Phonetic Symbolism and Brand Name Preference

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Two experiments investigated the effects of phonetic symbolism on brand name preference. Participants indicated preference for fictitious brand names for particular products (or for products with particular attributes) from word pairs that differed only on vowel sound (e.g., front vs. back vowels, or vowel sounds associated with positive vs. negative concepts). Participants preferred brand names more when the attributes connoted by the vowel sounds (e.g., small, sharp) were positive for a product category (e.g., convertible, knife), but they preferred the same names less when the attributes connoted were negative for a product category (e.g., sport utility vehicle, hammer). However, words with negative vowel sounds were least preferred regardless of product category or attribute.

Phonetic symbolism refers to a nonarbitrary relation between sound and meaning. It suggests that the mere sound of a word, apart from its actual definition, conveys meaning. These sounds derive from phonemes, which are the smallest units of sound (e.g., the sound of the letter *p*). Whether sounds are systematically related to certain meanings or their relation is arbitrary has been debated at least since 400 BC. In Plato's dialogue *Cratylus* (Plato 1892), Hermogenes and Socrates discuss this very issue. Hermogenes takes the position that the relation is arbitrary, but Socrates disagrees. Socrates concedes that across all words the relation may sometimes be arbitrary but that *good* words are ones in which their sound and meaning are congruent (see also Fitch 1994; Klink 2000). This debate can also be seen in the works of Ferdinand de Saussure (1916), who argues that the relation is arbitrary, and Otto Jespersen (1922), who argues for a systematic relation.

Although the debate over the existence of phonetic symbolism has a long and controversial history, an impressive amount of evidence has accumulated in its support (see Fitch 1994; French 1977; Nuckolls 1999). More recently, consumer researchers have begun to investigate the utility of phonetic symbolism for the naming of brands (Yorkston and Menon 2004). The purpose of this article is to extend this research by further exploring the implications of phonetic symbolism for constructing brand names. These implications are straightforward. If indeed, as Socrates suggests, "good words" are ones that have a fit between their sound and meaning, then good brand names would likely have this same relation. Two experiments are reported that test these possibilities.

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PHONETIC SYMBOLISM

Previous research on phonetic symbolism is quite extensive and diverse, making its categorization difficult. For the purposes of this article, we focus on vowels and consonants. Although the studies we report deal only with vowel sounds, the comparison with consonants and their effects provides a more comprehensive understanding of phonetic symbolism effects.

Vowels and Consonants

A common method of categorizing vowel sounds is by a front versus back distinction. This distinction refers to where the tongue is positioned when a word is pronounced. Consider the words *tee*, *tin*, and *toot*. When pronouncing *tee*, the tongue is more toward the front of the mouth than it is when pronouncing *tin*. Conversely, when pronouncing *toot*, the tongue is more toward the back of the mouth than it is when pronouncing *tin* (Klink 2000). Thus, with these three words as examples, the front/back distinction can be viewed as a continuum from *tee* to *tin* to *toot* (Yorkston and Menon 2004).

Studies have shown that the front/back distinction is consistently related to a variety of spatial dimensions. For ex-

ample, the front vowel sound tends to be associated with smaller and faster dimensions and the back vowel sound with larger and slower dimensions. In what may be the first controlled demonstration of this effect, Sapir (1929) constructed artificial words in the form of consonant-vowel-consonant that differed only by the middle vowel (e.g., *mil* vs. *mal*). He then told participants that these words referred to tables and asked participants which was the small table and which was the large table. Over 80% of the participants agreed that *mal* (back vowel sound) referred to the large table and that *mil* (front vowel sound) referred to the small table. This pattern held across numerous word pairs juxtaposing the front and back vowel sounds. Moreover, the results were consistent regardless of whether the participants were children, university students, American adults, or native Chinese speakers who also spoke English. Newman (1933), a student of Sapir's, went on to confirm the front/back continuum. He found that as the vowel sounds move from front to back, perceptions of size increase and of brightness decrease. Later studies showed that the effects hold when semantic differential scales rather than choice scales are used (Becker and Fisher 1988; Birch and Erickson 1958) and for many different dimensions (e.g., light/heavy, hard/soft, fast/slow, and angular/round are related to front/back, respectively; for a review, see French [1977]).

