CHAPTER 3

Sounds Convey Meaning: The Implications of Phonetic Symbolism for Brand Name Construction

L. J. Shrum
Tina M. Lowrey
University of Texas at San Antonio

When brand managers are confronted with the task of constructing brand names for new products, they undoubtedly face a complex and difficult task. Few would disagree that a brand's name can have a huge impact on the success of the brand. In fact, in one notable example (the Ford *Edsel*), the general pervasive dislike for the brand name has been suggested as a major reason for the product's failure (Hartley, 1992; Klink, 2000). It is thus no surprise that brand name construction and testing is itself a big business (Kohli & LaBahn, 1997) and few companies would choose a brand name these days without extensive testing.

But how does a brand manager get started in both generating and choosing among brand names? One obvious way is a semantic approach that looks at the meaning of particular words or syllables (for a review, see Lerman, chap. 5 in this volume). This strategy attempts to create meaningful brand names by choosing those that say something about the product category (e.g., *Newsweek*, Juicy Juice®) or about attributes that the product possesses (e.g., Mop & Glo®, Eveready®). These techniques have been shown to influence marketing and advertising effectiveness measures such as brand name recall and product preference (Keller, Heckler, & Houston, 1998; Lowrey, Shrum, & Dubitsky, 2003; Meyers-Levy, Louie, & Curren, 1994). It seems reasonable to suppose that brand managers would likely focus on just such techniques.

There are also quite a number of nonobvious, nonsemantic ways in which words can convey both meaning and distinctiveness. Some examples include phonetic devices such as rhyming, vowel repetition, and alliteration, orthographic devices such as unusual spellings or abbreviations, and morphological devices such as the com-

pounding or blending of words (see Vanden Bergh, Adler, & Oliver, 1987, for a comprehensive list and brand name examples). This chapter focuses on one of those nonobvious and nonsemantic devices, *phonetic symbolism*. Phonetic symbolism refers to the notion that the mere sound of a word, apart from its semantic connotation, conveys meaning. This notion has been speculated on and debated at least as far back as Plato. Empirical research on phonetic symbolism also has a long history and has itself generated quite a bit of controversy and debate, whether it be in terms of demonstrating the presence of the effect in a language, the generalizability of the effect across languages, or the underlying origin and mechanisms of the effect. In recent years, this research has been extended to the application of phonetic symbolism in constructing brand names.

The purpose of this chapter is twofold. First, it reviews in depth the research on phonetic symbolism, focusing on the different types of perceptions induced by various sounds, the nature of the evidence for and against these effects, and the generalizability of the effect. A thorough knowledge and understanding of previous research should be useful for researchers interested in applying these principles to marketing situations. Second, it extends this discussion to cover research that has specifically looked at phonetic symbolism and its implications in a marketing context. We discuss in detail previous empirical work that has looked at the effects of phonetic symbolism on brand name preference.

EMPIRICAL EVIDENCE FOR PHONETIC SYMBOLISM

Phonetic symbolism is simply the notion that phonemes can convey meaning on their own, apart from their configuration in words. Phonemes are the smallest unit of sound (e.g., the sound of the letter *t*) and form the basic building blocks of language. Phonetic symbolism might be best understood in terms of its opposite, that the sounds of words are arbitrary conventions. This debate has its origin at least from 400 B.C. In Plato's dialogue, *Cratylus* (Plato, 1892), Hermogenes asks Socrates if the sound of a word is merely arbitrary (Hermogenes believes that it is) or if the relation between a word's sound and its meaning is, well, meaningful. Socrates argues that, although the relation between the sound and meaning of some words may indeed be arbitrary, *good* words are those in which their sounds fit with their meaning (see also Fitch, 1994; Klink, 2000). This debate reemerges in the works of de Saussure (1916), who argues for the arbitrary relation, and Jespersen (1922), who argues for a meaningful relation.[1]

There are, of course, clear instances in which sound does convey meaning (and even Saussure would agree, but consider it to be an aberrant case), such as words

[1]In an amusing application of another linguistic device-metaphor—the debate between arbitrariness and meaningfulness of the sound–meaning relationship has been termed a conflict between the Juliet Principle (from Shakespeare's *Romeo and Juliet*, "that which we call a rose, by any other name would smell as sweet") and the Joyce Principle (in reference to James Joyce's frequent use of phonetic symbolism in his works; see Collins, 1977).

that are likely purposely constructed to convey that relation (e.g., cockadoodledoo, kerplunk, hiss). These words that imitate sounds are referred to as onomatopoeia. Apart from these obvious (and intended) relations, as Saussure believed, it seems unlikely, if not farfetched, that languages could develop such systematic nuance. Yet, the empirical research on the topic, although not without its share of controversy, tends to suggest otherwise. As we detail in the following sections, although all of the specific causal mechanisms have yet to be uncovered, the demonstrations of phonetic symbolism, both within and across languages, have been impressive.

The research on phonetic symbolism takes a variety of forms, differing on dimensions such as experimental control, universality of effects, and types of sounds or phonemes that are investigated. In fact, these dimensions are often constantly overlapping, making categorization somewhat difficult. Nevertheless, there are some general classifications that may be useful.

Vowels and Consonants

One convenient distinction for phonetic symbolism research is vowels versus consonants. By far the most research has focused on vowels, perhaps because the small number (relative to consonants) is more manageable. Vowels are generally categorized on a front versus back distinction. This distinction refers to the position of the tongue during pronunciation. For example, the highest position of the tongue is more toward the front of the mouth for *bee* than for *bin*, and more toward the back for *boot* than for *bin* (Klink, 2000).

Evidence for phonetic symbolism is provided by studies that have shown that the front–back distinction is consistently related to a variety of spacial dimensions. In what appears to be one of the first controlled demonstration of this effect, Sapir (1929) gave participants nonsense (artificial) words in the form of consonant-vowel-consonant that differed only in the middle vowel (e.g., *mil* vs. *mal*). He then gave participants an arbitrary referent ("these are tables") and asked them to indicate which was large and which was small. The participants showed over 80% agreement across a large number of word pairs in their association of the back vowel sound (e.g., *mal*) with a large table and the front vowel sound (e.g., *mil*) with a small table. The results were consistent regardless of whether the participants were children (ages 11–18), university students, American adults, or Chinese speakers. In a second experiment, he found similar results on judgments of size and speed.

