0.000]	[0.000]
Model age	5.709	5.819	5.750	0.683	0.677	0.698
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Constant	-5.457	-12.480	38.426	-167.681	-185.834	-154.886
	[0.951]	[0.876]	[0.664]	[0.003]	[0.001]	[0.008]
Automaker fixed effects	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES
Observations	387	387	387	1,816	1,816	1,816
R-squared	0.541	0.544	0.554	0.495	0.480	0.497
Model F	4.48	4.55	4.51	16.94	15.53	16.19

Notes: Two-tailed p-values based on robust standard errors provided in brackets below coefficients. The dependent variable is unit sales in all models.

Appendix S12: Check on a potential curvilinear relationship

	Dependent variable: Unit sales	
	Model 1	Model 2
Variables	Multilevel model	Fixed-effects model
Within-organization distinctiveness (X1)	-11.322	-12.109
	[0.006]	[0.000]
Between-organization distinctiveness (X2)	12.096	12.320
	[0.006]	[0.002]
Between-organization distinctiveness $(X2)^2$	-1.229	-1.170
	[0.302]	[0.495]
X1 × X2	13.063	13.496
	[0.027]	[0.000]
Price	-0.466	-0.461
	[0.004]	[0.000]
Advertising expenditures	0.282	0.250
	[0.000]	[0.021]
Horsepower-to-weight ratio	35.739	36.498
	[0.185]	[0.000]
Miles per dollar	1.235	1.124
	[0.139]	[0.039]
Safety ratings	4.714	4.607
	[0.512]	[0.284]
Reliability ratings	-0.553	-0.664
	[0.807]	[0.617]
Length	1.513	1.517
	[0.000]	[0.000]
Width	-1.764	-1.806
	[0.102]	[0.001]
Height	-1.055	-0.937
	[0.249]	[0.060]
Luxury segment	-35.324	-33.127
	[0.001]	[0.000]
Battery electric vehicle	49.333	49.183
	[0.202]	[0.000]
Model age	0.711	0.689
	[0.020]	[0.000]
Europe	-5.114	
	[0.757]	
Japan	65.653	
	[0.011]	
Korea	-45.785	
	[0.005]	
Constant	-64.583	-93.541
	[0.507]	[0.046]
Automaker fixed effects		YES
Auto firm fixed effects	YES	
Year fixed effects	YES	YES
R-squared	0.343	0.475
Log pseudolikelihood	-11953.51	
Model F		20.16

Notes: N = 2,203. Two-tailed p-values based on robust standard errors provided in brackets below coefficients.