Although the majority of research on phonetic symbolism has focused on vowels (perhaps because the number of vowels compared to consonants is much smaller and thus more manageable), similar findings have emerged for sounds generated by consonants. For example, consonants can be classified by the same front/back distinction as vowels, and research has shown that front consonants (as well as vowels) are associated with perceptions of weak and pleasant, and back consonants and vowels are associated with strong and unpleasant (Folkins and Lenrow 1966; Miron 1961). However, more common (and differentiated) classifications of consonants are as fricatives or stops. Fricatives evolve when air flows past the articulators (lips, teeth, tongue), creating friction. Examples are *s*, *f*, and *z*. In contrast, stops are formed when the articulators are completely closed, impeding air flow (e.g., *p*, *k*, *b*). Still another classification of consonants is as voiced or voiceless. Voiced consonants are pronounced with vibrating vocal cords (*b*, *d*), and voiceless consonants are pronounced without vocal cord vibration (*p*, *t*). Research has shown that voiceless consonants are generally perceived as smaller, less potent, lighter, and sharper than voiced consonants, and fricatives are perceived as smaller, lighter, and faster than stops (Folkins and Lenrow 1966; Klink 2000; Newman 1933).

In virtually all of the research mentioned thus far, phonetic symbolism effects have been demonstrated in controlled laboratory experiments using artificial words. The use of artificial words is an obvious attempt to avoid confounds associated with preexisting meanings of words or syllables. However, these effects have also been shown to occur in real language. Jespersen (1922) has noted that back vowels such as the [u] sound in *dull* or *ugh* are very often found in words expressing disgust or dislike (e.g., *blunder*, *bung*, *bungle*, *clumsy*, *muck*), and words beginning with *sl* also tend to have a negative connotation (*slouch*, *slut*, *slime*, *sloven*). Words beginning with *fl* often express movement (*flutter*, *flap*, *flicker*). Across languages and cultures, similarities have also been noted. Words connoting "little" in non-English languages are *kleine* (German), *petite* (French), *piccola* (Italian), and *mikros* (Greek), all of which have front vowel sounds for the initial syllable. The same is true for suffixes. Diminutives in English are made by adding *ie*, in Spanish *ico* and *ito*, and in Italian *ino* (Brown 1958).

Although the examples just provided are merely observational, other studies have provided more rigorous documentation of phonetic symbolism in real languages. For example, Bolinger (1950) documented that roughly half of all English words that begin with *gl* have a visual connotation (e.g., *glance*, *glitter*, *gleam*, *glow*). With respect to the front/back continuum and its relation to judgments of size, Johnson (1967) demonstrated that English words associated with size not only differ by about a 2-to-1 margin in the expected direction when front and back vowel sound words are compared but also conform to the general order noted in Newman's (1933) studies with artificial words. Finally, there is strong evidence that many of these real-language effects may be universal rather than simply culture specific. For example, studies have shown that when participants (e.g., Americans) are asked to guess the meanings of words in languages with which they are unfamiliar (e.g., Japanese), they generally show agreement well above chance (Tsuru and Fries 1933). Studies have also shown that the relation between perceptions of size and the front/back continuum in real languages noted by Johnson (1967) have been documented in over 80% of languages studied (Ultan 1978; for a more comprehensive review, see Shrum and Lowrey [2007]).

Phonetic Symbolism and Brand Names

As noted earlier, the implications of phonetic symbolism for brand names are relatively straightforward. If sounds do convey certain types of meaning, then perceptions of brands may be enhanced when the fit between the sound symbolism and the product attributes is maximized. A number of studies have demonstrated that the fit between a product category and brand name can affect variables such as recall, preference, and inference (Lowrey, Shrum, and Dubitsky 2003; Meyers-Levy, Louie, and Curren 1994; Pavia and Costa 1993; Saegert and Young 1983). Other research indicates that consumers have a general, but often poorly defined and articulated, notion that particular brand names and products fit together (Zinkhan and Martin 1987).

Recent research has begun to provide evidence that phonetic symbolism effects may indeed transfer to brand naming applications. These studies have borrowed directly from the concepts and methods introduced by the initial Sapir and Newman studies in an effort to isolate particular effects. One of the first was by Heath, Chatterjee, and France (1990). They systematically varied artificial words on whether the

initial consonants were stops or fricatives, and whether the vowel sounds were front or back (e.g., *Sige*, *Suge*, *Kige*, *Kuge*). They had participants indicate their perceptions of hardness, brand attitudes, and purchase intentions. The results showed a general (although sometimes only marginally significant) effect for both the consonant and vowel sounds. Both stop consonants and front vowels were associated with perceptions of harshness to a greater degree than were either fricatives or back vowels. However, these perceptions did not appear to translate into brand attitudes or purchase intentions in any consistent way.

Since the Heath et al. (1990) study, other research has investigated the link between phonetic symbolism and perceptions, and between these perceptions and product preference. Two sets of studies in particular are worth noting. Klink (2003) reported two studies that addressed the relations among sound symbolism, shape of the brand mark (logo), and brand liking. In the first study, Klink found that front vowels in brand names were more associated with lighter colors than were back vowels. The same pattern was also noted with fricatives and stops, respectively. Moreover, he found that front vowels and fricatives in brand names were more associated with smaller and more angular shapes than were back vowels and stops. In the second study, Klink showed that the effects of sound symbolism on perceptions of size, shape, and color exhibited an effect on brand liking and perceptions of taste. For ratings of beer, liking and strength of taste were greatest when the effects of size, shape, and color were consistent. That is, the beer was perceived to be stronger, darker, and heavier, and it was also liked better, when the name used a back vowel and the logo was more rounded, darker, and larger.

