Using Sublexical Priming to Enhance Brand Name Phonetic Symbolism Effects in Young Children

Introduction

Marketing scholars have highlighted the practicality of phonetic symbolism, which consists of using the sounds contained in words to assist in naming brands, both to enhance brand name preferences and to signal product/brand attributes, gender, and personality. The application of sound symbolism in branding has been shown to increase perceptions of brand name and product attribute fit (Lowrey and Shrum 2007) and, in turn, result in superior attitude towards the brand and likelihood of purchase (Baxter et al. 2015). For example, brand names comprising front vowel sounds (e.g., Frish and Fipple) are perceived as smaller, lighter, and more sophisticated than brand names containing back vowel sounds (e.g., Frosh and Fupple; Klink and Athaide 2012; Lowrey and Shrum 2007).

Recent research has shown that phonetic symbolism effects are developmental and may rely on the acquisition of fundamental phonological skills and knowledge. Specifically, Baxter, Kulczynski, and Ilicic (2014) demonstrated that only older children (above 10 years of age) possess the necessary proficiencies to categorize phonetic-based judgments, with these effects only evident when cognitive resources were abundant.

Across four experiments we demonstrate the role of phonological awareness (an ability to recognize syllables and sounds contained in words) in strengthening phonetic symbolism effects. Specifically, older children (with higher levels, as opposed to lower levels, of phonological awareness) are shown to use the sounds contained in brand names to infer product attributes. We also demonstrate that the use of sublexical priming, which encourages children to

focus on part of words, promotes phonetic symbolism effects in younger children (with lower levels of phonological awareness).

Theoretical development

Phonetic symbolism

Phonetic symbolism is the term applied to *sounds* in words, either vowel sounds or consonant sounds, that are capable of conveying meaning (Coutler and Coutler 2010). Studies in phonetic symbolism have consistently established that consumers associate brands with back vowel sounds (such as the [ä] sound in *Ully*) with large, heavy objects, and brands with front vowel sounds (such as the [i] in *Illy*) with small, light objects (Klink 2000); with consumers demonstrating a preference for a brand name that elicits meaning consistent with product attributes.

In recent years, researchers have suggested that developmental factors impact the presence of phonetic symbolism effects (Baxter and Lowrey 2011, 2014; Baxter et al. 2014). Specifically, children under the age of nine do not demonstrate sound-stimuli relationships consistent with phonetic symbolism theory (Baxter and Lowrey 2014; Baxter et al. 2014), which indicates an age-based boundary condition of the phenomenon. We examine the effect of phonological awareness on enhancing children's demonstration of phonetic symbolism effects.

Enhancing phonological awareness

Phonological awareness refers to an individual's ability to recognize syllables and sounds contained in words (i.e., phonemes; Mann 2002; McDevitt and Ormrod 2003). Phonological awareness is closely related to a child's reading skill (Huang and Hanley 1995), cognitive

development (Gopnik and Meltzoff 1986), and alphabet knowledge (Burgess and Lonigan 1998). A child who has yet to develop phonological skills (i.e., children in pre-reading stage of development, under approximately 6 years of age; Chall, 1989) is unlikely to have acquired phonological awareness (Fowler 1991). For example, it is unlikely that a child in pre-reading stages of development (i.e., under 6 years of age) will be able to recognize the three sounds forming the word 'butterfly' (that is, but/ter/fly), nor be able to articulate 'fly' when prompted to say the word 'butterfly' without the /butter/ sounds. When a child enters into the initial reading stage (i.e., at approximately 6 years of age; Chall, 1989) they begin to treat words phonetically (i.e., words as sounds; Ehri and Wilce 1985), with this skill strengthening as they develop.

Phonological awareness tasks prompt a child to focus on the sounds contained in words and require them to be able to identify and isolate phonemes in a variety of ways, such as, tapping out the number of sounds in a word, reversing the order of sounds in a word, and putting together sounds presented in isolation to form a word (e.g., rhyming tasks, phoneme segmentation tasks, phoneme deletion tasks, matching tasks, phoneme substitution tasks, blending tasks, and phoneme counting tasks). The tasks focus on the underlying phonological structure of the spoken word, not on the word's meaning (Blachman 2000).

