Multisensory Congruence in Brand Identity: Evidence from the Global Automotive Market

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Abstract

Background   There is now a rapidly growing body of literature on nonarbitrary mappings between sound and meaning. That is, certain images are provoked by pure sounds. On the other hand, studies have long established that typefaces have personas such that their visual features are associated with certain attributes. This paper explores the interplay between the two branding elements, the auditory image of a brand name and the visual image of its logotype, in the context of brand design communication to provide evidence that brands can enjoy the advantage of a congruency effect on their brand performance.

Methods   T tests and Chi-square tests were used to analyze brand name linguistics and visual characteristics of logotypes amongst globally leading automotive brands.

Results   Both the auditory and the visual images of globally leading companies were found, by and large, to agree in the connotations they deliver in conjunction with distinctive product attributes.

Conclusions   The findings provide an evidential ground to reason that delivering a consistent image through multisensory channels leads to a greater potential in corporate success. Further research is called for to prove the hypothesis exhaustively.

Keywords   Logotype, Multisensory Congruence, Sound Symbolism

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1. Introduction

Ever had the experience of meeting somebody for the first time and were surprised to find that they look exactly how you imagined them purely from their name? Studies have reported that people feel more drawn toward those whose name and face match (e.g., Barton & Halberstadt, 2018). Information perceived to be in line with existing beliefs, expectations, or hypothesis yields processing fluency, which in turn generates more positive attitude compared to information that contradicts prior knowledge. This study was driven by the curiosity of whether brands can also enjoy the advantage of such name-face matching effect. That is, what happens when the name of a brand and its visual face match? Does it lead to better brand performance?

In light of the competitive landscape of businesses becoming fiercer with new brands flooding in every day, companies are faced with the challenge to manage their brands ever more meticulously and strategically to cope with the dynamics of the market. The challenge calls for a multifaceted tactical approach that integrates aspects of branding that have been treated either disparately or merely intuitively. Among these aspects that particularly and significantly contribute to a brand's first impression are its name (the brand's auditory image) and its logotype (the brand's visual image). This study investigates brand name linguistics and the visual characteristics of logotypes amongst globally leading companies in search for a distinctive pattern that may well be one factor contributing to their corporate success.

2. Literature review

2. 1. Brand name

A brand name is a valuable—if not the most valuable—element in brand identity (e.g., Alserhan & Alserhan, 2012; Landler, 1991). Brand names often serve as the first point of interaction between a brand and a consumer. When consumers are exposed to a new brand, their expectation for the brand is almost entirely derived from the initial impression created by the brand name (Aaker, 1991). As with names of persons, brand names later act as the placeholder under which the consumer recognizes and recalls the brand and its corresponding image (Hillenbrand, Alcauter, Cervantes, & Barrios, 2013). The importance of brand names cannot be underestimated as they also influence consequent brand effects, including but not limited to brand awareness, brand value, brand quality, brand preference, and ultimately purchasing behavior that relates directly to corporate's financial performance (Aaker, 1991; Aaker & Keller, 1990; Bao, Shao, & Rivers, 2008; Herbig & Milewicz, 1993; Hillenbrand et al., 2013; Keller, 1993; Kohli & Labahn, 1997).

2. 1. 1. Brand naming

As important as they are, companies make a considerable investment to brand naming. However, the challenges faced by brand names are growing in complexity. In large, companies are required more so than before to give their business a name that effectively and efficiently addresses the emotional interests of consumers and that copes with the

obscuration of regional boundaries. Consumers today experience information overload and thus have shorter attention spans than before (Fox, 2002). This leads to increased volatility of consumers' emotional interests, which in turn requires companies to carefully plan their branding strategies as the slightest differentiation or advantage may well be the only factor that determines which brand breaks into consumers' desires and which does not (Vanden Bergh, Adler, & Oliver, 1987). Thus, companies must be careful in choosing their brand name so as to stand out amongst competing brands and to catch the fleeting attention of consumers.

The second challenge that brand names face today relates to the proliferation of the Internet, which has made regional boundaries almost meaningless. For most companies, their sales are no longer restricted to their local market. Thus, their international sales and their global presence are becoming increasingly critical. As a consequence, such cross-border branding has become a significant branding issue, especially in the domain of its linguistics as text is less transferable across regional boundaries compared to visual representations (Usunier & Shaner, 2002). In consideration of the twofold aspects in brand name linguistics—namely, its denotative and connotative meanings—most of the denotative meaning is lost when the brand crosses border because the process of extracting denotative semantics is completely dependent on the language of the reader. The brand name's connotative meaning is also largely lost because the rhetorical components are generally not understood consistently across cultural contexts (Usunier & Shaner, 2002). Then the idea is to embed meanings apart from denotative and connotative semantics in brand names that is both appealing to consumers and are consistently understood across linguistic and cultural boundaries. Hence, *sound symbolism.*

2. 1. 2. Sound symbolism

Sound symbolism is the notion that phonemes, or units of sound, convey meaning on its own. That is, the concept asserts that there exists a nonarbitrary relation between sound and image. Researchers have recently started to realize the relevance and the potential benefit of sound symbolism in the field of branding. In a pioneering experiment by Edward Sapir (1929), when participants were presented with two nonsense words, *mal* and *mil*, and were told that these words refer to either a larger or a smaller table, 81% of the participants agreed that *mal* refers to the larger table. In another seminal experiment, Köhler (1947) found that people relate fictitious words *maluma* and *takete* to round and spiky shapes, respectively, above chance of coincidence. This experiment was later reproduced by Ramachandran and Hubbard (2001) with the words simplified to *bouba* and *kiki*. Today, in linguistics and psychology communities, the correspondence between sound and shape is also commonly referred to as the "bouba/kiki effect." Since then, researchers have put much (although still insufficient) effort into demystifying the emotional and cognitive effects of purely auditory cues. Because a sound does not carry an absolute inherent image, the effects are generally measured on a spectrum of two opposing qualities to elicit their relative auditory image. Some of the most frequently studied qualities include smaller versus larger, angular versus rounder, lighter versus darker, and faster versus slower.