A second set of studies reported by Yorkston and Menon (2004) addressed whether sound symbolism translates to brand liking and under what conditions. They used two fictitious brand names for ice cream, Frish and Frosh, which differed only on the vowel sound. The [i] sound in Frish is more of a front vowel sound than the [ä] sound in Frosh. They reasoned that because the [ä] sound has been shown to be associated with attributes such as bigger, heavier, duller, and slower (compared to more front vowel sounds; Newman 1933), then the Frosh brand may be more likely to be perceived as smoother, richer, and creamier than the Frish brand name. If so, because these are positive attributes of ice cream, then ice cream with the brand name Frosh should be preferred over ice cream with the brand name Frish. Their results supported these hypotheses. Frosh was indeed perceived to be smoother, richer, and creamier than Frish, and it was also evaluated more favorably.

One additional set of findings pertaining to phonetic symbolism and names that we would like to point out, and which has particular relevance to the present research, concerns sounds that are related to generally negative evaluations. As Jespersen (1922) noted, some sounds seem to be consistently related to concepts such as disgust or dislike, at least within the English language. If this is the case, then names (brand or person) that contain these sounds might also be generally regarded as negative. Smith (1998) attempted to test this hypothesis through an analysis of election data. He hypothesized that if names of candidates contained vowel sounds that are often used to express disgust (e.g., *putrid*, *puke*), then candidates with last names containing such sounds (e.g., Dewey, Buchanan) might be less favorably perceived than other candidates with better-sounding names. To test this hypothesis, he analyzed U.S. presidential election outcomes, beginning in 1824 (when the popular vote was first recorded) through 1992. He constructed a "comfort index" that combined three phonetic dimensions (vowel sound, consonant sound, and rhythm), each of which contained several subdimensions. All dimensions were then weighted in terms of their negativity. Using this index, he then scored the family names of each of the presidential contenders, with the prediction that the one with the highest comfort index would be the winner.

His results were both enlightening and startling. Of the 42 elections, the candidate with the highest comfort index won the popular vote in 35 of them (83%). He subsequently extended this analysis to local elections in Spokane County, Washington, and found that 73% of the favorably named candidates won their elections. He also showed that the results held for the 1996 U.S. Senate and House elections, in which 65% of favorably named candidates won their Senate elections and 59% won their House elections.

OVERVIEW OF THE EXPERIMENTS

The results of the studies just reviewed are suggestive of the notion that the sounds of words convey meaning, and these various meanings may map onto brand name preference to the extent that the brand names represent Socrates' perception of good words. That is, they are words in which their sound fits with their meaning. One way in which a good fit might be realized is if the meaning of the sound is congruent or complementary to the product attributes. Thus, if the sound of a word connotes harshness (as opposed to softness), the word might be preferred as a brand name for a bathroom cleanser, but the opposite would be true for a skin conditioner. This is the logic used by Yorkston and Menon (2004), in which the [ä] sound in Frosh was more associated with smoothness and creaminess than was the [i] sound in Frish, which presumably led to the former brand being preferred over the latter brand for ice cream.

We were interested in extending the Yorkston and Menon (2004) findings and at the same time increasing their generalizability. First, the Yorkston and Menon study tested for phonetic symbolism effects on brand name preference using one word pair and one product category. To extend these findings and at the same time ensure that the effects are not idiosyncratic to either the word pair or the product category, we used a design that varied either product category (experiment 1) or product attributes (experiment 2) in a way that had opposite implications for the attractiveness of attributes that would be implied by the phonetic symbolism of the words, and we did so using multiple word pairs. Thus, under some product or attribute conditions, the

word with the front vowel sound should be preferred, but under other conditions, the word with the back vowel sound should be preferred. Specifically, in experiment 1, we juxtaposed two-seater convertible (smaller, faster, lighter) with sport utility vehicle (SUV; larger, slower, heavier), and knife (sharper) with hammer (duller). We expected that participants would prefer words with front vowel sounds as brand names over words with back vowel sounds when the product categories were two-seater convertible and knife, but would prefer those very same back vowel sound words as brand names over the same front vowel sound words when the product categories were SUV and hammer. Thus, we expected no main effects but, rather, a crossover interaction between the vowel sound produced by the brand name and the product category.

