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# Dimensions of brand-extension fit

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ABSTRACT

A sizable research stream in marketing finds that a strong fit between a brand extension product and its parent brand encourages positive consumer responses. Yet this large body of literature fails to provide managers with specific practical guidance about how to create brand-extension fit for optimal results. The problem is a lack of understanding of what brand-extension fit really is, and there has been little work to address this issue by synthesizing the key dimensions of brand-extension fit. The current article addresses this gap by identifying the key constituent dimensions of brand-extension fit. This is an important topic because brand extensions are essential for business renewal and growth.

We identify six dimensions of brand-extension fit: feature-based, function-based, resource-based, usage-occasion-based, market-based, and image-based fit. Each dimension addresses a different aspect of brand-extension fit and suggests ways for brand managers to create brand-extension fit. Less expected is that studies that use a strict subset of these dimensions overweight those fit dimensions that are included, and the associated estimated coefficients are biased. From a managerial perspective, counterfactual analysis also shows that reliance on a strict subset of these dimensions results in suboptimal decisions.


## 1. Introduction

A brand extension is a marketing strategy in which an organization extends its current brand name to a different product category. The goal of a brand extension is to harness a brand's popularity in one area to promote positive consumer response in a new area. Brand extensions are indispensable for brand renewal and growth because they are a widely used means of reducing the risk and expense of new product introductions (McCarthy, Heath, & Milberg, 2001). Nevertheless, they are risky, with a failure rate for many fast-moving consumer goods of as high as 80% (Torelli & Ahluwalia, 2011; Völckner & Sattler, 2006). Even highly successful brands have had failures such as cologne introduced by Harley Davidson in 1990, lemonade by Frito-Lay in 1998, yogurt by Cosmopolitan magazine in 1999, lip balm by Cheetos in 2005, and "Mighty Wings" by McDonald's in 2013.

Many analysts have come to realize that the likelihood of a successful brand extension is improved when there is a fit between an extension product and a popular parent brand. Academic research that develops what can be referred to as the theory of brand-extension fit dates back to Aaker and Keller (1990). Summing up some of the early literature on this subject, Völckner and Sattler (2006) found that the fit between a parent brand and an extension product is the most important of five key drivers of brand extension success (the others are marketing support, parent-brand conviction, retailer acceptance,

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and parent-brand experience). Practitioners likewise emphasize the importance of brand-extension fit. For example, John Parham, president of the brand extension agency Parham Santana, lists three pillars for successful brand extensions: fit, leverage, and opportunities (Klara, 2013).

After more than 30 years of academic research and 60 years of practice, however, specific guidance for managers is limited and sometimes contradictory as to how to create brand-extension fit in practice. This is because of a fundamental lack of agreement about what brand-extension fit really is and how to operationalize and measure it.

Some researchers have used direct, over-arching, and general measures of whether the extension product is "similar" to, "congruent" with, or "consistent" with the parent brand. Such overall measures are useful for testing theories related to brand extensions, but such an overall approach does not provide constructive advice for where specifically to look for good extension ideas or how an extension fits with its parent brand. Thus, even if an analyst measured a mediocre overall fit between the parent brands and the five brand extension failures alluded to above, the data would not help the analyst know what aspects of the extension product or the marketing program were problematic or what to do differently. The problem with fit may be obvious in some cases, but often some elements appear to fit while others do not (e.g., lemonade by Frito-Lay or "Mighty Wings" by McDonald's).

Other researchers have measured specific and focused constituent dimensions of fit between the parent brand and the extension product, such as the similarity of product features/attributes or the similarity of product image with customers. These scholars focus on different dimensions, with most of these scholars treating one or a limited number of such dimensions as an overall measure of brand-extension fit. There is no exhaustive list of specific dimensions that have been used in the literature, and focusing on one or a limited number of dimensions, while missing other key dimensions of fit, fails to cover the full construct of brand-extension fit. The current literature is not definitive, because various researchers have divergent points of emphasis, priorities, and conclusions. And there is little work that synthesizes the different measurements of brand-extension fit or the different ways of creating fit.

The current article takes up this challenge by identifying six key constituent dimensions of brand extension fit: feature-based fit, function-based fit, resource-based fit, usage-occasion-based fit, market-based fit, and image-based fit. We show that these dimensions address distinct aspects of brand-extension fit and combine to form a measurement scale that collectively covers the brand-extension fit construct. To demonstrate convergent validity and practical relevance, we relate these six dimensions to overall measures of brand-extension fit and to indicators of brand extension success. We further show that using one or a few of the six dimensions may understate and not fully cover the overall brand-extension fit construct, which can lead to biased or overstated importance weights of the specific dimensions that are used. We identify particular studies in the literature potentially subject to this problem. For managerial purposes, we also show in counterfactual simulations that using a subset of these dimensions leads to suboptimal decisions. These conclusions are relevant because many authors and managers have indeed used one or a few of these six dimensions as their measure of overall "brand-extension fit."

Section 2 of this article reviews the substantive conclusions of this large body of literature and summarizes different measures of brand-extension fit. Section 3 develops our measurement scale – in particular, describing how we identified important dimensions (using qualitative studies), confirming the applicability of six dimensions (study 1), and validating our model (study 2). Section 4 provides our conclusions and suggestions for future research.

## 2. Brand-extension fit: theoretical antecedents and measures

The brand-extension fit construct is formally defined here as *the similarity, consistency, or congruity between the parent brand (or category) and the extension product (or category)*. The literature applying this construct goes back to the seminal work of Aaker and Keller, who argued that "the fit between the two involved product classes has a direct positive association with the attitude toward the extension" (1990, p. 30). An early refocus on the fit of the extension product with the parent brand, rather than between the "two involved product classes," began with Broniarczyk and Alba (1994), who emphasized brand-specific associations. Ever since, many studies have consistently replicated the positive effect of fit or congruity on consumer behavior, regardless of whether researchers focused on the parent brand or parent category. Specifically, consumers respond more favorably to congruent brand extensions than to moderately incongruent ones, and more favorably to moderately incongruent brand extensions than to extremely incongruent ones.

### 2.1. Theoretical antecedents

This literature consistently builds on theories of categorization (Cohen & Basu, 1987; Fiske & Pavelchak, 1986; Fiske, 1982; Meyers-Levy & Tybout, 1989; Sujan, 1985; Tversky, 1977) and affect/image transfer (Boush et al., 1987; Shimp, 1981; Wright, 1975). In particular, the fit between a parent brand and an extension product promotes the categorization of the extension product with its parent brand, facilitating the transfer of positive perceptions and affect from the parent brand to the extension product. This effect is usually referred to as the fit (congruity) effect.

A large number of studies have subsequently explored moderators of the fit effect on consumer responses (see Fig. 1). These moderators can be categorized into three groups: (a) *parent brand characteristics*, including brand breadth (Boush & Loken, 1991), brand quality (Keller & Aaker, 1992), brand affect (Yeung & Wyer, 2005), brand attitude (Gierl & Huettl, 2011; Nan, 2006), brand emotional attachment (Fedorikhin, Park, & Thomson, 2008), brand equity (Buil, de Chernatony, &

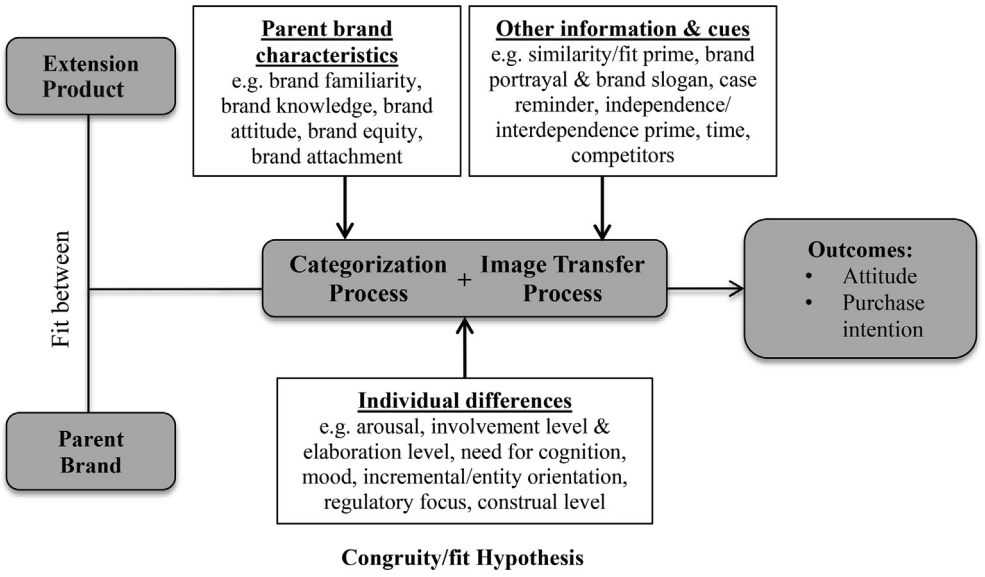


**Fig. 1.** Literature review of brand-extension fit.

Hem, 2009), and brand positioning (Liu & Hu, 2012); (b) *other information cues present in the environment*, including similarity/fit primes (Barone, Miniard, & Romeo, 2000; Yeung & Wyer, 2005; Zhang & Sood, 2002), ad exposure time (Lane, 2000), independence versus interdependence primes (Ahluwalia, 2008), the presence of art (Oakley, Duhachek, Balachander, & Sriram, 2007), competitive cues (Kapoor & Heslop, 2009; Milberg, Sinn, & Goodstein, 2010), brand portrayals, brand slogans, and peripheral design cues (Gierl & Huettl, 2011), the consumption occasion (Liu & Hu, 2012), family-brands versus sub-brands (Sood & Keller, 2012), and physical distance (Huang, Jia, & Wyer, 2017); and (c) *individual differences*, including mood (Barone et al., 2000; Yeung & Wyer, 2005), involvement level (Barone, 2005; Maoz & Tybout, 2002), age (Zhang & Sood, 2002), regulatory focus (Yeo & Park, 2006), analytical versus holistic thinking (Monga & John, 2006), construal level (Kim & John, 2008), country of origin (Buil et al., 2009), incremental versus entity orientation (Mathur, Jain, & Maheswaran, 2012), arousal level (Noseworthy, Muro, & Murray, 2014), and the nature of the purchase goal (Dimitriu et al., 2017).

Some of these variables, such as positive brand attitude, brand affect, and brand quality, are nearly as important as fit for brand extension success. Some of them, such as negative brand quality or associations, competitive cues, and very high or low arousal levels, nullify the fit effect. Also, some moderators, such as involvement level, exhibit a different effect pattern of fit: the moderate incongruity effect (Mandler, 1982). Specifically, moderately incongruent brand extensions receive more favorable responses from consumers than congruent ones and severely incongruent ones, and congruent brand extensions lead to more favorable outcomes than extremely incongruent ones.

### *2.2. Two broad approaches to measuring brand-extension fit*

The literature discussed above uses two broad approaches of measuring fit. The first approach directly measures consumers' *overall* perception of the similarity, consistency or congruity between the parent brand and the extension product. The second (multidimensional) approach measures *distinct constituent dimensions or parts* of brand-extension fit and combines these to obtain the overall fit.

The first approach measures fit with a single item such as "similar/dissimilar," "good/bad fit," or "consistent/incon sistent," or with multiple closely related overall measurement items (using some form of average of these). For example, Shen, Bei, and Chu (2011) used five items: "fit," "reasonable," "connected," "associated," and "understandable." By contrast, the second approach views consumers forming *separate evaluations of fit on distinct dimensions or aspects of the brand extension*, and the overall perception of fit between the parent brand and the extension product is *the combined effect of separate evaluations on these dimensions*. For example, Aaker and Keller (1990) measured three different items: substitute, complement, and transfer (discussed later), which they averaged as the overall measure of fit.

From the technical perspective of scale development theory, these two approaches to measuring fit can be understood, respectively, as *reflective* measurement scale development and *formative* scale development. The reflective approach treats fit as a unidimensional construct. Even if multiple (reflective) items are used to measure the single unidimensional construct, the items are theoretically similar, highly correlated, and methodologically interchangeable; despite slight nuances of perspective, each item reflects the same overall underlying construct, and adding or dropping any of them will not change the theoretical content/domain of the fit construct (Coltman, Devinney, Midgley, & Venaik, 2008). For instance, the five items

used by Shen et al. (2011), "fit," "reasonable," "connected," "associated," and "understandable," are similar and interchangeable, and dropping one would not materially change the theoretical domain of brand-extension fit that they describe.

By contrast, the formative approach treats fit as a multidimensional construct, in which multiple dimensions combine to form and define the overall latent construct. More specifically, each formative measure covers a unique and uninterchangeable theoretical theme, and changes in each formative measure cause a different change in the latent construct (Coltman et al., 2008). For example, the three formative measures of fit used by Aaker and Keller (1990), substitute, complement, and transfer, each cover a distinct consideration in consumers' evaluations of brand-extension fit, so dropping any of the measures will change the theoretical domain of brand-extension fit that is being described.