Following Sapir's (1929) study, other research extended the range of the front–back distinction to include more vowels. Sapir's student, Stanley Newman (1933), was able to show that the vowel sounds could be ordered along a continuum of implied size (e.g., the sounds [ē][2], [i], [ô], as in beat, hit, posh). As the vowel sounds move from front to back, perceptions of size increase. He also found similar

[2]The symbols used to denote sounds come from Webster's New World Dictionary (3rd college ed.).

results on judgments of brightness (front vowels are associated with greater brightness than back vowels). Both Birch and Erickson (1958) and Becker and Fisher (1988) extended this research using semantic differential scales (rather than choice). Numerous other studies have since shown that the front–back distinction is related to judgments of many different dimensions (e.g., hard–soft, angular–round, fast–slow, light–heavy, with front vowels more associated with the first word in each pair; for a review, see French, 1977). One caveat is worth noting, however. The results appear to hold only when participants are directed toward particular dimensions (which is larger, which is faster, etc.). When participants are given nonsense words varying in their sound and asked to spontaneously provide the first thing that comes to mind, evidence for phonetic symbolism is not observed (Bentley & Varon, 1933).

Although more research has focused on vowels, studies have also investigated the phonetic symbolism associated with various consonant sounds. Consonants, like vowels, can be classified on the front–back distinction. Studies of sounds related to consonants tend to show the same pattern of effects as vowels. For example, Miron (1961) found that both front vowels and consonants appearing in nonsense words tended to be associated with evaluations of "weak" and "pleasant," whereas back vowels and consonants were "unpleasant" and "strong." Folkins and Lenrow (1966) found similar results on the pleasant–unpleasant dimension.

Although the front–back distinction has been used for consonants, a classification based on a different articulatory position is actually more common. Consonants are typically categorized as either fricatives (spirants) or stops. Fricatives are formed by allowing air to flow past the articulators (lips, teeth, tongue), which creates friction. Examples of fricatives are *s*, *f*, and *z*. Stops, however, are formed from the complete closure of the articulators, which impedes air flow. Examples include *p*, *k*, *t*, *b*. In addition, consonants are also further categorized as either voiced or voiceless. Voiced consonants are produced with the vocal cords vibrating (*b*, *d*) and voiceless consonants are pronounced without vocal cord vibration (*p*, *t*). Note that the two dimensions (stop–fricative, voiced–voiceless) are orthogonal, and thus one has voiced and voiceless fricatives and voiced and voiceless stops. This somewhat lengthy explanation of categorization leads to a less lengthy observation: Voiceless consonants tend to be perceived as smaller (Klink, 2000; Newman, 1933), less potent (Folkins & Lenrow, 1966), and lighter and sharper (Klink, 2000) than voiced consonants, and fricatives tend to be perceived as smaller, faster, and lighter than stops (Klink, 2000). However, this categorization is not completely clear, as Klink (2000) did not manipulate the two dimensions orthogonally. Moreover, some variation within the stop consonants appears to exist. Taylor and Taylor (1962) found that *t* and *p* were perceived by English speakers to be small sounds, and *g* and *k* were perceived as large sounds; Greenberg and Jenkins (1966) found differences between voiced and voiceless consonants, and between stops and fricatives, for some dimensions but not others.

Artificial or Natural Language?

Another way in which research on phonetic symbolism can be divided is based on whether the studies use artificial, or nonsense, words or natural language. The use of artificial words has obvious merits in that it can control for semantic meaning associated with those words. Such studies, many reviewed in the previous sections, generally find that there is a high level of agreement between participants on the connotation of words with certain types of vowels (i.e., back vowels are associated with bigger size). However, for the most part, these studies investigated the effects within one language, usually English.

To provide confidence that phonetic symbolism is a real phenomenon, it seems reasonable to expect there to be some evidence in real language. But, obtaining this evidence in a rigorous manner poses some important threats to internal validity. For example, examination of certain types of words suggests a relation between sound and meaning. As noted by Jespersen (1922), back vowels such as the [u] sound in *dull* are very often found in words expressing disgust or dislike: "blunder, bungle, bung, clumsy … sloven, muck, muddle …" (p. 26). Words beginning with *fl* are often found in words expressing movement (e.g., flutter, flap, flit, flicker) and words beginning with *sl* often have a negative connotation (slouch, slut, slovenly, slime; Fitch, 1994; Jespersen, 1922). The same exercise can be undertaken to suggest a shared effect of phonetic symbolism across languages and cultures. Words for *little* in other languages are *kleine* (German), *mikros* (Greek), *petite* (French), *piccola* (Italian). Diminutives in English are made by adding *ie*, in Spanish *ico* and *ito*, in Italian *ino* (Brown, 1958).

Of course, these words or endings may simply be the ones that come most quickly to mind but do not necessarily indicate actual frequency biases, and there are always counterexamples (e.g., *big*). But, other studies have provided more rigor in testing these hypotheses. Newman (1933) took words from *Roget's Thesaurus* with meanings associated with size and compared the counts in terms of their relation to vowel sounds. Although Newman's initial conclusion was that there was little systematic relation between the meaning and the vowel sounds, a reanalysis of the data (Johnson, 1967) showed that the size words not only differed greatly when the farthest back and farthest front vowels were compared (by about a 2:1 margin) but that the order was similar to those found in Newman's experiments with nonsense words. Johnson (1967) replicated this effect, but this time had participants write down all the words they could think relating to either smallness or largeness. He then compared the frequency of words with their vowel sounds. The same order as previous studies emerged, and the differences between vowel sounds were even more dramatic than Newman's. Other studies have shown that there does appear to be a more than arbitrary relation between the use of particular consonants or consonant pairs. 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*).

Although these results are suggestive, it is difficult to address the issue in an exhaustive manner. One way to bridge the gap between experimental control and still use natural language is to test whether participants who speak one language agree on the meaning of words in another language when the words differ in their sounds. A number of studies have provided evidence of this effect. Tsuru (1934; see also Tsuru & Fries, 1933) had undergraduates who were native English language speakers read a list of Japanese language antonym pairs that had been translated into Roman characters (the words were also read out loud by a native Japanese speaker), and match the pairs to English equivalent pairs. The results showed that not only did the participants show very high agreement in their choices, but their level of translation accuracy was also remarkably high (69%). The same results have been replicated frequently (e.g., Brown, Black, & Horowitz, 1955; Weiss, 1963, 1966) in languages that are closely related (e.g., Indo-European languages such as English and German) and in languages that are historically unrelated (English and Japanese, English and Korean, English and Hindi, etc.). The results have also been replicated across all ages, including children as young as age 4 (Roper, Dixon, Ahern, & Gibson, 1976). However, for certain languages, the supportive results have not been obtained (e.g., Navajo: Atzet & Gerard, 1965; Hawaiian: Roper et al., 1976). Finally, the results have been replicated using native speakers other than English (e.g., Japanese, Chinese, Thai: Huang, Pratoomraj, & Johnson, 1969) and across numerous dimensions (Becker & Fisher, 1988). However, it is worth noting that this effect tends to be observed only when one of the pairs of antonyms is in the participant's native language. When participants must indicate which of two foreign word pairs (e.g., Japanese and Croatian) are similar, they perform no better than chance (Maltzman, Morrisett, & Brooks, 1956). The findings make sense in light of the Bentley and Varon (1933) findings that people do not spontaneously provide perceptions of dimensions. Rather, some understandable anchor is needed (e.g., same language).