A second purpose of the two experiments was to test some possible boundary conditions of the front/back distinction noted by Yorkston and Menon (2004) by extending the general logic of Smith (1998) to brand names. Specifically, we wanted to determine whether sounds that are generally considered negative, at least in the English language (e.g., the [yoo] sound in *puke*), might influence preference for brand names over and above the front versus back vowel sound effect. To test this hypothesis, we constructed artificial words that contained this [yoo] sound as well as ones that contained a more generally positive sound (e.g., the [ä] sound in *posh*). Moreover, the two sounds also differ on the front/back dimension, with the [yoo] sound more front and the [ä] sound more back. We then varied the exact same product categories described above (two-seater convertible, SUV, knife, hammer). If the effects of the positive- versus negative-sounding words is as pervasive as Smith's (1998) results suggest, we would expect a main effect for vowel sound and no interaction. That is, we would expect that participants would prefer the generally positive-sounding word as a brand name over the negative-sounding word, regardless of product category.

Finally, to replicate and extend the findings of experiment 1, in experiment 2 we varied the vowel sounds in the exact same way (front/back, positive/negative). However, instead of varying product category, we held the product category constant and manipulated the salience of the attributes associated with that product. We chose a product category (beer) in which the implications of the front and back vowel sounds for favorable product attributes are ambiguous. That is, on the one hand, attributes such as cold, clean, and crisp (which are generally connoted by front vowel sounds) might be considered positive attributes of beer. On the other hand, attributes such as smooth, rich, and creamy (which are generally connoted by back vowel sounds) seem just as likely to be considered positive attributes of beer. Thus, in experiment 2, we expected the same pattern of results noted in experiment 1, but as a function of the attributes we made salient rather than the product category. We expected that words with front vowel sounds would be preferred as brand names for a beer described as "cold, clean, and crisp," but words with back vowel sounds would be preferred when the beer was described as "smooth, mellow, and rich." However, just as in experiment 1, if the positive/negative dimension is pervasive, we would expect a main effect for the positive-sounding words over the negative-sounding words, regardless of the attributes that were made salient.

EXPERIMENT 1

Method

Participants and Procedure. One hundred and thirty-eight undergraduate business students (71 men and 66 women) participated in the study in return for partial class credit. All participants provided written consent to participate. The sessions were conducted in small groups (2–12 participants) in a laboratory equipped with privacy screens.

Participants received a list of 10 word pairs that varied only on the front/back or the positive/negative dimension. The order of presentation was counterbalanced. Participants were asked to indicate their preferences between each word pair as brand names for only one product (two-seater convertible, SUV, knife, or hammer). Thus, phonetic symbolism was a within-subjects factor, and product category was a between-subjects factor. Assignment to groups was random. After indicating their preference for the words as brand names, participants provided general demographic information, including whether English was their first language. Next, as a manipulation check, participants rated the words (brand names) using a series of seven-point semantic differential scales (e.g., heavy/light, good/bad, etc.). Finally, participants were asked to provide their impressions of the purpose of the study. Following the study, all participants were debriefed.

Stimuli. Artificial words were used in order to avoid obvious semantic associations. Two-syllable words were used for the same reason. Single-syllable words, even fictitious ones, often closely resemble real words or have associations as prefixes. (For example, *mal*, from the Sapir [1929] study, could be associated with a mall [large], or with a negative prefix, as in malcontent or maladaptive.) Extensive pretesting was conducted to arrive at a set of six word pairs that differed only on whether the words produced front or back vowel sounds, and at a set of four words that differed on whether the vowel sound produced was generally associated with negative or positive concepts. The six word pairs were adapted from both Yorkston and Menon (2001) and Klink (2000) and juxtaposed the front vowel sound of [i] with the back vowel sound of [ä], as follows: *gimmel*/*gommel*, *brimley*/*bromley*, *nillen*/*nallen*, *tiddip*/*toddip*, *sittal*/*sottal*, and *pinner*/*ponner*. The four positive/negative word pairs juxtaposed the [ä] and [yoo] sound: *pawdex*/*pewdex*, *mawlad*/*mewlad*, *fawtip*/*fewtip*, and *kawlan*/*kewlan*. Pretesting confirmed that when pronounced or heard, the words were perceived to sound as intended.

Product categories were also pretested to ensure a selection of products that differed on the important dimensions of size, weight, speed, and sharpness. Two general product

categories were selected: automotive vehicles and tools. For automotive vehicles, two-seater convertibles and SUVs were selected as opposites (small vs. large, light vs. heavy, fast vs. slow). For tools, knives and hammers were selected as opposites (light vs. heavy, sharp vs. dull).

