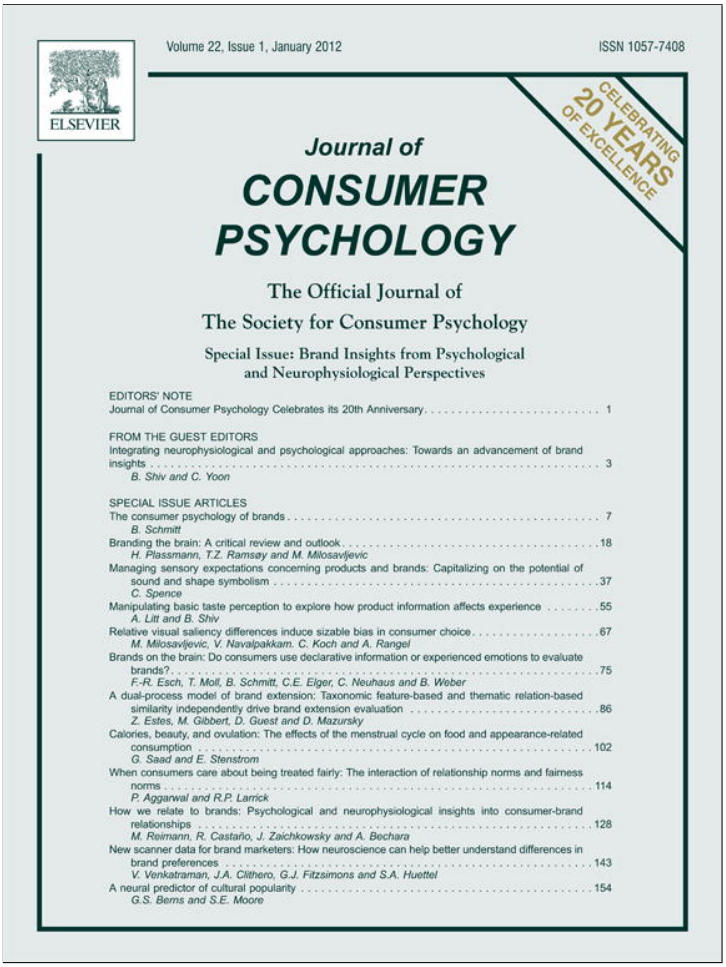

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A dual-process model of brand extension: Taxonomic feature-based and thematic relation-based similarity independently drive brand extension evaluation

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Abstract

The success of a brand extension depends largely on the similarity between the brand and its extension product. Recent psychological and neuroscientific evidence supports a dual-process model that distinguishes taxonomic feature-based similarity from thematic relation-based similarity. In addition to providing a parsimonious organizational framework for prior brand extension research, this dual-process model also provides novel predictions about the processing and evaluation of taxonomic brand extensions (e.g., Budweiser cola) and thematic brand extensions (e.g., Budweiser chips). Results indicate that taxonomic and thematic similarities independently contribute to branding professionals' and lay consumers' evaluations of real and hypothetical brand extensions (Studies 1A and 1B). Counter-intuitively, thematic brand extensions are processed more rapidly (Study 2), judged more novel, and evaluated more positively than taxonomic extensions (Study 3). When induced to consider the commonalities between the brand and the extension product, however, taxonomic extensions are judged more novel and evaluated more positively (Study 3). Implications for brand extension and marketing more generally are discussed.

Keywords: Brand extension; Dual-process model of similarity; Processing fluency; Product evaluation; Taxonomic similarity; Thematic relations

Introduction

Approximately 80% of new products introduced each year are brand extensions (Keller, 1998), so it is important for marketing researchers and brand managers to understand how consumers evaluate them. Indeed, what makes one brand extension succeed and another fail? In theory, the advice for brand managers when confronted with the task of extending their parent brand into a new category can be summarized in one simple word: "fit". Essentially, "fit" is the relation between the extension product and the brand's core product, and a great deal of research indicates that the extension should be *similar* to the brand (e.g., Aaker & Keller, 1990; Boush & Loken, 1991; Martin & Stewart, 2001; Volckner & Sattler, 2007). We therefore investigate how current psychological theorizing about similarity can advance our understanding of brand extension evaluation.

Recent research in cognitive psychology and neuroscience supports a dual-process model, whereby feature-based "taxonomic similarity" and relation-based "thematic similarity" *independently* contribute to our perception of similarity (Estes, 2003a; Schwartz et al., 2011; Wisniewski & Bassok, 1999). The present article redefines brand extension fit in terms of these two distinct sources of similarity. This new organizational framework provides clarity and parsimony to the rich but disjointed literature on brand extension, thus enabling a novel interpretation of several important drivers of brand extension evaluation identified in past research.

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The dual-process model of similarity also generates novel and counter-intuitive predictions about the processing and evaluation of brand extensions. Specifically, recent psychological and neuroscientific evidence suggests that taxonomic (e.g., *Budweiser* cola) and thematic brand extensions (e.g., *Budweiser* chips) may differ in processing ease, which in turn may affect evaluations of those different types of brand extensions (e.g., Lee & Labroo, 2004). Because processing ease can be manipulated as a marketing tool, for instance in advertising and point-of sales (Labroo et al., 2008), our conclusions also provide important thrusts for new managerial applications.[1]

The article is organized as follows. First we introduce the dual-process model that has emerged recently in the psychology literature on similarity judgments. After considering the implications of this model for prior research on brand extension, we then describe some of its novel predictions about brand extension. Finally we report four studies that demonstrate the unique contributions of taxonomic and thematic similarities to brand extension evaluation, and the differential processing and evaluation of taxonomic and thematic brand extensions.

A dual-process model of similarity

Until recently, similarity was thought to result solely from a comparison process that identifies the common and distinctive features between objects (Gentner & Markman, 1997; Tversky, 1977). Much evidence now indicates, however, that similarity is also based on the relations between objects. Thus, a dual-process model distinguishes taxonomic feature-based similarity from thematic relation-based similarity (Wisniewski & Bassok, 1999).

Taxonomic relations entail membership in a common category on the basis of shared features. For example, CARS and MOTORCYCLES share important features (e.g., having an engine and wheels) and hence belong to the same taxonomic category of "vehicles." PIZZA and CHIPS, due to their shared feature of being edible, are both members of the "food" category. Concepts belong in a taxonomic category, and hence are taxonomically related to all other category members, by virtue of shared features. For example, in order for something to be "food," it must be edible. As a consequence, taxonomically related concepts tend to be similar to one another. Thus, taxonomic relations are characterized by (1) internality, in that they are based on the features of the objects themselves, and (2) similarity, in that they cohere around shared features (Hampton, 2006; Markman & Wisniewski, 1997).

Thematic relations are spatial, temporal, or functional relations between two or more things that perform different roles in the same scenario or event (Estes et al., 2011; Lin & Murphy, 2001). For example, MOTORCYCLES and HELMETS are thematically related, as are PIZZA and BEER. Critically, thematic relations are "external" in that they occur between multiple objects, concepts, people, or events. This contrasts "internal" features, which occur within a single entity, and which form the basis of taxonomic relations. To illustrate, MOTORCYCLES have an engine and wheels. Both of these are internal features because they predicate the concept in itself; they entail no other object, concept, person, or event. But MOTORCYCLES and HELMETS are related externally because they perform different roles in the same theme of motorcycle travel. Indeed, due to their playing different roles in a common scenario, thematically related concepts tend to be featurally dissimilar (Estes, 2003a; Wilkenfeld & Ward, 2001; Wisniewski, 1996). Thus, thematic relations are characterized by (1) externality, in that they arise between two or more things, and (2) differentiation, in that those things must perform different functional roles in that relation.[2]

A great deal of recent psychological and neuroscientific evidence indicates that taxonomic and thematic relations are processed differently (for review see Estes et al., 2011). Neuroimaging studies reveal that taxonomic and thematic processing activate distinct neural circuits (Sachs et al., 2008; Sachs et al., 2008; Sass et al., 2009), and neurological cases have also dissociated taxonomic and thematic processing (Davidoff & Roberson, 2004; Schwartz et al., 2011). Taxonomic and thematic processing also *independently* affect similarity judgments. People tend to thematically relate stimuli when judging their similarity (Bassok & Medin, 1997), thematically related concepts such as MILK and COFFEE are judged more similar than unrelated concepts such as MILK and LEMONADE (Golonka & Estes, 2009; Simmons & Estes, 2008; Wisniewski & Bassok, 1999), and concepts are judged more similar when a thematic relation between them is explicitly stated (Jones & Love, 2007) or merely inferred (Estes, 2003a). So in sum, taxonomic and thematic relations (1) are processed in distinct brain circuits, (2) may be selectively impaired or preserved, and (3) differentially affect similarity.