Culture-Specific or Universal Effect?

Quite a bit of debate has been generated on whether phonetic symbolism is culture-specific or a universal effect across languages. It is an important debate because it has implications for the underlying mechanisms, which we discuss in the next section. Evidence for at least a culture-specific phonetic symbolism is very strong. The high level of agreement for within-culture participants on dimensions such as size, speed, hardness, and so forth, suggests that a particular language seems to have recognizable associations between sound and meaning. So too do the studies that show that same-language participants agree highly with the meaning of foreign words. The studies show that this effect can be obtained in most (but not all) languages.

What is particularly intriguing for the universality hypothesis is the results showing that not only do participants show a high level of agreement on what words

in other languages mean (when prompted with appropriate dimensional guides), but they are also almost always correct at a rate better than chance. Recall that in the Tsuru (1934) study, English language participants guessed the meaning of Japanese words 69% of the time, and in Brown et al. (1955) they were correct on Hindi and Chinese words almost 60% of the time. A culture-specific hypothesis has difficulty accounting for such results. In addition, this type of evidence for phonetic symbolism has been shown across a large number of languages, regardless of whether the languages are historically related. However, as noted earlier, there are some instances (Hawaiian, Navajo) in which no effects were found. Although this calls into question the complete universality of the effect, such negative findings may be useful in understanding how the effect occurs.

A number of studies have shown that the same sound–meaning relations noted in the English lexicon also tend to appear in a vast number of languages. Fitch (1994) selected a language from each of the major language phyla (but excluding Indo-European), for a total of 16 languages. He then consulted sources of vocabularies (e.g., dictionaries) to obtain word pairs pertaining to size (e.g., big–small, huge–tiny) and noted whether the words for big versus small conformed to the front–back distinction (he called them short vs. long vocal tracts). He found support for phonetic symbolism in 11 of the 16 languages, with the results of the remaining 5 languages being inconclusive. Thus, put differently, in no instance did he find support contradicting the pattern of phonetic symbolism noted by Sapir (1929) and so many others. Other studies have found similar results (Jespersen, 1933; Nichols, 1971). In a more comprehensive study, Ultan (1978) surveyed 136 languages for evidence of the relation between vowel sounds and size. Although some of the languages did not show any conclusive phonetic symbolism for size, for those that did, 83% were consistent with the front–small, back–large relation. Finally, in a study that looked specifically at ethnozoological nouns (as opposed to the more typical adjectives in the studies previously mentioned), Berlin (1994) analyzed a Jivaroan language, Huambisa, and found that smaller birds and fish tend to be named with higher frequency (front) vowel sounds and larger fish and birds named with lower frequency (back) vowel sounds.

Underlying Mechanisms

So what can explain the phenomenon of phonetic symbolism? On the one hand, it is a somewhat difficult concept to grasp. It might be thought of as a form of synesthesia, which refers to cross-modal sensory associations such as hearing in colors. In the case of sound symbolism, the sense of sound might imply another sense or perception (size, brightness, etc.). However, it is unclear how certain degrees within a sense would necessarily become associated with certain degrees within another sense. On the other hand, perhaps it is not that difficult to grasp at all. Onomatopoeia—sound imitating sound—is straightforward and uncontroversial. Perhaps sound symbolism is a more subtle extension of this relation in which sound

is used to represent nonacoustic perceptions. Ullmann (1966) calls this "secondary onomatopoeia." Some scholars have echoed Socrates' argument that these learned associations essentially make for "good words" and thus tend to get selected for as a language evolves, thereby moving our language to greater and greater use of symbolic words (Brown et al., 1955; Jakobson & Waugh, 1979; Jespersen, 1922).

Although this general explanation provides a framework for understanding why phonetic symbolism might exist, it does not tell how the association comes about. This question has also generated a number of speculations. Unfortunately, many of these explanations are difficult to untangle. Consider the most consistent finding in the literature: The [i] vowel sound in *mil* connotes smallness relative to the [a] sound in *mal*, which is more associated with largeness. Both Sapir (1929) and Newman (1933) suggest that this relation might be due to the fact that the "volume" of certain vowel sounds is greater than others (Sapir, 1929, p. 235). For higher front vowels, in which the tongue is higher and at the front of the mouth, the resonant cavity is small relative to back vowels, in which the tongue is lower and toward the back of the mouth (Pinker, 1994). But this difference in resonant cavity itself produces differences in amplification of frequencies (front vowels produce small cavities, which produce higher formant frequencies).

From these two explanations only, it is unclear whether it is a physiological effect or an acoustical effect. Some research seems to suggest that it is likely a frequency (acoustical) effect. This research has looked at the effects of varying either the formant frequencies of pronounced words or varying pure tones that participants hear. The findings from this extensive program of research show that higher frequencies exhibit consistently different associations than lower frequencies, and these differences are similar to those found with front versus back vowels. For example, lower frequencies are generally associated with larger, rounder figures, and higher frequencies associated with smaller, angular features (O'Boyle & Tarte, 1980; see also Tarte, 1982), and this pattern has been found for speakers of Urdu as well as speakers of English (O'Boyle, Miller, & Rahmani, 1987).

A recent investigation of the formant frequency hypothesis posed another possibility: Differential perceptions of size associated with the front and back vowels may be evolutionary. Fitch (1994) was interested in investigating the connections between vocal tract length, formant dispersion, and perceived body size. He reasoned that perhaps it is not frequency per se, but the size of the vocal tract (which is positively correlated with formant dispersion) that predicts body size. He provided supportive data for this hypothesis by showing that vocal tract length correlates with body size in rhesus macaques (Fitch, 1997). In experiments with humans, using synthesized vowel sounds and independently varying formant frequency and dispersion, he had participants estimate the body size of the "person" speaking the vowel sound (the sounds were actually synthesized sounds that approximated a human voice). In the first experiment, he found that human participants used vocal tract length (formant dispersion) and formant frequency to estimate body size. In the second experiment, he made the connection to phonetic symbolism by showing

that lengthening the vocal tract while producing the sound of [oo] (as in *boot*) versus [ē] as in *beet* ncreased perceptions of body size by human participants (for reviews, see Fitch, 1994; Fitch & Hauser, 2002). These results suggest that, over time, humans used formant dispersion as a cue to body size. Moreover, because of this attribution, animals also learned to manipulate vocal tract length, and therefore formant dispersion, to increase perceptions of size in listeners when it was advantageous (e.g., during encounters with an enemy). Fitch (1994) supported this reasoning by showing that saki monkeys use lip protrusion (which elongates the vocal tract) during aggressive interactions. Ironically, this method of attempting to appear bigger to others is referred to as lack of "truth in advertising" (Fitch, 1994).