Research also demonstrates that phonological information is entered through either direct auditory input (when a brand name is presented in audio form) or from sub-vocal articulation (converting the brand name read into a sound that one hears inside one's head; Slowiaczek and Clifton, 1980). Research finds that even skilled readers use subvocalization when they are silently reading (see McGuigan, 1970 for a review). Since phonological information is subvocalized (i.e., converted into audio when reading the printed word), we expect that phonetic symbolism effects will not be influenced by whether the brand name is presented in print or

audio form. We expect that phonetic symbolism effects are conditional on age (the acquisition of phonological awareness), yet not the mode of brand name presentation (audio, visual, audio and visual) (Study 1). We suggest that older children (with higher phonological awareness) will demonstrate phonetic symbolism effects, resulting in brand meaning consistent with brand name sound (i.e., front vowel sound with light, small, and fast attributes, and back vowel sound with heavy, large, and slow attributes), regardless of the way in which the brand name is presented (i.e., audio, visual, audio and visual). We expect that younger children (with lower phonological awareness), however, will not have acquired the necessary phonological development skills in order to demonstrate phonetic symbolism effects, irrespective of the way in which the brand name is presented (i.e., audio, visual, audio and visual). Specifically, we suggest that a younger child will not be able to distinguish between the sounds contained in a word irrespective of whether the word (i.e., brand name) is presented in visual or audio form.

Sublexical priming

We propose that an individual's focus on, or attention to, parts (segments) of words, such as brand names, can be primed through exposure to phonological cues. We argue that sublexical processing can be activated, which involves translating letters to sounds and then connecting the sound segments to arrive at a phonological, sound-based, code (Awaida and Beech 1995). For example, when undertaking a phoneme deletion task, such as identifying the word 'tape' without the sound /t/ (target word = ape), an individual's attention to phonemes is made salient, which will result in heightened phonological processing when undertaking subsequent tasks.

We propose that the temporal sequence of a sublexical prime will influence phonetic-based judgments. Drawing from literature on temporal sequence in memory (Ariely 1998; Kahneman et al. 1993), we argue that when younger children (with lower levels of phonological

awareness) report their brand meaning judgments immediately following a sublexical task, their judgments will be consistent with phonetic symbolism theory, irrespective of the way in which the brand name is presented (i.e., audio, visual, audio and visual) (Study 1). Specifically, when younger children are exposed to the front vowel brand name, Vipiz, in any form (audio, visual, audio and visual) they will perceive it as fast, light, and small only when their attention to phonemes is activated through a sublexical priming task. Older children (with higher levels of phonological awareness) will have already acquired the necessary phonological development skills and, as such, exposure to sublexical priming will not have a significant effect on their phonological processing and subsequent product evaluations, irrespective brand name presentation mode (i.e., audio, visual, audio and visual) (Study 2). We suggest that sublexical tasks can also be embedded within branded communications to heighten cognizance of phonemes for children with low phonological awareness, which will, in turn, enhance phonetic symbolism based-effects (Study 3a). Furthermore, we show that building up pronunciation and attention to phonemes in brand names through chunking (Newell 1990) (e.g., an advertisement featuring G O R P S rather than GORPS) can enhance phonetic-based inferences for younger children (those low in phonological awareness) (Study 3b).