Appendix S13: List of automakers and car models in our sample

Automaker #	Automaker name	Model #	Model name	Automaker #	Automaker name	Model #	Model name	Automaker #	Automaker name	Model #	Model name
1	Acura	1	ACURA CL	5	Cadillac	42	STS	10	Ford	83	FUSION
1	Acura	2	ACURA ILX	5	Cadillac	43	XLR	10	Ford	84	GT (FORD)
1	Acura	3	ACURA NSX	5	Cadillac	44	XTS	10	Ford	85	MUSTANG
1	Acura	4	ACURA RL	6	Chevrolet	45	AVEO	10	Ford	86	TAURUS
1	Acura	5	ACURA RLX	6	Chevrolet	46	CAMARO	10	Ford	87	THUNDERBIRD
1	Acura	6	ACURA RSX	6	Chevrolet	47	CAVALIER	11	Honda	88	ACCORD
1	Acura	7	ACURA TL	6	Chevrolet	48	COBALT	11	Honda	89	CIVIC
1	Acura	8	ACURA TLX	6	Chevrolet	49	CORVETTE	11	Honda	90	CR-Z
1	Acura	9	ACURA TSX	6	Chevrolet	50	CRUZE	11	Honda	91	FIT
2	Audi	10	AUDI A3	6	Chevrolet	51	IMPALA	11	Honda	92	INSIGHT
2	Audi	11	AUDI A4	6	Chevrolet	52	MALIBU	11	Honda	93	PRELUDE
2	Audi	12	AUDI A5	6	Chevrolet	53	METRO	11	Honda	94	S2000
2	Audi	13	AUDI A6	6	Chevrolet	54	MONTE CARLO	12	Hyundai	95	ACCENT
2	Audi	14	AUDI A7	6	Chevrolet	55	PRIZM	12	Hyundai	96	AZERA
2	Audi	15	AUDI A8	6	Chevrolet	56	SONIC	12	Hyundai	97	ELANTRA
2	Audi	16	AUDI R8	6	Chevrolet	57	SPARK	12	Hyundai	98	EQUUS
2	Audi	17	AUDI TT	6	Chevrolet	58	SS	12	Hyundai	99	GENESIS
3	BMW	18	BMW 1 SERIES	7	Chrysler	59	200 SERIES	12	Hyundai	100	SONATA
3	BMW	19	BMW 2 SERIES	7	Chrysler	60	300 SERIES	12	Hyundai	101	TIBURON
3	BMW	20	BMW 3 SERIES	7	Chrysler	61	CONCORDE	12	Hyundai	102	VELOSTER
3	BMW	21	BMW 4 SERIES	7	Chrysler	62	CROSSFIRE	12	Hyundai	103	XG
3	BMW	22	BMW 5 SERIES	7	Chrysler	63	LHS	13	Infiniti	104	INFINITI G
3	BMW	23	BMW 6 SERIES	7	Chrysler	64	PT CRUISER	13	Infiniti	105	INFINITI M
3	BMW	24	BMW 7 SERIES	7	Chrysler	65	SEBRING	13	Infiniti	106	INFINITI Q45
3	BMW	25	BMW Z3	8	Dodge	66	AVENGER	13	Infiniti	107	INFINITI Q50
3	BMW	26	BMW Z4	8	Dodge	67	CALIBER	13	Infiniti	108	INFINITI Q60
3	BMW	27	BMW i3	8	Dodge	68	CHALLENGER	13	Infiniti	109	INFINITI Q70
3	BMW	28	BMW i8	8	Dodge	69	CHARGER	14	Jaguar	110	JAGUAR F-TYPE
4	Buick	29	CENTURY	8	Dodge	70	DART	14	Jaguar	111	JAGUAR S-TYPE
4	Buick	30	LACROSSE	8	Dodge	71	INTREPID	14	Jaguar	112	JAGUAR X-TYPE
4	Buick	31	LESABRE	8	Dodge	72	MAGNUM	14	Jaguar	113	JAGUAR XF
4	Buick	32	PARK AVE	8	Dodge	73	NEON (DODGE)	14	Jaguar	114	JAGUAR XJ
4	Buick	33	REGAL	8	Dodge	74	STRATUS	14	Jaguar	115	JAGUAR XK
4	Buick	34	VERANO	8	Dodge	75	VIPER	15	Kia	116	CADENZA
5	Cadillac	35	ATS	9	Fiat	76	FIAT 500	15	Kia	117	FORTE
5	Cadillac	36	CATERA	9	Fiat	77	FIAT 500L	15	Kia	118	K900
5	Cadillac	37	CTS	10	Ford	78	CROWN VICTORIA	15	Kia	119	OPTIMA
5	Cadillac	38	DEVILLE	10	Ford	79	ESCORT	15	Kia	120	RIO
5	Cadillac	39	DTS	10	Ford	80	FIESTA	15	Kia	121	SEPHIA
5	Cadillac	40	ELDORADO	10	Ford	81	FIVE HUNDRED	15	Kia	122	SOUL
5	Cadillac	41	SEVILLE	10	Ford	82	FOCUS	15	Kia	123	SPECTRA

Appendix S13: List of automakers and car models in our sample (cont'd)