This second approach to scale development can be supported by schema theory, which can itself be traced back to Gestalt psychology. In schema theory, human minds organize information and ideas at different levels of abstraction in mental networks or structures, called schema; and brand or product category schema are formed when people interact with brands or product categories (Mandler, 1982) through direct personal experiences, such as personal usage, or indirect experiences, such as advertisements or consumer reviews. When consumers evaluate a brand extension product, they usually first invoke their schemas about the parent brand and the extension product (or category), and then compare these schemas in different ways or from different perspectives. The perception of fit is an outcome of an evaluation process in which consumers evaluate the fit between a parent brand and its extension product according to different dimensions or aspects sequentially or simultaneously, and then form an overall perception of fit. This process can be a single-directional process, or an interactive cycle for which consumers can always go back to any specific dimension and update their evaluation.

A summary of studies that use the first approach of directly measuring the *overall perception* of fit is provided in Table 1.

The popularity of this approach can be attributed to the ease of using overall perceived fit to predict some key variables, such as consumers' overall attitudes and behavioral intentions toward an extension. The disadvantage of this approach, however, is that it fails to break down brand-extension fit into its constituent parts. Understanding these constituent parts is useful for stimulating ideas for courses of action, which is critical for managers.

A summary of other articles that use the second approach by measuring distinct dimensions or aspects of brand-extension fit and combining them to arrive at overall fit is presented in Table 2.

An interesting feature that this table reveals is that various authors have suggested rather different measures. For example, Park, Milberg, and Lawson (1991) focused on abstract image, whereas Aaker and Keller (1990) focused on three measures of product features. Some authors, such as Völckner, Sattler, and Kaufmann (2008), have used both reflective and formative measures. We believe there is a need to synthesize these different dimensions and aspects of brand-extension fit. The following section describes an in-depth scale development exercise that provides such a synthesis.

## 3. Analysis & results

To identify the key dimension of brand-extension fit and develop a comprehensive formative measurement scale, we follow the steps outlined in Fig. 2. This framework builds on past suggestions for formative scale development (Chin, 2010; Coltman et al., 2008; Diamantopoulos & Winklhofer, 2001), which depart somewhat from the traditional Churchill (1979) paradigm for developing reflective measurement scales (for further background on the framework we follow, see online technical appendix B).

### 3.1. What is brand-extension fit? Defining the content area of the focal construct

We define *brand-extension fit* as consumer perceptions of the *similarity, consistency, or congruity between a parent brand and an extension product*. Consumers may perceive similarities between a parent brand and an extension product in different ways, however. A key goal of the current paper is to arrive at an operational version of this definition that elaborates on this conceptual definition by *specifying the main dimensions or ways* in which the parent brand and extension product are perceived to fit with each other.

### 3.2. What makes up brand-extension fit? Identifying key dimensions

To identify the dimensions that individually influence and jointly constitute brand-extension fit, we conducted four types of qualitative analysis: (1) a comprehensive review of the formative measurement items for brand-extension fit in the literature; (2) five in-depth interviews with qualified practitioners and academics; (3) a small survey (using open-ended questions about a brand-extension case scenario from 37 undergraduate students); and (4) a small focus group with six marketing doctoral students.

Our literature review, interviews, and survey suggest six major themes, each associated with a key dimension of brand-extension fit. We provide below a simplified narrative motivating the relevance of these themes, following the order that these measurement items appeared in the literature (summarized in Table 3). We illustrate each theme with quotes from our in-depth interviews and open-ended survey (for how we arrive at themes regarding these six dimensions, see online technical appendix A).

**Table 1**
Measures of overall brand-extension fit (reflective measures of fit).

| Research Paper | Type of Research | Measure Used |
|---|---|---|
| Boush and Loken (1991). JMR | Exp | 1: dissimilar, 7: similar. |
| Broniarczyk and Alba (1994). JMR | Exp | 1: not similar, 9: very similar. |
| Bijmolt, Wedel, Pieters, and DeSarbo (1998) IJRM | Cor | 1: highly dissimilar, 7: highly similar. |
| Morrin (1999). JMR | Exp | 1: very bad fit, 9: very good fit. |
| Barone et al. (2000). JCR | Exp | How similar the extension was to the current products marketed by [the parent brand] (1: not at all similar; 7: very similar). |
| Lane (2000). JM | Exp | Good fit/bad fit, and extremely consistent/extremely inconsistent anchored at 0 and 6. |
| McCarthy et al. (2001). ML | Exp | How well [the brand name] seemed to fit with the [extension] category (1: not much, 9: very much). |
| Maoz and Tybout (2002). JCP | Exp | A single 9-point semantic differential scale. |
| Zhang and Sood (2002). JCR | Exp | 1: not at all similar, 5: very similar. |
| Barone (2005). JCP | Exp | 1: not at all similar; 7: very similar. |
| Yeung and Wyer (2005). JMR | Exp | Each product's relationship to [parent brand]: −5: not at all to +5: very. |
| Nan (2006). P&M | Exp | How much sense does it make? How logical is it for the [product category] brand [brand name] to introduce [extension]? How do [extension] fit with the [product category] brand [brand name]? How surprised are you that the[product category] brand [brand name] will introduce [extension]? |
| Yeo and Park (2006). JCP | Exp | 1: very dissimilar; 7: very similar. |
| Monga and John (2006). JCR | Exp | 1: inconsistent; 7: consistent. |
| Shine, Park, and Wyer (2007). JMR | Exp | 1: very dissimilar, 7: very similar. |
| Fedorikhin et al. (2008). JCP | Exp | Three-item 7-point Likert scale: "are very similar," "go together really well," and "is a natural extension." |
| Hagtvedt and Patrick (2008). JCP | Exp | The extent to which they thought the [parent brand] had a close fit with the extension product (1: not at all, 7: very). |
| Kim and John (2008). JCP | Exp | Two 7-point scales: inconsistent/consistent, atypical/typical. |
| Martinez, Polo, and De Chernatony (2008). IMR | Cor | How similar or dissimilar are "new product" to the products usually offered by X? (1: very dissimilar, 7: very similar); How inconsistent or consistent is the new product with X's brand image? (1: very inconsistent, 7: very consistent) |
| Buil et al. (2009). EJM | Exp | The degree of similarity on a seven-point Likert scale. |
| Kapoor and Heslop (2009). IJRM | Exp | 1: no sense at all; 9: a lot of sense. |
| Milberg et al. (2010). JCR | Exp | Two scales: 1: very low fit, 7: very high fit; 1: makes little sense, 7: makes a lot of sense. |
| Bambauer-Sachse, Hüttl, and Gierl (2011). P&M | Exp | Four items from Boush and Loken (1991), Dawar and Anderson (1994), and Bridges, Keller, and Sood (2000). |
| Gierl and Huettl (2011). IJRM | Exp | "The core product and this extension are very similar/not at all similar"; "The core product and this extension possess a very high/very low fit"; "I can understand the connection very easily/not at all"; "The extension is logical and makes sense to a very high/very low degree." |
| Shen et al. (2011). P&M | Exp | Five items: "fit," "reasonable," "connected," "associated," and "understandable". |
| Liu and Hu (2012). P&M | Exp | 1: very dissimilar, 7: very similar. |
| Mathur et al. (2012). JCP | Exp | "is very dissimilar(1)/ similar(7) to the brand," "has a low-fit (1)/has a high-fit (7)." |
| Sood and Keller (2012). JMR | Exp | Three seven-point scales: "bad fit/good fit between company and product," "not at all logical/very logical for company," and "not at all appropriate/very appropriate for company." |
| Milberg, Goodstein, Sinn, Cuneo, and Epstein (2013). JMM | Exp | Two scales: 1: very low fit, 7: very high fit; 1: makes little sense, 7: makes a lot of sense. |
| Noseworthy et al. (2014). JCR | Exp | Three items: "is common," "is likely," "matches expectations." |
| Huang et al. (2017). P&M | Exp | 1: inconsistent, 7: consistent. |
| Dimitriu et al. (2017). EJM | Exp | 1: very dissimilar; 7: very similar. |

*Note*. Cor: correlational research; Exp: experimental research; JMR: *Journal of Marketing Researc*h; IJRM: *International Journal of Research in Marketing*; JCR: *Journal of Consumer Research*; JM: *Journal of Marketing*; ML: *Marketing Letters*; JCP: *Journal of Consumer Psychology*; P&M: *Psychology & Marketing*; IMR: *International Marketing Review*; EJM: *European Journal of Marketing*; JMM: *Journal of Marketing Management*.

As mentioned above, Aaker and Keller (1990) began the study of brand-extension fit by focusing on three key aspects of fit: *substitutability, complementarity, and transferability* (see Table 2).[1] These aspects appeared to be motivated by micro-economic considerations, borrowing substitutes and complements from demand theory, and the transfer item from supply-side considerations. They are respectively covered in the first three items in Table 3, worded from a business and marketing perspective as Function-based, Usage-occasion-based, and Resource-based fit:

[1] The exact wording Aaker and Keller (1990) used for these three items has been adopted by many subsequent scholars, sometimes with minor edits. Sunde and Brodie (1993); Echambadi et al. (2006); and Kalamas et al. (2006) used all three items; Pina et al. (2006) used *complement* and *transfer;* and Keller and Aaker (1992); Völckner and Sattler (2006); and Sichtmann et al. (2017) used *transfer*. Other authors have used different wording to describe the same basic items: Smith and Park (1992) referred to the similarity of the type of needs they satisfy, the situation in which they are used, skills required to manufacture them; Martin et al. (2005) referred to goal-derived categorization measures, usage similarity, and ability to manufacture and produce; Oakley et al. (2008) referred to similar needs being satisfied and skills required for production; Ahluwalia (2008) referred to the similarity of usage occasion; Voelckner, Sattler, and Kaufmann (2008) referred to the ability to make a product in the extension product class; and Salinas and Pérez (2009) referred to whether the firm's resources are helpful to making the product extension.

**Table 2**
Measures of aspects of brand-extension fit (formative measures of fit).

| Research Paper | Type of Research | Measure Used |
|---|---|---|
| Aaker and Keller (1990). JM | Cor | (1) The extent to which the products were substitutes that they would select between in certain usage situations (SUBSTITUTE); (2) the extent to which the products were complements that they would be likely to use together in certain usage situations (COMPLEMENT); (3) Would the people, facilities, and skills used in developing, refining, and making the original product be helpful if the manufacturer were to make the product extension? (TRANSFER). |
| Park et al. (1991). JCR | Exp | Feature similarity, concept consistency. |
| Keller and Aaker (1992). JMR | Exp | How helpful the people, facilities, and skills used in developing, refining, and making the first product would be if the manufacturer were to make the second product? |
| Smith and Park (1992). JMR | Cor | How similar the focal product was to each of the other products affiliated with the brand in terms of (1) the type of needs they satisfy, (2) the situation in which they are used, (3) skills required to manufacture them, and (4) their physical features? |
| Sunde and Brodie (1993). IJRM | Cor | Transferability, Complementarity, Substitutability (Aaker & Keller, 1990). |
| Broniarczyk and Alba (1994). JMR | Exp | (1) A 9-point scale from "not similar" to "very similar". (2) The relevance of the brand associations in each of the potential extension categories on a 9-point scale ranging from "not at all relevant" to "very relevant." |
| Martin, Stewart, and Matta (2005). JAMS | Exp | (1) Feature-based perceived similarity: (a) Overall Similarity: "How similar\typical"; (b) Manufacturing Similarity: "What is the ability of [parent brand] to manufacture and produce [extension products]?"<br>(2) Usage Similarity: (a) "How similar are [parent brand products] and [extension products] in terms of how\when they are used?" (b) "How likely are you to use [parent brand products] and [extension products] together?" (c) "How appropriate is it to use [parent brand products] to exercise?".<br>(3) Goal-derived categorization Goodness-of-fit: (a) "How well does [extension product] fit with the goal of [parent brand]?" (b) "How consistent is [extension product] fit with the goal of [parent brand]?" (c) "How well does [extension product] exemplify the goal of [parent brand]?" |
| Echambadi, Arroniz, Reinartz, and Lee (2006). IJRM | Cor | Transferability, Complementarity, and Substitutability (Aaker & Keller, 1990). |
| Kalamas, Cleveland, Laroche, and Laufer (2006). JSM | Exp | Fit; Substitutability, Complementarity, and Transferability (Aaker & Keller, 1990). |
| Pina, Martinez, De Chernatony, and Drury (2006). EJM | Cor | (1) The company's capacity to offer the extension, (2) the possibility of jointly using the extension and the current services (Aaker & Keller, 1990). |
| Völckner and Sattler (2006). JM | Cor | (1) The overall similarity of the brand extension to the parent brand; (2) Transferability (Aaker & Keller, 1990); (3) the relevance of the brand-specific associations in the extension product category (Broniarczyk & Alba, 1994). |
| Völckner and Sattler (2007) IJRM | Cor | (1) Global similarity; (2) Brand concept consistency; (3) Relevance of the extended associations; (4) Symbolic value of the parent brand; (5) Linkage of the utility of the parent brand to product attributes of the original product category. |
| Ahluwalia (2008). JMR | Exp | The level of similarity between each proposed extension product and the product categories, attributes, usage situations, and target market associated with the parent brand of the extension. The overall perceived fit ("similar/dissimilar", "inconsistent/consistent"). |
| Oakley et al. (2007). JCR | Exp | How similar is the extension to the parent brand product (1) in terms of consumer needs being satisfied and (2) in terms of skills required for production? |
| Völckner et al. (2008). ML | Cor | Five 7-point scales anchored by high/low global similarity, high/low similarity of the extension to products the brand currently makes, very logical/not at all logical for the company, high/low perceived ability of the company to make a product in the extension product class, and appropriate/inappropriate for the parent brand. |
| Salinas and Pérez (2009). JBR | Cor | (1) Category fit: (a) The extension is similar to the brand's products. (b) The firm's resources are helpful to make the product extension.<br>(2) Image fit: (a) The product extension fits with the brand image, (b) Launching the extension is logical for the company, (c) Launching the extension is appropriate for the company. |
| Sichtmann et al. (2017). EJM | Cor | (1) How does the picture you have of [brand name] fit [extension product]? (2) How does the [extension product] fit with the other products and services that are offered by [brand name]? (3) Would the people, facilities and skills of [brand name] used to deliver the original service be helpful if the service provider were to offer the following products and services? (Völckner & Sattler, 2006). |