Sound symbolic brand names—those that induce certain quality or feeling purely from their sound—provide marketing advantages that specifically address the aforementioned challenges in brand naming. Firstly, consumers unconsciously and effortlessly deduce meaning from

the sound of brand names to infer about the brand and prefer those brand names that convey relevant product attributes or benefits (e.g., Hillenbrand et al., 2013; Klink, 2001; Lowrey & Shrum, 2007; Shrum, Lowrey, Luna, Lerman, & Liu, 2012; Yorkston & Menon, 2004). For instance, people prefer the "sharper-sounding" brand name *tiddip* than the "duller-sounding" brand name *toddip* for a knife, but prefer *toddip* over *tiddip* for a hammer (Lowrey & Shrum, 2007). As such, sound symbolism in brand names elicits emotional consumer response and also increases purchasing intentions (Bongers, 2019). Consumers also remember these brand names better compared to non-sound symbolic brand names (Klink, 2001). Sound symbolism offers another key benefit to marketing efforts as much evidence support that the phenomenon is universal and independent of the reader's language (e.g., Adelman, Estes, & Cossu, 2018; Athaide & Klink, 2012; Brown, Black, & Horowitz, 1955; Chen, Huang, Woods, & Spence, 2016; D'Anselmo, Prete, Zdybek, Tommasi, & Brancucci, 2019; Davis, 1961; Huang, Pratoomraj, & Johnson, 1969; Miron, 1961; O'Boyle, Miller, & Rahmani, 1987; Shrum et al., 2012; Sidhu, Pexman, & Saint-Aubin, 2016). That is, sound symbolic effect is transferrable across regional borders such that consumers of different language and culture have consistently shown to deduce similar images from pure sounds. Hence sound symbolism in brand names can be expected to deliver a consistent auditory image in the global market.

2. 2. Logotype

The effects of sound symbolism in brand names received much attention in linguistics and marketing domains during the last few decades. What has received extremely limited attention is the interplay between such auditory image induced by a brand's name and the visual image induced by the brand's visual identity. Research that studied the direct relationship between sound symbolic image and visual identity in the context of branding is extremely scarce. One notable research is by Klink (2003) in which brands with symbol marks that are consistent in design with the linguistic features of brand names were found to better communicate intended brand meaning. This study was later replicated by Klink and Athaide (2014) with bilingual subjects in India and yielded parallel results. To the best of knowledge, there are no other research that has investigated sound symbolism in brand names in direct relation to the visual components of brand identity specific to the context of brand design.

The gap in literature between the auditory image of brand names and the visual image of brand logotypes is somewhat surprising since it is in the most logical sense that the effect due to pure sounds and the effect due to visual forms cannot be treated disparately so long the material is presented visually (Taylor & Taylor, 1965). Visual images must be taken into consideration when evaluating the effects of brand name linguistics due to ecological validity. That is, consumers are more likely to encounter brand names visually in advertisements or on a product package. It is least likely that a consumer experiences a brand name in a purely acoustic presentation during the entire consumption process (Klink, 2000).

Any communication message can be considered as having at least two components: the content and the style, which refer to what is being said and how it is said, respectively (Tannenbaum et al., 1964). It has been concretely established that the style of a message— or the typeface in which a message is written—significantly influences the impact of the message so as to conflict with or reinforce the content of the message. That is, typefaces carry emotional connotations purely in their visual features such that certain typefaces induce

certain images (e.g., Brumberger, 2003; Davis & Smith, 1933; Grohmann, 2016; Grohmann, Giese, & Parkman, 2013; Haskins, 1958; Lieven, Grohmann, Herrmann, Landwehr, & van Tilburg, 2015; Morrison, 1986; Nedeljković, Novaković, & Pinćjer, 2017; Poffenberger & Franken, 1923; Qiu, Watanabe, & Omura, 2017; Tannenbaum et al., 1964; Tantillo, Lorenzo-Aiss, & Mathisen, 1995; Van Leeuwen, 2006; Wen & Lurie, 2018; Xu, Chen, & Liu, 2017). Moreover, the extent to which individuals agree as to which typeface arouses what sensation is rather consistent. In terms of product categories, people share a general understanding that some kinds of typefaces are more suitable than others for some products (Davis & Smith, 1933; Poffenberger & Franken, 1923; Schiller, 1935). Thus, consumers' judgment on the appropriateness of a typeface for a product depends on the connotative meaning of the typeface per se (Doyle & Bottomley, 2006). In regard to logotype design practices, a good logotype design is one that aligns with the positioning strategies of the brand and the product and that effectively delivers its brand image and personality (Wheeler, 2013).

As a logotype is the face of a brand name, its visual style cannot be considered independently. Then, if the sound of a brand name itself delivers an auditory image and the visual style of the brand's logotype delivers a visual image, the interplay between the two cues received by a consumer's two sensory organs—the ears and the eyes—should influence the ultimate perceptual response of the consumer. It is in the best of interest of designers, marketers, and managers alike that the brand name and logotype appropriately and effectively interact to maximize their functional impact. The value of considering brand names' phonetic elements together with the typeface features of logotypes is clearly demonstrated by two studies. In a notable experiment frequently cited in sound symbolism research, Yorkston and Menon (2004) showed that the fictional ice cream brand name Frosh communicates a smoother, creamier, and richer qualities than does the brand name *Frish* due to the difference in sound symbolic effects of 'o' and 'i' sounds. However, Doyle and Bottomley (2011) later proved that such pattern can be reversed and that *Frish* can be perceived more smoother, creamier, and richer than *Frosh*, depending on the visual characteristics of the typefaces in which the brand names are written. As sound symbolic effect and visual perception can clearly reinforce or conflict with each other so as to yield opposing perceptual responses, they must not be treated disparately but be studied with respect to their interaction.