Results and Discussion

Manipulation Checks and Order Effects. Only native English speakers were included in the analyses, resulting in the dropping of 15 participants. One additional participant was excluded because of incomplete data, leaving 122 participants whose data were analyzed. No participants guessed the true purpose of the study. Word pair order had no effect on name preference; thus, the results were pooled across order conditions. There were no effects of any of the demographic variables. We also analyzed the semantic differential data to confirm that the vowel sounds had their intended effects. For words used to test the positive/negative dimension (e.g., *pawdex* vs. *pewdex*), the words with the [ä] sound were rated as more positive (good/bad, pleasant/unpleasant) than words with the [yoo] sound (all p's $< .05$). For words used to test the front/back vowel sound dimension (e.g., *tiddip* vs. *toddip*), words with front vowels sounds were rated as lighter, sharper, and smaller than words with back vowel sounds (all p's $< .05$).

Front versus Back Vowel Sound Effects. Because front vowel sounds tend to be associated with attributes such as faster, smaller, and lighter, we expected that words with front vowel sounds would be preferred as brand names over words with back vowel sounds when the product was a two-seater convertible or a knife, but that just the opposite would be the case when the product was an SUV or a hammer. To test for these possibilities, we first created continuous dependent variables that represented the proportion of front and back vowel sound words chosen for each product category. (Thus, if a person preferred two back vowel words out of the possible six, the person received a score of .33, or 33%.) We then conducted a 2 (vowel sound) × 4 (product) analysis of variance (ANOVA), with vowel sound a within-subjects factor and product a between-subjects factor.

The results of this analysis can be found in the top half of table 1. As expected, front vowel sound words were preferred over back vowel sound words when the product was a two-seater convertible (63% vs. 37%) or a knife (66% vs. 34%), but back vowel sound words were preferred over front vowel sound words when the product was an SUV (70% vs. 30%) or a hammer (66% vs. 34%). This interaction was significant ($F(3, 117) = 24.18$, $p < .001$). No main effects were observed ($F < 1$). Separate t-tests confirmed that the differences between each product were significantly different (all p's $< .001$, one tailed).

Positive versus Negative Vowel Sound Effects. Unlike the predicted interaction between front/back vowel sounds and product category, the positive versus negative hypothesis predicts a main effect for positive vowel sounds over negative vowel sounds. Data bearing on this proposition can be found in the bottom half of table 1. The results suggest that the positive/negative effect does in fact override the front/back effect. The main effect for vowel sound was significant ($F(1, 118) = 32.60$, $p < .001$), but the interaction was not ($F(3, 118) = 1.70$, $p = .17$). The positive vowel sound words were preferred for all product categories: convertible (61% vs. 39%), SUV (71% vs. 29%), knife (59% vs. 41%), and hammer (71% vs. 29%). Separate t-tests indicated that each of the contrasts within product category were significantly different (all p's $< .04$, one tailed).

Our expectation that the positive vowel sounds would be preferred over negative ones was confirmed. As noted earlier, implicit in this prediction is that the positive versus negative dimension would dominate over the front versus back vowel sound dimension. That is, although the [yoo] sound (e.g., *kewlan*) is more of a front vowel sound than the [ä] sound (e.g., *kawlan*), which would generally lead to the interaction with product category observed in the top half of table 1, we expected that positive-sounding words would always be preferred over negative-sounding words. Although the failure to observe a product by vowel sound interaction suggests confirmation of this hypothesis, a closer inspection of the data reveals a pattern. Specifically, for the products in which the front vowel sound would generally be preferred (convertible, knife), the preference for the positive-sounding words as brand names is about 11 percentage points lower (60% vs. 71% on average) than the preference for the positive-sounding words for products in which back vowel sound words would generally be preferred (SUV, hammer).

TABLE 1

EXPERIMENT 1: BRAND NAME PREFERENCE AS A FUNCTION OF VOWEL SOUNDS AND PRODUCT CATEGORY

Product category	Front versus back vowel sound dimension	
	Front vowel words preferred (%)	Back vowel words preferred (%)
Convertible	63	37
SUV	30	70
Knife	66	34
Hammer	34	66
	Positive versus negative vowel sound dimension	
	Positive vowel words preferred (%)	Negative vowel words preferred (%)
Convertible	61	39
SUV	71	29
Knife	59	41
Hammer	71	29

NOTE.—SUV = sport utility vehicle. All contrasts between front and back vowel words preferred (%) are significant at $p < .001$ (one tailed), and all contrasts between positive and negative words preferred (%) are significant at $p < .04$ (one tailed).

This suggests that the front/back distinction may temper somewhat the effect of the positive/negative dimension.

To determine if the phonetic effects of positive versus negative vowel sounds are significantly tempered by the front/back distinction, we recoded the products such that the convertible and knife comprised one group (small, sharp) and the SUV and hammer comprised the other (large, dull), and we conducted a 2 (product) × 2 (vowel sound) ANOVA. The results showed a significant interaction ($F(1, 120) = 5.12$, $p = .025$). The positive-sounding (and back vowel) words were preferred more for the slow, dull group (71% vs. 29%) than they were for the small, sharp group (60% vs. 40%).