*Note*. Cor: correlational research; Exp: experimental research; JM: *Journal of Marketing;* JCR: *Journal of Consumer Research*; JMR: *Journal of Marketing Research*; IJRM: *International Journal of Research in Marketing*; JAMS: *Journal of Academy of Marketing Science*; JSM: *Journal of Strategic Marketing*; EJM: *European Journal of Marketing*; ML: *Marketing Letters*; JBR: *Journal of Business Research*.

(1) *Function-based fit*. This theme focuses on the fit or match between the functions of the parent brand's product(s) and the extension product. For example, one respondent to our survey wrote, "MP3[s] have similar functions as phones," which instantiates function-based fit. Furthermore, three closely related subthemes emerged in our data. One relates to how a particular function can meet consumers' needs and wants; another relates to how a product's functions provide benefits to the consumer; and a third relates to the usability of an extension product, often with reference to the usability of a parent brand's products.

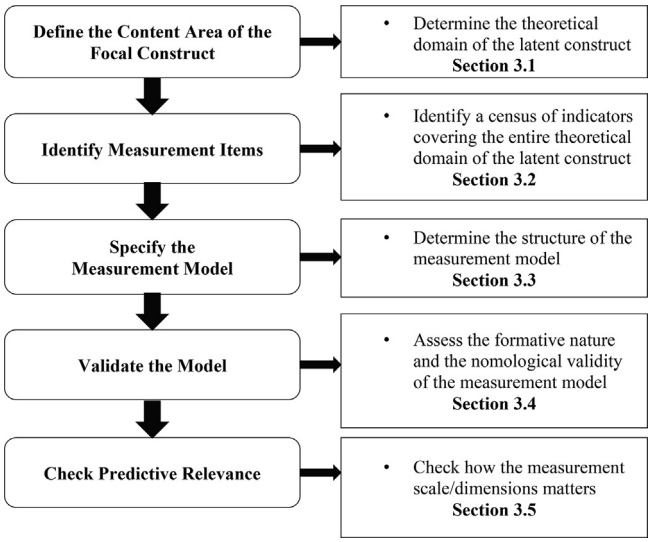


**Fig. 2.** Scale development framework.

(2) *Usage-occasion-based fit*. This theme focuses on the comparison between the usage occasions of the parent brand's product(s) and the extension product. Two kinds of situations were identified. In one, the parent brand's product(s) and the extension product share the same usage occasion but have different functions; for example, one respondent to the survey wrote, "MP3 players go well with the phones and their accessories." In the other, the parent brand's product(s) and the extension product share the same usage occasion and similar functions; for instance, another survey participant wrote, "90% of the world's population with cellphones has music on it."
(3) *Resource-based fit*. This theme focuses on the comparison between the existing resources of the parent brand and the resources required to develop the extension product. For example, one interview participant asked, "Coz I have to consider operations. Can they actually deliver?" This theme goes beyond the marketing scope and considers business and product operations, such as the parent company's financial, technology, production, distribution, and intellectual resources.

As an almost immediate reaction to the three measurement items used by Aaker and Keller (1990), two more themes of fit emerged. Park et al. (1991) focused on the fit between the parent and extension product attributes, while Broniarczyk and Alba (1994) focused on the relevance of the parent brand associations for the potential extension product. These two dimensions of fit are covered in Table 3 as Feature-based and Image-based fit.

(4) *Feature-based fit.* This theme focuses on the comparison between the attributes or features of the parent brand's product(s) and the extension product. Comparisons on the feature level are concrete and granular, including such factors as product ingredients, price, shape, color, and others.
(5) *Image-based fit*. This theme focuses on the abstract image-level comparison between the parent brand and the extension product. In other words, it considers whether an extension product fits with the abstract associations in consumers' minds about the parent brand, including brand values, associations, meanings, slogans, experiences, and essence.

A sixth theme emerged in our qualitative data, suggesting that sometimes firms introduce an extension product to address their existing loyal customers (even if the extension product is different from the company's existing products). Ahluwalia (2008) has used such an item: the similarity of the target market associated with the parent brand. This is covered in Table 3 as Target-market fit.

(6) *Target-market fit*. This theme focuses on the comparison between the target markets of the parent brand's product(s) and of the extension product. The fit at the market level will influence whether the extension product can easily establish its own customer base.

To examine the relevance of the above six themes, we conducted a focus-group with six doctoral students in marketing (a) to evaluate the comprehensiveness of our six items, and (b) to confirm that these six items were perceived to have a causal effect on the latent brand-extension fit construct. Other potential items covering distinct theoretical domains of the fit

**Table 3**
Dimensions of brand-extension fit suggested by the qualitative data.

| **Dimensions** of brand-extension fit | **Definitions** the congruity, similarity, or consistency between . . . | **Literature** | **In-depth Interview Example Quotes** | **Open-Ended Questions Quotes** |
|---|---|---|---|---|
| Function-based | the basic function of the parent brand's main product and that of the extension product | Aaker and Keller (1990); Smith and Park (1992); Sunde and Brodie (1993); Martin et al. (2005); Echambadi et al. (2006); Kalamas et al. (2006); Pina et al. (2006); Völckner and Sattler (2007); Oakley et al. (2007). | ". . ..Aquafina (bottle mineral water). They make lip stick. Hydration transfer from the parent brand to the extension brand." | 8.11% participants "MP3 have similar functions as phones" |
| Usage-occasion-based | the usage occasion of the parent brand's main product and that of the extension product | Aaker and Keller (1990); Ahluwalia, 2008; Echambadi, Arroniz, Reinartz, & Lee, 2006; Kalamas, Cleveland, Laroche, & Laufer, 2006; Keller & Aaker, 1992; Martin, Stewart, & Matta, 2005; Pina, Martinez, De Chernatony, & Drury, 2006; Smith & Park, 1992; Völckner & Sattler, 2006. | ". . . the concept of workspace. The desk and chair works in the concept of workspace, but they may not share that many physical similarities. They may be not perceptually similar, but conceptually similar." | 18.92% participants "people can play music from their cell phone and connect to the speakers the company sells" |
| Resource-based | the resource required (e.g., people, facilities, skills, strategy, knowledge, expertise) to develop and manufacture the parent brand's main product and the extension product | Aaker and Keller (1990); Echambadi, Arroniz, Reinartz, & Lee, 2006; Kalamas, Cleveland, Laroche, & Laufer, 2006; Keller & Aaker, 1992; Oakley, Duhachek, Balachander, & Sriram, 2007; Pina, Martinez, De Chernatony, & Drury, 2006; Sichtmann et al., 2017; Smith & Park, 1992; Völckner & Sattler, 2006; Völckner, Sattler, & Kaufmann, 2008. | "Coz I have to consider operations. Can they actually deliver?" | 35.14% participants "if they already manufacture portable devices, they will have the infrastructure to switch fairly seamlessly into MP3 players" |
| Feature-based | the specific features or attributes of the parent brand's main product and those of the extension product | Park et al. (1991); Smith and Park (1992); Martin et al. (2005); Völckner and Sattler (2007); Ahluwalia (2008). | "On the attribute level, they have to fit." | 10.81% participants "uses lots of the same features that are enticing as an MP3 player considering it has the software to play sounds, the interface to navigate through song selection and the physical features" |
| Image-based | the abstract associations coming up in consumers' mind (e.g., meaning, image, associations, experience, essence) when thinking of the parent brand's main product and the extension product | Park et al. (1991); Broniarczyk and Alba (1994); Völckner and Sattler (2006; 2007); Salinas and Pérez (2009); Sichtmann et al. (2017). | "Apple is known for its innovations, and they came up with a product, that is an extension, but it is not perceived as innovative as the parent brand. That is a problem." | 16.22% participants "the company should extend to the MP3 players category since they would not stray too far away from their products/ image" |
| Target-market-based | the target market of the parent brand's main product and that of the extension product | Ahluwalia (2008). | "I think they (Disney) are trying to broaden their (market), they are trying to go after their (children's) grandparents." | 10.83% participants "MP3 players can be targeted to a different market audience " |

construct were suggested, and some definitions in Table 3 were modified to cover some of the suggestions. The focus group did agree that the items in Table 3 should have a causal effect on the overall fit.

*Discussion.* Two key theoretical considerations should be considered here. First, the dimensions (formative measurement items) should collectively define the latent construct. In this step, we identified six distinct dimensions that cover the theoretical domain of the brand-extension fit construct. Second, a causal relationship between the dimensions and the latent construct is required. The six dimensions here appear to satisfy the causality direction criterion.

### *3.3. Confirming six dimensions: Specifying the model (Study 1)*

To arrive at a final measurement model, we conducted an exploratory factor analysis (Study 1) to consider the internal structure of 25 measurement items that we coded from the qualitative data in the interviews and open-ended questions in

the survey (see Table A.2 and Table A.3 in online technical appendix A). This reduces the 25 measurement items to a more manageable number and provides an objective check as to whether the six themes of the previous section correspond to important underlying dimensions that collectively account for the perceptions of brand-extension fit.

We recruited 321 undergraduate students from two North American universities to participate in this study. Each participant was randomly assigned to extensively evaluate one of six brand extension stimuli – BMW extending to cameras, lawnmowers, and motorboats; Haagen-Dazs to chocolate boxes, popcorn, and iced tea – according to these 25 measurement items of brand-extension fit, using a 7-point scale (1: extremely dissimilar; 7: extremely similar). The dataset and analysis code are provided on Mendeley. (see https://doi.org/10.17632/hrrgyyfv6d.1)

Table 4 below shows the results of the exploratory factor analysis. Our 25 measurement items load on six factors, which are labelled according to the measurement items that load on them. This interpretation (labeling) is consistent with the six themes identified from the qualitative coding results in Table 3.

This shows that the six themes of the previous section correspond with six distinct dimensions that collectively account for brand-extension fit. We accordingly propose that the internal structure of six fit dimensions can be represented by the simple model shown in Fig. 3.