2. 3. Multisensory congruence

The interplay between auditory and visual cues is important in the context of brand performance as consumers' attitudinal response governs their purchasing behavior (Houston, Childers, & Heckler, 1987). Research results testify that when the phonemes in brand names convey meanings that match with product attributes, consumer preference is increased (Klink, 2009; Lowrey & Shrum, 2007) whereas incongruent visual communication elements increase brand ambiguity (Van Rompay, Pruyn, & Tieke, 2009). Further, when this fit extends to include visual representations, the effect is reinforced such that congruent auditory and visual cues better communicate intended brand meaning (Klink, 2003) and lead to increased consumer engagement, brand evaluation, memorability, preference, and purchasing intentions (e.g., Childers & Jass, 2002; Fenko, Lotterman, & Galetzka, 2016; Lieven et al., 2015; Salgado-Montejo, Velasco, Olier, Alvarado, & Spence, 2014; Van Rompay & Pruyn, 2011; Wen & Lurie, 2018; Yorkston & De Mello, 2005).

3. Method

3. 1. Sample selection

This study explores into the auditory image of brand names and the visual image of brand logotypes amongst globally leading companies in search for a distinctive pattern that may have played a considerable role in their corporate success. This is to understand how global leaders, deliberately or not, formulated their brand name and logotype so as to agree or disagree in the images embedded in them.

Since the study involves twofold analyses—auditory image analysis and visual image analysis—it is essential to consider subjects that can be analyzed by both measures. The more restrictive measure is that of the auditory image. No phoneme can be considered to carry an absolute image so it must be thought of as positioning on a spectrum of two opposing images. The two images considered in the current study are smaller versus larger since previous research have shown that these qualities are amongst the most evidently delivered by sound. More specifically, Auracher (2017), Huang, Pratoomraj, & Johnson (1969), Klink (2000; 2003), Klink & Athaide (2014), Newman (1933), Ohtake & Haryu (2013), Peiffer-Smadja & Cohen (2019); Preziosi & Coane (2017), Sapir (1929), Tarte & Barritt (1971), Taylor & Taylor (1962), and Thompson & Estes (2011) have all established that there exists significant associations between vowels and smaller-larger images such that front vowels are associated with a smaller image and back vowels are associated with a larger image. Likewise, Klink (2000; 2003), Klink & Athaide (2014), and Preziosi & Coane (2017) established that there exists significant associations between consonants and smaller-larger images such that fricative consonants are associated with a smaller image and plosive consonants are associated with a larger image. The phonetic categories of vowels and consonants are to be explained in detail later. With this auditory image spectrum of smaller versus larger in place, the category of brands must then be carefully selected such that two subsets of the category can arguably be considered to innately carry these qualities. Among the 100 brands listed in Interbrand Best Global Brands 2019, fourteen belongs to the automobile sector (see Appendix 1; Harley Davidson was excluded as the brand only manufactures motorcycles). From this extracted list, compact cars and sports utility vehicles (SUVs) manufactured by these brands have been selected as the objects of the study since they carry a distinctive yet relative image of smaller versus larger.

Automobiles have previously been explored in sound symbolism research. Namely, Lowrey and Shrum (2007), Shrum et al. (2012), and Kuehnl & Mantau (2013) considered two-seater convertible cars and SUVs as their product categories. The researchers explained that the reason for choosing these categories is because they carry comparable opposing qualities in terms of their size (smaller versus larger), weight (lighter versus heavier), and speed (faster versus slower). In the current study, SUVs are compared with compact cars instead of convertibles because (1) the quality of size is a distinctive attribute between the two vehicle types such that being small or large is a one of the key decision factors that buyers choose to purchase a compact car or an SUV, (2) the quality of weight is better distinguished between SUVs and compact cars than between SUVs and convertibles, and (3) the quality of speed is not a neutral attribute for a car in that people do not choose SUVs over convertibles because they want a slower car.

The initial list of study subjects was collected from the international product line-ups of the fourteen leading automotive manufacturers. From that list, model names that are either an abbreviation (e.g., C-HR, GLA, HR-V, etc.) or alpha-numeric (e.g., Audi Q series, BMW X series, etc.) have been excluded as these linguistic forms are not governed by the same phonetic mechanisms involved in the current study. These names are heavily influenced by the idiolect of individuals as they are most likely to be pronounced in accordance to how each letter or number is called in the consumer's mother tongue. The final list of subjects comprises 24 compact cars and 34 SUVs (see Appendix 2). These two subject groups are to be analyzed phonetically and visually in direct comparison.

3. 2. Analysis framework
3. 2. 1. Auditory measures

To analyze the phonemes of the brand names, the names are first converted into international phonetic alphabets (IPA) according to the notation standards devised by the International Phonetic Association. This alphabetic system was formulated in the 19th century as a standardized representation of the sounds of verbal language based primarily on the Latin alphabet. The International Phonetic Association categorizes the phonetic alphabets into various classifications. Among these, the classifications adopted for analysis in the current study are front versus back for vowels (see Figure 1) and fricative versus plosive for consonants (see Figure 2). Front vowels are defined by having the highest point of the tongue positioned relatively in front of the mouth such as /i/ in eat, /ε/ in bed, and /æ/ in hat. On the contrary, back vowels are defined by having the highest point of the tongue positioned relatively back in the mouth such as /u/ in food, /ʌ/ in mud, and /ɒ/ in hot. Central vowels are neutral with respect to the image they connote and thus are not included in the phonetic analysis of the study. Among consonants, fricatives are characterized by the audible friction produced by squeezing air through the passage in the vocal tract such as /f/ in feel, /s/ in see, and /ʃ/ in show. On the contrary, plosives are characterized by sounds that are produced by completely stopping airflow such as /p/ in pad, /t/ in tin, and /k/ in cat. As mentioned, front vowels and fricative consonants deliver a smaller quality relative to back vowels and plosive consonants that deliver a larger quality. For each subject group—compact cars and SUVs— the frequencies of "smaller-sounding" phonemes (front vowels and fricative consonants) and "larger-sounding" phonemes (back vowels and plosive consonants) are compared. Further, the number of syllables and the number of phonemes are compared between the subject groups as they also belong to the auditory image of the brand names—that is, how short or long are the sound of these names.
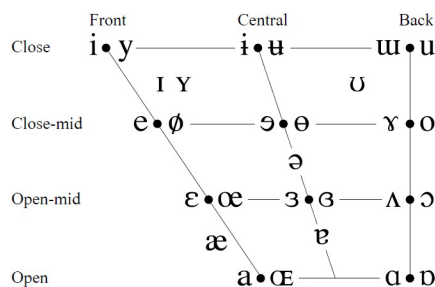