PHONETIC SYMBOLISM AND BRAND NAMES

The implications of the research on phonetic symbolism just reviewed seem very straightforward. If the sounds of words do in fact convey meaning, then that meaning should not only be conveyed by a particular brand name, but may also have implications for the evaluation of the product itself. A number of studies have shown that the congruency or "fit" between a brand name and the product category can increase important marketing variables such as recall, preference, and inference (Chisnall, 1974; Lowrey et al., 2003; Meyers-Levy et al., 1994; Peterson & Ross, 1972). Other research suggests that consumers have a general (but ill-defined and poorly articulated) notion that certain brand names and products fit together (Zinkhan & Martin, 1987). Thus, it seems reasonable to think that if word sounds (apart from their direct semantic associations) induce particular inferences regarding attributes, some word sounds may be more preferable than others for specific products.

Despite the logic of the relation between phonetic symbolism and brand names, it remains an empirical question as to whether or not such effects exist, and if they do, whether or not they are important. In fact, there are ample reasons to think that phonetic symbolism might have little or nothing to do with brand name perceptions. For one, firms spend quite a bit of time and energy in developing brand names (Chisnall, 1974; Kohli & LaBahn, 1997). Because the "suggestiveness" or "meaningfulness" of a brand name has an important impact on memory and perception (Childers & Houston, 1984; Keller et al., 1998; Lutz & Lutz, 1977; Saegert & Young, 1983), names tend to be used that provide direct (e.g., Easy-Off®, Picture Perfect) or indirect (e.g., Lexus being related to luxurious because of the orthographic relatedness of the two words) connections between the brand and its attributes. In such cases, subtle effects of simple sounds may be overwhelmed by other features of the brand names. A second issue is whether the possibly subtle effects of phonetic symbolism get transferred from perceptions that the word or name engenders to perceptions of the product itself and, in turn, whether these perceptions get transferred to marketing variables such as product or brand name preference.

Fortunately, there are a number of studies that provide answers to these empirical questions. Like the basic research in phonetic symbolism, these studies vary from general ones that look at the features of actual brand names in the marketplace, to correlational studies relating frequency of usage and phonetic characteristics, to controlled laboratory studies using artificial and nonsense brand names.

Phonetics in Brand Names

Perhaps one of the first to discuss phonetic symbolism in the context of brand names was Collins (1977), who coined the terms *Joyce Principle* and *Juliet Principle* (noted earlier) to describe the pro- and anti-phonetic symbolism arguments, respectively. In fact, Collins discusses in detail the early findings of Sapir (1929) and Newman (1933) and speculates on their implications for brand name perceptions. Other researchers have focused on the peculiar nature of certain consonants and, in particular, the letter *k*. Schloss (1981) noted that certain letters appear to occur more often in brand names than one would expect given their base rate of occurrence in all words in the English language. He compiled a list of the top 200 brands of 1979 and found that 54% of the names began with the letters *c*, *p*, or *k*, but only 19% of words in the English language start with those letters. For *k* in particular, 6% of brand names began with *k*, but only 1% of English language words begin with *k*. Vanden Bergh (1990) replicated these findings in a later and larger set of brand names, and Vanden Bergh, Collins, Schultz, and Adler (1984) showed that nonsense words beginning with stop consonants (also called "initial plosives") are better recalled than words that do not start with initial stop consonants.

Although these findings are interesting, they provide little help in understanding why these effects occur or whether or not they have anything to do with phonetic symbolism. It may be that a letter such as *k* simply looks funny, either because of its odd, angular shape, or simply because it doesn't occur that often in the English language. The latter example might cause it to be distinctively encoded (Eysenck, 1979). Indeed, word frequency has been shown to induce such processing (Lockhart, Craik, & Jacoby, 1976) and to enhance the memory of brand names (Meyers-Levy, 1989). In this case, it would be an orthographic rather than a phonetic linguistic device that causes the effect. In a similar manner, the letter *k* is considered a "versatile" letter in that it is infrequently used in the English language but nevertheless is more easily combined with other common consonants than are the other infrequently used letters such as *j*, *q*, *x*, *y*, and *z*. Moreover, because it has the same sound as a "hard" *c*, it provides the opportunity for unusual spellings (e.g,. Kool-Aid), which have been shown to enhance brand name recall and recognition (Lowrey et al., 2003).

Phonetic Symbolism and Perceptions of Product Attributes

Recent research has attempted to address the relation between phonetic symbolism and brand names in a more systematic and controlled manner and, in particular, to

look at how phonetic symbolism may impact the perceptions of a brand's attributes. These studies have borrowed heavily from the concepts and methods employed in the initial Sapir and Newman studies in an effort to tease out and isolate particular effects. One of the first was conducted by Heath, Chatterjee, and France (1990). They systematically varied single-syllable, artificial words on whether the initial consonants were hard (stops) or soft (fricatives), and whether the vowel sounds were high (front) or low (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. The presence of both stop consonants and front vowels caused the product to be judged as harsher than either fricatives or back vowels. However, these perceptions did not appear to translate into brand attitudes or purchase intentions in any meaningful way.

A more comprehensive study of vowel and consonant effects was conducted by Klink (2000). He constructed 124 nonsense word pairs that varied only on one phonetic dimension, either they began with a stop or a fricative consonant (e.g., kobal vs. fobal), or they had either a front or back vowel in the first syllable (e.g., geleve, goleve). He also coded whether the stops and fricatives were voiced or voiceless, allowing for a comparison within each consonant category. Klink then had participants judge the words on a variety of different dimensions within particular product category (e.g., "Which ketchup seems thicker?"). As expected, he found that words with front vowel sounds were considered smaller, lighter (in color), milder, thinner, softer, faster, colder, less bitter, more feminine, lighter (in weight), and prettier than words with back vowel sounds. He found similar results with the stops versus fricatives. Words with initial stops were perceived to be smaller, faster, lighter, and more feminine than words with fricatives (but contrary to predictions, not sharper or harder). Within the voiced versus voiceless contrasts, words beginning with voiceless stops were perceived as smaller, faster, lighter, and sharper than words beginning with voiced stops, and likewise, words beginning with voiceless fricatives were perceived as smaller, softer, and more feminine than words beginning with voiced fricatives.