Automaker #	Automaker name	Model #	Model name	Automaker #	Automaker name	Model #	Model name	Automaker #	Automaker name	Model #	Model name
16	Lexus	124	LEXUS CT	21	Mitsubishi	165	I	28	Saturn	206	SKY
16	Lexus	125	LEXUS ES	21	Mitsubishi	166	LANCER	29	Scion	207	SCION FR-S
16	Lexus	126	LEXUS GS	21	Mitsubishi	167	MIRAGE	29	Scion	208	SCION iA
16	Lexus	127	LEXUS HS	22	Nissan	168	ALTIMA	29	Scion	209	SCION iM
16	Lexus	128	LEXUS IS	22	Nissan	169	CUBE	29	Scion	210	SCION iQ
16	Lexus	129	LEXUS LFA	22	Nissan	170	GT-R	29	Scion	211	SCION tC
16	Lexus	130	LEXUS LS	22	Nissan	171	MAXIMA	29	Scion	212	SCION xA
16	Lexus	131	LEXUS RC	22	Nissan	172	NISSAN 350Z	29	Scion	213	SCION xB
16	Lexus	132	LEXUS SC	22	Nissan	173	NISSAN 370Z	29	Scion	214	SCION xD
17	Lincoln	133	CONTINENTAL	22	Nissan	174	SENTRA	30	Subaru	215	BRZ
17	Lincoln	134	LS (LINCOLN)	22	Nissan	175	VERSA	30	Subaru	216	IMPREZA
17	Lincoln	135	MKS	23	Oldsmobile	176	ALERO	30	Subaru	217	LEGACY
17	Lincoln	136	MKZ	23	Oldsmobile	177	AURORA	30	Subaru	218	WRX
17	Lincoln	137	TOWN CAR	23	Oldsmobile	178	INTRIGUE	31	Suzuki	219	AERIO
17	Lincoln	138	ZEPHYR	24	Plymouth	179	PROWLER	31	Suzuki	220	ESTEEM
18	Mazda	139	MAZDA 626	25	Pontiac	180	BONNEVILLE	31	Suzuki	221	FORENZA
18	Mazda	140	MAZDA2	25	Pontiac	181	FIREBIRD	31	Suzuki	222	KIZASHI
18	Mazda	141	MAZDA3	25	Pontiac	182	G3	31	Suzuki	223	SX4
18	Mazda	142	MAZDA6	25	Pontiac	183	G5	31	Suzuki	224	VERONA
18	Mazda	143	MILLENIA	25	Pontiac	184	G6	32	Toyota	225	AVALON
18	Mazda	144	MX-5 MIATA	25	Pontiac	185	G8	32	Toyota	226	CAMRY
18	Mazda	145	PROTEGE	25	Pontiac	186	GRAND AM	32	Toyota	227	CELICA
18	Mazda	146	RX-8	25	Pontiac	187	GRAND PRIX	32	Toyota	228	COROLLA
19	Mercedes	147	MERCEDES C CLASS	25	Pontiac	188	GTO	32	Toyota	229	ECHO
19	Mercedes	148	MERCEDES CL	25	Pontiac	189	SOLSTICE	32	Toyota	230	PRIUS
19	Mercedes	149	MERCEDES CLA	25	Pontiac	190	SUNFIRE	32	Toyota	231	YARIS
19	Mercedes	150	MERCEDES CLK	25	Pontiac	191	VIBE	33	Volkswagen	232	BEETLE
19	Mercedes	151	MERCEDES CLS	26	Porsche	192	BOXSTER	33	Volkswagen	233	CC
19	Mercedes	152	MERCEDES E CLASS	26	Porsche	193	CARRERA GT	33	Volkswagen	234	EOS
19	Mercedes	153	MERCEDES S CLASS	26	Porsche	194	CAYMAN	33	Volkswagen	235	GOLF
19	Mercedes	154	MERCEDES SL	26	Porsche	195	PANAMERA	33	Volkswagen	236	GTI
19	Mercedes	155	MERCEDES SLK	26	Porsche	196	PORSCHE 911	33	Volkswagen	237	JETTA
19	Mercedes	156	MERCEDES SLS	26	Porsche	197	PORSCHE 918	33	Volkswagen	238	PASSAT
20	Mercury	157	COUGAR	27	Saab	198	SAAB 9-2X	33	Volkswagen	239	PHAETON
20	Mercury	158	GRAND MARQUIS	27	Saab	199	SAAB 9-3	33	Volkswagen	240	RABBIT
20	Mercury	159	MILAN	27	Saab	200	SAAB 9-5	34	Volvo	241	VOLVO 30
20	Mercury	160	MONTEGO	28	Saturn	201	ASTRA	34	Volvo	242	VOLVO 40
20	Mercury	161	SABLE	28	Saturn	202	AURA	34	Volvo	243	VOLVO 50
21	Mitsubishi	162	DIAMANTE	28	Saturn	203	ION	34	Volvo	244	VOLVO 60
21	Mitsubishi	163	ECLIPSE	28	Saturn	204	SATURN L	34	Volvo	245	VOLVO 70
21	Mitsubishi	164	GALANT	28	Saturn	205	SATURN S	34	Volvo	246	VOLVO 80