Figure 1 Vowel phonemes
Source: International Phonetic Association

	Bilabial	Labiodental	Dental	Alveolar	Postalveolar	Retroflex	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive	p b			t d		ʈ ɖ	c ɟ	k g	q ɢ		ʔ
Nasal	m	ɱ		n		ɳ	ɲ	ŋ	N		
Trill	ʙ			r					ʀ		
Tap or Flap		ⱱ		ɾ		ɽ					
Fricative	ɸ β	f v	θ ð	s z	ʃ ʒ	ʂ ʐ	ç ʝ	x ɣ	χ ʁ	ħ ʕ	h ɦ
Lateral fricative				ɬ ɮ							
Approximant		ʋ		ɹ		ɻ	j	ɰ			
Lateral approximant				l		ɭ	ʎ	ʟ			

Figure 2 Consonant phonemes
Source: International Phonetic Association

An example of auditory image analysis is provided in Table 1. For Nissan's Pathfinder, its IPA notation is "pæθ faɪn dər," which includes three syllables and ten individual phonemes. The brand name contains three front vowels—ɪ, æ, and a—and no back vowels. For consonants, the name contains two fricative consonants—f and θ—and two plosive consonants—p and d.

Table 1 Example of auditory analysis

Brand	Model		IPA			N(Syllable)			N(Phoneme)			
Nissan	Pathfinder		pæ θ faɪn dər			3			10			

		Front							Back					
Vowel	Type	i	y	ɪ	e	ɛ	æ	a	u	ʊ	o	ʌ	ɔ	ɑ	ɒ
	Count			1			1	1							
	Image	Smaller							Larger						

		Fricative							Plosive					
Consonant	Type	f	v	θ	s	z	ʃ	h	p	b	t	d	c	k	g
	Count	1		1					1			1			
	Image	Smaller							Larger						

3. 2. 2. Visual measures

To visually analyze the brand logotypes, seven measures were used—font type, letter case, font orientation, the number of letters, average font weight, average font width, and total width. These measures have been selected because they specifically associate with the typographic image of the typeface in which the logotypes are written. Font type was determined to be either sans serif, serif, or script. Letter case was determined to be either uppercase, title case, or lowercase. Orientation was determined to be either roman (upright) or oblique (slanted). The number of letters is included as a visual measure as opposed to the numbers of syllables or phonemes since the latter two determine the length and variety of the sound whereas the former affects the visual length of the logotype.

Regarding font weight, several methods exist, although most are unsuitable for the purpose of the study. The font-weight numerical scale of 100 to 1000 is rather ordinal and generally not proportional. The font-weight names such as Thin or Bold is also unsuitable because such ordering too is ordinal and is commonly designated by the type designer. Font weight can also be numerically measured by ink area, that is, the percentage of black pixels a letter takes up within its frame. This method too is not well-suited in analyzing logotypes as

weights cannot be compared across different letters. A font-weight estimation method that type designers usually prefer is to divide the x-height or the cap height by the thickness of its vertical stem (Bigelow, 2019). For instance, the x-height/stem ratio of Times Roman is 5.5, meaning that the x-height is 5.5 times the average thickness of the vertical stems. As such, a lower measurement of weight implies a heavier font and a higher measurement of weight implies a lighter font. For each study subject, the width was calculated by dividing the cap height (in case the logotype is in uppercase) or the x-height (in case the logotype is in title or lowercase) by the average thickness of the vertical stems.

Regarding font width, all observed logotypes were in a variable-width font. That is, different letters have different widths such that the width of a structurally narrower letter like 'i' is much less than a structurally wider letter like 'm'. This width includes side bearings of inter-letter spacings. For each study subject, the width of each logotype was computed by dividing the total width of the logotype by the number of letters to deduce an estimated average width of the typeface that takes into account the letter case, letter frequencies, and space characters.

An example of visual analysis is provided in Table 2, supplemented with Figure 3. For Nissan's Pathfinder, the type of the font used in the logotype is sans serif, written in all uppercase in an upright roman orientation and containing ten letters. To determine the weight and width, all logotypes were first set to an equal cap height (x-height in case of title or lowercase). The average thickness of the vertical stems included in the logotype of Pathfinder was found to be about 0.2541 in relation to the cap height being unity. Dividing 1 by 0.2541 yields 3.94. That is, the height of the logotype is roughly 3.94 times the average thickness of its vertical stems. As for font width, the total width of the entire logotype was found to be approximately 11.43 in relation to the cap height being unity. Since the logotype contains ten letters, then it can be deduced that the average width of a letter is about 1.14. That is, the ratio of the cap height to the average width of the typeface is roughly 1:1.14, as depicted by the dotted frame around the letter 'F' in Figure 3.

Table 2 Example of visual analysis

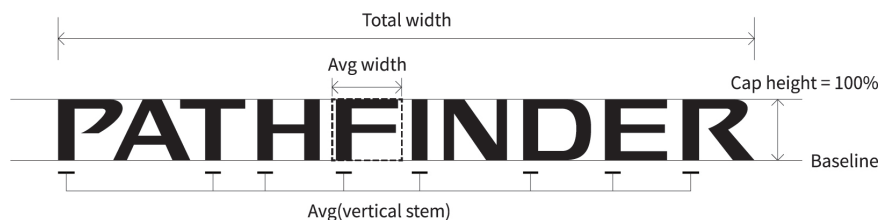| Brand | Model | Type | | | Case | | | Orientation | | N (Letter) | Avg. Weight | Avg. Width | Total Width |
		Sans Serif	Serif	Script	Uppercase	Title Case	Lowercase	Roman	Oblique				
Nissan	Pathfinder	✓			✓			✓		10	3.94	1.14	11.43

Figure 3 Example of average weight and average width measurements

4. Result

4. 1. Auditory analysis result

Both the number of syllables and the number of phonemes were found to be greater for SUVs than for compact cars (see Figure 4). T-tests revealed that there are statistically significant differences in the number of syllables (t = -3.305, df = 55.151, p < .01) and the number of phonemes (t = -3.837, df = 55.753, p < .01) depending on vehicle type (see Table 3). Comparing the mean differences, the number of syllables was shorter for compact cars (M = 1.92) than for SUVs (M = 2.56), and the number of phonemes was also shorter for compact cars (M = 5.13) than for SUVs (M = 7.09). That is, the acoustic length of the brand names of compact cars is significantly shorter than the acoustic length of the brand names of SUVs.