Phonetic Symbolism and Product Preference

The Klink (2000) studies demonstrated that the same types of phonetic symbolism effects noted in early studies manifest themselves in perceptions of product attributes. In particular, the meaning created by the *sound* of the brand names appears to be used to form impressions of the attributes of that brand. However, it is unclear whether the attribute impressions created through this phonetic symbolism translate into product preference. On the one hand, it is reasonable to think that it might, given that the fit between a brand name and product attributes has been shown to influence product preference (Meyers-Levy et al., 1994). On the other hand, the effects may be so subtle that no such transfer takes place.

Three particular sets of studies since then have attempted to address this very issue. The first is Klink (2003). Two studies addressed the relation between sound symbolism, shape of the brand mark (i.e., logo), and brand liking. In the first study, Klink found that front vowels in brand names tended to be more associated with lighter colors than did back vowels. The same pattern was also noted with fricatives and stops, respectively. Moreover, he found that front vowels and fricatives in brand names tended to be more associated with smaller and more angular shapes compared to 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 was greatest when the effects of size, shape, and color were consistent. That is, the beer was perceived to be stronger, darker, heavier, and was liked better when the name used a back vowel and the logo was more rounded, darker, and larger.

A second set of studies was conducted by Yorkston and Menon (2004) to specifically address whether sound symbolism translates to brand liking and under what conditions. They constructed 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 high, front sound than the [ä] sound in Frosh. They reasoned that because the [ä] sound has been shown to be associated with things being bigger, heavier, duller, and slower (compared to more high, front vowel sounds; e.g., 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, ice cream with the brand name Frosh should also 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. Moreover, Yorkston and Menon were able to make some inferences about the underlying processes, given their experimental design. Along with the sounds of the brand names, they also manipulated the perceived diagnosticity of the brand names (by telling some participants the name was real and others that the name was just a test name), the timing of the diagnosticity information (presented at the same time as the brand name or after the presentation of the brand name), and the cognitive capacity available for processing (having some participants pay attention to the mention of a specific number by the experimenter). Their results suggest that phonetic symbolism is a relatively automatic process but that people can correct for its use when it is not diagnostic (e.g., in the test condition rather than real condition), but then only if they are presented with the diagnostic information at the time they form the initial impression. If they receive information that the brand name is not diagnostic after they form the initial perception based on phonetic symbolism, then they do not go back and correct for that initial impression.

Finally, in a third set of studies (Lowrey & Shrum, 2005), we attempted to build on the Yorkston and Menon (2004) findings and to address some potential ambiguities. For example, the Yorkston and Menon studies used only one brand name pair,

Frish and Frosh. One problem with these names is that structurally they are closely related to real words and thus may bring to mind the semantic meaning of those words. Frish is similar to fish; Frosh is similar to frost or frosty. Both might have implications for naming a product such as ice cream (e.g., negative for Frish, positive for Frosh). Another potential problem lies in the ambiguity of the attributes for the product category. Note that previous research on phonetic symbolism did not look at the attributes of creamy, rich, or smooth, and thus there is no systematic confirmation of this perception. In addition, previous research has shown that the high front vowel in Frish is associated with coldness, which might be considered a positive attribute for ice cream.

Although the pattern of the Yorkston and Menon results suggest that these ambiguities did not present problems for the interpretation of their results, we thought it would be useful to test the same general notion—that phonetic symbolism not only affects perceptions of product attributes, but can also translate into brand name preference—in a more systematic manner. We were also interested in testing another hypothesis relating to sounds associated with disgust or dislike. As discussed earlier, linguistic scholars have noted the link between certain back vowel sounds (e.g., the [u] sounds in *blunder, bungle, muck, yuck*) and words of disgust (Jespersen, 1922; see also Jakobson & Waugh, 1979). To our knowledge, only one empirical study has looked at the implications of this relation. Smith (1998) investigated the effect of name sounds on political elections. He coded the names of candidates on various linguistic dimensions, which he combined to form a "comfort factor." This comfort factor consisted of positive (e.g., stressed middle vowel, two syllables, initial stress) and negative (e.g., stressed high back vowel as in *yuck, phooey*, initial fricative) linguistic signifiers. Thus, *Jackson* would receive a fairly high score and *Hughes* would receive a fairly low score. When he used this analytical technique for all U. S. presidents in races from 1824 (i.e., when popular votes were first recorded) to the present, he found that 35 of 42 (83%) of the winning last names had more positive comfort scores. He also used the technique to analyze the 1995 local elections in Spokane County, Washington, and found that 73% of the winning candidates had more positive comfort scores than their opponents.

To test the general front–back hypothesis and the "disgust" hypothesis, we created two sets of brand name pairs using artificial words. One set was designed to test the same front–back vowel distinction addressed by Yorkston and Menon (i.e., [i] vs. [ä]). A second set was constructed to test a particular sound often associated with disgust, the [y$\overline{oo}$] sound (as in *puke*). The first set consisted of six different word pairs (e.g., *nillen* vs. *nallen*, *gimmel* vs. *gommel*). The second set consisted of four word pairs (e.g., *fewtip* vs. *fawtip*, *mewlad* vs. *mawlad*). Note that the back vowel [ä] sound in *mawlad* is identical to the back vowel [ä] sound in *nallen*.

Next, we constructed a study that would allow for a within-subjects design but not create worry about participant anticipation of the purpose of the study. In the first study, we presented all participants with the two sets of word pairs just described (10 word pairs total; order was counterbalanced) and asked them to choose

which they preferred as a brand name for a particular product category. The important part of the design was that product category was manipulated such that in some cases the attributes implied by a front vowel sound would be positive, but in other cases would be negative. Conversely, the attributes implied by a back vowel sound would be positive for one product category but negative for another.

Recall that front vowel sounds tend to be perceived as smaller, faster, sharper, whereas back vowel sounds tend to be perceived as bigger, slower, duller. Given this, we chose the product categories of SUV, two-seater convertible, hammer, and knife, and manipulated them between groups. Thus, we had a mixed design in which phonetic sound was a within-subjects variable and product category was between subjects. For the front–back vowel contrast, we expected a sound by product category interaction in which back vowel sounds would be preferred as a brand name when the categories were SUV or hammer, and front vowel sounds would be preferred for brand names when the categories were convertible and knife. However, for the words that we expected to have generally negative connotations (e.g., *fewtip* less preferred than *fawtip*), we expected a main effect for vowel sound: Regardless of product categories, the back vowel sound [ä] would be preferred over the sound of [y$\overline{oo}$], which is often associated with sounds of disgust. Note that this implies that the association with sounds of disgust would generally override the symbolism of back vowel sounds in the other word pair set. That is, the [y$\overline{oo}$] sound is actually more of a front vowel than [ä], and thus should be preferred over [ä] for two-seater convertible or knife, if it did not carry the extra "baggage" of association with disgust.