Taxonomic similarity and thematic similarity in brand extension

Taxonomic and thematic brand extensions are readily identifiable in the marketplace. Taxonomic extensions share many of the brand's core features by extending into similar product categories (e.g., *Adidas* sandals, *BMW* motorcycles, *Ivory* shampoo), whereas thematic extensions break out of the brand's

[1] Because this research concerns consumer evaluations rather than production constraints, we do not differentiate between brand extensions in which the brand manufactures the product and those in which it licenses the product to another manufacturer (e.g., *Adidas* deodorant, *Caterpillar* boots).

[2] Note also that thematic relations are not simply *ad hoc categories*, which are created spontaneously to achieve some goal (Barsalou, 1983). Examples include THINGS TO REMOVE FROM A BURNING HOUSE and THINGS NOT TO EAT ON A DIET. Although the goal around which an ad hoc category is based may resemble a theme (e.g., a burning house theme or a diet theme), such ad hoc categories differ importantly from themes (Estes et al., 2011; Lin & Murphy, 2001). Members of an ad hoc category go together as a result of some internal, goal-based property that they all possess (see Barsalou, 1983, p. 225). All members of THINGS TO REMOVE FROM A BURNING HOUSE have some property (i.e., value) that identifies them for salvaging. It could be monetary value (e.g., JEWELRY), sentimental value (e.g., PHOTOS), or some other value (e.g., PETS). Moreover, the members of such ad hoc categories do not take up different external roles. JEWELRY, PHOTOS, and PETS do not perform different roles in a common scenario like BOATS, SAILS, and ANCHORS do. Rather, they all serve the same goal of salvaging valuables from a burning house. Without the goal, those things no longer cohere or relate to one another in any obvious way. So whereas an ad hoc category is based around some *shared internal property* that serves the same goal among all its members, a thematic relation is based around *differing external roles* in some scenario.

traditional category by extending to different product categories that are nevertheless connected through spatial, temporal, or functional relations (e.g., *Adidas* deodorant, *Caterpillar* shoes, *Colgate* toothbrush). For example, the recent successful launch of *Adidas* deodorant is not taxonomic, because deodorant is in a very different category and shares few if any internal features with *Adidas*'s core product (i.e., shoes). Rather, this extension is thematic, based on different external roles: When exercising in *Adidas* gear, one also needs deodorant.

An important contribution that the dual-process model of similarity (Golonka & Estes, 2009; Wisniewski & Bassok, 1999) offers to brand extension research is to provide an organizing framework for an otherwise disjointed literature. The current knowledge of brand extension evaluation, while relatively well developed, constitutes a long but unorganized list of constructs that affect evaluation, or fit (see Table 1). Each of these constructs is important for understanding brand extension evaluation, but can they be grouped in any informative way, and can any limitations be identified? We suggest that the dual-process model can do just that. As evident in Table 1, most prior work on brand extension evaluation has either focused exclusively on taxonomic similarity, or confounded it with thematic similarity. (Table 1 will be considered further in the General discussion.) Consequently, the current knowledge of similarity in brand extension evaluation is fundamentally limited. Drawing on the neural and behavioral dissociation of taxonomic and thematic similarities, the dual-process model thus provides a new and parsimonious account of two distinct drivers of brand extension evaluation.

As evident in Table 1, the only extant construct that incorporates thematic similarity is the factor of usage-based similarity

Table 1
Prior explanatory constructs in brand extension research, and their relations to taxonomic and thematic similarities.

Source	Construct	Description	Example	Similarity	Similarity explanation
1.	Complementarity	Products are consumed jointly	Heineken popcorn	Thematic	Based on spatial and temporal relations between core and extension products
	Substitutability	One product can replace the other in usage	Haagen Dazs candy bar	Taxonomic	Substitutes typically have highly similar internal features
	Transferability	Ability of the firm to produce the extension product	McDonald's frozen fries	Taxonomic	Products with similar internal features require similar production processes
2.	Brand extension typicality	Similarity to the brand's core products	An electronics brand extending to cameras	Taxonomic	Based on internal features of core and extension products
3.	Product-feature similarity	Shared concrete or abstract attributes between brand and extension product	Timex calculator	Taxonomic	Based on internal features of core and extension products
	Brand-concept consistency	Ability of extension product to accommodate the brand's abstract association	Timex batteries	Confounded	Attributes such as "functional" and "prestigious" are abstract internal features, but stimuli included thematic extensions (e.g., Timex batteries)
4.	Product category similarity	Shared concrete or abstract attributes between brand and extension product	Cheerios waffles	Taxonomic	Based on internal features of core and extension products
	Brand-specific association	An attribute or benefit that differentiates a brand	Cheerios oatmeal	Confounded	Most brand associations are concrete internal features (e.g., sweet), but stimuli included thematic extensions (e.g., Nike thirst quencher)
5.	Category dominance	Strength of association between product category and brand	Kodak VCR	Taxonomic	Based on internal features of core and extension products
	Intercategory relatedness	Strength of association between brand and extension product	Kodak video camera	Confounded	Relatedness was defined as either substitutability or complementarity, and stimuli included both taxonomic (e.g., Kodak video camera) and thematic (e.g., Nike tennis racket) extensions
6.	Attribute-based relationship	Shared physical attributes	A watch brand extending to kitchen timers with similar features	Taxonomic	Based on internal features of core and extension products
	Non-attribute-based relationship	Shared user associations	A watch brand extending to handbags of similar fashionability	Taxonomic	"Fashionable" is a feature of a brand and/or product
7.	Feature-based similarity	Shared physical attributes	Reebok dress shoes	Taxonomic	Based on internal features of core and extension products
	Usage-based similarity	Common product usage contexts	Gillette shaving foam	Thematic	Based on spatial and temporal relations between core and extension products
	Brand-concept consistency	Ability of extension product to accommodate the brand's abstract association	Rolex bracelet	Confounded	Associations may be either taxonomic or thematic
	Goal-based similarity	Shared associations organized around common goals	Reebok athletic apparel	Confounded	Goal-based similarity could be either taxonomic (e.g., tell the time) or thematic (e.g., sport theme), but is measured in terms of internal features

Source: 1. Aaker and Keller (1990); 2. Boush and Loken (1991); 3. Park et al. (1991); 4. Broniarczyk and Alba (1994); 5. Herr et al. (1996); 6. Bridges et al. (2000); 7. Martin and Stewart (2001).

(a.k.a. complementarity), which occurs when an extension product is frequently used in conjunction with the brand's core product. While complementarity does utilize thematic similarity, not all thematically similar products are complementary, at least not in a traditional sense. Traditionally two complementary products are strongly associated, such as footballs and boots or an internet search engine and a mapping service. Such complementary brand extensions (e.g., *Nike* footballs; *Google* maps) are indeed thematic, in that the core and extension products perform different roles in a common usage scenario. But thematic similarity goes beyond complementarity in that thematic similarity does not require a pre-existing association between the brand and the extension product (Estes & Jones, 2009; Simmons & Estes, 2008). For instance, one would not associate shoes with body deodorant, but *Adidas* deodorant was an immediate success on the market. Similarly, shoes are not typically associated with music, but Nike+ (which integrates the *Apple* iPod into *Nike* shoes) has also been overwhelmingly successful. So whereas a traditional complementary brand extension involves a brand and a product that do interact, thematic similarity has the broader potential to link brands and products that do not currently interact but could successfully do so.

Due to their distinct neural and behavioral causes and consequences (Estes et al., 2011), taxonomic and thematic similarities should provide unique contributions to product evaluation. By "unique contributions" we mean that neither type of similarity can fully account for the other. Although the positive effect of taxonomic similarity on evaluation is well established (Boush & Loken, 1991; Martin & Stewart, 2001; Park et al., 1991; Volckner & Sattler, 2006, 2007), few studies have investigated thematic similarity in brand extension evaluation. Aaker and Keller (1990) presented hypothetical brand extensions to undergraduates, who rated the substitutability and complementarity of the extensions, as well as their overall attitude toward the extensions. They found that both substitutability and complementarity positively affected attitudes toward the brand extensions. Shine et al. (2007) examined the effect of complementarity on evaluation in cases where multiple extensions are introduced simultaneously. They showed that a target brand extension (e.g., *Xerox* digital camera) was evaluated more positively when presented along with another complementary extension from the same brand (e.g., *Xerox* digital photo printer) than when presented alone. However, they found no benefit when the complementary extension was from a different brand (e.g., *IBM* digital photo printer). Although both of these studies suggest that thematic similarity may improve product evaluations, neither unequivocally demonstrates a unique contribution of thematic similarity to evaluation. Because it was not their purpose, Aaker and Keller (1990) did not report a more stringent analysis to determine whether complementarity explained significant unique variance after accounting for substitutability. Moreover, Shine et al. (2007) demonstrated that the effect of complementarity may be subtle or brand-specific. We therefore investigated whether taxonomic and thematic similarities provide unique contributions to branding professionals' evaluations of real brand extensions (Study 1A) and to lay consumers' evaluations of hypothetical brand extensions (Study 1B).