To analyze the relevant frequencies of the type of phonemes observed from the brand names, the data was first converted to represent the percentages in terms of the smaller-larger image they convey. That is, the percentage of "smaller-sounding" phonemes (front vowels and fricative consonants) and the percentage of "larger-sounding" phonemes (back vowels and plosive consonants) were computed in terms of the total image-conveying phonemes (the sum of front and back vowels and fricative and plosive consonants). For instance, in Nissan's Pathfinder, the number of "smaller" phonemes and the number of "larger" phonemes are five and two, respectively, out of the seven image-conveying phonemes. That is, the percentages of "smaller" phonemes and of "larger" phonemes are 71% and 29%, respectively. Such percentages are analyzed instead of absolute frequencies because absolute frequencies are influenced by the length of the brand name such that longer names obviously contain more phonemes than shorter names.

The brand names of compact cars were found to contain more "smaller" phonemes than did the brand names of SUVs and the brand names of SUVs were found to contain more "larger" phonemes than did the brand names of compact cars (see Figure 5). T-tests revealed that there are statistically significant differences in the percentage of "smaller" phonemes (t = 2.176, df = 56, p < .05) and the percentage of "larger" phonemes (t = -2.176, df = 56, p < .05) depending on vehicle type (see Table 3). Comparing the mean differences, the percentage of "smaller" phonemes is greater in compact car brand names (M = 62%) than in SUV brand names (M = 47%) and, complementarily, the percentage of "larger" phonemes is greater in SUV brand names (M = 53%) than in compact car brand names (M = 38%). That is, in line with previous research findings, those phonemes (both vowels and consonants) that deliver the relative image of being smaller are more frequently observed from the brand names of compact cars than from the brand names of SUVs. Likewise, those phonemes (both vowels and consonants) that deliver the relative image of being larger are more frequently observed from the brand names of SUVs than from the brand names of compact cars.
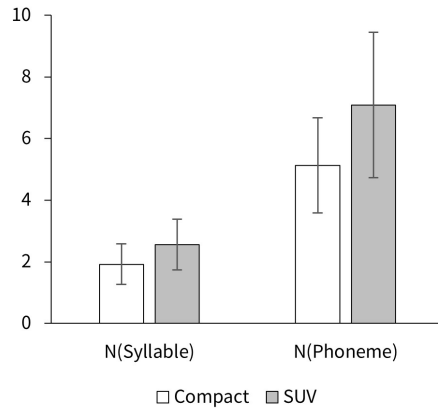
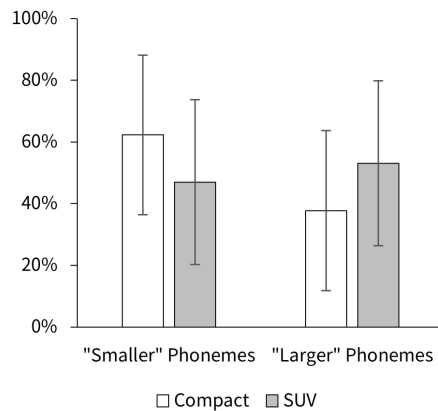**Figure 4** Comparisons of the numbers of syllables and phonemes

Figure 5 Comparisons of the percentages of "smaller" and "larger" phonemes

Table 3 Independent samples t–tests on auditory measures

Variable	Vehicle Type	N	Mean	Std. Deviation	t	df	Sig.
N(Syllable)	Compact	24	1.92	.654	−3.305	55.151	.002
	SUV	34	2.56	.824			
N(Phoneme)	Compact	24	5.13	1.541	−3.837	55.753	.000
	SUV	34	7.09	2.353			
Percentage of "Smaller" Phonemes	Compact	24	.6226	.25923	2.176	56	.034
	SUV	34	.4694	.26731			
Percentage of "Larger" Phonemes	Compact	24	.3774	.25923	−2.176	56	.034
	SUV	34	.5306	.26731			

4. 2. Visual analysis result

Regarding font type, a chi-square test revealed that there is no statistically significant difference in the font type of logotypes by vehicle type (X^2 = .573, df = 2, p > .1; see Table 4). However, it is natural that the vast majority of logotypes for both compact cars and SUVs are in sans serif fonts (see Figure 6) as they are more recognizable, readable, and give a cleaner, modern, and more technical feel than do serif fonts (e.g., Bigelow, 2019; Morris, Aquilante, Yager, & Bigelow, 2002; Qiu et al., 2017; Roethlein, 1912; Tantillo et al., 1995). Thus, sans

serif fonts are more suitable for logotypes, especially in the automotive sector. Regarding the limited use of script fonts for brand logotypes, although the difference in percentages between that of compact cars and that of SUVs is minimal, their stylization differs. Compact car logotypes in script fonts were found to have a much more organic, free flowing, almost hand-drawn feel whereas SUV logotypes in script fonts were found to have a rather regular, cursive-like stroke style.