### 3.4. Analyzing model structure: Estimating and validating the model (Study 2)

#### 3.4.1. Study design

*Incentive-aligned experiment design*. To provide external validity and generalizability, we recruited 813 U.S. consumers from the Qualtrics U.S. consumer panel, using a quota sampling method controlling for age, gender, place of residence, and income level to generate a representative sample of U.S. consumers. We used an incentive-aligned experiment design (Ding, 2007) to engage participants to generate high-quality data. In our study, (1) we asked some demographic questions, including gender, age, place of residence, and annual income level. (2) In the study description, we informed participants that if they successfully finished this study, in addition to their standard participation payment, they would automatically enter a lottery (1 out of 50 people would be drawn as a winner). The winner of the lottery would receive one of four brand-extension products from Coca-Cola (i.e., Coca-Cola T-shirt, calendar, radio, and napkin holder) with similar monetary values. Which extension product the lottery winners would receive was the one that our research team predicted by using their answers in the brand-extension evaluation task. The most accurate prediction would be derived from their truthful answers. If their answers were not truthful or well-considered, the product they received would not match their preference. In addition, as a further incentive, if our predicted choice matched their preferred choice indicated at the end of the study (see point 5), they would receive another 5-dollar VISA gift card. The lottery was drawn one month after the study was finished. (3) Participants then answered a battery of comprehension-check questions to make sure that each participant understood these arrangements. If they failed any of these questions, they would be asked to re-read the study description and answer again, until they successfully answered all questions right. (4) Participants next moved to the main brand-extension evaluation task. Each participant evaluated four brand extension stimuli, either with real or fictional parent brands, selected randomly from the 84 brand extensions stimuli, in terms of their overall attitude (OA) toward the brand extension, on a seven-point bipolar scale from "dislike" to "like"; their purchase intention (PI), on a seven-point bipolar scale from "uninterested" to "interested to buy"; their perception of the six dimensions of brand-extension fit, on seven-point scales: F1: feature-based fit, F2: function-based fit, F3: resource-based fit, F4: usage-occasion-based fit, F5: Target-market-based fit, and F6: Image-based Fit (see appendix A); and four reflective items of overall brand-extension fit on seven-point bipolar scales: R1: natural extension or not, R2: fit together well or bad, R3: dissimilar-similar, and R4: incongruent-congruent. (5) At the end of the study, the four brand extension products from Coca-Cola were presented, and participants were asked to indicate which one they liked the most. After their choice, they evaluated these four Coca-Cola extension products on our six dimensions (F1-F6), and four overall measures of fit (R1-R4).

*Stimuli development*. With the goal of utilizing a comprehensive set of brand extension stimuli, we selected and developed 84 brand extension stimuli from previous literature, half of which used fictional parent brands and the other half used real parent brands. Specifically, for 12 fictional (real) brands, we considered three different extensions, and for 3 fictional (real) brands, we considered two extensions (see appendix B). Note that each of these 84 brand extensions was pretested in past research to represent two (high vs. low)/three (high vs. medium vs. low) levels of brand-extension fit. In this way, we examined a broad sample of brand extensions covering a widely distributed range of fit levels.

After data cleaning, 3252 data points were generated, each representing a different evaluation of a brand extension (the dataset and analysis codes are provided on Mendeley), coming from 813 participants, each evaluating 4 brand extensions. The data consist of evaluations of 84 brand extensions, with an average of 38.7 evaluations for each brand extension. The 84 brand extensions came from 30 parent brands, with 2.8 brand extensions for each parent brand). The 30 parent brands consist of 15 real brands and 15 fictional brands, coming from diverse industries. These brand extensions constitute a comprehensive list of stimuli used in the literature, pretested by the scholars who used them.

#### 3.4.2. Model estimation

*Base model estimates.* Our base model is a simple linear regression, shown in the top row of Table 5. The dependent variable, Overall Fit, is the average of four overall measures of brand-extension fit (i.e., Average(R1 + R2 + R3 + R4)). We are interested in how Overall Fit is influenced by the six dimensions (F1 to F6). We observe that all six dimensions are highly

**Table 4**
Exploratory factor analysis of brand-extension fit (25 measurement items).

| Latent and Observed Variable | % of Variance | Reliability | Factor Loading |
|---|---|---|---|
| **Image-based fit** | 26.34 | 0.954 | |
| *Brand values* | | | 0.861 |
| *Brand essence* | | | 0.845 |
| *Brand slogans* | | | 0.844 |
| *Brand meaning* | | | 0.838 |
| *Brand image* | | | 0.809 |
| *Brand experiences* | | | 0.796 |
| *Corporate philosophy* | | | 0.740 |
| *Brand history* | | | 0.681 |
| **Resource-based fit** | 16.66 | 0.922 | |
| *Technology resource* | | | 0.831 |
| *Human resource* | | | 0.819 |
| *Production resource* | | | 0.813 |
| *Distribution channels* | | | 0.775 |
| *Financial resource* | | | 0.774 |
| **Function-based fit** | 11.547 | 0.856 | |
| *Usability* | | | 0.833 |
| *Benefits for consumers* | | | 0.760 |
| *Functionality* | | | 0.742 |
| *Satisfy consumers' needs* | | | 0.600 |
| **Usage-occasion-based fit** | 9.289 | 0.916 | |
| *Where to use these two products* | | | 0.868 |
| *When to use these two products* | | | 0.798 |
| **Feature-based fit** | 8.754 | 0.869 | |
| *Physical appearance* | | | 0.783 |
| *Product materials* | | | 0.783 |
| *Product attributes* | | | 0.538 |
| *Price level* | | | 0.409 |
| **Target-market-based fit** | 7.299 | 0.920 | |
| *Existing customer bases* | | | 0.676 |
| *Target markets* | | | 0.671 |

*Note.* Extraction method: Principal Component Analysis. Rotation method: Varimax. Reliability test: Cronbach's alpha.

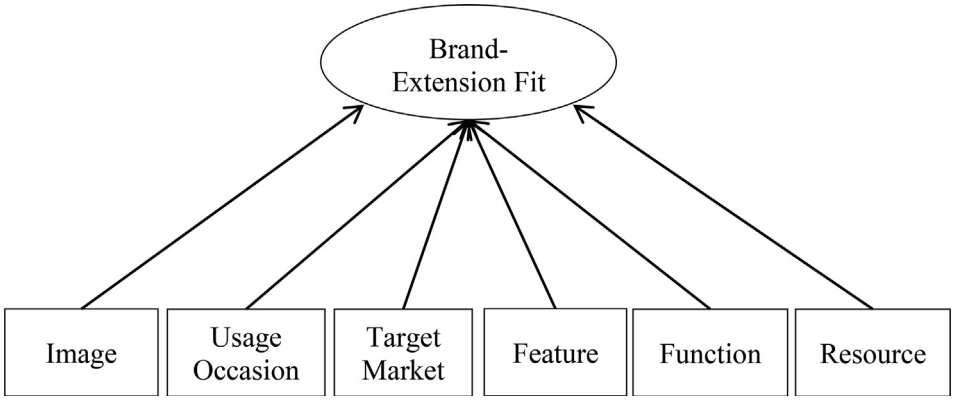


**Fig. 3.** Measurement model of brand-extension fit.

significant in the expected direction with comparable magnitudes. Although the data were not standardized, the six coefficients produce a sum very close to 1 (0.973), so the overall fit is essentially explained by a weighted average of the six dimensions. From largest to smallest, the dimensions (weights) are image-based (0.276), feature-based (0.203), market-based (0.151), usage-based (0.126), resource-based (0.115), and function-based (0.102) fit. The adjusted R-squared is 0.785, which is good, but still leaves some residual variance.

This appears to be a meaningful set of results, perhaps resulting from a very clean and consequential dataset, with multiple comprehension checks of consequentiality, multiple attention checks throughout, and checks against highly unlikely straight-lining behavior (the same score appearing throughout multiple sequences of questions). Indeed, these results are

**Table 5**
Base vs. Competing Models.

| IV(s) | $R^2$-adj | Intercept | Effects | | | | | | Random Effects- Intercept | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Feature | Function | Resource | Usage Occasion | Target Market | Image | Participant No. | Stimuli | Parent Brand |
| Feature + Function + Resource + Usage + Market + Image (linear fixed effect, n = 3252) | 0.785 | 0.186** | 0.203** | 0.102** | 0.115** | 0.126** | 0.151** | 0.276** | NA | NA | NA |
| Feature + Function + Resource + Usage + Market + Image (linear mixed effect, n = 3252) | NA | 0.411** | 0.181** (0.072[e]) | 0.105** (0.047) | 0.124** (0.053) | 0.133** (0.078) | 0.145** (0.075) | 0.231** (0.095) | 0.151[d] 813[a] | 0.066[d] 84[b] | 0.052[d] 30[c] |
| Feature + Function + Resource + Usage + Market + Image (fictional brands: mixed effects, n = 1664) | NA | 0.492** | 0.163** (0.072) | 0.116** (0.047) | 0.137** (0.053) | 0.135** (0.078) | 0.177** (0.075) | 0.179** (0.095) | 0.168[d] 416[a] | 0.062[d] 42[b] | 0.071[d] 15[c] |
| Feature + Function + Resource + Usage + Market + Image (real brands, mixed effects, n = 1588) | NA | 0.310** | 0.199** (0.085) | 0.095** (0.053) | 0.111** (0.088) | 0.132** (0.080) | 0.120** (0.031) | 0.282** (0.111) | 0.131[d] 397[a] | 0.065[d] 42[b] | 0.022[d] 15[c] |
| **Comparison between Effects of Brand-Extension Fit Scale Items Estimated Individually and Jointly (n = 3252)** | | | | | | | | | | | |
| Feature | 0.623 | 1.591** | 0.715** | | | | | | | | |
| Function | 0.586 | 1.522** | | 0.706** | | | | | | | |
| Resource (Keller & Aaker, 1992) | 0.552 | 1.458** | | | 0.710** | | | | | | |
| Usage | 0.558 | 1.217** | | | | 0.731** | | | | | |
| Market | 0.568 | 0.765** | | | | | 0.780** | | | | |
| Image (Broniarczyk & Alba, 1994) | 0.674 | 0.844** | | | | | | 0.813** | | | |
| Function + Resource + Usage (Aaker & Keller, 1990) | 0.716 | 0.497** | | 0.239** | 0.301** | 0.372** | | | | | |
| Feature + Function (Park et al., 1991) | 0.679 | 1.192** | 0.445** | 0.352** | | | | | | | |
| Feature + Function + Resource (Smith & Park, 1992) | 0.690 | 1.043** | 0.362** | 0.284** | 0.179** | | | | | | |
| Function + Resource (Oakley et al., 2007) | 0.642 | 1.100** | | 0.438** | 0.358** | | | | | | |
| Feature + Resource (Salinas & Perez, 2009) | 0.659 | 1.211** | 0.489** | | 0.300** | | | | | | |
| **Comparative Analysis of Predictive Accuracy (n = 3252)** | | | | | | | | | | | |
| **IV(s)** | **Decision Rule** | **Accuracy** | **Kappa** | **Sensitivity** | **Positive Predicted Value** | **Decision Rule** | **Accuracy** | **Kappa** | **Sensitivity** | **Positive Predicted Value** | |
| Feature + Function + Resource + Usage + Market + Image | >=5 | 0.776 | 0.558 | 0.934 | 0.617 | >=6 | 0.738 | 0.457 | 0.954 | 0.682 | |
| Function + Resource + Usage (Aaker & Keller, 1990) | | 0.754 | 0.516 | 0.902 | 0.597 | | 0.706 | 0.388 | 0.963 | 0.652 | |
| Feature + Function (Park et al., 1991) | | 0.766 | 0.537 | 0.908 | 0.609 | | 0.697 | 0.368 | 0.970 | 0.644 | |
| Resource (Aaker & Keller, 1992) | | 0.771 | 0.519 | 0.776 | 0.641 | | 0.657 | 0.279 | 0.972 | 0.612 | |
| Feature + Function + Resource (Smith & Park, 1992) | | 0.764 | 0.535 | 0.916 | 0.606 | | 0.706 | 0.388 | 0.963 | 0.652 | |
| Image (Broniarczyk & Alba, 1994) | | 0.693 | 0.420 | 0.919 | 0.533 | | 0.675 | 0.320 | 0.965 | 0.628 | |
| Function + Resource (Oakley et al., 2007) | | 0.768 | 0.533 | 0.873 | 0.617 | | 0.681 | 0.333 | 0.967 | 0.632 | |
| Feature + Resource (Salinas & Perez, 2009) | | 0.763 | 0.53 | 0.897 | 0.607 | | 0.705 | 0.383 | 0.975 | 0.649 | |

*Note.* DV: overall fit; [a:] number of participants; [b:] number of stimuli; [c:] number of brands; [d:] variance (random effects); [e:] std. dev. of slope coefficient across parent brands; **: $p < .001$.

replicable; we collected another large dataset from Mturk and a smaller dataset from undergraduate students, which were not consequential, but the results were very similar.