Processing and evaluation of taxonomic and thematic brand extensions

In addition to providing a new and parsimonious organizational structure for thinking about brand extension, a second important contribution of the dual-process model is that it also generates novel predictions. For instance, recent psychological research indicates that taxonomic and thematic brand extensions may differ in *processing ease*. Given the wealth of evidence that taxonomic similarity facilitates positive evaluation, one might assume that taxonomically similar brand extensions would also be processed relatively rapidly. Counter-intuitively, however, cognitive research suggests otherwise. The combination of a brand name and an extension product, such as "Budweiser chips", creates a noun compound (see Schmitt & Dube, 1992). The vast majority of noun compounds are interpreted either featurally or relationally (Wisniewski, 1997).[3] For instance, "rainbow trout" is featural in that a feature of the modifier is attributed to the head noun (i.e., a multicolored trout), whereas "river trout" is relational in that a relation is inferred between the modifier and head noun (i.e., a trout that inhabits a river). Taxonomic and thematic brand extensions can also be viewed as featural and relational, respectively. For example, "Budweiser cola" is featural in that cola shares features with the brand's core product, beer (i.e., both are consumable liquids). In contrast, "Budweiser chips" is relational in that chips are thematically similar to beer (i.e., they are often consumed together). Critically, relational word pairs such as "river trout" are understood faster than featural word pairs such as "rainbow trout" (Estes, 2003b; Gagné, 2000). And perhaps most poignantly, Gill and Dube (2007) presented new product concepts that were interpreted either featurally such as a "disk iron" (i.e., a round iron for clothing) or relationally such as a "leather iron" (i.e., an iron for leather clothing), and they measured participants' time to comprehend the new product concepts. Across two experiments, participants understood relational products more quickly than featural products. Thus, counter-intuitively, brand extensions that are thematically similar to the brand's core product may be understood more quickly than brand extensions that are taxonomically similar. Study 2 tested this prediction.

Rapid processing is often taken as evidence of processing fluency (e.g., Reber et al., 2004; Whittlesea & Williams, 2001). Processing fluency, in turn, affects evaluation. Thus, the predicted difference in processing ease has further implications for the evaluation of taxonomic and thematic brand extensions. First, processing fluency induces a feeling of familiarity (Jacoby & Whitehouse, 1989; Whittlesea, 1993; Whittlesea & Williams, 2001). That is, stimuli that are processed easily or rapidly are assumed by participants to be familiar. So if thematic brand extensions are processed more rapidly than taxonomic extensions, then thematic extensions should be perceived as more familiar (i.e., less novel) than taxonomic extensions.

[3] A small percentage of noun compounds are instead interpreted via hybridization or category conjunction, as in "sofa bed" and "pet fish" (see Gibbert et al, in press; Gibbert & Mazursky, 2009; Hampton, 1987; Wisniewski, 1997).

Second, processing fluency also elicits positive product evaluations (Labroo et al., 2008; Labroo & Lee, 2006; Lee & Labroo, 2004; see also Reber et al., 2004). For instance, participants who were asked to imagine a frog subsequently preferred a bottle of wine that contained an image of a frog on the label, presumably because the label with the frog was processed easily (Labroo et al., 2008). If thematic brand extensions are indeed processed more rapidly than taxonomic extensions, then thematic extensions should also be evaluated more positively. Such a result would be counter-intuitive, insofar as taxonomic similarity is currently thought to be the main driver of brand extension success (see Table 1). Crucially, these differences in perceived novelty and evaluation are hypothesized to occur when processing is unconstrained (i.e., not guided by the marketer). But often the marketer can manipulate the type of information that is available during evaluation, such as attributes shared by the brand and the extension product, and such communicative constraints affect evaluations (Aaker & Keller, 1990; Bridges et al., 2000; Kirmani & Shiv, 1998; Noseworthy et al., 2010). Study 3 therefore compared the perceived novelty and evaluation of taxonomic and thematic brand extensions under processing conditions that were either less constrained or more deliberative.

We report four studies that investigate the unique contributions of taxonomic and thematic similarities to the evaluation of real brand extensions (Study 1A) and hypothetical brand extensions (Study 1B), processing differences between taxonomic and thematic brand extensions (Study 2), and evaluations of taxonomic and thematic brand extensions under different processing conditions (Study 3).

Study 1A

Study 1A tested whether taxonomic similarity and thematic similarity uniquely contribute to branding professionals' evaluations of actual new brand extensions. That is, we used expert classifications of real brand extensions to predict branding professionals' judgments of the success of those brand extensions. The products were 54 brand extensions sampled from the TippingSprung surveys (Sprung & Tipping, 2004, 2005, 2006, 2007, 2008), in which 2991 branding professionals evaluated the success of new brand extensions launched between 2003 and 2008. The surveys included several candidates for best and worst new brand extensions, with professionals voting for the single best and the single worst extension in each of the five years. These professional evaluations served as the dependent measure of brand extension success. Two independent expert judges also classified each of those new brand extensions as taxonomically and/or thematically similar. These expert classifications served as independent predictor variables. We used stepwise regressions to first allow taxonomic similarity to account for as much variance in evaluations as possible, and then subsequently test whether thematic similarity accounts for a significant portion of the residual variance. This approach provides a stringent test of the dual-process model, in favor of theoretical parsimony: If taxonomic similarity explains a significant amount of variance in product evaluations, but thematic similarity fails to explain significant unique variance after accounting for taxonomic similarity, then a simple model with only taxonomic similarity would be more parsimonious.

Table 2
Examples of real brand extensions from the "best" and "worst" categories sampled in Study 1.

		Taxonomically			
		Similar		Dissimilar	
Thematically	Similar	Best:	Pillsbury ice cream	Best:	Coppertone sunglasses
		Worst:	Sunkist pistachios	Worst:	Everlast fragrance and grooming
	Dissimilar	Best:	Maytag air conditioner	Best:	Bic phone
		Worst:	Ferrari Segway	Worst:	Harley-Davidson cake decorating kit

Method

Materials

Fifty-four actual brand extensions, launched between 2003 and 2008, were sampled from the TippingSprung surveys. Tipping Sprung is an American brand consultancy, and the surveys were conducted annually in conjunction with *Brandweek* magazine over a five-year period from 2004 to 2008. The surveys were constructed in consultation with fifteen branding experts, who established between eight and eleven general categories of brand extensions that varied somewhat across years, with several candidate brand extensions in each category. The present study only included candidate brand extensions from the "best" category (described as "most intuitive extension from a trusted brand" in 2004 and 2005, and as "an innovative and impactful extension, in harmony with the core brand" in 2006, 2007, and 2008) and from the "worst" category (described as "the extension that least fits the brand's core values" in 2004 and 2005, as "most inappropriate brand extension" in 2006, and as "the extension that least fits the brand's core values" in 2007 and 2008). Each category was presented with 4 to 7 candidate brand extensions, and respondents were asked to vote for one brand extension in each category. The surveys were administered via email. The 2004 survey was sent to 2659 branding experts, of whom 208 responded. The 2005, 2006, 2007, and 2008 surveys were additionally sent to subscribers of *Brandweek*, with 449, 860, 785, and 689 respondents in those respective years, for a total of 2991 respondents. Further methodological details are available in Sprung and Tipping (2004, 2005, 2006, 2007, 2008). Examples of stimuli are provided in Table 2.

Procedure

Two expert judges independently classified each of the 54 brand extensions as taxonomic and/or thematic. One of the judges was an author of this paper and was therefore privy to the research hypotheses. The other judge, who has published several papers on thematic relations in language and memory, was blind to the hypotheses.[4] The 54 brand extensions were presented in a random order, and both judges independently

[4] We are indebted to Lara L. Jones for serving as an expert judge. Credentials of expertise include several related publications (Estes & Jones, 2006, 2008; Jones, 2010; Jones & Estes, in press; Jones et al., 2008).

classified each extension as taxonomically and/or thematically similar in a binary manner ("no"=0, "yes"=1).

Scoring and analyses

Taxonomic and thematic similarities served as predictor variables. Inter-rater agreement between the two expert judges was 79%, where chance is 50% and values around 80% are considered good. Disagreements were scored as the average of the two judgments. Thus, each extension was scored as clearly dissimilar (0, where both judges agreed), somewhat similar (0.5, where the judges disagreed), or clearly similar (1.0, where both judges agreed) on each of the two factors (i.e., taxonomic and thematic). Although the taxonomic similarity scores were positively skewed (skew=+1.05, where −.80 to +.80 is considered normal), a square root transformation sufficiently corrected the distribution toward normality (skew=+.77). All analyses reported below therefore used this square root transformation of taxonomic similarity. In contrast, thematic similarity scores were normally distributed (skew=−.07), and hence no transformation was necessary. Across the 54 brand extensions, taxonomic and thematic similarities were uncorrelated, r=+.01, p=.94. This statistical independence, or lack of collinearity, indicates that the measures are appropriate for use in the planned regression analyses.