Regarding letter case, a chi-square test revealed that there is a statistically significant difference in the type of letter case in logotypes depending on vehicle type (X^2 = 6.104, df = 2, p < .05; see Table 4). Most logotypes were found to be in all uppercase for both vehicle types (79% of compact cars and 94% of SUVs). A small percentage of both compact cars and SUVs were using logotypes in title case. A clear distinction, however, was found in the percentage of lowercase logotypes. While 17% of the logotypes of compact cars were written in all lowercase, none were found among the logotypes of SUVs (see Figure 7). Lowercase logotypes have been shown to increase perceptions of brand friendliness whereas uppercase logotypes increase perceptions of potency and brand authority (e.g., Tannenbaum et al., 1964; Xu et al., 2017). Moreover, the key visual feature of lowercase letters compared to capitals is that they accompany ascender and descender lines that protrude beyond the x-height and the baseline. Research asserts that longer ascenders and descenders add a more youthful and friendlier atmosphere to the typeface (Sassoon, 1993). Then it can be inferred that the mere existence of ascenders and descenders delivers such a youthful tone as opposed to all caps. Such image is in line with the target audience of compact cars. A 2000 nationwide poll involving 9,411 respondents conducted by Maeil Business Newspaper, the most popular business newspaper of South Korea, reported that 9.9% of respondents in their twenties prefer to purchase a compact car as their next vehicle whereas the percentage is only 2.6% among respondents in their forties or older. In contrast, 18.9% of respondents in their forties or older prefer to purchase a full-size car whereas the percentage is only 6.3% among respondents in their twenties (*Internet Public Opinion Poll Series - Vehicles*, 2000).

Further, lowercase and uppercase brand names have been found to associate with femininity and masculinity, respectively (Davis & Smith, 1933; Wen & Lurie, 2018; Xu et al., 2017). Of course, car models are not marketed for one specific gender. However, industry trend reports support that, in general, females are much gravitated toward buying smaller cars while males prefer to buy more heavy-duty vehicles like SUVs ("Men Prefer Flashy or Brawny Vehicles; Women Prefer Import Brands and Smaller Vehicles According to TrueCar. com Study," 2012). Specific to compact car preference, the abovementioned nationwide poll revealed that 11.2% of females as opposed to a mere 6.5% of males prefer a compact car as their next vehicle (*Internet Public Opinion Poll Series - Vehicles*, 2000). Such congruity between brand name letter case and brand age and gender further increases product attitudes and purchase intentions (Wen & Lurie, 2018).

Regarding font orientation, the logotypes did not differ between compact cars and SUVs in their use of roman and oblique fonts (see Figure 8). A further chi-square test confirmed that there is no statistically significant difference on the use of roman and oblique typefaces for logotypes depending on vehicle type (X^2 = .001, df = 1, p > .1; see Table 4). Previous studies have investigated the differences in perceptions between roman and oblique typefaces, measured in terms of Osgood's dimensions of evaluation, potency, and activity. In those studies, oblique typefaces were consistently rated more active but less potent than roman

typefaces (Doyle & Bottomley, 2009; Tannenbaum et al., 1964). As activity and potency are equally appealing attributes for automobiles despite the physical size or weight, it can be interpreted that the similar use of roman and italic typefaces in brand logotypes of both compact cars and SUVs is due to the fact that they share their marketing strategies to appeal as an active and potent product.
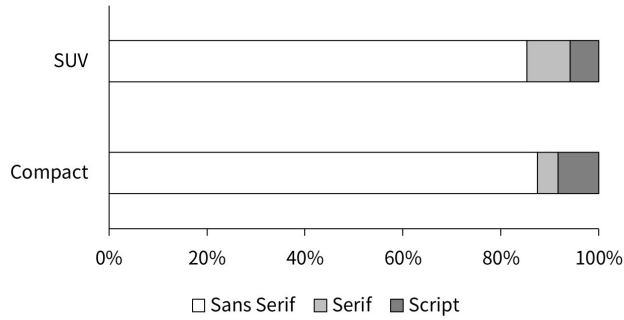
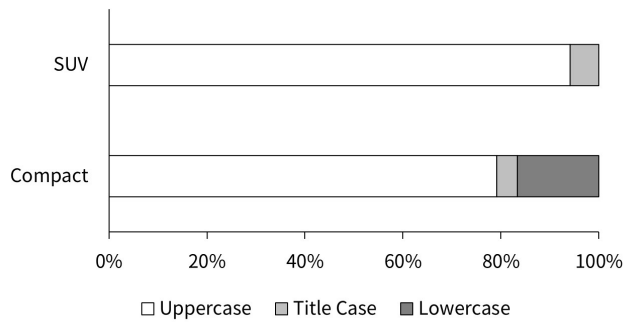

Figure 6 Comparison of font type
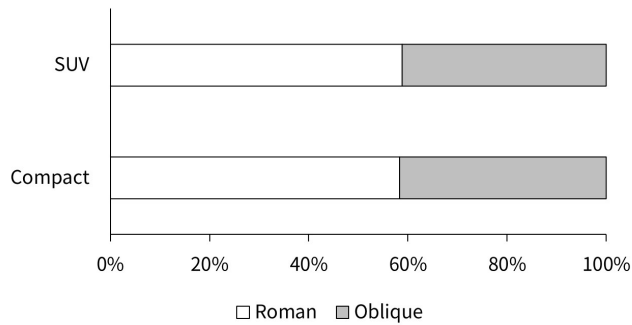

Figure 7 Comparison of letter case

Figure 8 Comparison of font orientation

Table 4 Crosstabulations between vehicle type and font characteristics

Variable		Vehicle Type		Chi−Square Tests		
		Compact N(%)	SUV N(%)	X^2	df	p
Font Type	Sans Serif	21(87.5%)	29(85.3%)	.573	2	.751
	Serif	1(4.2%)	3(8.8%)			
	Script	2(8.3%)	2(5.9%)			
Letter Case	Uppercase	19(79.2%)	32(94.1%)	6.104	2	.047
	Title Case	1(4.2%)	2(5.9%)			
	Lowercase	4(16.7%)	0(0.0%)			
Orientation	Roman	14(58.3%)	20(58.8%)	.001	1	.970
	Oblique	10(41.7%)	14(41.2%)			

Regarding the number of letters, the brand names of compact cars was found to be shorter than the brand names of SUVs (see Figure 9). A t-test revealed that there is a statistically significant difference in the number of letters depending on vehicle type (t = -4.792, df = 52.510, p < .01; see Table 5). Comparing the mean differences, the number of letters in compact car logotypes (M = 4.96) is shorter than the number of letters in SUV logotypes (M = 7.09). In a research by Strategic Name Development, the average number of letters contained in Brandweek's top 1,000 most advertised US brands was found to be 10.4 (Lozito, 2006). Taking this into consideration, the brand names of automobiles are generally shorter, more so for compact cars than for SUVs, and so the length significantly differs between compact cars and SUVs not only acoustically but also visually.