Overall, the results were supportive of our theoretical reasoning. Sounds of words appear to convey meaning apart from the denotative meaning of the words, and people spontaneously apply these meanings when fitting brand names with products. When the sounds of the words are associated with certain attributes (small, sharp), the words are preferred as brand names for products in which those attributes are favorable (convertible, knife). Conversely, when the sounds of the words are associated with an opposite meaning (large, dull), they are preferred for product categories for which those attributes are considered appropriate (SUV, hammer).

However, we found that the general effects just noted have boundary conditions. We were able to demonstrate that certain sounds are generally considered negative (because they are often associated with sounds of disgust), and this generally negative connotation tends to overwhelm the effects of the front versus back vowel sound distinction. But we also found that the "overwhelming" effect is not total. Although positive vowel sound words were always preferred over negative vowel sound words, this effect was greater when the product categories also matched the front/back distinction than when they did not. Thus, we were also able to demonstrate that different types of vowel sounds can themselves interact when the connotations of those sounds diverge.

The general pattern of results replicates and extends previous work on phonetic symbolism and brand name judgments, and it does so in a way that minimizes alternative explanations related to aspects of the words themselves. We not only showed a change in preference between two word pairs as a function of product category but illustrated that the preferences for the exact same words were actually opposite to the extent that the attributes were opposite (i.e., fast vs. slow, etc.). In experiment 2, we were interested in using the same logic to increase confidence further in the validity of the findings. We used the same general design (front/back and positive/negative vowel sounds), but with one change. In experiment 1, we varied the product category and its associated attributes. In experiment 2, we held the product category constant (beer) but manipulated the salience of the attributes of the product in a way that had implications for whether the front or back vowel sound words would be preferred.

EXPERIMENT 2

Method

Participants, Procedure, and Measures. Eighty-four undergraduate business students (50 men and 34 women) participated in the experiment in exchange for partial class credit. All participants provided written consent to participate. The sessions were conducted in small groups (2–12 participants) in a laboratory equipped with privacy screens.

The procedure and measures were generally the same as in experiment 1. Participants indicated their preference for the brand names by choosing from the same 10 word pairs from experiment 1. However, in experiment 2, the product was held constant and the attributes associated with it were manipulated. Some participants were asked to indicate which word (e.g., *brimley* or *bromley*, *pewdex* or *pawdex*) they liked best as a brand name for a cold, clean, and crisp-tasting beer, whereas other participants were asked to indicate which word they liked best for a smooth, mellow, and rich-tasting beer. Assignment to groups was random. After making these choices, participants provided the same demographic and manipulation check data as in experiment 1. All participants were debriefed.

Results and Discussion

Only native English speakers were included in the analyses, resulting in the exclusion of data for 7 participants, leaving 77 participants whose data were analyzed. No order effects were noted, and no participants guessed the purpose of the study. The manipulation check results were almost identical to those in experiment 1, confirming that the vowel sounds appeared to convey the intended meanings.

Front versus Back Vowel Sound Effects. We expected that front vowel sound words would be preferred as brand names over back vowel sound words when the beer was described as cold, clean, and crisp, but we expected that the opposite would be true when the beer was described as smooth, mellow, and rich. To test these hypotheses, we conducted a 2 (vowel sound) × 2 (attribute) ANOVA, with vowel sound a within-subjects factor and attribute a between-subjects factor. As in the previous experiment, the dependent variables represented the proportion of front and back vowel sound words chosen for each product category.

The results of this analysis are shown in the top portion of table 2. As expected, front vowel sound words were preferred over back vowel sound words (69% vs. 31%) when the product attribute was cold, clean, and crisp, but back vowel sound words were preferred over front vowel sound words when the attribute was smooth, mellow, and rich (58% vs. 42%). The interaction was significant ($F(1, 75) = 27.54$, $p < .001$). Individual contrasts indicated that the predicted differences were also significant (all p's $< .032$, one tailed).

Positive versus Negative Vowel Sound Effects. As with experiment 1, we expected a preference for positive

TABLE 2

EXPERIMENT 2: BRAND NAME PREFERENCE AS A FUNCTION OF VOWEL SOUNDS AND PRODUCT ATTRIBUTE

	Front versus back vowel sound dimension	
Product attribute	Front vowel words preferred (%)	Back vowel words preferred (%)
Cold/clean/crisp	69	31
Smooth/mellow/rich	42	58
	Positive versus negative vowel sound dimension	
	Positive vowel words preferred (%)	Negative vowel words preferred (%)
Cold/clean/crisp	58	42
Smooth/mellow/rich	73	27

NOTE.—Contrasts between front and back vowel words preferred (%) are significant at $p < .001$ (one tailed), and contrasts between positive and negative words preferred (%) are significant at $p < .032$ (one tailed).