The percentage of votes that a given extension received in its category served as the dependent (criterion) variable. Note however that the percentages of votes in the "best" and "worst" brand extension categories indicate opposite evaluations. A score of 75% indicates a positive evaluation in the "best" category but a negative evaluation in the "worst" category. We therefore transformed the percentages of the extensions in the "worst" category by simply subtracting them from zero. Thus, the evaluation scale ranged from −100 to +100. This transformation had three important merits. First, it allowed calculations across the "best" and "worst" extension categories by rendering them onto the same scale. Second, it also rendered the "best" and "worst" extension categories non-overlapping, so that all extensions from the "best" category have higher scores than all extensions from the "worst" category. This statistical property captures the assumption that the worst extension in the "best" category is more positive than the best extension in the "worst" category. Third, the transformed measure produced a distribution of scores that was appropriate for regression analyses. This distribution of evaluation scores (% votes) was normal (M=0, SE=3.15, Min=−45, Max=+57) with minimal skew (+0.27).

Results and discussion

We first conducted a multiple linear regression to examine the joint contributions of taxonomic and thematic similarities to professionals' evaluations of real brand extensions. The model was significant, R^2=.41, $F(2, 51)$=18.01, p<.001, with taxonomic similarity (β=+.40, p<.001) and thematic similarity (β=+.50, p<.001) both explaining significant variance in brand extension evaluations. The addition of an interaction term did not improve the model fit, ΔR^2=.001, $F(1, 50)$=.12, p=.73, suggesting that the two predictors contributed independently to evaluations. We then conducted a stepwise regression in which thematic and taxonomic similarity were respectively entered in the first and second steps. This analysis tests whether taxonomic similarity explained any unique variance above and beyond thematic similarity. After accounting for the significant effect of thematic similarity [R^2=.25, $F(1, 52)$=17.49, p<.001], taxonomic similarity did indeed explain a significant amount of residual variance in evaluation scores [ΔR^2=.16, $F(1, 51)$=14.11, p<.001]. This result replicates many prior demonstrations that greater taxonomic similarity between the brand's core product and its extension product promotes the success of that extension (Boush & Loken, 1991; Martin & Stewart, 2001; Park et al., 1991; Volckner & Sattler, 2006, 2007).

Most importantly, another stepwise regression tested whether thematic similarity explained any unique variance above and beyond taxonomic similarity. As predicted, after accounting for the significant effect of taxonomic similarity [R^2=.17, $F(1, 52)$=10.41, p<.01], thematic similarity explained a significant amount of additional variance in brand extension success [ΔR^2=.25, $F(1, 51)$=21.50, p<.001]. That is, taxonomic similarity uniquely explained 16–17% of the variance in professionals' evaluations of actual new brand extensions, and thematic similarity explained a further 25% of the variance in those evaluations.[5] Thematically dissimilar brand extensions tended to receive negative evaluations, whereas thematically similar extensions tended to receive positive evaluations. Together these results indicate that taxonomic and thematic similarities independently and uniquely contribute to brand extension evaluation. Critically, the positive relationship between thematic similarity and brand extension evaluation was observed even after statistically controlling for the effect of taxonomic similarity.

Study 1B

Two characteristics of Study 1A support its practical validity. First, the judges were experts in their respective fields: Experts on taxonomic and thematic similarities classified the stimuli, and branding professionals evaluated the success of those brand extensions. We can therefore be relatively confident in the validity of the results. Second, the stimuli were actual brand extensions available in the marketplace. This supports the external validity of the results. However, those same two characteristics may alternatively be viewed as theoretical limitations. To the extent that brand managers aim to understand how lay consumers evaluate brand extensions, the preceding study's use of expert classifications and professional evaluations does not directly address that aim. Study 1A does

[5] To provide an even more conservative test, we also conducted an additional regression that included a dummy variable coding whether the items were from the "worst" or "best" extension category. This dummy variable and taxonomic similarity were both entered in a first step, with thematic relatedness entered separately in a second step. Even in this most stringent test, thematic relatedness again explained a significant amount of unique variance in evaluations, β=+.20, $F(1, 50)$=5.27, p=.03.

not reveal whether lay consumers are able to apprehend the difference between taxonomic and thematic extensions, nor whether they evaluate them differently. Additionally, the use of actual brand extensions introduces a host of uncontrolled factors, such as properties of the brand (e.g., prestige) and prior knowledge of the brand extension (i.e., familiarity). Such uncontrolled factors suggest that a corroboration study with greater experimental control could be informative.

Study 1B therefore addressed these concerns. Rather than expert classifications and judgments, Study 1B used students' ratings of taxonomic and thematic similarities to predict other students' evaluations of those brand extensions. And rather than judgments of success, Study 1B solicited judgments of fit. Finally, rather than presenting one extension from each brand, Study 1B presented one taxonomic and one thematic extension from each brand. By introducing greater experimental control in this way, properties of the brand itself were held constant across the taxonomic and thematic extensions, so that only the type of similarity between the brand and the extension product varied.

Method

Participants

Participants in each stage of Study 1B, and in the two experiments reported subsequently, were students at a large European university. A total of 194 participated in Study 1B, and no individual participated in more than one stage of the study.

Generation of brand extensions

First we selected 35 well known brands that are known for a single product category, so that no product category included more than one representative brand. Then we asked five PhD students in marketing to generate one taxonomic and one thematic brand extension for each of those 35 brands. They received the following description of taxonomic and thematic products:

> "Products and services can be related in two different ways. Some are related *taxonomically*, that is, they are both members of the same general category of products or services. For example, cars and motorcycles are both vehicles. Taxonomically related products also tend to have many of the same features, such as cars and motorcycles both having tires, engines, and seats. In contrast, other products and services are related *thematically*, that is, they interact in a systematic way. For instance, motorcycles and helmets are thematically related in that one wears a helmet when driving a motorcycle. Notice that thematically related products tend not to have the same features. Unlike motorcycles, helmets do not have tires, an engine, or a seat. Rather, thematically related products and services fulfill different external functions. So taxonomic products share features, whereas thematic products share a relation."

From the resulting 350 extensions (i.e., 35 brands × 2 extensions × 5 respondents) we then selected, for each of the 35 brands, what we agreed were the single best examples of a taxonomic extension and a thematic extension (i.e., familiar products with strong taxonomic or thematic relations to the brand's typical product).

Taxonomic and thematic similarity ratings

Next, 95 trained participants rated the taxonomic and thematic similarities of the selected extension products to the given brand's typical product. Participants were students on a Masters course in International Management, and they completed the rating task at the conclusion of an hour-long lecture on taxonomic and thematic similarities by one of the authors. Each brand was presented with its typical product (e.g., "Budweiser beer") and a new extension product (e.g., "cola" or "potato chips"), and participants were instructed to rate on a 1 (not at all) to 7 (extremely) scale the extent to which the two products or services "belong in the same category or have the same features" (taxonomic similarity) and "are related or complement one another" (thematic similarity). Two lists were created such that each participant rated each brand only once, with either a taxonomic extension or a thematic extension, and each participant rated an approximately equal number of taxonomic and thematic extensions. From these ratings we selected 24 brands, each with one taxonomic and one thematic extension, for further testing. These 24 brands were selected on the basis that both of their extension products scored relatively high on either taxonomic or thematic similarity; for the excluded brands, one or both of their extension products scored relatively low on both taxonomic and thematic similarities. Examples of stimuli are provided in Table 3.

For the 48 selected brand extensions (i.e., 24 brands × 2 extensions), the taxonomic similarity ratings (M=3.40, SE=.20, Min=1.32, Max=6.28, $skew$=+.11) and thematic similarity ratings (M=4.33, SE=.14, Min=2.38, Max=6.15, $skew$=+.15) were both normally distributed with good range, so no transformations were required. Taxonomic and thematic similarity ratings were significantly and negatively correlated (r=−.41, p<.01). Taxonomic similarity increased as thematic similarity decreased, and vice versa. This finding corroborates prior research: Thematically related concepts perform different roles in the same theme, and those different roles typically require different features, which in turn produce low taxonomic similarity (Estes, 2003a; Wilkenfeld & Ward, 2001; Wisniewski, 1996). Note however that this observation is accentuated by our selection procedures, which were expressly intended to maximize the contrast between taxonomic and thematic similarities. Although taxonomic and thematic similarities were significantly correlated, the strength of this correlation (r=−.41) did not approach the level at which problems of collinearity arise (i.e., $-.8>r>+.8$), and indeed the observed collinearity tolerance of .84 far exceeded the threshold (i.e., .10) below which collinearity is typically identified (Field, 2009). That is, taxonomic and thematic similarity ratings were not collinear, and hence these measures are appropriate for regression analyses.

Brand fit

Finally, we asked 58 participants to rate the fit between each brand and its extension products. Specifically, participants

Table 3
Examples of hypothetical brand extensions used in Studies 1B–3.