Appendix S14: Online survey procedures and results overview

In this appendix, we provided a brief sketch of the online survey, details about the questionnaire, quantitative and qualitative evidence can be found in Appendix S15, S16 and S17.

We recruited 250 participants from M-Turk to complete a survey.[1] We included an instructional manipulation check (IMC) to test whether the online participants read the instructions (Oppenheimer, Meyvis, & Davidenko, 2009). After dropping 37 respondents who did not pass the IMC, we derived a final sample that included 213 respondents with an average age of 36.47 (SD=10.27); 47.42% of the respondents were female; and 91.08% had previous car purchasing experience.[2]

In this survey, participants were asked to select their preferred car design from two choices. We performed a chi-square goodness-of-fit test to see if one choice was significantly preferred over the other. In line with our expectations, 58.22% of consumers prefer a car model with a design consistent with the typical design of the brand (i.e., low within-organization distinctiveness), which is significantly higher than the percent of consumers who prefer a different design ($p = 0.017$); 62.91% prefer a car brand that has a unique design compared with other brands (i.e., high between-organization distinctiveness), which is significantly higher than the percent of consumers who prefer a similar design ($p < 0.001$). We further performed a chi-square test of independence and found that consumers' preferred choices at two different levels are highly dependent ($p < 0.001$). Specifically, consumers who prefer a car brand with a unique (similar) design are more likely to choose a car model that is different from (consistent with) the typical design of its brand, suggesting that the negative evaluation toward an atypical design of a car model is alleviated if the model is from a car brand that has a unique and distinctive design. All these results lend further support to our findings.

The explanations and comments of participants also provided us with strong qualitative evidence that supports our key arguments. Regarding within-organization distinctiveness, consumers who value high prototypicality conveyed that the typical design of car models facilitates recognition and evokes positive emotions related to the brand: "*I want people to be able to identify the brand of the car that I am driving so it makes sense that is consistent with others offered by the brand*"; "*I like consistency and knowing what I can expect. I also feel like it is a consistent design because it is tried and true*." In addition, 87.32% of respondents consider not only aesthetic design but also other attributes such as size, function, and technology as important factors in differentiating car models of the same brand, thus validating our argument that the differentiation pressure on product design is low within an automaker. Regarding between-organization distinctiveness, consumers pointed to the usefulness of distinctive design in increasing differentiation and reducing competition: "*It helps create a strong impression, build a brand identity, convey key information, narrate your story, and build consumer trust*"; "*Most cars no longer have any personality or unique styling, therefore I would choose a car with unique styling over competitors*."

[1] Potential respondents are limited to those currently located in the U.S. To ensure high data quality, we followed prior research to restrict the participation to M-Turkers with high productivity (i.e., above 500 previously approved tasks) and high reputation (i.e., above 95% approval ratings for completed tasks) (Peer, Vosgerau, & Acquisti, 2014).