vowel sound words over negative vowel sound words regardless of product attribute. This was confirmed by a significant main effect for vowel sound ($F(1, 75) = 29.09$, $p < .001$). Positive vowel sound words were preferred over negative ones for both the cold, clean, and crisp attribute description (58% vs. 42%) and the smooth, mellow, and rich attribute description (73% vs. 27%). Individual contrasts indicated that the predicted differences for the two attributes were both significant (both p's $< .03$, one tailed). However, this main effect for positive- over negative-sounding words was qualified by a sound by attribute interaction ($F(1, 75) = 7.10$, $p < .001$). Just as in experiment 1, the front/back distinction tempered the positive/negative effect somewhat. That is, the size of the preference for positive- over negative-sounding words was less in the cold, clean, and crisp condition (58% vs. 42%) than in the smooth, mellow, and rich condition (73% vs. 27%). As demonstrated in the Yorkston and Menon (2004) study (using ice cream as the focal product), smooth and rich tends to be associated more with back than with front vowel sounds. Because the positive sound is also a back vowel sound, it tends to be less preferred for the opposite type of attributes (cold, clean, crisp). Thus, we find that the positive versus negative sound effect, although pervasive and always preferred, is nonetheless tempered by the implications of the front versus back vowel sound dimension.

GENERAL DISCUSSION

The results of the two studies reported here converge on the same conclusion: the sounds of words can convey meaning apart from their actual definitions, and this meaning can systematically bias perceptions and judgments. We showed that people prefer particular words as brand names when the attributes connoted by the vowel sound of the word are congruent with the attributes of the product. In experiment 1, we demonstrated this by manipulating the product and, thereby, its associated attributes. In experiment 2 we replicated this general finding but held product category constant and manipulated the attributes. Moreover, the effect was typically substantial, with the congruent attribute/sound word usually preferred over the incongruent one by about a 2-to-1 margin.

We also demonstrated that this reliable finding has some boundary conditions. Smith's (1998) work attested to the possibly pervasive effect of a preference for positive-sounding words over negative-sounding words. The results from our two studies are consistent with those findings. When the back vowel sound [ä] was juxtaposed with the front vowel sound [i], the [ä] vowel sound word was preferred only when the attributes implied by that sound (large, slow, dull) had positive implications for the product (SUV, hammer). When they did not (two-seater convertible, knife), the [i] vowel sound was actually preferred over the [ä] by a substantial margin (on average, 66% to 34%). However, when that same [ä] sound was juxtaposed with the negative-sounding [yoo], the [ä] sound word was always preferred as the brand name, regardless of product category.

Having said that, it is also worth noting that the positive/negative effect did not appear to eliminate the front/back effect totally. In experiment 1, although the positive/negative effect was such that (in the aggregate) the positive-sounding word was always preferred over the negative-sounding word, this effect was greater when the implications of the front/back dimension were congruent with the product category (SUV, hammer) than when they were not, with a difference of 11 percentage points on average. This same interaction was also observed in experiment 2, and the magnitude of the difference was similar, though slightly larger (15 percentage points).

The findings of these studies make a number of contributions. For one, they provide an important replication and extension of Yorkston and Menon (2004). Our design used multiple artificial words to operationalize the vowel sounds and used multiple products (and their associated attributes), or manipulated the attributes themselves, for which participants chose their preferred names. Moreover, we manipulated the products in such a way that each of the vowel sounds would be preferred over the other, depending on which product the brand name was for. This design allowed us greatly to reduce alternative explanations for the effects that might be associated with nonphonetic aspects of the words (e.g., orthographic, semantic, etc.).

Although the incremental contribution of replications, particularly ones that focus on methodology, is often considered to be low, within the domain of phonetic symbolism research such replications and increased attention to alternative explanations are not trivial. In fact, research on phonetic symbolism has not only a long but a very combative and controversial history (Bentley and Varon 1933; Taylor 1963; Weiss 1964). As Jenkins (1959, 194) noted some time ago, "phonetic symbolism has been thrown out of psy-

chology and linguistics again and again, but persists in returning when its latest antagonist turns his back." A big part of its various abandonments and reinstatements is the difficulty in conducting tightly controlled experiments that can effectively counter threats to validity. The basis of phonetic symbolism is that each phoneme, each sound, represented by a letter or combination of letters, can convey meaning. Thus, effects of different phonemes can not only be independent and additive but may also interact as well. Testing all of the possible combinations of phonemes is probably implausible, but that does not eliminate them as possible alternative explanations. Moreover, in addition to phonetic effects, there may be other aspects of words that influence perceptions. As just one example, using the *mil* versus *mal* example from Sapir (1929), perceptions of size might be the result of a kinesthetic cue (open vs. pursed lips during articulation) or the appearance of the manipulated vowels (a fat *a* vs. a thin *i*). It was not until experiments showing that the phonetic symbolism effects held for hearing but not deaf participants (who had been taught to speak) that these alternative explanations were addressed (Johnson, Suzuki, and Olds 1964).