Brand	Extension	Similarity	Explanation
Boeing	redundant helicopter	Taxonomic	Core and extension products are both airborne vehicles
	Suitcase	Thematic	Core and extension products are used together during travel
Budweiser	cola	Taxonomic	Core and extension products are both consumable liquids
	Potato chips	Thematic	Core and extension products are consumed together
McDonald's	Sushi	Taxonomic	Core and extension products are both foods
	Cigarettes	Thematic	Extension product is often used after core product
Nike	Jeans	Taxonomic	Core and extension products are both apparel
	Gym	Thematic	Core and extension products are used together during exercise
Starbucks	Energy drink	Taxonomic	Core and extension products are both consumable liquids
	Sofa	Thematic	Core and extension products are used together during consumption

rated on a 1 to 7 scale the extent to which the proposed extension "fits with the parent brand", "is negative or positive", and "is logical for the parent brand to sell". These three items were selected from those tested by Batra et al. (2010), who sampled several different measures of brand fit that have been used commonly in prior studies, and then analyzed via Principal Components Analysis which of those measures predicted a more objective estimate of fit. We selected these three items because they all loaded heavily on the objective fit estimates (loadings >.83) and because they appeared to capture slightly different aspects of fit (e.g., cognitive versus attitudinal aspects). Two lists were created so that each participant rated each brand with only one extension product, which was either taxonomically or thematically similar, and each participant rated an approximately equal number of taxonomic and thematic extensions. As expected, the three measures were virtually identical ($\alpha = .99$), and thus they were combined into a single measure of fit. These fit scores were normally distributed with good range ($M = 3.96$, $SE = .15$, $Min = 1.82$, $Max = 5.93$, $skew = -.15$).

Evaluation of the unbranded products

To ensure that the taxonomic and the thematic extension products were similarly evaluated in the absence of any brand information, we had 36 additional participants rate on a 1 to 7 scale the extent to which each product alone (i.e., unbranded) was usable and the likelihood that they would buy it. Because these two measures cohered strongly ($\alpha = .93$), they were combined into a single measure of "unbranded evaluation". These unbranded evaluations were normally distributed with good range ($M = 4.60$, $SE = .18$, $Min = 1.94$, $Max = 6.63$, $skew = -.32$).

Results and discussion

We first tested whether taxonomic and thematic similarities jointly predicted fit ratings by entering these two predictors simultaneously in a linear regression, along with unbranded ratings of the products. The overall model was significant, $R^2 = .35$, $F(3, 44) = 8.01$, $p < .001$, with taxonomic similarity ($\beta = +.57$, $p < .001$) and thematic similarity ($\beta = +.49$, $p < .001$) both explaining significant variance in brand fit. Unbranded product ratings, in contrast, did not predict fit ratings ($\beta = -.05$, $p = .69$). As in Study 1A, the addition of an interaction term did not significantly improve the model fit, $\Delta R^2 = .04$, $F(1, 43) = 2.86$, $p = .10$.

We then conducted a stepwise regression to test the unique contribution of taxonomic similarity to brand fit. Thematic similarity and unbranded evaluations were entered in the first step, with taxonomic similarity added in a second step. Although the first model was only marginally significant, $R^2 = .11$, $F(2, 45) = 2.65$, $p = .08$, thematic similarity nonetheless explained a significant portion of the variance in fit ($\beta = +.29$, $p < .05$). The unbranded product ratings did not predict fit ($\beta = -.22$, $p = .14$). More importantly, adding taxonomic similarity significantly improved the model, $\Delta R^2 = .25$, $F(1, 44) = 16.86$, $p < .001$. This finding confirms that taxonomic similarity positively and uniquely contributed to brand fit (Boush & Loken, 1991; Martin & Stewart, 2001; Park et al., 1991; Volckner & Sattler, 2006, 2007), thereby validating the current sample of brand extensions.

Finally, to test whether thematic relatedness contributed to perceptions of brand fit above and beyond the contribution of taxonomic similarity, we conducted a stepwise regression in which taxonomic similarity and unbranded evaluation were entered in the first step before thematic similarity was entered in the second. The first model was significant, $R^2 = .16$, $F(2, 45) = 4.14$, $p < .05$, with a significant contribution from taxonomic similarity ($\beta = +.39$, $p = .01$) but not unbranded evaluation ($\beta = -.01$, $p = .93$). Importantly, however, in the second model thematic similarity explained a significant amount of unique variance in fit ratings above and beyond that explained by taxonomic similarity, $\Delta R^2 = .20$, $F(1, 44) = 13.45$, $p < .001$. That is, taxonomic similarity explained significant variance in fit, and thematic similarity uniquely explained a significant portion of additional variance in brand fit. Results thus corroborated those of Study 1A. Together these two studies demonstrate that taxonomic and thematic similarities positively and uniquely contribute to branding professionals' and lay consumers' evaluations of the success and fit of real and hypothetical brand extensions.

Study 2

Study 2 examined the relative processing ease of taxonomic and thematic brand extensions. Because relational word pairs such as "river trout" tend to be understood faster than featural word pairs such as "rainbow trout" (Estes, 2003b; Gagné, 2000; see also Gill & Dube, 2007), we predicted the following:

H1. Thematically similar brand extensions are processed more rapidly than taxonomically similar brand extensions.

Using a semantic priming paradigm in which the brand (e.g., "Budweiser") served as a prime stimulus and the extension product (e.g., "cola") served as the target stimulus, we examined processing ease via a lexical decision task in which participants indicated as quickly as possible whether the target is a real word (e.g., "cola") or a nonword (e.g., "dola"). The target words denoted hypothetical extension products that were similar to the prime brand (e.g., "Budweiser") either taxonomically (e.g., "cola") or thematically (e.g., "chips").

Method

Participants

Twenty-five native Italian speakers participated.

Materials

From Study 1B we selected 14 brands, each with one taxonomic extension and one thematic extension (see Table 3). These 14 brands were selected because their taxonomic and thematic extensions differed in taxonomic similarity and in thematic similarity but not in brand fit, and because those extensions were single words (e.g., "cola" was included but "energy drink" was excluded) that did not differ in length or familiarity. These latter characteristics were important for the lexical decision task. The taxonomic extensions were significantly higher in taxonomic similarity than in thematic similarity ($t(13) = 4.23$, $p < .001$), whereas the thematic extensions were significantly higher in thematic similarity than in taxonomic similarity ($t(13) = 16.30$, $p < .001$), thus validating the stimulus manipulation. The taxonomic and thematic extensions were closely matched on brand fit ($p = .92$), word length ($p = .94$), and word frequency ($p = .71$).[6]

To disguise the purpose of the experiment, we also included for each of the 14 brands one filler extension that was neither taxonomically nor thematically related (e.g., "Marlboro calculator", "Nike lamp"). These were intended as filler trials only, and because ratings of taxonomic similarity, thematic similarity, and brand fit are not available for these items, they were not included in any analyses. Finally, we created 42 nonwords by changing a single letter of each of the 42 extension words (14 brands × 3 extensions). For instance, "computer" was changed to "comzuter". Thus there were 14 brands, each with 3 word targets (i.e., taxonomic, thematic, and filler extensions) and 3 nonword targets, for a total of 84 trials.

Procedure

The experiment was administered in Italian via E-Prime software, and participants were tested individually. The procedure was modeled closely after a standard lexical decision experiment (e.g., Estes & Jones, 2009). Participants were informed that they would see a series of letter strings, and that their task was to indicate as quickly and accurately as possible for each letter string whether it is a real word in the Italian language (by pressing the "X" key) or whether it is not an Italian word (by pressing the "N" key). Instructions were delivered onscreen, and participants completed ten practice trials prior to the experimental trials. The practice trials consisted of five brands that were not used in the experimental trials, each with one unrelated word target and one nonword target.

Participants initiated each trial by pressing the space bar, which triggered a white fixation cross that appeared centrally on a black background for 250 ms, followed by a prime (brand name) that appeared centrally in red font for 500 ms, and then another white fixation cross for a further 100 ms. Finally, the target (extension product or nonword) appeared centrally in white font and remained onscreen until the participant indicated by key press whether the target was a real word in the Italian language. The 84 experimental trials appeared in a unique random order for each participant.

Analyses

Trials on which the participant responded incorrectly were excluded from response time analyses (1.7% of experimental trials). We also excluded all outlying response times that deviated by more than 2.5 *SD*s from the condition mean, calculated separately for each participant (1.5% of experimental trials). Thus, following standard procedure, trimmed mean correct response time served as the primary dependent variable. Effect sizes are reported in terms of partial eta squared (η^2_p), which is a within-participant measure of the proportion of variance in the dependent variable (in this case, response time) uniquely explained by the given independent variable (in this case, extension-type: taxonomic or thematic).