The results of this experiment were consistent with our expectations. First, with respect to the front–back distinction and perceptions, participants perceived the back vowel sounds to differ from the front vowel sounds in the expected ways (thicker, heavier, stronger, duller, etc.). Second, the expected interaction between vowel sound and product category was observed. Brand names with front vowel sounds were preferred over names with back vowel sounds, by roughly a 2 to 1 margin, for the categories of convertible and knife. However, the pattern was reversed when the product categories were SUV or hammer. Brand names with back vowel sounds were preferred over names with front vowel sounds, again by over a 2 to 1 margin. In addition, the pattern of results for the [y$\overline{oo}$] versus [ä] distinction also supported our reasoning. Regardless of product category, the [ä]-sounding words were preferred over [y$\overline{oo}$]-sounding words, again by roughly a 2 to1 margin.

These results provide further evidence of the effects of phonetic symbolism, and also show that the effect sizes can at times be substantial. We conducted an additional experiment to further extend these findings. In the previous experiment, we varied the product category and its associated attributes, and showed that names in which the attributes implied by the vowel sounds (e.g., front vowel = sharp) were a positive fit for a product (e.g., knife) were preferred over names with sounds that implied a poor fit (e.g., back vowel = dull). To provide an even more stringent test, we conducted a second experiment in which we held the product category constant but manipulated the attributes associated with the product. We chose beer because

it has positive attributes associated with both front vowel sounds (cold, clean, crisp) and back vowel sounds (smooth, mellow, rich). We expected that brand names with front vowel sounds would be preferred over names with back vowel sounds when the product was described as a cool, clean, crisp-tasting beer, but the opposite would be true when the product was described as a smooth, mellow, rich-tasting beer (attributes similar to those used in Yorkston and Menon, 2004). Thus, we expected an interaction between vowel sound and product attribute. However, as in Experiment 1, we expected to see only a main effect when the choice involved [y$\overline{oo}$] versus [ä] words, such that [ä] words would be preferred over [y$\overline{oo}$] words regardless of product attributes.

Again, the findings supported our hypotheses. Front vowel sounds were preferred over back vowel sounds for a cool, clean, crisp-tasting beer, but back vowel sounds were preferred over front vowel sounds for a smooth, mellow, rich-tasting beer. In contrast, just as in Experiment 1, the [ä] sound was preferred over the [y$\overline{oo}$] sound regardless of the attributes of the beer. In addition, manipulation checks indicated that relative to the front vowel sound, the back vowel sound was perceived in the manner expected on 15 relevant dimensions. However, the front vowels did not differ from back vowels in ratings of bad–good or pleasant–unpleasant. Conversely, the [y$\overline{oo}$] was rated as more bad and more unpleasant than the [ä], but differed on few other dimensions.

CONCLUSIONS

Based on the body of evidence accumulated to date, it seems evident that phonetic symbolism effects are real and not spurious. Multiple methods have been used to show evidence of the effect: natural occurrence in language, controlled experiments using natural language, controlled experiments using artificial (nonsense) words, studies of multiple languages using those that are both historically related and historically unrelated to each other. Research has also ruled out some alternative explanations, such as the possibility that it is the shape rather than sounds of words that convey meaning (i.e., *mil* might be perceived as more angular than *mal* because of the respective shapes of the vowels), by showing that the phonetic symbolism effects are obtained for hearing participants but not for deaf participants (Johnson, Suzuki, & Olds, 1964). Although any one study often has some limiting flaws, the convergence of the findings provides impressive support for the effects of sound on meaning.

Even if the general notion of phonetic symbolism is a valid one, it is unclear how pervasive or generalizable it is. Clearly, the most evidence has emerged for the relation between front versus back vowels and perceptions of size (and to a lesser degree, brightness). However, as noted earlier, a large number of studies (including two of our own) have shown that the front–back distinction can be extended to perceptions along a number of dimensions. In addition, consonant sounds have also been shown to impart meaning, although the evidence seems to be weaker than for vowels. The

relative lack of evidence for consonants may simply be that because they are more numerous than vowel sounds, they are difficult to study systematically. Moreover, one aspect missing from previous research is how the vowel and consonant sounds either offset or interact with each other. For example, English speakers tend to classify the sounds associated with the consonants *g* and *k* as "big" sounds and the sounds associated with the *t* and *n* as small sounds (Taylor, 1963; Taylor & Taylor, 1962). Couple this finding with the frequently documented association between front vowels and smallness, and between back vowels and largeness, and the ambiguity quickly becomes evident. In fact, this "confound" was pointed out by Taylor (1963) in her comments on Newman (1933). As noted earlier, Newman's list of natural words showed little evidence of phonetic symbolism: There appeared to be little relation between the meaning of the words and their front–back distinction (but as noted earlier, see Johnson's, 1967, reanalysis). However, Taylor (1963) points out that there is actually a significant tendency for Newman's words beginning with *t* and *n* to be related to smallness and *g* and *k* to be related to largeness. Thus, it is unclear in situations that mix the vowel and consonant effects which has the bigger effect, which effects get cancelled, and so forth.

The "almost universal" classification of phonetic symbolism effects also receives some support. Again, the size dimension and its relation to front versus back vowels has received the most study, but the effects have also been shown to hold for a number of dimension perceptions. An abundance of evidence shows consistent findings across languages, regardless of whether the languages are historically related or unrelated. This evidence has been shown both experimentally and in studies of naturally occurring language. The seminal work of Fitch (1994), which linked the perceptions of sounds to survival and evolutionary mechanisms (see also, Morton, 1977), provides further support for the universality hypothesis.

However, notwithstanding Fitch's (1994) research on size and its relation to sound, little work has been able to satisfactorily address the underlying mechanisms. What makes research in this area so difficult is that the origins and underlying mechanisms of sound–meaning relationships may differ across different sounds. For example, simply because the front–back distinction has been linked with evolutionary concepts of survival and defense mechanisms is not sufficient reason to conclude that the possible associations between words beginning with *fl* and movement have similar explanations.

A major impediment to believing in the existence of sound symbolism is that clearly not all words possess it. Of course, that is to be expected, given the relatively small number of sounds compared to the size of the lexicon. However, as others have noted, it is not that all words possess sound symbolism, but as Socrates suggests, it is a hallmark of *good* words. Perhaps Jespersen (1922, p. 398) said it best:

> There is no denying, however, that there are words we feel instinctively to be adequate to express the ideas they stand for, and others the sounds of which are felt to be more or less incongruous with their signification.