[2] Including the 37 respondents who failed the IMC does not significantly change the demographic statistics of the sample and improves the level of significance of the results reported in subsequent chi-square tests.

Appendix S15: Online survey questionnaire

We are conducting a research project about car design. Your inputs are very important for our research. Please answer all questions honestly and carefully. Thank you so much!

Q1. When choosing to buy a car, do you prefer a car brand that has a unique design or a similar design to other brands? *(Please note that your focus here is on car design, and you should not consider any other factors such as price)*

A. Unique design
B. Similar design

Q2. Please explain why:

(Participants who chose A in Q1 were directed to Q3 and Q4; Participants who chose B in Q1 were directed to Q5 and Q6)

Q3. If you chose a car brand that has a **unique** design, you then need to choose a car model of this brand. Do you prefer a car model that has a consistent design with or a different design from the typical design of this car brand?

A. Consistent design
B. Different design

Q4. Please explain why:

Q5. If you chose a car brand that has a **similar** design to other brands, you then need to choose a car model of this brand. Do you prefer a car model that has a consistent design with or a different design from the typical design of this car brand?

A. Consistent design
B. Different design

Q6. Please explain why:

Q7. Which of the following attributes are important for you to distinguish between different car models of the same brand? *(You can select multiple choices)*

A. Size
B. Function
C. Technology
D. Aesthetic design
E. Others

Q8. If you chose "others", please explain what other attributes are important:

Q9. What is your age?

Q10. What is your gender?

Male
Female

Q11. Have you purchased cars before?

Yes
No

Appendix S16: Statistical analysis of the responses to the online survey questionnaire

1. Chi-square goodness of fit

Q5: Within-organization distinctiveness 1 = Consistent design 0 = Different design	Expected percent	Expected frequency	Observed frequency
1	50	106.5	124
0	50	106.5	89

chisq(1) = 5.75, p = 0.0165

Q3: Between-organization distinctiveness 1 = Unique design 0 = Similar design	Expected percent	Expected frequency	Observed frequency
1	50	106.5	134
0	50	106.5	79

chisq(1) = 14.2, p = 0.0002

2. Chi-square test of independence

Within-organization distinctiveness / Between-organization distinctiveness	1 = Consistent design	0 = Different design	Total
1 = Unique design	51	83	134
0 = Similar design	73	6	79
Total	124	89	213

Pearson chi2(1) = 60.3427, Pr = 0.000

Appendix S17: Selected quotes from the responses to the online survey questionnaire

Selected Quotes from Survey Supporting H1 (i.e., prefer low within-organization distinctiveness)

Age	Gender	Car purchasing experience	Quote
25	Male	Yes	*I prefer people to know the brand that I have bought. If the design is too different, it will look like a different brand.*
26	Male	Yes	*Because changing something that already works seems good to me that they want to modify certain things but totally changing the whole essence of their design does not seem right to me*
26	Male	No	*It having a consistent design means that they know what they're good at. I would trust the brand more.*
27	Female	Yes	*I like a consistent design because it showcases what they are best at. If they make the same thing consistently they will gain more experience and be able to do it well.*
28	Female	Yes	*I like things that are familiar. I am not a fan of big and major changes. I like to know what I am getting into. I probably trust that brand for reasons that have to do with consistency so that would be most important.*
29	Female	No	*I want people to be able to identify the brand of the car that I am driving so it makes sense that is consistent with others offered by the brand*
30	Female	Yes	*I don't think I have too much of a preference as long as it's what I prefer. I chose consistent because it makes me feel like the brand is likely good at doing that particular design. An alternative may feel more risky.*
30	Female	Yes	*They'll know what they're doing when things are kept consistent. It would mean they've chosen the right shapes and parts that work best and have tested them over the years.*
32	Male	Yes	*I prefer a model that has a consistent design because it means that it is probably more well designed.*
33	Male	Yes	*I would prefer a consistent design. There is a reason that cars have this design and it is very functional.*
34	Male	Yes	*if it is consistent then that means there is a good reason they keep that design in the first place.*
36	Male	Yes	*When choosing a car brand, I often choose the brand because of the overall looks of its models, so I'd want to buy a car model that is in line with the brand's style.*
37	Female	Yes	*A consistent design would be tested through other cars and I would know that this design is the most efficient and effective.*
42	Male	Yes	*I like the brand to have consistency in their designs. I dont like it when my favorite car brands go way outside the box and end up failing on a new design look*
50	Female	Yes	*I like cars with classic, consistent design such as Porsche. It bothers me when car makers completely redesign vehicles but keep the same model name.*