Results and discussion

Error rates were extremely low and did not differ between taxonomic and thematic extensions ($M = 1.71\%$, $p = .54$). As predicted, however, thematic extensions ($M = 934$, $SE = 65$) elicited significantly faster responses than taxonomic extensions ($M = 992$, $SE = 64$), $t(24) = 2.85$, $p < .01$, $\eta^2_p = .25$. For example, after reading the brand "Nike", participants recognized the thematic extension "gym" faster than the taxonomic extension "jeans". This result was not attributable to brand fit, word length, or word frequency, as those factors were controlled. This faster processing of thematic extensions corroborates prior evidence that relational word pairs are understood faster than featural word pairs (Estes, 2003b; Gagné, 2000; Gill & Dube, 2007). Thus, in support of H1, thematic brand extensions were processed more rapidly than taxonomic brand extensions.

Study 3

Study 3 examined the evaluation of taxonomic and thematic brand extensions under different processing conditions. In an "unconstrained" condition, participants freely evaluated brand extensions with no further processing constraints (cf. Aaker & Keller, 1990). The finding in Study 2 that thematic brand

[6] Because no standard corpus of word frequency norms is available in Italian, this analysis is conducted on the frequency of occurrence of their English translations in the British National Corpus.

extensions were processed more rapidly than taxonomic brand extensions motivates two simple predictions about such unconstrained evaluations. Rapid processing, which indicates processing fluency (e.g., Reber et al., 2004; Whittlesea & Williams, 2001), induces a feeling of familiarity (Jacoby & Whitehouse, 1989; Whittlesea, 1993; Whittlesea & Williams, 2001) and elicits positive product evaluations (Labroo & Lee, 2006; Labroo et al., 2008; Lee & Labroo, 2004).[7] So given that thematic brand extensions are processed more rapidly than taxonomic extensions (Study 2), we predicted the following:

H2. Under unconstrained processing, taxonomic brand extensions are perceived to be more novel than thematic brand extensions.

H3. Under unconstrained processing, thematic brand extensions are evaluated more positively than taxonomic brand extensions.[8]

In a second condition of Study 3, processing was constrained. Prior studies have investigated processing constraints by manipulating the type of information that is presented, such as brand attributes or extension product attributes (Aaker & Keller, 1990; Bridges et al., 2000; Kirmani & Shiv, 1998; Noseworthy et al., 2010). We instead used a common method from cognitive psychology to manipulate processing, namely listing commonalities between two concepts (Markman & Gentner, 1993; Markman & Wisniewski, 1997; Wisniewski & Bassok, 1999). That is, some participants in Study 3 were simply asked to evaluate a series of brand extensions (unconstrained condition), whereas others were asked to first state what each brand and its extension product have in common before evaluating them (commonality condition). This method had the advantage of allowing us to examine whether participants were indeed noticing the taxonomic and thematic similarities between the different types of extensions, without any overt description to convey those similarities. Ahluwalia (2008) found that asking participants a similarly general question about a brand extension (e.g., "What would you expect from Sony vacation resorts?") significantly affected participants' processing and evaluation of that product.

We expected that listing commonalities would induce more deliberative processing and would differentially affect evaluations of taxonomic and thematic brand extensions (cf. Wisniewski & Bassok, 1999). Consider first the taxonomic brand extensions: Commonality listing should emphasize the featural similarity between the taxonomic extensions and their parent brands. According to H2, taxonomic extensions should initially seem relatively novel. But more deliberative processing would emphasize their high featural similarity, and hence their perceived novelty might diminish. That is, explicitly considering the many common features between a taxonomic extension and its parent brand should render them less surprising and novel. Moreover, some evidence suggests that commonality processing might also improve the evaluation of taxonomic brand extensions. Relative to unconstrained processing, Aaker and Keller (1990) found that describing the features of brand extensions significantly improved their evaluation. Bridges et al. (2000) also found that taxonomic ("attribute-based") brand extensions were evaluated more positively when the featural similarity between the brand's core product and its extension product was emphasized than when presented with no further information (see also Monga & John, 2010). Collectively, these results suggest that commonality processing should decrease the perceived novelty but improve evaluations of taxonomic extensions.

In contrast, thematic extensions should be affected in the opposite manner. Thematic extensions should initially seem familiar and positive because they are easy to process. But commonality listing would affect thematic extensions in two ways. First, the more deliberative processing would disrupt the fluency that thematic extensions normally evoke under unconstrained conditions. And second, commonality listing should reveal the featural dissimilarity between a thematic extension and its parent brand. Thus, commonality listing should increase their perceived novelty by highlighting their featural dissimilarity, but should render them less positive by disrupting their processing fluency. We thus predicted the following:

H4. Under commonality processing, thematic brand extensions are perceived to be more novel than taxonomic brand extensions.

H5. Under commonality processing, taxonomic brand extensions are evaluated more positively than thematic brand extensions.

Effectively then, we predicted two disordinal interactions: Relative to taxonomic brand extensions, thematic brand extensions should be (1) perceived less novel in the unconstrained condition but more novel in the commonality condition, and (2) evaluated more positively in the unconstrained condition but less positively in the commonality condition.[9] Note also

[7] Studies of processing fluency in consumer behavior often adopt novelty as a proxy for familiarity, and indeed perceived novelty is an important mediator of evaluations and behaviors following fluency manipulations (e.g., Song & Schwarz, 2009). Novelty and familiarity tend to relate inversely in the context of product evaluations, such that highly familiar products are judged less novel (e.g., Gibbert & et al, in press). However, it should be noted that familiarity and novelty are distinct constructs, and that our predictions about novelty may not apply in all consumer behavior contexts. Whereas we expected novelty and evaluation to relate negatively, in some cases a surprising or incongruous product could be evaluated positively. For example, in the context of novelty seeking (Hirschman, 1980), motivational factors drive a positive relationship between novelty and evaluation. In the present study, however, we simply asked participants to rate how "new" the brand extension was. Because this measure of novelty did not assess how surprising or incongruous the products were, we assumed that it was the inverse of familiarity.

[8] Note that this hypothesis, while consistent with results of Studies 1A and 1B, is theoretically different and stronger. Whereas Studies 1A and 1B demonstrated independent contributions of taxonomic and thematic similarity to evaluation, H3 concerns the relative strengths of those two contributions when pitted against one another.

[9] It is a common belief that the innovativeness of a new product facilitates its success in the marketplace. However, meta-analyses have not supported this belief: The relationship between innovativeness and success can range from extremely negative to extremely positive, depending on measurement and contextual factors (Henard & Szymanski, 2001; Szymanski et al., 2007). Our prediction of a negative relationship between novelty and evaluation therefore runs counter to this intuition, but it is nevertheless consistent with much prior research.

that these predictions serve as a further test of the dual-process model of similarity in brand extension. If taxonomic and thematic similarities arise from distinct processes, then a single manipulation (e.g., processing condition) could differentially affect taxonomic and thematic brand extensions. Alternatively, if taxonomic and thematic similarities arose instead from a single process, then presumably the given manipulation should have the same effect on both taxonomic and thematic extensions.

Method

Participants

One hundred thirty students participated, with approximately equal numbers in the unconstrained ($n=69$) and commonality conditions ($n=61$).

Materials

From Study 1B we selected 12 brands, each with one taxonomic extension and one thematic extension, for use in Study 3. Examples of stimuli are provided in Table 3. The taxonomic extensions were significantly higher in taxonomic similarity than in thematic similarity ($t(11)=2.31$, $p<.05$), whereas the thematic extensions were significantly higher in thematic similarity than in taxonomic similarity ($t(11)=10.68$, $p<.01$). These differences in taxonomic and thematic similarities confirm that the selected stimuli did indeed contrast in their relation to the brands' typical products. The taxonomic and thematic extension products were matched on unbranded evaluation ($p>.10$). That is, in the absence of any brand, the two product-types were rated equally usable and equally likely to be purchased. Thus, any difference in brand extension evaluation observed in Study 3 would not be attributable to the extension products themselves, but rather to the relation between the brand and the product. Because we sought clear manipulations of taxonomic and thematic similarities, unfortunately, we were unable to match the extensions for brand fit ($t(11)=3.50$, $p<.01$): Fit was greater among taxonomic extensions than among thematic extensions. Notably, however, this difference in fit actually worked against our hypotheses in the unconstrained condition, where we predicted more positive evaluations of the extensions that were lower in fit (i.e., thematic extensions).

Procedure

The experiment was conducted in a large classroom setting. Participants were informed that they would see products with brands that do not typically sell those products, they were asked to suppose that those brands would sell the given products, and they were asked to evaluate those products with regard to the given brands. In the commonality condition, each brand extension (e.g., "Budweiser cola") appeared in bold font centered horizontally above a text box and a series of four ratings scales. Immediately below the brand extension was the following prompt: "What do the two have in common? Please name the first commonality that comes to mind." Below this prompt was a textbox extending approximately one inch by six inches across the page. Below the textbox was an instruction to "Please answer the following questions relating to the product above". Finally, below that were rating scales for novelty ("new"), usability ("usable"), purchase intention ("I would buy it"), and predicted success ("likelihood of market success"). The scales ranged from 1 (low) to 7 (high) and appeared to the right of each criterion. Participants indicated their evaluations by circling a number on each scale. The procedure of the unconstrained condition was identical, except that the commonality prompt and textbox were omitted.