To help account for some of the residual variance from the first model, the second row of Table 5 shows a linear mixed-effects model (estimated in R with lmer in the package *lme4*; Bates, Mächler, Bolker, & Walker, 2014). The coefficients for the linear effect of F1 to F6 are not significantly different from those of the simple linear model. As random effects, we included intercepts for participants (the 813 participants account for a variance of 0.151), brand extension stimuli (84 stimuli account for a variance of 0.066), and parent brands (30 parent brands account for a variance of 0.052). We also had by-parent-brand random slopes for the effect of F1 to F6: the standard deviations across parent brands are shown in parentheses below the associated mean-effect parameter. For example, the standard deviation of the image-based fit slope coefficient is 0.095 (note: this is not the standard error). This means that a change of the coefficient effects of F1 to F6 occurs as one moves from one parent brand to another. For example, a brand with image-based fit one standard deviation above the average brand would have a coefficient on F6 of 0.326 (=0.231 + 0.095), which is a sizable difference. In principle, we could have provided a 30-row table of all linear models, like row 1 of Table 5, for each of the 30 brands (which is available in online technical appendix E), but we can more efficiently summarize most of the same information below the second row of Table 5. We therefore provide evidence of considerable variation of the effects of F1,. . ., F6 across parent brands. In particular, image-based fit, which has the greatest mean effect (of 0.231), also has the greatest variation across parent brands. Overall, these various random effects "absorb" some of the residual variance (which is brought down to .478 for the mixed-effects model from .741 for the fixed-effects linear regression model). [2]

Due to the notable variation based on the parent brand, we broke the dataset into two roughly equal parts and show mixed-effects models in rows 3 and 4 for the fictional and real brands. Not surprisingly, the effect of image-based fit for real brands (a mean effect of 0.282) is considerably higher than for fictional brands (a mean effect of 0.179). This is the biggest difference, by far, associated with a comparison of fictional and real brands, and the other effects vary.[3]

The competing models (the bottom two sections of Table 5) are discussed in more detail in Section 3.5 below, but here we observe that our proposed model fits the data better and has lower residual variance than various competing models presented in the literature. We also calculated the accuracy, kappa, sensitivity, and positive predictive value, when F1,. . ., F6 were used to predict whether the Overall Fit would be greater than or equal to 5, compared to whether the Overall Fit was *actually* greater than or equal to 5 in the data. We made similar calculations for the various competing models. We also did these calculations using a threshold for the success of Overall Fit being greater than or equal to 6. These diagnostic measures work better for our model than for the various competing models.

### 3.4.3. Model validation

We used Structural Equation Modeling-Partial Least Square (SEM-PLS) to validate our proposed model, and used SmartPLS software for the data analysis. We considered the validity of our model by considering the following three issues.

*Formativeness check*. To check if our six measurement items are formative of the latent construct, we conducted a confirmatory tetrad test-PLS analysis (following the approach laid out in Gudergan, Ringle, Wende, & Will, 2008; Coltman et al., 2008) to show that the six dimensions of fit can be reasonably modeled as antecedents of brand-extension fit – which is better than modeling these dimensions as reflective ones. We also conducted VIF (variance inflation factor) tests to show that the six dimensions are distinct from each other (see appendix C for details).

*Nomological validity*. Our SEM estimation results (see appendix C) show that the impact of our six-dimension brand-extension fit model on consumer attitude and purchase intention is partially mediated (with a large path coefficient) by overall fit (directly measured), as theorized in the literature. Furthermore, our six-dimension model and an overall model of brand-extension fit (single factor, measured with reflective items) work in similar ways in influencing consumer attitudes and purchase intentions, and also in interacting with parent brand familiarity.

*Convergent validity*. Redundancy analysis shows that the correlation between our six-dimension fit model (formative fit) and the traditional overall fit model (reflective fit) is 0.886 (see appendix C). This indicates that our six-dimension model does not leave out important determinants of overall brand-extension fit, and, therefore, suggests that our six-dimension model of fit has a very strong convergence with an overall fit model to represent the same latent construct (i.e., brand-extension fit).

## 3.5. How does the proposed model matter? Checking predictive, methodological, and managerial relevance (Study 2 – continued)

*Predictive relevance*. Our proposed model matters because it predicts consumer outcomes. Section 3.4 examined whether our six-dimension brand-extension fit model effectively predicts consumer attitudes and purchase intentions toward brand extensions, which are two critical outcome variables. This section further considers model predictions afforded by using our multi-dimensional (formative) model, compared with the overall (reflective) model. Table 6 shows that the total effects of fit, measured by our six-dimension model, on attitude and purchase intention are, respectively, 0.786 and 0.637, larger than the effects of fit, measured by the overall scale (0.681 and 0.552).

[2] We also checked for common nonlinearities and interaction terms, and we found no support for nonlinearities or meaningful interaction terms. Details are available in online technical appendix C.

[3] The analysis of fictional brands can be interpreted as removing the effects of brand loyalty that are present for real brands. Thus, even when brand loyalty is not present, we see that the other five dimensions of the model are mostly unchanged, and that only imaged-based fit is reduced, which is to be expected.

**Table 6**
Path analysis (SEM-PLS).

| Path | Estimate |
|---|---|
| ***Direct Effect*** | |
| Fit (overall/one-factor) → Attitude | 0.681*** |
| Fit (multi-dimensional) → Attitude | 0.183*** |
| ***Indirect Effect*** | |
| Fit (overall/one-factor) → Purchase Intention | 0.552*** |
| Fit (multi-dimensional) → Purchase Intention | 0.637*** |
| ***Total Effect*** | |
| Fit (overall/one-factor) → Attitude | 0.681*** |
| Fit (multi-dimensional) → Attitude | 0.786*** |
| Fit (overall/one-factor) → Purchase Intention | 0.552*** |
| Fit (multi-dimensional) → Purchase Intention | 0.637*** |

*Note.* ***: $p < 0.001$.

This result has important practical implications. Our six-dimension brand-extension fit model not only provides an understanding of how individual dimensions of fit influence overall fit, but also has a bigger impact on consumers' responses than a traditional overall (reflective) model.

*Methodological relevance and competing models.* Our proposed model also matters because it helps interpret past literature that uses a strict subset of the proposed six dimensions as measures of brand-extension fit. When we compared our model with competing models, we observed that using an incomplete subset of the six dimensions of brand-extension fit introduces bias by overweighting the effect of the included dimensions and underweighting left-out ones, as shown in the bottom two sections of Table 5. For example, Keller and Aaker (1992) essentially used our measure of resource-based fit (i.e., "How helpful the people, facilities, and skills used in developing, refining, and making the first product would be if the manufacturer were to make the second product?") as a sole measure of brand-extension fit in their study. In our study, we observed that the resource-based fit, when it is the only variable included, has a coefficient of 0.710, which is much overweighted relative to the corresponding coefficient of 0.115, when all six dimensions of fit are included. Perhaps more importantly, the associated adjusted R-squared is only 55.2% in predicting overall fit. Similar conclusions about overweighting (bias for) included dimensions of fit and reduced overall fit apply for all these studies. The reason for this bias is that the included items pick up some of the effect of the left-out items. At the same time, however, the included items appear to not fully cover the focal construct of brand-extension fit.

The above general argument suggests that the conclusions of the articles listed in Table 2 may understate the overall impact of brand-extension fit, because their measures of the focal construct were based on only a subset of the six dimensions of brand-extension fit. In this sense, the main results of these articles may be conservative, because measures that more fully cover the brand-extension fit construct would be expected to give even more significant results than those reported in these articles. On the other hand, the more detailed results of these articles may also overweight the specific items that they do include, which can be misleading.

It is worth observing that the three formative measures of Aaker and Keller's original study in 1990 perform reasonably well in terms of R-squared, but the weights are still over-estimated. Also, there are some studies that used a (reflective) measure of overall fit, together with one or two of the six (formative) dimensions in the proposed scale. Not surprisingly, these provide somewhat better predictions of overall fit. However, from the perspective of understanding the constituent dimensions of brand-extension fit, combining formative and reflective measures does not make much sense, because the relationship between the formative and reflective measures would not be specified correctly. This can drastically underweight the formative measures and potentially lead to inaccurate theoretical conclusions.

Overall, we see that the use of only one or two of the proposed six dimensions of fit introduces measurement error in academic studies. Knowing the six dimensions of brand-extension fit helps one recognize this problem, puts the studies listed in Table 2 in perspective, and suggests the need to avoid using a strict subset of our proposed six dimensions as a measurement scale for brand-extension fit. Instead, using either the proposed six-dimensional scale or an overall (reflective) brand-extension fit scale (or measuring both and checking for convergent validity) is preferable.

*Managerial relevance and suboptimal decisions from incomplete models.* Our proposed model matters, perhaps most concretely, because it helps practitioners avoid making suboptimal decisions by relying on only one or two of the proposed dimensions of brand-extension fit. In particular, the following analysis demonstrates how a practitioner relying on underspecified models may make decisions that generate lower predicted purchase intention and market share than would be possible if they used our proposed six-dimension model.

To demonstrate how relying on an incorrectly specified model of brand-extension fit may lead to suboptimal decision-making, we considered the following stylized counterfactual simulations. We consider a scenario in which a brand manager develops $k$ brand-extension prototypes before choosing one to manufacture and roll out. We used a strong counterfactual assumption that for each prototype, the manager can emphasize only one of the six dimensions of fit (feature-based, function-based, resource-based, usage-occasion-based, target-market-based, and image-based fit) in our model. The development of each prototype is modeled as a random draw on the distribution in our dataset of the emphasized fit dimension. For example, the feature-based fit in our dataset had a mean value of 4.236 and a standard deviation of 2.049. If the feature-

**Table 7**
Maximum expected purchase intention when *k* prototypes are developed.

| Brand extension design direction | Number of prototypes (k) | | |
|---|---|---|---|
| | **3** | **5** | **10** |
| Design direction from the six-dimension model | 5.088[a] (0.661[b]) | 5.337 (0.633) | 5.620 (0.593) |
| Random design direction | 4.794 (0.487) | 4.939 (0.502) | 5.151 (0.521) |
| Design direction from Keller and Aaker (1992) | 4.696 (0.381) | 4.788 (0.373) | 4.896 (0.382) |
| *Max of the real brands for six-dimensional model* | *McDonald's* | *Tiffany & co.* | *Tiffany & co.* |
| Design direction from the six-dimensional model | 5.324 (0.581) | 5.663 (0.939) | 6.265 (0.833) |
| Random design direction | 4.864 (0.329) | 4.934 (0.731) | 5.396 (0.792) |
| Design direction from Keller and Aaker (1992) | 4.725 (0.068) | 4.681 (0.373) | 4.920 (0.331) |
| *Min of the real brands for six-dimensional model* | *CNN* | *Guess* | *Guess* |
| Design direction from six-dimensional model | 4.392 (0.730) | 4.601 (0.367) | 4.796 (0.309) |
| Random design direction | 4.063 (0.510) | 4.315 (0.280) | 4.661 (0.296) |
| Design direction from Keller and Aaker (1992) | 4.008 (0.401) | 4.220 (0.143) | 4.296 (0.120) |

*Note.* [a]purchase intention average over all brands over 1000 simulations; [b]standard deviation over 1000 simulations. We compared the entries in this table labeled "Design direction from the six-dimension model" with the associated entries for "Random design direction." In all cases in this table, the comparison is significant at 0.05 level.

based fit were the emphasized dimension, we would take a draw on that distribution. Each of the other five fit items is assumed to take on the mean value of the associated fit in our dataset; this assumption seems conservative, because if one dimension of fit is emphasized, one would expect the other dimensions to be somewhat deemphasized. This can be used to predict consumer purchase intention for the extension product. We assumed that after developing *k* prototypes (i.e., *k* predicted purchase intentions are realized), the manager would choose the one with the highest predicted purchase intention.

Table7 summarizes simulations for three different brand-extension design directions.

(1) *Design direction selected over the six dimensions of our model.* The first row represents the scenario in which the manager is assumed to have a customized estimate of our model for their brand, which we have estimated from our Study 2 dataset. The manager is assumed to emphasize improvement in the fit dimension with the highest weighted effect (i.e., the highest product of estimated coefficient times the standard deviation in the data set of the associated fit variable). Our dataset considers various brand extensions from 15 actual brands and 15 fictional brands; and, of course, the estimated coefficients for each of the six dimensions (predicting purchase intention) are vastly different for different brands, as one would expect. Our counterfactual simulation assumes that the manager would pick a dimension in which to emphasize improvement that would have the greatest potential impact on the manager's brand. In this sense, the counterfactual simulation customizes new product development to the focal brand being considered.
In particular, for a given brand, the simulation determines the fit dimension (from the six dimensions in our model) with the greatest impact for the focal brand. For this fit dimension, *k* random draws of the associated fit are taken, which are intended to be representative of *k* prototypes. The random draw with the maximum impact is then selected, and the purchase intention for that prototype is recorded. Our simulation does this process 1000 times for each brand. We recorded the average purchase intention over the 1000 runs for each brand, and then calculated the average over all 30 brands' average purchase intentions.
(2) *Random design direction.* The second row represents the scenario in which the manager does not know any information about the fit coefficients, and may not even be explicitly aware of our six-item model. For each prototype, prior to drawing the attribute level, there is a prior random draw to choose one of the six fit dimensions to emphasize. Thus, for this case only, different runs for a given brand will likely emphasize improvements on different fit dimensions (if *k* is more than 1). This is intended to characterize an undirected "brainstorming" decision-making approach.
(3) *Design direction from* Keller and Aaker (1992). The third row assumes that the manager emphasizes resource-based fit only (following Keller & Aaker, 1992).