Selected Quotes from Survey Supporting H2 (i.e., prefer high between-organization distinctiveness)

Age	Gender	Car purchasing experience	Quote
22	Male	Yes	*I prefer a unique design because it is what sets a car apart from other brands. I makes it look nicer in my own eyes.*
22	Female	No	*It will stand out and be memorable for consumers. Also a unique design may challenge the market itself and other manufacturers.*
28	Female	Yes	*I love being unique more so when dealing with cars, For recognition and class differentiation. Similar designs are so commonly used even as cabs*
31	Male	Yes	*it is because it will have aesthetics qualities and this is very important to the car because it make it to be more marketable*
34	Male	Yes	*We create brands and logos, which uniquely represent your company and remain well anchored in the minds of all target groups. Pretty is standard*
37	Female	Yes	*Unique designs catch my eye better and I feel offer something different than the mainstream. I would enjoy having a car that had a different design than others and standing out in that way.*
38	Female	Yes	*Unique designs are more eye-catching. Unique designs show thoughtfulness on the part of the manufacturer.*
45	Female	Yes	*it is to help create a strong impression, build a brand identity, convey key information, narrate your story, and build consumer trust.*
56	Female	Yes	*I feel like almost all cars look alike, and for the past couple of years I've thought about buying a new car but they all look the same, and I want something a little unique. I don't want it over the top different, but I want something that I can appreciate looking at.*
61	Male	Yes	*Most cars no longer have any personality or unique styling, therefore I would choose a car with unique styling over competitors*

Appendix S18: Edmunds consumer reviews analysis procedures and results overview

To provide real-world examples that further add face validity to our arguments and findings, we also did a text analysis of consumer reviews from Edmunds.com, which is a reputable website for consumers to share purchase experiences and opinions on car models (Kim & Chun, 2019; Shaffer & Zettelmeyer, 2002). We scraped all reviews released between 2001 and 2016 for all car models in our sample and obtained a data set of 98,319 reviews. We conducted two rounds of initial screening to remove reviews irrelevant to our research by using the following lists of keywords: design, look*, exterior, styl*, appear* in the first round, and typical, similar, distinct, unique in the second round.

After reading the remaining 1,522 reviews, we selected reviews aligned with our arguments and reported them in the online appendix. It is noteworthy that we did not find consumer reviews supporting opposing arguments regarding within-organization distinctiveness after this systematic approach; none of the reviews we read perceived low prototypicality within an automaker as superior. Examples of consumer reviews that point to high prototypicality as a strength within organizations would be: "*smooth ride and styling, typical of a Cadillac*"; "*car is great looking, with classic, timeless VW looks inside and out*." Reviews that compared the exterior design among different brands were more prevalent and diverged in their perspectives. Many commended car brands for being distinctive: "*Cadillac dares to be different. I love it for being distinctive*." Interestingly, quite a few reviews criticized car brands for not being distinctive enough: "*on the styling front, sad to say I can't distinguish the 200 from the Kia's and Hyundai's on the road."* In only five reviews did consumers suggest a preference for low between-organization distinctiveness, and the only reason was that they intentionally searched for cars that had styles similar to the one they previously owned from another brand. Taken together, the text analysis of car reviews offered strong evidence that further confirms that low within- and high between-organization distinctiveness in general positively influence consumers' evaluations on products.