The 24 brand extensions (i.e., 12 brands × 2 extensions) were counterbalanced across two experimental lists, so that each brand appeared in each list with either its taxonomic extension or its thematic extension, and no brand or product appeared in either list more than once. Each list thus contained six taxonomic and six thematic extensions, which appeared in a randomly intermixed order, and participants were randomly assigned to complete one of the two lists. Two brand extensions appeared on each page of a printed questionnaire, which participants completed at their own pace.

Manipulation check

As a basic check of whether participants interpreted the taxonomic and thematic brand extensions as we intended, participants' written responses on the commonality listing component were categorized broadly as either "taxonomic" or "thematic" by an undergraduate judge who was unaware of the purpose of the study. An example of a taxonomic commonality was "both are bottled drinks" for *Budweiser* cola, and an example of a thematic commonality was "both are consumed at a football match" for *Budweiser* chips. As expected, taxonomic commonalities were significantly more frequent among taxonomic extensions than among thematic extensions, $t(60)=12.69$, $p<.001$, and thematic commonalities were significantly more frequent among thematic extensions than among taxonomic extensions, $t(60)=9.61$, $p<.001$.

Analyses

Participants' novelty, usability, purchase intention, and predicted success ratings were first submitted to Principal Components Analysis with Varimax rotation, which identified two latent factors that jointly explained 84% of the variance in ratings. The first factor (eigenvalue = 2.32) individually explained 58% of the variance and exhibited high loadings for usability, purchase intention, and predicted success (all >.84) and a low loading for novelty (.001). The second factor (eigenvalue = 1.03) explained a further 26% of the variance and exhibited a high loading for novelty (.99) and low loadings for usability, purchase intention, and predicted success (all <.18). This observed pattern of multiple items reducing to two latent factors is typical of brand extension evaluation (e.g., Batra et al., 2010). We therefore combined the usability, purchase intention, and predicted success ratings into a single "evaluation" index ($\alpha=.85$). Dependent variables thus consisted of novelty and evaluation ratings, which were analyzed via analysis of variance (ANOVA).

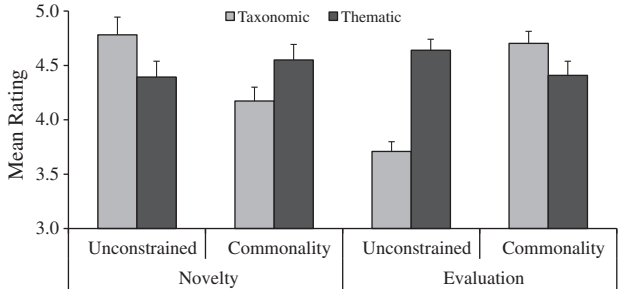

Fig. 1. Novelty and evaluation ratings ($M+SE$) of taxonomic and thematic brand extensions in unconstrained and commonality conditions, Study 3.

Results and discussion

As evident in Fig. 1, the unconstrained and commonality conditions elicited opposite results on both the novelty and the evaluation of the brand extensions. Initial 2 (condition: unconstrained, commonality; between-participants) × 2 (extension: taxonomic, thematic; within-participants) ANOVAs revealed that the expected interactions were significant in both novelty [$F(1, 128)=15.06$, $p<.001$] and evaluation [$F(1, 128)=46.24$, $p<.001$], which were examined further via follow-up analyses. In the unconstrained condition, the thematic extensions were judged significantly less novel than the taxonomic extensions [$F(1, 68)=6.61$, $p=.01$, $\eta^2_p=.09$]. This finding supports H2 and is consistent with prior studies showing that processing fluency increases perceived familiarity (Jacoby & Whitehouse, 1989; Whittlesea, 1993; Whittlesea & Williams, 2001). Because thematic extensions are processed more rapidly than taxonomic extensions (Study 2), thematic extensions are judged to be more familiar (i.e., less novel). In the commonality condition, however, those exact same thematic extensions were judged significantly more novel than the taxonomic extensions [$F(1, 60)=9.61$, $p<.01$, $\eta^2_p=.14$]. This result supports H4. Presumably, commonality processing revealed the featural similarity of taxonomic extensions and the featural dissimilarity of thematic extensions, thus rendering the taxonomic extensions relatively less novel than the thematic extensions.

Also as predicted, evaluation ratings exhibited an interaction in the opposite direction. Thematic extensions were evaluated more positively than taxonomic extensions in the unconstrained condition [$F(1, 68)=50.78$, $p<.001$, $\eta^2_p=.43$], which again was predicted from their greater processing speed (Study 2). This result thus supports H3. Critically, however, this pattern was reversed in the commonality condition [$F(1, 60)=5.81$, $p<.05$, $\eta^2_p=.09$]. When participants considered the commonality between the brand and its taxonomic extension, the strong featural similarity became evident, and hence evaluation of those taxonomic extensions improved dramatically (cf. Aaker & Keller, 1990; Bridges et al., 2000; Kirmani & Shiv, 1998). But considering the commonality between the brand and its thematic extension disrupts its natural processing fluency and highlights its featural dissimilarity, thus decreasing evaluations of thematic extensions. This result supports H5. Interestingly, the effect of extension-type on product evaluations was nearly five times as large in the unconstrained condition (uniquely explaining 43% of the variance) as in the commonality condition (9%).

In sum, Study 3 supported H2–H5, showing that thematic brand extensions were perceived to be less novel but more positive under unconstrained processing, and more novel but less positive under commonality processing. If taxonomic and thematic similarities arose from a single process, then presumably commonality processing should have elicited a similar pattern of results among taxonomic and thematic brand extensions. Rather, the interactive effects observed here indicate that taxonomic and thematic similarities are distinct theoretical constructs with different behavioral outcomes.[10]

General discussion

Based on an extensive body of evidence from cognitive science and neuropsychology (Estes et al., 2011), we distinguished taxonomic from thematic brand extensions. Whereas taxonomic extensions have similar internal features as the brand's core product (e.g., *BMW* motorcycles), thematic extensions have differing roles in an external relation with the brand's core product (e.g., *Adidas* deodorant). Studies 1A and 1B demonstrated that taxonomic and thematic similarities contribute independently to evaluations of brand extensions. Even after statistically accounting for taxonomic similarity, thematic similarity still explained a significant amount of unique variance in branding professionals' evaluations of the success of the best and worst brand extensions introduced onto the market during a five-year period (Study 1A) and in lay consumers' evaluations of the fit of hypothetical brand extensions (Study 1B). Using the lexical decision task (i.e., word/nonword judgments) in a semantic priming paradigm, Study 2 demonstrated that thematic extensions such as *Budweiser* chips are processed more rapidly than taxonomic extensions such as *Budweiser* cola. Finally, Study 3 showed that thematic extensions were judged less novel and were evaluated more positively under unconstrained processing, whereas taxonomic extensions were judged less novel and were evaluated more positively under commonality processing.

Theoretical contributions

Our primary aim was to investigate whether recent psychological theorizing on similarity can contribute to brand

[10] An anonymous reviewer suggested an alternative explanation of results in the commonality condition: If it is easier to list a commonality for a taxonomic extension than for a thematic extension, then that relative processing ease (in commonality listing) could explain the lower novelty and more positive evaluation of taxonomic extensions than of thematic extensions. Although we find this explanation intuitively plausible, other empirical results suggest otherwise. Specifically, some studies reject the premise of this explanation: People frequently list thematic similarities in a commonality listing task even when they are explicitly instructed not to (Wisniewski & Bassok, 1999), and in general thematic similarity is apprehended faster than taxonomic similarity (Estes et al., 2011). Thus, we are aware of no evidence that it is easier to list a commonality for a taxonomic extension than for a thematic extension. Nonetheless, because our study did not include any measure of the ease of listing a commonality, we cannot definitively exclude this possibility.

extension research. Because brand extensions are evaluated largely on fit (Aaker & Keller, 1990), and fit is based largely on similarity (Martin & Stewart, 2001), we reasoned that the dual-process model of similarity might advance our understanding of brand extension in two important ways.