This notion of *good* words and *bad* words being rooted in part in sound symbolism provides a useful segué into the sound symbolism and naming of brands. In the general use of language, it may make little difference whether a word's sound fits its meaning as long as the communicators agree on its meaning. An exception would be for literary endeavors (e.g., poems) that rely on sense elements to create mood or meaning. However, for naming brands, the fit may be crucial. There is a rapidly accumulating body of research attesting to the fact that people often make quick, if not unconscious, judgments and decisions on a regular basis, and also often have little understanding of why they make them (Hassin, Uleman, & Bargh, 2004; Kahneman, Slovic, & Tversky, 1982). Thus, a simple incongruence between sound-based perceptions and the brand's positive attributes may be enough for consumers to pass on a potential purchase.

The newly emerging research on the relation between sound symbolism and brand name preference suggests that attention to the sound–meaning relation may be useful for marketers. Certainly, no one would suggest that it is the only, or even the main, determinant in forming impressions of a brand, nor would anyone suggest that a brand be renamed simply because its sound symbolism is incongruent with its attributes, or even negative in general. However, if a new brand name is being developed, attending to sound symbolism features would likely be useful. In addition, in the event that a particularly negative name cannot be changed, the perceptions might be addressed through advertising. This was certainly the strategy for Smucker's® jelly and their slogan "With a name like Smucker's, it has to be good."

In conclusion, the research linking sound symbolism and brand name preference has done two things. First, it has given marketers something relatively simple to consider in developing brand names. Companies clearly test a lot during this process, with a focus on some obvious associations (rhymes, close spellings, etc.). However, some less obvious associations may also come to mind, for reasons that are generally not clear to either the marketer or the consumer. Second, the research that links phonetic symbolism to brand name perceptions and preference also adds importantly to the basic body of work in the field. In fact, these studies take phonetic symbolism a clear step further than any research on phonetic symbolism to date. They show that not only does the sound of words convey meaning, but people use this information in forming judgments. Thus, this work not only extends theory and research in phonetic symbolism, it also bolsters the previous research. That is, the brand name research makes it increasingly difficult to argue against the notion that at least some aspects of the sounds of words convey meaning.

REFERENCES

Atzet, J., & Gerard, H. E. (1965). A study of phonetic symbolism among native Navajo speakers. *Journal of Personal and Social Psychology*, *1*, 524–527.

Becker, J. A., & Fisher, S. K. (1988). Comparison of associations to vowel speech sounds by English and Spanish speakers. *American Journal of Psychology*, *101*, 51–57.

Bentley, M., & Varon, E. J. (1933). An accessory study of "phonetic symbolism." *American Journal of Psychology*, *45*, 76–86.

Berlin, B. (1994). Evidence for pervasive synesthetic sound symbolism in ethnozoological nomenclature. In L. Hinton, J. Nichols, & J. J. Ohala (Eds.), *Sound symbolism* (pp. 76–103). Cambridge, England: Cambridge University Press.

Birch, D., & Erickson, M. (1958). Phonetic symbolism with respect to three dimensions from the semantic differential. *Journal of General Psychology*, *58*, 291–297.

Bolinger, D. (1950). Rime, assonance, and morpheme analysis. *Word*, *6*, 117–136.

Brown, R. (1958). *Words and things*. New York: The Free Press.

Brown, R., Black, A. H., & Horowitz, A. E. (1955). Phonetic symbolism in natural languages. *Journal of Abnormal and Social Psychology*, *50*, 388–393.

Childers, T. L., & Houston, M. J. (1984). Conditions for a picture superiority effect on consumer memory. *Journal of Consumer Research*, *11*, 551–563.

Chisnall, P. M. (1974). Aluminum household foil in the common market: Research for an effective brand name. *Journal of Management Studies*, *11*, 246–255.

Collins, L. (1977). A name to conjure with. *European Journal of Marketing*, *11*, 340–363.

Eysenck, M. W. (1979). Depth, evaluation, and distinctiveness. In L. S. Cermak & F. I. M. Craik (Eds.), *Levels of processing in human memory* (pp. 89–123). Hillsdale, NJ: Lawrence Erlbaum Associates.

Fitch, W. T. (1994). *Vocal tract length perception and the evolution of language*. Unpublished doctoral dissertation, Brown University.

Fitch, W. T. (1997). Vocal tract length and formant frequency dispersion correlate with body size in rhesus macaques. *Journal of the Acoustical Society of America*, *102*, 1213–1222.

Fitch, W. T., & Hauser, M. D. (2002). Unpacking "honesty": Vertebrate vocal production and the evolution of acoustic signals. In A. Simmons, R. R. Fay, & A. N. Popper (Eds.), *Springer handbook of auditory research* (pp. 65–137). New York: Springer.

Folkins, C., & Lenrow, P. B. (1966). An investigation of the expressive values of graphemes. *The Psychological Record*, *16*, 193–200.

French, P. L. (1977). Toward an explanation of phonetic symbolism. *Word, 28*, 305–322.

Greenberg, J. H., & Jenkins, J. J. (1966). Studies in the psychological correlates of the sound system of American English. *Word*, *22*, 207–242.

Hartley, R. F. (1992). *Marketing mistakes* (5th ed.). New York: Wiley.

Hassin, R. R., Uleman, J. S., & Bargh, J. A. (Eds.). (2004). *The new unconscious*. New York: Oxford University Press.

Heath, T. B., Chatterjee, S., & France, K. R. (1990). Using the phonemes of brand names to symbolize brand attributes. In W. Bearden & A. Parasuraman (Eds.), *The AMA educator's proceedings: Enhancing knowledge development in marketing* (pp. 38–42). Chicago: American Marketing Association.

Huang, Y. H., Pratoomraj, S., & Johnson, R. C. (1969). Universal magnitude symbolism. *Journal of Verbal Learning and Verbal Behavior, 8*, 155–156.

Jakobson, R., & Waugh, L. (1979). *The sound shape of language*. Bloomington, IN: Indiana University Press.

Jespersen, O. (1922). *Language: Its nature, development and origin*. London: Allen & Unwin.

Jespersen, O. (1933). Symbolic value of the vowel i. In O. Jespersen (Ed.), *Linguistica* (pp. 283–303). Copenhagen: Levin & Munksgaard.

Johnson, R. C. (1967). Magnitude symbolism of English words. *Journal of Verbal Learning and Verbal Behavior*, *6*, 508–511.

Johnson, R. C., Suzuki, N. S., & Olds, W. K. (1964). Phonetic symbolism in an artificial language. *Journal of Abnormal and Social Psychology*, *69*, 233–236.