Appendix S19: Selected quotes from Edmunds consumer reviews

Consumer Reviews Supporting H1

Date of review	Automaker	Model	Year	Review title	Quote	Relevance to our study
01/10/2004	Jaguar	S-Type R	2004	A great drivers car	*What a beauty. I owned 3 other S-types, because I love the classic Jaguar lines. Upgrading each year is due to the engineering refinement and design enhancements.*	Low within-organization distinctiveness (advantage)
07/28/2005	Saab	9-2X Wagon	2005	Yahoo a Saabaru	*The exterior looks more saab-like than the swedish made 93 sedan.*	Low within-organization distinctiveness (advantage)
01/25/2008	Saturn	ION Red Line	2006	ION Red Line is fast, fun	*On the outside, the ION Red Line looks similar to the regular ION coupe, but mechanically they live on different planets.*	Low within-organization distinctiveness (advantage)
08/31/2008	Audi	TT Convertible	2001	Good looking car	*The TT is a good looking car, comfortable and fun to drive with that unique Audi look*	Low within-organization distinctiveness (advantage)
03/16/2009	Cadillac	CTS Sedan	2007	Cadillac does it again	*Smooth ride and styling, typical of a Cadillac.*	Low within-organization distinctiveness (advantage)
04/17/2010	Porsche	Panamera Sedan 4S	2010	Porsche Panamera 4S	*This car is absolutely phenomenal! It has all of the basic Porsche characteristics that every fan loves, but with heavy dose of luxury, quiet and comfort.*	Low within-organization distinctiveness (advantage)
10/23/2010	Volkswagen	Rabbit Hatchback	2009	VW could have done better	*The exterior of this car is quite nice, following the line of the Golf.*	Low within-organization distinctiveness (advantage)
04/28/2015	Mercedes-Benz	CLA-Class Sedan	2015	Car is 2 and 1/2 years old	*It's a typical Mercedes. Well thought out design and great to drive with great looks.*	Low within-organization distinctiveness (advantage)
01/23/2016	Cadillac	ATS Sedan	2014	Leftover 2014 a ragingg bargain	*It has many traditional Cadillac styling cues with the slender vertical tail lights especially appealing, but everything is tidy, compact and modern. This is a Cadillac, but a youthful, enthusiast Cadillac. I love the way this car looks inside and out.*	Low within-organization distinctiveness (advantage)
11/05/2016	Volkswagen	Jetta Sedan	2015	The Red Rocket	*Car is great looking, with classic, timeless VW looks inside and out.*	Low within-organization distinctiveness (advantage)
11/07/2016	Porsche	Boxster Convertible	2008	Bought a 2008 Base Boxster.....great car! `	*The exterior is typical Porsche...SEXY.*	Low within-organization distinctiveness (advantage)