The point is, if a manager knows which fit dimension has the biggest "bang for the buck," the manager can focus investment on brand extensions that emphasize that fit dimension. Our counterfactual simulations (Table 7) indicate that if the

brand manager uses the proposed six-dimension model to develop $k$ = 10 prototypes, the expected purchase intention from the best of these prototypes can increase to 5.620 from 4.896 (14.8% higher[4]) as compared to using only resource-based fit (Keller & Aaker, 1992) and to 5.620 from 5.151 (9.1% higher) as compared to using a random design direction.

To put the lift numbers in purchase intentions into perspective, we convert them into predictions for changes in market share. We provide approximate predictions based on the meta-analysis results of the correlation between purchase intentions and market outcomes by Morwitz, Steckel, and Gupta (2007).[5] We consider the estimated mean intention-behavior correlation in their meta-analysis as a moderate correlation ($\widehat{\rho_m} = .49$), and one standard deviation below and above this mean as weak and strong correlations ($\widehat{\rho_w} = .18$, and $\widehat{\rho_s} = .80$). Accordingly, the lift from 4.896 (design direction from Keller & Aaker, 1992) to 5.620 (design direction from our six-dimension model) in purchase intentions translates to an increase of 5.91% in market share (for moderate intention-behavior correlation, with weak and strong cases of 2.17% and 9.65% respectively). And the lift from 5.151 (random design direction) to 5.620 (design direction from six-dimension model) translates to an increase of 3.83% in market share (for moderate intention-behavior correlation, with weak and strong cases of 1.41% and 6.25% respectively).

Note that these 14.8% and 9.1% lift results are calculated from averages over all brand extensions for all brands in our dataset, considering 84 brand extensions for 30 brands/product categories. Of course, some brands will experience greater lift when guiding product development using our six-dimension model. Table 7 also lists some brands that experience the greatest lift in our simulations. In particular, the real brands with the greatest lift are Tiffany & Co. and McDonald's. Our simulations indicate that if a brand manager for Tiffany & Co. uses the proposed six-dimension model to develop $k$ = 10 prototypes, the expected purchase intention from the best of these prototypes is 27.3% higher than using only resource-based fit (Keller & Aaker, 1992) and 16.1% higher than using a random design direction. Our associated predicted changes in market share are 10.98% and 7.10% (for moderate intention-behavior correlation $\widehat{\rho_m} = .49$). This is what happens if the firm chooses the best of 10 prototypes. The benefit of guiding product development with our six-dimension model for 5 prototypes is slightly smaller (21.0% lift over the Keller and Aaker scale in 1992 and 14.8% lift against randomly guided product development; with predicted market share changes of 8.02% and 5.95%, respectively, for moderate intention-behavior correlation $\widehat{\rho_m} = .49$). Interestingly, other brands in our study, such as CNN and Guess, do not experience such a lift. For strong brands, the benefits of guiding extension product development with our model are shown to be worthwhile, and the benefits appear somewhat less for narrow or weaker brands. As background on the variation in fit-dimensions weights over the different brands, Table F.2. of online technical appendix E gives the estimated models over the different brands for Study 2.

This section described our development of a six-dimension model for brand-extension fit. We identified the relevant dimensions, specified the measurement model structure, estimated and validated the model, and showed predictive, methodological, and managerial relevance.

## 4. Conclusions and discussion

### 4.1. Conclusions

This article identifies six key dimensions that constitute the brand-extension fit construct: feature-based, function-based, resource-based, usage-occasion-based, target-market-based, and image-based fit. These six dimensions are shown to make up a comprehensive formative measurement scale of brand-extension fit. Our approach involved the following steps: (a) define the relevant content area (brand-extension fit); (b) identify possible dimensions of brand-extension fit from a review of past measurement items used in the literature, in-depth interviews, a focus group, and an open-ended customer survey; (c) arrive at a six-dimensional model, with support from an exploratory factor analysis of consumer responses to 25 measurement items (identified in step b); (d) estimate and validate the proposed model with a large dataset that we collected about consumers' evaluations of a wide range of brand extensions; and (e) check the relevance and practical usefulness of our model for theory and practice. In step (d), we considered linear and mixed-effects specifications, and we validated the model using SEM-PLS by conducting various analyses suggested in the literature. In step (e), we show that biases likely arose in previous studies in the literature because overall fit was measured with a strict subset of our proposed six dimensions. This provides perspective on the large body of brand-extension-fit literature over the last 30 years. We also conducted counterfactual simulations that demonstrate the extent to which decisions are suboptimal when a brand manager does not use the proposed six dimensions to guide the development of brand extensions.

[4] 0.148 = (5.620–4.896)/4.896. Note that this comparison is based on a 1–7 point scale.

[5] We use the following approximation $\widehat{\Delta y} = \widehat{\rho}(x_2 - x_1)/6$, where $\widehat{\Delta y}$ is the predicted change in market share arising from a change in purchase intentions from $x_1$ to $x_2$ and $\widehat{\rho}$ is the applicable estimated correlation between purchase intentions and market share. Our calculations use the findings of Morwitz et al. (2007) that the mean correlation of purchase intentions and market outcomes (which includes market share and sales in the various studies) is $\bar{\rho} = .49$, with an associated standard deviation is 0.31, across 40 different studies conducted between 1959 and 2006 (covering "data from more than 65,000 consumers on more than 200 different products," p. 353). Here, the above equation is motivated by the known relationship $\hat{b} = \frac{\sigma_y}{\sigma_x}\hat{\rho}$ for the estimated coefficient for $b$ for the simple linear relationship $y = a + bx + \epsilon$, where $\rho$ is the correlation coefficient between $x$ and $y$, and $a$ is the intercept parameter and $\epsilon$ is the error term. As a preliminary approximation that only accounts for the scale difference in $x$ and $y$, we assume that $\sigma_y = (\sigma_x/6)$. Thus, dividing the right-hand side of the above equation by 6 recognizes that market share $y$ has a one-unit-long scale ranging over [0,1] and our purchase intention measure has a six-point scale (ranging over [1,7]).

### 4.2. Implication for practice

The six dimensions of brand-extension fit identified in this article provide a guide for extension product development. We have already shown that using a strict subset of the proposed six dimensions leads to suboptimal decisions. To use all six dimensions effectively, survey data can be collected about past, hypothetical, or prospective new brand extensions to estimate our six-dimensional model to predict overall fit and consumer purchase intention. This estimated model can be applied for the following managerial purposes:

*Stimulate extension ideas.* Product development teams can more efficaciously focus their new product development efforts on ideas that embody the dimension(s) with the greatest standardized weight estimates from our model.

*Select from alternatives.* The estimated weights of the six dimensions provide insight into why closely ranked alternatives score similarly. This enhances a brand manager's intuition to make better judgments between closely ranked extension prospects.

*Team decision-making.* The estimated weights from our model provide objective guidance about trade-offs between the six proposed dimensions of brand-extension fit to which different product-development team members may gravitate. This may help balance the conflicting goals held by designers, concerned with features, functions, and technological limitations; procurement managers, concerned with the supply chain and resource management; and marketing managers, concerned with brand image, target markets, and usage occasions.

*Understanding the distribution channel.* To help understand the proclivities of channel members, including intermediaries such as retailers carrying the product, channel members can be surveyed to learn which dimensions of brand-extension fit they see as most applicable. This can also help in predicting channel members' intentions to carry a brand extension.

*Brand assessment from a long-term strategic perspective*. More broadly, our model can help managers address important questions as part of a SWOT analysis, such as "What is our brand, really? What does our brand mean to consumers? What strengths of our brand can be leveraged? What weaknesses should be avoided?" This is helpful not only for selecting brand extensions, but also for consolidating and designing a balanced, compatible, and synergistic portfolio of brands. This may also have implications for mergers and acquisitions.

### 4.3. Implication for theory

The six dimensions of brand-extension fit that we identify in this article synthesize a variety of aspects of fit measured and studied in the brand extension literature. Research that uses only one or two of these dimensions as a proxy for overall brand-extension fit (as shown in Table 5) can lead to biased estimates of dimension weights and, generally, an incomplete understanding of the potentialities for brand extensions. Also relevant would be to consider empirically whether consumer demographics and psychographics are associated with proclivities at individual or group levels to give greater weight to various of the six dimensions outlined in this article. In addition, using these dimensions in choice models for brands may be relevant.

From a consumer psychology perspective, these six dimensions of fit may have implications for how consumers perceive brands and how these perceptions may shift over time. For example, some of the six fit dimensions, such as feature-based fit, are more concrete, while others, such as image-based fit, are more abstract, which suggests the application of construal theory (Kardes, Cronley, & Kim, 2007; Trope & Liberman, 2010). Looking at brands through this lens may have implications for the temporal, spatial, and social distance that people feel toward brands. Also related to consumer psychology, the six dimensions of brand-extension fit may have implications for the dimensions of brand personality studied by Aaker (1997), and a study of how these perspectives are related would be desirable.

Lastly, one may suspect that our proposed six dimensions of brand-extension fit may be naturally related to each other. For example, feature-based and function-based fit are similar in that both are concrete and relate to tangible product information perceived by consumers; but they differ in that function-based fit places constraints on and, to some extent, determines features that are required for a brand extension. To gain perspective, we explored and found (see appendix D) that these six dimensions align along two higher-order dimensions: engineering-based fit (feature-based, function-based, resource-based fit) and market-based fit (usage-occasion-based, market-based, and image-based fit). Furthermore, we also investigated and found via an experiment (see appendix D) that for utilitarian brands, engineering-based fit plays a more critical role than market-based fit as a determinant of brand-extension success, and that the reverse is true for hedonic brands.

### 4.4. Future research

There are at least four important avenues for future research. First, it would be desirable to explore and examine whether some moderators, such as individual differences or contextual cues, interact with the six dimensions we identify. This is of theoretical interest to understand the workings of brand-extension fit, and also very relevant for practitioners to know how to influence perceptions of brand-extension fit.

Second, the construct of fit has been considered in many application areas in marketing, including product designs, brand alliances, celebrity endorsement, event sponsorship, and cause-related marketing. A natural extension of the present research would be to ascertain the dimensions of fit and explore developing similar scales for these other application domains.

Third, the brand-extension fit literature starts by assuming positive parent brand attitudes and associations, and then argues that brand extensions can leverage off of these positive associations if there is a fit between the parent brand and the extension product. An issue worth studying concerns the trade-off between investing in a brand extension and investing in improving consumers' attitudes towards the core brand. At a minimum, the core brand cannot be neglected as it provides the foundation for brand extensions.

Fourth, in this era of disruption due to Covid-19, it will be interesting to study whether brands, particularly in high-touch sectors such as retailing, can introduce extension services and products that meet needs safely in a post-pandemic world, even though, because of new technologies, the brand-extension fit may only be moderate. As the economy transitions, it will be useful for consumer theory to continue to advance our understanding of the durability, malleability, and extendibility of brands.

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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## Appendix A. Measures for six dimensions of fit

Table A.1.

**Table A.1**
Measures for six dimensions of fit.

| **Dimensions** of brand-extension fit | **Measures** (1: extremely dissimilar; 7: extremely similar) |
|---|---|
| Feature-based | How similar are [parent brand (product)] and [extension product], in terms of their specific features and attributes (e.g. size, color, smell, taste, price, etc.)? |
| Function-based | How similar are [parent brand (product)] and [extension product], in terms of their basic functions, benefits and functionality? |
| Resource-based | How similar are [parent brand (product)] and [extension product], in terms of the resources required to develop the products (e.g., people, facilities, skills, strategy, knowledge, expertise)? |
| Image-based | How similar are [parent brand (product)] and [extension product], in terms of their abstract images and concepts (i.e., associations, concepts or images that come to you mind when you think about the brand/product)? |
| Usage-occasion-based | How similar are [parent brand (product)] and [extension product], in terms of their usage occasions (i.e., where or when to use them)? |
| Target-market-based | How similar are [parent brand (product)] and [extension product], in terms of their target markets (i.e., consumers at which a product is aimed)? |

## Appendix B. Research stimuli used in study 2

Table B.1.