A second contribution is the establishment of boundary conditions to the front versus back vowel sound effects noted in this study and others (Klink 2000; Yorkston and Menon 2004). In this case, the boundary condition pertains to a different type of vowel sound (generally positive vs. negative), one that for the most part has received little attention in the phonetic symbolism research. Specifically, we looked at the effects of sounds that are generally considered negative in the English language (Jespersen 1922). We found that the positive/negative distinction was clearly more dominant but that the front/back distinction did appear to temper this dominance. When the words varied on the extent to which they are associated with sounds of disgust, the positive-sounding word was preferred as a brand name regardless of product category. However, the general pattern of preference for the positive-sounding word was somewhat less when the back vowel sound of the positive-sounding word conveyed attributes (slow, dull) that are generally considered negative for the product category (two-seater convertible, knife).

Having made the case for this boundary condition, it is also important that we not overstate it. We used only one negatively associated vowel sound, so it is unclear the extent to which other negatively associated vowel sounds (e.g., the [u] sound in *ugh* or *yuck*) might apply. Likewise, we did not completely cross the front/back distinction with the positive/negative distinction. Our intention was only to look at the extent to which the positive/negative distinction might potentially override the well-documented front/back distinction.

A third contribution is the obvious implications for the naming of brands. New brands are frequently created, and thus so are new brand names. In many cases, brand managers use various linguistic devices to increase the memorability of those names. These devices include the well-documented effects of semantic fit with product attributes (Keller, Heckler, and Houston 1998; Saegert and Young 1983). In many instances, the semantic connotation of the brand name comes from the meaning of the word(s) itself (e.g., DustBuster, Easy-Off, etc.). However, there are also instances in which brand names are not constructed from real words but are simply made up (e.g., Exxon, Lexus, Kodak). Our findings suggest that in these cases, understanding the relation between the sounds generated by vowels and consonants and the meanings that are associated with these sounds would be useful.

The findings of the studies presented here also have important implications for phonetic symbolism research in general. Much of the research on phonetic symbolism has been more direct. For example, in attempting to determine whether sounds convey particular meanings, participants might be asked to rate words that vary in terms of their sounds on various dimensions using semantic differential scales (much like the manipulation check measures used in this study) or to guess the meaning of a word in a foreign language with which they are unfamiliar. In taking these direct measures, researchers are often unable to determine whether the effects actually occur spontaneously in natural settings. In contrast, the more implicit aspects of the design and measures we used suggest that the effects are indeed spontaneous. Participants were not asked to make judgments about the words themselves along particular dimensions (size, speed, dullness, etc.) but instead to simply indicate their preference for words as brand names for particular products (although participants were later asked to make these judgments for manipulation check purposes). By producing results that showed that the preference judgments for the words were a function of the alignment between the concepts implied by certain sounds that have been documented in previous research (e.g., the front/back distinction) and the fit or favorableness of those attributes for a product, we are able to demonstrate the spontaneous nature of phonetic symbolism effects. These findings lend further support to the notion that phonetic symbolism effects are valid rather than artifactual.

Although we attempted to answer a number of questions in this research, there are clearly many unanswered ones. Future research should investigate whether and to what extent sounds other then the [yoo] sound elicit negative perceptions. In addition, looking at the possible combinatory or interactive effects between the sounds connoted by both vowels and consonants is an underresearched area. However, this is also a clearly daunting task, given the number of possible combinations of vowel/consonant, vowel/vowel, and consonant/consonant sounds (and their corresponding implications). It seems clear that some sort of metric would need to be devised that could measure the relative implications of various vowel and consonant sounds.

Another possibility for future research would be to address whether the effects noted in these studies are universal or are language or culture specific. Certainly, the research on the front/back vowel sound distinction strongly suggests that, if not universal, the effect clearly spans language and culture (Ultan 1978). Indeed, preliminary findings from

studies seeking to replicate the ones presented here in other languages (e.g., French, Mandarin, and Spanish) suggest that the effects do hold in non-English languages (Lowrey, Luna, and Lerman 2006). However, whether the generally negative/positive distinction also holds is an open question. Little research has addressed this particular sound distinction, so at the least the same systematic studies that show the interrelations among vowel sound, word meaning, and word frequency would need to be conducted. Moreover, words used to express disgust (or ecstasy) not only vary greatly across languages but may also vary across cultures within the same language (e.g., British vs. American). Clearly, much research needs to be done to determine whether these types of sound symbolism effects are universal.

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