Consumer Reviews Supporting H2

Date of review	Automaker	Model	Year	Review title	Quote	Relevance to our study
03/24/2005	Jaguar	XJ-Series Sedan	2005	Reborn Driver	*And let's face it: there's no other car in the price range that has such beautiful styling. Audi, BMW, Mercedes, Lexus - especially from a 3/4 view - all look the same. I take pride in owning a classically distinctive motorcar that turns heads, esp'ly mine.*	High between-organization distinctiveness (advantage)
11/22/2006	Audi	A6 Sedan	2004	Seductive	*I have always appreciated the sexy curves and distinct appearance of an Audi.*	High between-organization distinctiveness (advantage)
03/14/2008	Cadillac	XLR-V Convertible	2008	So far, so awesome	*I chose the xlr-v for the styling, the acceleration, the hard top, the fact that all the options are included at base price (unlike the M6 or the SL550) and that it had a much more attractive and distinctive exterior body style than most cars in its class.*	High between-organization distinctiveness (advantage)
01/31/2010	Pontiac	Grand Prix Sedan	2008	Great style at low price	*The last Grand Prix is very distinctive which is a real plus compared to generic "non-style" from Toyota and other mass marketers.*	High between-organization distinctiveness (advantage)
05/22/2011	Chrysler	Chrysler 200 Limited with V-6: WOW	2011	200 Sedan Limited 4dr Sedan (2.4L 4cyl 6A)	*Compared to all the mainstream competitors it's really unique in it's design and for the money I really don't think anything can quite compare.*	High between-organization distinctiveness (advantage)
03/27/2014	Volkswagen	CC Sedan	2012	Stylish car, fun to drive, with solid performance	*If you are looking for a distinctive stylish look, this car may be for you.It beats the other more common vehicles around like the Camry, Accord, and Sonata.*	High between-organization distinctiveness (advantage)
01/19/2015	Mercury	Milan Sedan	2009	Excellent car, exceptional value	*I like the Milan, as well, for its distinctive styling. It is a good deal different from its sister, the Fusion, and over looks like nothing else on the road.*	High between-organization distinctiveness (advantage)
12/27/2015	Lincoln	MKZ Hybrid	2016	Great Dark Horse Luxury Car	*I also want to be DIFFERENT and not drive the stereotypical "Mercedes". Compared to the BLAND styling of current Lexus models, this car is a killer! Beautiful lines, design, and interior.*	High between-organization distinctiveness (advantage)
02/04/2016	Subaru	WRX Sedan 4dr Sedan	2016	Three months into this near-perfect sports sedan:	*I had looked at Accord, Camry, A4, etc before buying the SE and I like its distinctive appearance.*	High between-organization distinctiveness (advantage)
01/08/2017	Cadillac	ATS-V Coupe	2016	Wow, you must test drive this car.	*Most coupes and sedans all have the same look which is trying to look like the modern re-design of*	High between-organization

					the BMW 7 series. Cadillac dares to be different. I love it for being distinctive.	distinctiveness (advantage)
03/22/2002	Lexus	LS 430 Sedan	2002	Great Car, But Can I Have My Caddie Back	*Styling is nice, but not distinctive. My '94 Fleetwood had a distinctive style that stands out in the crowd. The Lexus looks like any other import. The LS430 is an outstanding car. But will my next car be a Lexus? The jury is still out...I still think about my Caddie.*	Low between-organization distinctiveness (need improvement)
11/06/2003	Lexus	ES 300 Sedan	2003	Wonderful - with even greater potential	*A wonderful vehicle in a class by itself. Attracts attention, but the ES and Camry look too similar.*	Low between-organization distinctiveness (need improvement)
03/07/2005	Mitsubishi	Galant Sedan	2005	2005 Mitsubishi Galant	*Overall Mitsubishi did a great job redesigning this vehicle but it is oddly similar to the new Honda Accord, which I also have. Looks like a little industrial espionage by somebody.*	Low between-organization distinctiveness (need improvement)
08/27/2006	Subaru	Impreza Wagon	2006	I Love My Suby.	*I like the new look of the 06's, however many other cars out there have a similar front end,*	Low between-organization distinctiveness (need improvement)
05/22/2008	Lexus	LS 460 Sedan	2007	Some design flaws	*I have owned 5 Lexus. 1st was 1990. The best was last model of the 430. The new model has the following flaws... 4) The design doesn't say, distinctive or luxury... instead it says, "this is a pregnant Camry."*	Low between-organization distinctiveness (need improvement)
07/15/2010	Audi	A4 Sedan	2010	Don't get the CVT	*I was given this car as a loaner car while my 06 A4 was being repaired… The new A4 redesign is nice, but I actually think that the old A4 was prettier, and more engaging. This new one just feels similar to a Lexus, with less reliability.*	Low between-organization distinctiveness (need improvement)
11/13/2015	Chrysler	200 Sedan	2015	This Car Needs An Autobahn	*On the styling front, sad to say I can't distinguish the 200 from the Kia's and Huyndai's on the road. Say hello to my new Cadillac CTS4 with Performance Package that runs circles around the 200, is highly distinctive, and not an embarrassment to hand over to the valet.*	Low between-organization distinctiveness (need improvement)