**Table B.1**
Research stimuli used in study 2.

| Stimuli with Fictional Parent Brands | | | Stimuli with Real Parent Brands | | | |
|---|---|---|---|---|---|---|
| **Parent brand category** | **Extension category** | **Source** | **Parent brand** | **Parent brand category** | **Extension category** | **Source** |
| Sneakers | BBQ grills<br>Shorts<br>Sunglasses | Fedorikhin et al. (2008) | Alaska Airline | Airlines | Suitcases<br>Flight socks<br>Running shoes | Yeung and Wyer (2005) |
| Juice | Beer<br>Soft drink<br>Coffee | Sood and Keller (2012) | Benetton | Clothing | Dresses<br>Leather shoes<br>Cotton spandex athletic wear | Martin et al. (2005) |
| Cell phones | Guitars<br>Speakers<br>Tablets | Fedorikhin et al. (2008) | BMW | Automobile | Motorboat<br>Lawnmower<br>Camera | Maoz and Tybout (2002) |
| Airlines | Flight socks<br>Running shoes<br>Suitcases | Yeung and Wyer (2005) | Cheerios | Breakfast cereal | Frozen dinner<br>Waffles<br>Lollipops | Broniarczyk and Alba (1994) |
| Automobile | Camera<br>Lawnmower<br>Motorboat | Maoz and Tybout (2002) | Guess | Clothing | Watches<br>USB<br>Ski gear | Martin et al. (2005) |
| Breakfast cereal | Frozen dinner<br>Lollipops<br>Waffles | Broniarczyk and Alba (1994) | Haagen-Dazs | Ice cream | Chocolate gift<br>Popcorn<br>Ice tea | Liu and Hu (2012) |
| Digital camera | Breakfast cereal<br>Digital camcorder<br>Televisions | Nan (2006) | Johnson & Johnson | Consumer packaged goods | Skin care lotion<br>Stuffed toy<br>Instant noodles | Ahluwalia (2008) |
| Fast food | Frozen French fries for home cooking<br>Pralines<br>Roasted coffee | Gierl and Huettl (2011) | McDonald's | Fast food | Frozen French fries for home cooking<br>Roasted coffee<br>Pralines | Gierl and Huettl (2011) |
| Ice cream | Chocolate gift<br>Ice tea<br>Popcorn | Liu and Hu (2012) | Nike | Sports wear and goods | Comfort insoles<br>Treadmills<br>Camera | Kim and John (2008) |
| Luxury watches | Fountain pens<br>Handbags<br>Sunglasses | Shen et al. (2011) | Nikon | Camera | Cereal<br>Camcorder<br>TV | Nan (2006) |
| Photocopy machines | Digital photo printers<br>Modems<br>Wristwatches | Kalamas et al. (2006) | Rolex | Luxury watches | Sunglasses<br>Fountain pens<br>Handbags | Shen et al. (2011) |
| Potato chips | Cheese crackers<br>Cookies<br>Ice cream | Keller and Aaker (1992) | Xerox | Photocopy machines | Modems<br>Wristwatches<br>Digital photo printers | Kalamas et al. (2006) |
| News network | Weekly news magazine<br>Movie channels | Yeo and Park (2006) | CNN | News network | Weekly news magazine<br>Movie channels | Yeo and Park (2006) |
| Automobile tire company | Bicycle tires<br>Sports Scandals | Lane (2000) | Michelin | Automobile tire company | Bicycle tires<br>Sports Sandals | Lane (2000) |
| Luxury jewelry | High heel shoes<br>Work flats | Yorkston, Nunes, and Matta (2010) | Tiffany co. | Luxury jewelry | High heel shoes<br>Work flats | Yorkston et al. (2010) |

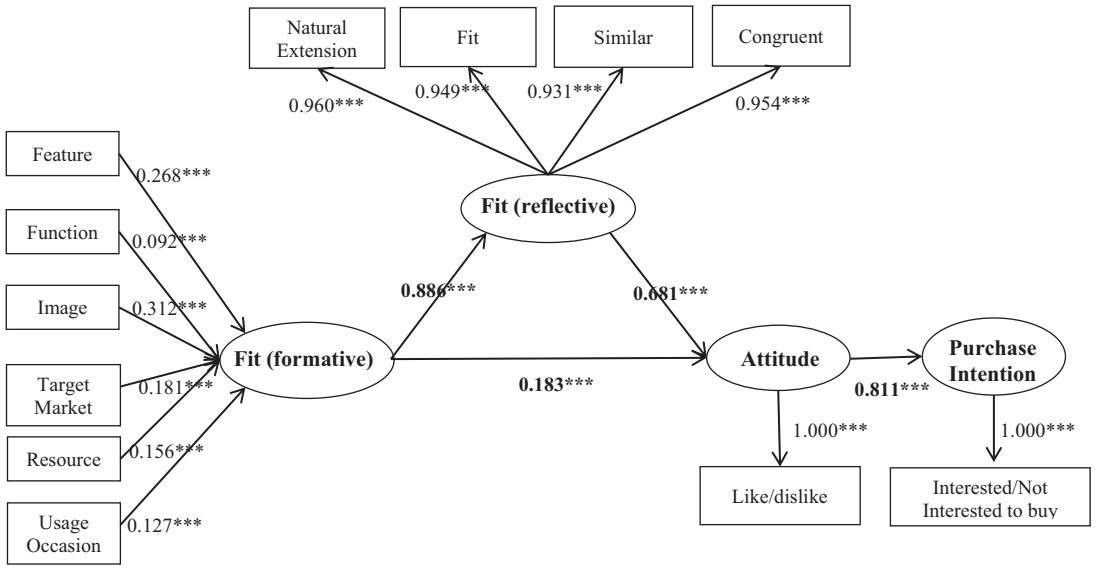
## Appendix C. Model validation of study 2

From a technical standpoint, since we are assessing a formative model of brand-extension fit, we use approaches for model validation that were designed for formative measurement scales. In particular, we consider the validity of our model by checking (a) if our six measurement items are formative (formativeness checks), (b) whether our multi-dimensional model of fit (formative fit) and overall model of fit (reflective fit) work in similar ways – as we would expect – in influencing other related outcome variables (nomological analysis), and (c) the extent to which the multi-dimensional model and the overall model represent the same construct (redundancy analysis to check for convergent validity).

These checks of model validity require estimation of structural equation models. Because our proposed model (Fig. 3) is formative, our estimations were done using Partial Least Squares (SEM-PLS). We used PLS rather than more traditional covariance-based SEM (CB-SEM) techniques because that latter assume that the measurement items are all reflective of a

**Table C.1**
Confirmatory tetrad analysis and collinearity results.

| Model-implied non-redundant vanishing tetrad | Residual value | Bootstrap t-value | *p* value | Item | Max VIF | Implication |
|---|---|---|---|---|---|---|
| $\tau_{Feature,Function,Resource,Market}$ | 1.231 | 11.817 | 0.000 | Feature | 3.698 | Formative |
| $\tau_{Feature,Function,Market,Image}$ | 1.364 | 13.244 | 0.000 | Function | 3.555 | |
| $\tau_{Feature,Function,Image,Resource}$ | −0.265 | 3.284 | 0.001 | Image | 3.951 | |
| $\tau_{Feature,Function,Image,Usage}$ | 0.783 | 7.280 | 0.000 | Target market | 3.290 | |
| $\tau_{Feature,Function,Market,Resource}$ | −0.168 | 2.110 | 0.035 | Resource | 3.321 | |
| $\tau_{Feature,Function,Resource,Usage}$ | −0.785 | 7.967 | 0.000 | Usage occasion | 3.111 | |
| $\tau_{Feature,Image,Market,Usage}$ | 0.715 | 9.959 | 0.000 | | | |
| $\tau_{Feature,Image,Usage,Resource}$ | −0.136 | 2.062 | 0.039 | | | |




Model Fit: SRMR: 0.026; Chi-square:1395.024; NFI: 0.976.
*Note: the numbers are path coefficients/weights/loadings; ***: p <.0001.*

**Fig. C. 1.** Relationships between six-dimensional fit model, overall fit model (reflective measurement), and consumer responses (attitude and purchase intention).

latent construct. This is not the case for a formative model like that of Fig. 3. Using CB-SEM for a formative model introduces measurement model misspecification, which can lead to substantial estimation bias (Jarvis et al., 2003). We used SmartPLS software for the data analysis.

*Formativeness check*. To consider whether our six measurement items are not simply reflective of a single factor, we conducted a confirmatory tetrad test-PLS analysis (following the approach laid out in Gudergan et al., 2008; Coltman et al., 2008).[6] The estimation results are shown in Table C.1 (left section).

The confirmatory tetrad tests for various selections from the six measurement items are all significant, suggesting that our six items of brand-extension fit are not reflective and should be specified as formative items of the brand-extension fit construct. Although the tetrad tests are not a conclusive criterion, they provide support for using a formative structure.

Furthermore, to check whether there is a problem with collinearity among our measurement items, VIF (variance inflation factor) tests for our six measurement items were calculated and presented in Table C.1 (middle section). All of the VIF scores are well below the common threshold of 15, suggesting no collinearity and that these six dimensions are indeed distinct. This analysis offers no objection to our proposed measurement model.

*Nomological validity*. In the brand extension literature, empirical research consistently shows that brand-extension fit has a significant and positive effect on consumers' overall attitude towards and purchase intention for the brand extension product. We, accordingly, include consumer attitude and purchase intention as dependent variables, and we examine the structural model of Fig. C.1 to help evaluate our measurement model for brand-extension fit in terms of its nomological validity

[6] Given several measurement items, one examines a test statistic from a tetrad (set of four of these items) composed of the product of two covariances minus the product of two other covariances. Under the null hypothesis of a reflective model, the symmetry of the underlying structure suggests a zero expected value for the test statistic. But for formative structures, a zero expected value for the test statistic would usually not be expected. (See Bollen & Ting, 2000).

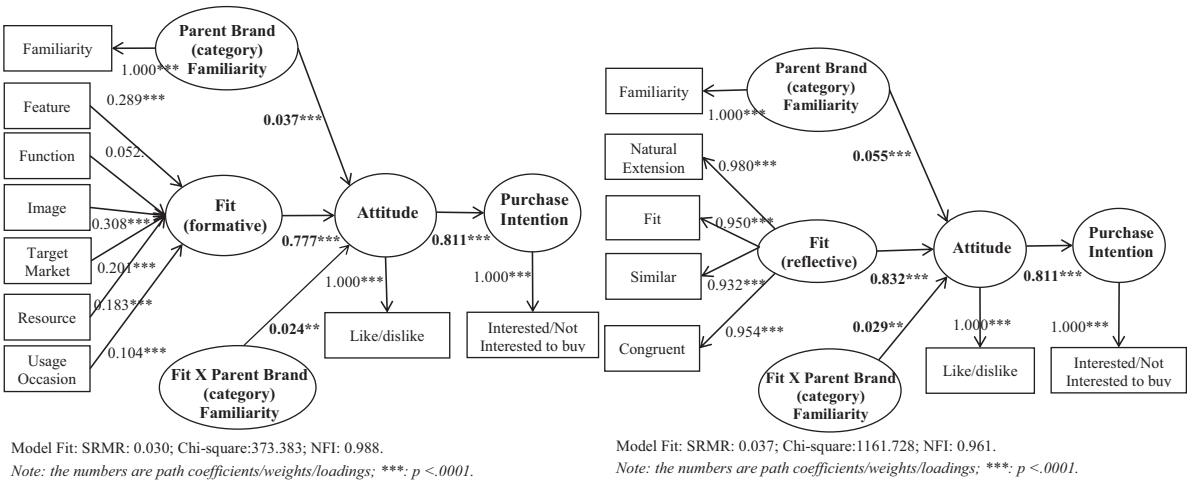



**Fig. C. 2.** Comparison between an overall fit model (reflective) and a six-dimension fit model (formative) for nomological analysis.

(the degree to which predictions or expected relationships in a formal theoretical network are confirmed). Our PLS results are shown in Fig. C.1.

The following key results can be identified. (1) The path from formative fit (our six-dimension fit model) to reflective fit (the overall fit model) is significantly positive with a coefficient of 0.886, which matches our expectation that the six dimensions of brand-extension fit are antecedents to overall fit. (2) Both formative fit and reflective fit all have a significant positive effect on consumers' brand-extension attitude, which further positively influence consumers' purchase intention. (3) More importantly, reflective fit is a partial mediator of the relationship between formative fit and consumers' attitude and purchase intention. In other words, formative fit influences consumers' brand-extension responses via reflective fit and also has its own unique direct effect on consumers' responses not explained by reflective fit. We believe this confirms expected theoretical relationships, particularly (1) and (3) above.

Next, to examine whether our multi-dimensional (formative fit) model and the overall (reflective fit) model work similarly in influencing consumer response, we compare two parallel structural models in Fig. C.2.

The right panel shows a model that includes overall (reflective) brand-extension fit. The estimation results are consistent with previous research: the traditional overall brand-extension fit has a positive effect on consumers' brand-extension attitude (0.832), which further positively influences their purchase intention (0.811). At the same time, parent brand familiarity also significantly interacts with brand-extension fit to influence consumers' responses (0.029). The left panel of Fig. C.2 shows a model that instead includes our six-dimension (formative) brand-extension fit. The estimation results show that the path of formative fit on attitude is positive and significant (0.777), the path of attitude on purchase intention remains the same (0.811), and the interaction between formative fit and parent brand familiarity is also positive and significant (0.024). Indeed, our six-dimension fit model and the overall fit model behave very similarly in the networks of relationships shown in the left and right panels of Fig. C.2, which provides support for nomological validity.

*Convergent validity*. We also conducted a redundancy analysis that shows that our six-dimension fit model (formative fit) has a very strong convergence with the traditional overall fit model (reflective fit). The correlation between the brand-extension fit constructs measured in these two models is 0.886 (see online technical appendix D for details). This shows that our six dimensions do not leave out important determinants of overall brand-extension fit, and, therefore, suggests that our formative measurement scale covers the same theoretical domain as the traditional reflective model of brand-extension fit.