Kahneman, D., Slovic, P., & Tversky, A. (Eds.). (1982). *Judgment under uncertainty: Heuristics and biases*. New York: Cambridge University Press.
Keller, K. L., Heckler, S. E., & Houston, M. J. (1998). The effects of brand name suggestiveness on advertising recall. *Journal of Marketing*, *62*, 48–57.
Klink, R. R. (2000). Creating brand names with meaning: The use of sound symbolism. *Marketing Letters*, *11*, 5–20.
Klink, R. R. (2003). Creating meaningful brands: The relationship between brand name and brand mark. *Marketing Letters*, *14*, 143–157.
Kohli, C., & LaBahn, D. W. (1997). Creating effective brand names: A study of the brand naming process. *Journal of Advertising Research*, *37*, 67–75.
Lockhart, R. S., Craik, F. I. M., & Jacoby, L. L. (1976). Depth of processing, recognition, and recall: Some aspects of a general memory system. In J. Brown (Ed.), *Recall and recognition* (pp. 107–123). London: Wiley.
Lowrey, T. M., & Shrum, L. J. (2005). *Effects of phonetic symbolism on brand name preference*. Unpublished manuscript, University of Texas at San Antonio.
Lowrey, T. M., Shrum, L. J., & Dubitsky, T. M. (2003). The relation between brand-name linguistic characteristics and brand-name memory. *Journal of Advertising*, *32*(3), 7–17.
Lutz, K. A., & Lutz, R. J. (1977). Effects of interactive imagery on learning: Application to advertising. *Journal of Applied Psychology*, *62*, 493–498.
Maltzman, I., Morrisett, L., & Brooks, L. O. (1956). An investigation of phonetic symbolism. *Journal of Abnormal and Social Psychology*, *53*, 249–251.
Meyers-Levy, J. (1989). The influence of a brand name's association set size and word frequency on brand memory. *Journal of Consumer Research*, *16*, 197–207.
Meyers-Levy, J., Louie, T. A., & Curren, M. T. (1994). How does the congruity of brand names affect evaluations of brand name extensions? *Journal of Applied Psychology*, *79*, 46–53.
Miron, M. S. (1961). A cross-linguistic investigation of phonetic symbolism. *Journal of Abnormal and Social Psychology*, *62*, 623–630.
Morton, E. W. (1977). On the occurrence and significance of motivation-structural rules in some bird and mammal sounds. *American Naturalist*, *111*, 855–869.
Newman, S. S. (1933). Further experiments in phonetic symbolism. *American Journal of Psychology*, *45*, 53–75.
Nichols, J. (1971). Diminutive consonant symbolism in western North America. *Language*, *47*, 826–848.
O'Boyle, M. W., Miller, D. A., & Rahmani, F. (1987). Sound–meaning relationships in speakers of Urdu and English: Evidence for a cross-cultural phonetic symbolism. *Journal of Psycholinguistic Research, 16*, 273–288.
O'Boyle, M. W., & Tarte, R. D. (1980). Implications for phonetic symbolism: The relationship between pure tones and geometric figures. *Journal of Psycholinguistic Research, 9*, 535–544.
Peterson, R. A., & Ross, I. (1972). How to name new brands. *Journal of Advertising Research*, *12*, 29–34.
Pinker, S. (1994). *The language instinct*. New York: William Morrow.
Plato (1892). Cratylus. In B. Jowett (Ed.), *The dialogues of Plato* (Vol. 1, pp. 253–289). Oxford, England: Clarendon.
Roper, C. W., Dixon, P. W., Ahern, E. H., & Gibson, V. L. (1976). The effect of language and sex on universal phonetic symbolism. *Language and Speech*, *19*, 388–396.
Saegert, J., & Young, R. K. (1983). Levels of processing and memory for advertisements. In L. Percy & A. G. Woodside (Eds.), *Advertising and consumer psychology* (pp. 117–131). Lexington, MA: Lexington Books.

Sapir, E. (1929). A study in phonetic symbolism. *Journal of Experimental Psychology*, *12*, 225–239.

Saussure, F. D. (1916). *Course in general linguistics* (W. Baskin, Trans.). New York: McGraw-Hill.

Schloss, I. (1981). Chickens and pickles: Choosing a brand name. *Journal of Advertising Research*, *21*, 47–49.

Smith, G. W. (1998). The political impact of name sounds. *Communication Monographs*, *65*(2), 154–172.

Tarte, R. D. (1982). The relationship between monosyllables and pure tones: An investigation of phonetic symbolism. *Journal of Verbal Learning and Verbal Behavior, 21*, 352–360.

Taylor, I. K. (1963). Phonetic symbolism re-examined. *Psychological Bulletin*, *60*, 200–209.

Taylor, I. K., & Taylor, M. M. (1962). Phonetic symbolism in four unrelated languages. *Canadian Journal of Psychology*, *16*, 344–356.

Tsuru, S. (1934). *Sound and meaning*. Unpublished manuscript.

Tsuru, S., & Fries, H. (1933). A problem in meaning. *Journal of General Psychology*, *8*, 281–284.

Ullmann, S. (1966). Semantic universals. In J. H. Greenberg (Ed.), *Universals of language* (pp. 217–262). Cambridge, MA: MIT Press.

Ultan, R. (1978). Size–sound symbolism. In J. H. Greenberg, C. A. Ferguson, & E. A. Moravcsik (Eds.), *Universals of human language*: *Vol. 2*. *Phonology* (pp. 525–568). Stanford, CA: Stanford University Press.

Vanden Bergh, B. (1990). The rekurring kase of the special k. *Brand Names*, RC9–12.

Vanden Bergh, B., Adler, K., & Oliver, L. (1987). Linguistic distinction among top brand names. *Journal of Advertising Research*, 39–44.

Vanden Bergh, B., Collins, J., Schultz, M., & Adler, K. (1984). Sound advice on brand names. *Journalism Quarterly*, *61*, 835–840.

Weiss, J. H. (1963). "Meaningfulness" versus meaning dimension in guessing the meanings of foreign words. *Journal of Abnormal and Social Psychology*, *66*, 541–546.

Weiss, J. H. (1966). A study of the ability of English speakers to guess the meanings of nonantonym foreign words. *Journal of General Psychology*, *74*, 97–106.

Yorkston, E. A., & Menon, G. (2004). A sound idea: Phonetic effects of brand names on consumer judgments. *Journal of Consumer Research*, *31*, 43–51.

Zinkhan, G. M., & Martin, C. R., Jr. (1987). New brand names and inferential beliefs: Some insights on naming new products. *Journal of Business Research*, *15*, 157–172.