Regarding the average weight and the average width of the logotypes, no apparent differences were found for both measures between compact cars and SUVs (see Figure 9). T-tests confirmed that there exist no statistically significant differences in both the average weight (t = -.877, df = 52, p > .1) and the average width (t = .249, df = 52, p > .1; see Table 5) of the typeface depending on vehicle type. The average weight of compact car logotypes was 2.73 and the average weight of SUV logotypes was 2.95. Considering the weight scale of a commonly used typeface, these weights are close to Black (see Table 6). The prevalent use of such heavier fonts amongst automobile logotypes is reasonable in that they connote qualities such as solidity, strength, heaviness, and masculinity compared to lighter fonts (Lewis & Walker, 1989; Lieven et al., 2015; Van Leeuwen, 2006; Walker, 2016).

The almost identical average widths between the logotypes of compact cars and of SUVs is also as expected since widths of variable-width fonts do not range much. In relation to the height being unity, the uppercase widths of commonly used typefaces are close to unity. For instance, the average capital width of Times Roman is 1 and the average capital width of Helvetica is 0.98 (Bigelow, 2019). Then it is reasonable that no significant difference is found between the widths of the logotypes of compact cars and the widths of the logotypes of SUVs. Further, considering the average widths of commonly used typefaces, the logotypes of both compact cars and SUVs are rather extremely extended. Extended typefaces, compared to their regular counterparts, have been shown to carry images of strength and masculinity (Davis & Smith, 1933). This is again in line with the target consumer group of the product category. Moreover, because the width measure accounts for the side bearings, the wide width also implies that the kerning of the logotypes of automobiles are rather loose. This can be interpreted so as to promote spaciousness of vehicles, apart from its exterior size.

Although buyers of compact cars generally prefer the smaller size compared to SUVs, inner spaciousness—one that relate to comfort—is possibly a benefit pursued by any vehicle. Also, since the average widths do not differ between compact car and SUV logotypes but the numbers of letters do, it is as expected that the total width of the logotype itself is significantly longer for SUVs (M = 11.3) than for compact cars (M = 8.2) in relation to the height being unity. A t-test confirms that the logotype of SUVs is visually longer than the logotypes of compact cars (t = -1.952, df = 52, p < .1; see Table 5).
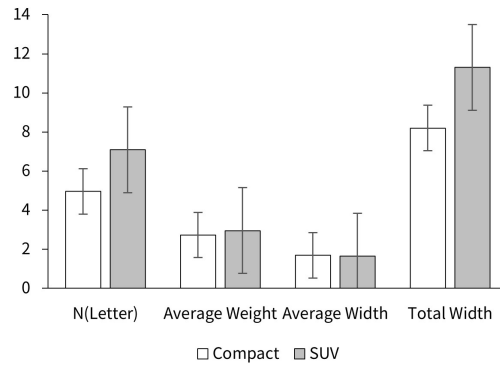
Figure 9 Comparisons of the numbers of letters, average weight, average width, and total width

Table 5 Independent samples t–tests on visual measures

Variable	Vehicle Type	N	Mean	Std. Deviation	t	df	Sig.
N(Letter)	Compact	24	4.96	1.160	−4.792	52.510	.000
	SUV	34	7.09	2.193			
Avg. Weight[a]	Compact	22	2.7291	1.02377	−.877	52	.384
	SUV	32	2.9494	.81739			
Avg. Width[a]	Compact	22	1.6859	.35078	.249	52	.804
	SUV	32	1.6406	.79856			
Total Width[a]	Compact	22	8.2009	2.53218	−1.952	52	.056
	SUV	32	11.3000	7.12667			

[a] in relation to cap height or x–height being unity

Table 6 Font weights and height/stem ratios of Lucida Sans Serif typeface
Source: lucidafonts.com (Bigelow & Holmes, 2015)

Lucida Sans Serif	Weight Name	CSS#	Height/Stem
ABcdefg@12!	UltraThin	100	22.0
ABcdefg@12!	ExtraThin	150	14.6
ABcdefg@12!	Thin	200	11.0
ABcdefg@12!	ExtraLite	250	8.8
ABcdefg@12!	Lite	300	7.3
ABcdefg@12	Book	350	6.3
ABcdefg@12	Text	375	5.9
ABcdefg@12	Normal	400	5.5

ABcdefg@12	Thick	425	5.2
ABcdefg@12	ExtraThick	450	4.9
ABcdefg@12	Dark	500	4.4
ABcdefg@12	ExtraDark	550	4.0
ABcdefg@12	Bold	600	3.7
ABcdefg@1!	ExtraBold	650	3.4
ABcdefg@1!	UltraBold	700	3.2
ABcdefg@1	Black	800	2.8
ABcdefg@1	ExtraBlack	900	2.5
ABcdefg@!	UltraBlack	999	2.3

5. Discussion and conclusion

The degree of fitness between the auditory image provoked by the phonetic features in brand names and the visual image provoked by the typographic features in brand logotypes was explored amongst globally leading automobile companies in search for a pattern that could well be a hidden ingredient in their global success. The study was driven by the apparent gap in literature that has yet to bridge between the auditory and visual cues that constitute to the brand's identity. Comparative analyses on compact cars and SUVs manufactured by leading global automobile brands revealed that their brand identity (both linguistic and visual) by and large is in line with their product attributes. Linguistic analyses revealed that the sounds of SUV brand names were longer than the sounds of compact car brand names. Moreover, those phonemes that connote a smaller image were observed more frequently among compact car brand names while those that connote a larger image were observed more frequently among SUV brand names, implying that the pure sound of the brand names agrees with specific product attributes. Visual analyses revealed that the typographic characteristics of brand logotypes also largely agree with product attributes. Lowercase logotypes—the type that deliver the images of youth and femininity—were only observed among compact cars. Also, SUV logotypes were found to be visually longer and containing more letters compared with compact car logotypes. Other visual measures were found not to significantly differ between compact cars and SUVs but were in line with the general product category. Thus, both the phonetic and the visual features of brand names and logotypes by and large agree with product attributes, considering the differences in product positioning between the two vehicle types.