## Appendix D. Higher-order dimensions of brand-extension fit: engineering-based vs. market-based fit

To gain perspective on our proposed six dimensions of brand-extension fit, we explored whether these six dimensions can be grouped into high-order dimensions to generate meaningful and useful practical intuition for brand managers.

### *Market-based fit vs. Engineering-based fit*

*Study design.* To explore the relationship among the six dimensions of brand-extension fit, we conducted an exploratory study. Two sets of brand extension stimuli were developed. The first set of stimuli involved a fictitious soap dispenser manufacturer (a fictitious parent brand with no specific brand information) using a brand extension strategy to develop a new product, which is either liquid soap, towels, or cheese. The second set of stimuli involved M&M's (a real chocolate candy brand that is familiar to consumers) extending to either chocolate bars, cakes, or sports drinks. Each set of stimuli included three different brand extensions, ranging from high-fit, to moderate-fit, to low-fit extensions.

We recruited 95 undergraduate students in a North American university. Each participant evaluated two of the six brand extension stimuli, with the first one randomly selected from the first set, and the second one from the second set. The evaluation questions for each brand extension stimuli are the six measurement items. After we compiled all the data together, 190 data points were generated, with each data point representing one participant's evaluation of one brand extension stimulus.

*Results.* We noted that some of these measurement items are highly correlated with each other. Theoretically, the high correlations may suggest that these six dimensions have some overlap regarding their coverage of the theoretical domain of the latent construct (see online technical appendix F). Therefore, we conducted a principal component factor analysis to explore the internal relationships among the six measurement items. The factor analysis results (online technical appendix G) show that these six dimensions of brand-extension fit are loaded on two distinct factors, which accounts for 83.52% of the total variance. The first factor, which we call *market-based fit*, includes image-based, target-market-based and usage-occasion fit. The second factor, which we call *engineering-based fit*, includes feature-based, function-based, and resource-based fit. The former factor (image-based, target-market-based, and usage-occasion-based fit) pertains to how people perceive a brand, whereas the latter factor (function-based, feature-based, and resource-based fit) pertains to aspects of technical similarity of the products under the same brand. To summarize, the exploratory analyses suggest that the six dimensions of brand-extension fit can be further categorized into two higher-order underlying dimensions: *market-based* and *engineering-based fit*.

*Relative importance of market-based and engineering-based fit for hedonic and utilitarian brands*

This study is intended to further explore whether engineering-based fit and market-based fit play equally important roles in influencing consumer responses to brand extensions. To achieve this objective, we focus on a key factor: the hedonic vs. utilitarian characteristics of the parent brand. This factor is not only theoretically interesting, but also of managerial importance. Theoretically, the hedonic and utilitarian characteristics of the parent brand have never been directly investigated before in the brand extension literature, neither as a moderator of the overall fit effect, nor as a factor that interacts with the effects of engineering-based fit and market-based fit. Managerially, brand characteristics are something that brand managers are familiar with, so if the impact of engineering-based fit and market-based fit is different for utilitarian and hedonic brands, then brand managers can use each of these dimensions of fit differently according to their own brand's characteristics.

More specifically, utilitarian brands are usually positioned around functional dimensions, focusing on the utility or the functionality of its products and service, while hedonic brands, on the other hand, are usually positioned around experiential dimensions, focusing on the fun, pleasure, or enjoyment its products or services can bring (Noseworthy & Trudel, 2011). Therefore, when consumers evaluate brand extensions from a utilitarian (hedonic) brand, they tend to focus on the link or the fit between the parent brand and its extension product on engineering-related (market-related) dimensions, such as function, feature, and resource (target-market, image, usage-occasion). Thus, engineering-based fit (market-based fit) should play a more critical role than market-based fit (engineering-based fit) in affecting consumer responses toward the extension product for utilitarian (hedonic) brands. Therefore, we propose the following research hypotheses:

**H1-a (b).** For utilitarian (hedonic) brands, the engineering-based (market-based) fit between the parent brand and its extension product will be more important than the market-based (engineering-based) fit in affecting consumer responses toward the brand extension product.

*Study design.* A 2 (engineering-based fit: high vs. low) by 2 (market-based fit: high vs. low) by 3 (brand characteristic: hedonic brand vs. utilitarian brand vs. mixed brand with both utilitarian and hedonic values) mixed experiment design was used to test the research hypotheses listed above. Engineering-based fit and market-based fit are between-subject factors, and brand characteristic is a within-subject factor.

The experimental stimuli used in this study were developed in the following two stages: (1) The authors of this article first came up with various potential parent brands and extension products, and then narrowed them down to six real brands and four extension product ideas for each brand. (2) We conducted a pretest with 132 Mturk participants. Each participant evaluated six brand extension ideas about each brand extension idea on the six types of brand-extension fit, and the hedonic and utilitarian perception of the parent brand. The research stimuli (Table D.1) were finalized based on the pretest results.

For the main experiment, 179 undergraduate students (males: 46.9%) in a North American university were recruited to participate in a research study in exchange for one participation credit. In this study, each participant evaluated three brand extension ideas, one for each of the three different brands (i.e., Dawn, Royal Caribbean Cruise Line, and McDonald's), and each idea was randomly selected from the four extension ideas developed from previous steps. For each brand extension idea, participants first reviewed the brand-extension information, then answered a series of questions, including attitude toward the brand extension, purchase intention for the brand extension product, their perceptions of the six dimensions of brand-extension fit, their perceptions of the hedonic/utilitarian nature of the parent brand using the HED/UT scale developed by Voss, Spangenberg, and Grohmann (2003), including five seven-point hedonic items and five seven-point utilitarian items, and provided some demographic information.

**Table D.1**
Analysis results.

| Parent brand | High market-based fit, High engineering-based fit | High market-based fit, Low engineering-based fit | Low market-based fit, High engineering-based fit | Low market-based fit, Low engineering-based fit |
|---|---|---|---|---|
| **Utilitarian brand: Dawn** | Dish washer detergent pod (N = 45) | Kitchen towel (N = 45) | Bathtub cleaner (N = 44) | Yogurt (N = 45) |
| DV: Attitude | 6.00[a] (0.95[b]) | 5.02 (1.14) | 5.98 (1.05) | 1.91 (1.16) |
| DV: Purchase intention | 5.22 (1.35) | 4.62 (1.30) | 5.50 (1.07) | 1.96 (1.33) |
| **Hedonic brand: Royal Caribbean Cruise line** | Hotel (N = 45) | Airline (N = 45) | Logistics (N = 44) | Ski gear (N = 45) |
| DV: Attitude | 5.29 (0.99) | 4.91 (1.16) | 4.23 (1.14) | 3.33 (1.52) |
| DV: Purchase intention | 4.76 (1.15) | 4.11 (1.61) | 3.11 (1.57) | 2.53 (1.38) |
| **Mixed brand: McDonald's** | Fried Chicken (N = 44) | Portable hand sanitizer (N = 45) | Olive Oil (N = 45) | Laundry detergent (N = 45) |
| DV: Attitude | 5.7 (1.34) | 2.93 (1.54) | 2.47 (1.60) | 1.62 (0.91) |
| DV: Purchase intention | 5.5 (1.75) | 2.82 (1.71) | 2.33 (1.71) | 1.89 (1.32) |
| **Regression analyses** | | | | |
| **IV** | **DV** | **Utilitarian brand: Dawn** | **Hedonic brand: Royal Caribbean Cruise line** | **Mixed brand: McDonald's** |
| Market-based fit | Attitude | 0.298[c] *** | 0.411*** | 0.386*** |
| Engineering-based fit | | 0.584 *** | 0.330*** | 0.410*** |
| Market-based fit | Purchase Intention | 0.147 | 0.467 *** | 0.243* |
| Engineering-based fit | | 0.594*** | 0.180 * | 0.458*** |

*Note.* [a]mean value of the dependent variable; [b]standard deviation; [c]standardized coefficient; DV: dependent variable; ***: $p < 0.001$; *: $p < 0.05$.

*Results.* The manipulation checks for utilitarian vs. hedonic brands, market-based fit, and engineering-based fit were successfully (see online technical appendix H). The main results are summarized in Table D.1.

*Results for utilitarian brand: Dawn.* Regarding the dependent variable of consumer attitudes toward the extension product, a two-way ANOVA with market-based fit and engineering-based fit as two independent factors demonstrated a main effect of engineering-based fit ($F(1, 175) = 244.62$, $p < .001$), a main effect of market-based fit ($F(1, 175) = 94.43$, $p < .001$), and a significant interaction effect ($F(1, 175) = 91.71$, $p < .001$). More importantly, planned contrast tests showed that consumer attitudes toward the bathtub cleaner ($M = 5.98$, *S.D.* = 1.04), which had a low level of market-based fit and a high level of engineering-based fit, were significantly higher than that toward kitchen towels, which had a high level of market-based fit and a low level of engineering-based fit ($M = 5.02$, *S.D.* = 1.14, $t(175) = 4.176$, $p < .001$). The results for consumer purchase intentions are very similar.

Most importantly, the regression analyses (Table D.1), in which the indexes of market-based fit and engineering-based fit are independent variables, showed that engineering-based fit plays a significantly more important role than market-based fit in affecting consumer attitudes ($\beta_{Engineer} = 0.584$, S.E.=0.070; $\beta_{Market}$=0.298, S.E.= 0.087) and purchase intentions toward the extension product ($\beta_{Engineer}$=0.594, S.E.=0.087; $\beta_{Market}$=0.147, S.E.=0.107), supporting H1-a.

*Results for hedonic brand: Royal Caribbean Cruise Line.* For consumer attitudes, a two-way ANOVA with market-based fit and engineering-based fit as two independent factors demonstrated a main effect of engineering-based fit ($F(1, 175) = 12.15$, $p = .001$), and a main effect of market-based fit ($F(1, 175) = 52.33$, $p < .001$). More importantly, planned contrast tests showed that consumer attitudes toward airlines ($M = 4.91$, *S.D.* = 1.16), which had a high level of market-based fit and a low level of engineering-based fit, were significantly higher than toward logistics, which had a low level of market-based fit and a high level of engineering-based fit ($M = 4.23$, *S.D.* = 1.14, $t(175) = 2.64$, $p < .001$). The results for consumer purchase intentions are similar.

Most importantly, the regression analyses (Table D.1), in which the indexes of market-based fit and engineering-based fit are independent variables, showed that market-based fit plays a significantly more important role than engineering-based fit in affecting consumer attitudes ($\beta_{Engineer} = 0.330$, S.E.=0.069; $\beta_{Market}$=0.411, S.E.=0.071) and purchase intentions toward the extension product ($\beta_{Engineer} = 0.180$, S.E.=0.089; $\beta_{Market}$=0.467, S.E.=0.091), supporting H1-b.

*Results for mixed brand: McDonald's.* For consumer attitudes, a two-way ANOVA showed a main effect of engineering-based fit ($F(1, 175) = 122.11$, $p < .001$), a main effect of market-based fit ($F(1, 175) = 77.15$, $p < .001$), and a significant interaction effect ($F(1, 175) = 21.91$, $p < .001$). More importantly, planned contrast tests showed that consumer attitudes toward olive oil ($M = 2.93$, *S.D.* = 1.54), which had a low level of market-based fit and a high level of engineering-based fit, were not significantly different from those toward portable hand sanitizers, which had a high level of market-based fit and a low level of engineering-based fit ($M = 2.47$, *S.D.* = 1.60, $t(175) = 1.61$, $p = .110$). The analyses for consumer purchase intentions showed similar results.

The regression analyses in Table D.1 show that market-based fit and engineering-based fit play equally important roles in affecting consumers' attitudes ($\beta_{Engineer} = 0.410$, S.E.=0.094; $\beta_{Market}$=0.386, S.E.=0.101). However, engineering-based fit plays a

significantly more important role than market-based fit in affecting consumers' purchase intentions toward the extension product ($\beta_{Engineer}$ = 0.458, S.E.=0.113; $\beta_{Market}$=0.243, S.E.=0.122).

*Discussion.* This experimental study investigates and demonstrates that the two higher-order dimensions of brand-extension fit (i.e., engineering-based fit and market-based fit) play different roles for utilitarian and hedonic brands in their brand extension strategies. In particular, when a utilitarian brand decides to develop extension products, the engineering-based brand-extension fit plays a more important role than market-based fit. Conversely, for a hedonic brand, market-based fit is more important than engineering-based fit. When a brand is perceived as a mixed brand with both utilitarian and hedonic properties, engineering-based fit and market-based fit are equally important in influencing consumer behavior.

## Online technical appendices. Supplementary material

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ijresmar.2021.09.013 and https://doi.org/10.17632/hrrgyyfv6d.1.

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