First, the dual-process model offers a novel and parsimonious organization of an otherwise disorganized literature. To begin with, as summarized in Table 1, most of the extant constructs are taxonomic in nature. Many of these taxonomic constructs are conceptualized differently by their proponents, but the dual-process model reveals that they evoke similar neural and cognitive processes in the consumer's mind. For instance, *substitutability* and *transferability* are different concerns for the marketer, but they likely entail highly similar cognitive processing by the consumer. Similarly, the dual-process framework also identifies some abstract constructs as taxonomic even though they do not refer to concrete physical attributes. For example, "prestigious" (Park et al., 1991) and "fashionable" (Bridges et al., 2000) are used to exemplify abstract relations between the brand and the extension product, but both are taxonomic because they refer to shared internal features of the brand and the extension product. Additionally, the dual-process model also identifies several constructs that confound taxonomic and thematic similarities (see Table 1). For instance, Herr et al. (1996) investigated a catch-all construct of *intercategory relatedness*: "The relatedness of two product categories can depend on the similarity of common features, substitutability in providing a common function, or complementarity in a common-usage situation" (p. 139). Other examples that confound taxonomic and thematic similarities are *brand-concept consistency* and *brand-specific associations*, which are defined taxonomically in terms of attributes but were investigated with both taxonomic extensions (e.g., *Timex* calculator, *Froot Loops* waffles) and thematic extensions (e.g., *Timex* batteries, *Nike* thirst quencher). While these constructs provide a wider perspective on brand extension, they fail to differentiate the specific contributions of taxonomic and thematic similarities. Finally, the dual-process model also reveals an imbalance in knowledge: Because prior studies have either neglected thematic similarity or confounded it with taxonomic similarity, the prior literature is largely uninformative about the role of thematic similarity in evaluation (e.g., Batra et al., 2010; Volckner & Sattler, 2006, 2007). Limited research has investigated thematic similarity in brand extension (see Table 1), but those studies did not clearly differentiate thematic extensions from taxonomic extensions, and they did not illuminate the differences in processing and evaluation. Thus, the dual-process model (1) groups together several theoretically distinct constructs that all entail taxonomic similarity, (2) reveals processing confounds among several extant constructs that entail both taxonomic and thematic similarities, and (3) identifies a limitation in knowledge of thematic similarity in brand extension research.

A second important contribution of the dual-process model is its generation of novel predictions and conclusions. From psychological evidence that relational word pairs (e.g., "river trout") are understood faster than featural word pairs (e.g., "rainbow trout"; Estes, 2003b; Gagné, 2000), we predicted that thematic brand extensions would be processed more rapidly (H1), judged less novel (H2), and evaluated more positively (H3) than taxonomic brand extensions. Note that all three of these predictions are counter-intuitive from the marketing perspective, which traditionally espouses taxonomic similarity as the main driver of successful brand extension. We also manipulated processing conditions via a commonality listing method from cognitive psychology (Markman & Gentner, 1993; Markman & Wisniewski, 1997; Wisniewski & Bassok, 1999). We predicted that commonality processing would render taxonomic brand extensions less novel (H4) and more positive (H5) than thematic brand extensions. All of these predictions were motivated by recent psychological research, and all of them were supported by the data.

Managerial implications

The present study is the first to demonstrate differences in the processing and evaluation of taxonomic and thematic brand extensions. These differences have broad implications for managerial practice. To begin with, the results have practical implications for using thematic similarity as a more general branding strategy. They may suggest acquisitions, alliances, and sponsorships across categories that, while taxonomically dissimilar, nevertheless are thematically similar. Consider for instance the acquisition of Kinko's, a print and copy store chain, by FedEx, a parcel delivery company. While taxonomically dissimilar, the two companies were thematically related: FedEx noticed that many of its customers shipped documents that were printed or copied at Kinko's. This acquisition was widely commended by industry experts and has indeed proven successful. Thematic similarity can also be used to create corporate alliances. The Nike+, for example, is a combination of the *Apple* iPod and a *Nike* shoe. *Apple* and *Nike* are taxonomically dissimilar but thematically similar (see also Park et al., 1996). Another practical application is sponsorship. For example, *Louis Vuitton* sponsors The Climate Project, which is Al Gore's organization to promote awareness of climate change. Although taxonomically very different, they are related by a travel theme: Climate change is partly due to emissions from travel, and *Louis Vuitton* manufactures luxury travel goods. *Louis Vuitton*'s sponsorship is an effort to reduce their impact on climate change. Thus, some thematic brand extensions, acquisitions, alliances, and sponsorships are evident in the marketplace, but we suggest that thematic similarity has greater potential than is currently being utilized.

The differential processing ease of taxonomic and thematic brand extensions may also be utilized as a marketing tool (cf. Labroo et al., 2008). Given that thematic extensions are processed relatively rapidly, they may be well suited for advertisements that are very brief (e.g., a 15-second commercial) or in busy contexts (e.g., a banner on a website). Contrarily, because taxonomic extensions tend to be processed more slowly, they may require more thorough (e.g., a 1-minute commercial) or focused advertisements (e.g., a page in a magazine) to be appreciated by consumers. As another example, the current results (and in particular the commonality condition of Study 3) underscore the efficacy of comparative advertising for taxonomic brand

extensions (Zhang & Markman, 1998). For example, when promoting a new product such as *Budweiser* cola, it may be beneficial in the ad to compare it to another taxonomic extension such as *Red Bull* cola. In contrast, thematic brand extensions such as *Budweiser* chips may not benefit to the same extent from comparative advertising, which would likely highlight their lack of taxonomic fit. *Budweiser* might be a valued brewer, and their beer might indeed go well with chips. But upon further thought, producing good chips requires a different set of skills, so it might be best left to experts in that industry. Finally, in addition to utilizing the differential processing ease of taxonomic and thematic extensions, managers could also manipulate that processing ease. With sufficient exposures (i.e., repeated advertisements) or subtle pre-exposures (i.e., product primes), processing ease is facilitated (Labroo et al., 2008). Thus, the relatively slow processing speed of taxonomic brand extensions would presumably be overcome with a sustained advertizing campaign.

Limitations and future research

A limitation of the present research is that the results are restricted to outcome measures, including evaluations of success (Study 1A) and fit (Study 1B), processing speed (Study 2), and novelty, usability, purchase intention, and predicted success (Study 3). These measures provide only limited evidence of underlying processes. For instance, does processing ease mediate evaluations? Is it easier and faster to think of a common usage scenario (as in thematic extensions) than to compare two products (as in taxonomic extensions)? Do taxonomic and thematic brand extensions differentially affect beliefs about the extension product? The present research does not address such questions about potential mediators. Nonetheless, by demonstrating several differences in the processing and evaluation of taxonomic and thematic brand extensions, we believe that this research provides a substantial first step toward understanding consumers' evaluations of these different types of brand extensions.

One promising direction for further research is the hybridization of products. Several recent studies have examined the role of similarity in hybridization (Gibbert & et al., in press; Gibbert & Mazursky, 2009). Most notably, Rajagopal and Burnkrant (2009) primed either featural (taxonomic) or relational (thematic) processing, and then had participants evaluate a hybrid product (e.g., a GPS navigation system+radar detector). They found that featural priming increased the accessibility of and agreement with beliefs about the constituent product (e.g., the radar detector). This finding is consistent with results of the commonality condition in our Study 3, where focusing on commonalities improved participants' evaluations of taxonomic brand extensions. What all of these studies lack, however, is a comparison of taxonomic and thematic hybrid products. Thematically similar products might be hybridized quite successfully, despite their taxonomic dissimilarity.

In demonstrating an appreciation of thematic relations by both branding professionals and lay consumers, the present study suggests good generalizability. However, taxonomic and thematic processing may vary across individuals and across the lifespan (see Estes et al., 2011). Individuals tend to have a natural bias for either taxonomic or thematic processing (Lin & Murphy, 2001; Simmons & Estes, 2008; see also Ahluwalia, 2008; Choi et al., 2007; Monga & John, 2007, 2010). Western cultures, which tend to emphasize the features of objects (see Nisbett et al., 2001), may generally be biased toward taxonomic brand extensions. Eastern cultures tend instead to emphasize the relations between objects (Ji et al., 2004) and hence may be biased toward thematic brand extensions (Ahluwalia, 2008; Monga & John, 2007, 2010). Finally, the preference for taxonomic and thematic processing varies systematically across the lifespan. Whereas young children prefer thematic processing (e.g., Borghi & Caramelli, 2003), with formal education a preference for taxonomic processing develops and dominates from late childhood into older adulthood, at which point a thematic preference re-emerges (Smiley & Brown, 1979). Thus, consistent with other age-related differences in consumer decision-making (Yoon et al., 2009), thematic brand extensions might be particularly appreciated by children and older adults. Collectively, these observations suggest that evaluation of taxonomic and thematic brand extensions may vary considerably across individuals and samples. A limitation of the present research, then, is its lack of a measure of such individual processing biases. Participants in the present study, for instance, were sampled from an Italian university. The fact that they processed thematic extensions more rapidly than taxonomic extensions (Study 2), just like American participants understand thematic word pairs more quickly than taxonomic word pairs (Estes, 2003b; Gagné, 2000), suggests that our participants are similar in processing style to other Western cultures. Nevertheless, the investigation of such individual and cultural factors in taxonomic and thematic processing remains an important direction for further research.

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