Then what does it imply that the auditory and visual brand design elements coincide? When brand design elements agree in the connotative image they relay, a more positive and higher emotional engagement is induced on the part of the consumers, positively influencing memorability and perceptions of brand credibility, brand aesthetics, and brand

value (Childers & Jass, 2002; Fenko et al., 2016; Klink, 2003; Salgado-Montejo et al., 2014; Van Rompay & Pruyn, 2011). Research suggest that such congruency effect is due to schema congruity, which asserts that information perceived as schema congruent yields processing fluency and leads to a comfortable feeling of familiarity (Alina & Ioan, 2013). It is uncertain that the brands examined in this study deliberately aligned their brand name's auditory image and their logotype's visual image. However, this finding provides at least an evidential reason to believe that delivering a consistent image through multisensory channels leads to a greater potential in corporate performance. Such hypothesis is yet to be proven exhaustively. However, further research in establishing extensive and concrete evidence in diverse regional and industrial contexts will collectively contribute toward revealing the secret to successful brand design and communication. Thus, the current study serves as the foothold to expand researching efforts to formulate how various multisensory cues affect consumers' mutual response by demonstrating that popular leading brands do indeed align the images of their branding elements. The next step is to experiment exactly how certain perceptual effects—cognitive and emotional—are influenced when consumers are presented with either congruent or incongruent brand design elements.

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Appendix

Appendix 1 Interbrand Best Global Brands 2019
Source: Interbrand

Rank	Brand	Industry Sector	Rank	Brand	Industry Sector
1	Apple	Technology	51	L'Oréal	FMCG
2	Google	Technology	52	Nissan	Automotive
3	Amazon	Technology	53	Goldman Sachs	Financial Services
4	Microsoft	Technology	54	HP	Electronics
5	Coca–Cola	Beverages	55	Visa	Financial Services
6	Samsung	Technology	56	Sony	Electronics
7	Toyota	Automotive	57	Kellogg's	FMCG
8	Mercedes–Benz	Automotive	58	Siemens	Diversified
9	McDonald's	Restaurants	59	Danone	FMCG
10	Disney	Media	60	Nestle	FMCG
11	BMW	Automotive	61	Canon	Electronics
12	IBM	Business Services	62	Mastercard	Financial Services
13	Intel	Technology	63	Dell Technologies	Electronics
14	Facebook	Technology	64	3M	Diversified
15	Cisco	Business Services	65	Netflix	Media
16	Nike	Goods	66	Colgate	FMCG
17	Louis Vuitton	Luxury	67	Santander	Financial
18	Oracle	Business Services	68	Cartier	Luxury
19	GE	Diversified	69	Morgan Stanley	Financial Services
20	SAP	Business Services	70	Salesforce	Business Services
21	Honda	Automotive	71	Hewlett Packard Enterprise	Business Services
22	Chanel	Luxury	72	PayPal	Financial Services
23	American Express	Financial Services	73	FedEx	Logistics
24	Pepsi	Beverages	74	Huawei	Technology

25	J.P. Morgan	Financial Services	75	Lego	FMCG
26	Ikea	Retail	76	Caterpillar	Diversified
27	UPS	Logistics	77	Ferrari	Automotive
28	Hermes	Luxury	78	Kia	Automotive
29	Zara	Apparel	79	Corona	Alcohol
30	H&M	Apparel	80	Jack Daniel's	Alcohol
31	Accenture	Business Services	81	Panasonic	Electronics
32	Budweiser	Alcohol	82	Dior	Luxury
33	Gucci	Luxury	83	DHL	Logistics
34	Pampers	FMCG	84	John Deere	Diversified
35	Ford	Automotive	85	Land Rover	Automotive
36	Hyundai	Automotive	86	Johnson & Johnson	FMCG
37	Gillette	FMCG	87	Uber	Technology
38	Nescafe	Beverages	88	Heineken	Alcohol
39	Adobe	Business Services	89	Nintendo	Electronics
40	Volkswagen	Automotive	90	Mini	Automotive
41	Citi	Financial Services	91	Discovery	Media
42	Audi	Automotive	92	Spotify	Media
43	Allianz	Financial Services	93	KFC	Restaurants
44	eBay	Retail	94	Tiffany & Co.	Luxury
45	Adidas	Sporting Goods	95	Hennessy	Alcohol
46	AXA	Financial Services	96	Burberry	Luxury
47	HSBC	Financial Services	97	Shell	Energy
48	Starbucks	Restaurants	98	LinkedIn	Media
49	Philips	Electronics	99	Harley Davidson	Automotive
50	Porsche	Automotive	100	Prada	Luxury

Appendix 2 Brand names collected for analyses

Source: Official international websites of each manufacturer

Type	Model			
Compact	Accent	Eon	Jazz	Sentra
	Carens	Etron	Leaf	Soul
	Ceed	Fiesta	Picanto	Stonic
	Cerato	Fit	Prius	Versa
	Civic	Forte	Rio	Xcent
	Elantra	Golf	Rondo	Yaris
SUV	4Runner	Escape	Macan	Sequoia
	Armada	Expedition	Mohave	Sorento
	Atlas	Explorer	Murano	Sportage
	Cayenne	Flex	Palisade	Telluride
	Creta	Grand Carnival	Pathfinder	Tiguan
	Defender	Highlander	Range Rover	Tucson
	Discovery	Kicks	Rogue	Venue
	Ecosport	Kona	Santa Fe	
	Edge	Land Cruiser	Sedona	