Study 1

Study 1 aimed to demonstrate the moderating effect of age on phonetic-based inferences. Further, the conditional effect of brand name mode of presentation (visual, audio and visual/audio) was examined. Consistent with the approach adopted by Baxter et al. (2014), three hundred and eighty five Australian children aged six to sixteen years, who obtained parental consent, participated in an online experiment (182 male, 203 female; M_{age} = 9.29, SD = 2.54). A

3 (presentation mode: visual vs. audio vs. visual and audio) x 2 (brand name: front vowel sound vs. back vowel sound) factorial design was employed, whereby participants were randomly allocated to one of the six experimental conditions. First, participants in the visual brand name conditions were shown a print advertisement for a new brand of a scooter, those in the audio presentation conditions were exposed to an audio advertisement (spoken: "*New scooter, [brand name], on TV and at shops soon!*"), and participants in the visual and audio conditions, simultaneously experienced the visual and audio advertisement. To increase the likelihood that participants in the visual brand name conditions would be able to independently (if necessary) read the words contained in the visual advertisement, a pronounceable two-syllable brand name was selected (as recommended by Fox and Routh, 1975) and pre-tested (n = 8, M_{age} = 6.38). All children could read both manipulations of the chosen brand names. The sound contained in the brand name was manipulated across conditions: Vipiz (front vowel) or Vopoz (back vowel). Participants were then asked to evaluate the scooter in terms of: speed (slow – fast), weight (heavy – light), and size (large – small) utilizing seven-point semantic differential scales. Next, participants were asked to complete a phoneme counting task designed to assess their phonological awareness. Utilizing procedures employed by Leather and Henry (1994), participants were presented with three practice words (But, Butter, Butterfly) followed by a series of twenty test words. Participants were asked to indicate the number of sounds contained in each word: one, two, or three. For example, "butter has how many sounds in it?" (Answer: 2 – but/ter; refer to Figure 1 which outlines the complete set of test items and correct responses). Phonological awareness was measured by calculating the total number of correct responses across the twenty-item task (phonological awareness: 0 – 20, M_{PA} = 12.63, SD_{PA} = 4.42). Finally, simple demographic information was obtained.

Figure 1: Phoneme Task Counting Task Items

1. Children, has ___ sounds in it (2)
2. Letter, has ___ sounds in it (2)
3. Jump, has ___ sounds in it (1)
4. Morning, has ___ sounds in it (2)
5. Dog, has ___ sounds in it (1)
6. Monkey, has ___ sounds in it (2)
7. Anything, has ___ sounds in it (3)
8. Wind, has ___ sounds in it (1)
9. Nobody, has ___ sounds in it (3)
10. Wagon, has ___ sounds in it (2)
11. Cucumber, has ___ sounds in it (3)
12. Apple, has ___ sounds in it (2)
13. Funny, has ___ sounds in it (2)
14. Boat, has ___ sounds in it (1)
15. Father, has ___ sounds in it (2)
16. Holiday, has ___ sounds in it (3)
17. Yellow, has ___ sounds in it (2)
18. Cake, has ___ sounds in it (1)
19. Fix, has ___ sounds in it (1)
20. Break, has ___ sounds in it (1)

An ANOVA model was estimated to verify that neither participant age ($F(5, 379) = .884$, $p = .492$) nor phonological awareness score ($F(5, 379) = .421$, $p = .838$) differed across experimental conditions. A frequency analysis revealed that participant gender was approximately evenly distributed across experimental groups ($\chi^2 = 21.50$, $p = .205$).

Results

We expected to observe a positive linear relationship between age and phonological awareness. To test our assertion regression analysis was performed. As expected, age was found to be a significant predictor of phonological awareness score ($R^2 = .472$, $\beta = .82$, $p < .001$). Specifically, results demonstrated that phonological awareness increases as children age.

Next, we argued that phonetic symbolism effects would strengthen as children age (and acquire phonological awareness skills). Further, we proposed that due to sub-vocal articulation, effects will be observed irrespective of brand name presentation mode (i.e., visual and/or audio).

Three-way interaction effect. To examine the presence of a three-way interaction between brand name, mode of presentation, and age, the Preacher et al. (2007) PROCESS macro

bootstrapping procedure (n = 10 000, Model 3) was employed. First, a Product Attribute Index (PAI) was created, combining participant's judgments of product speed, weight, and size. Results demonstrated that neither mode of presentation (β = -.034, p = .844), nor age (β = .005, p = .808) were significant predictors of product evaluations. As expected, a significant three-way interaction was not found between brand name, mode of presentation, and age (β = .009, p = .731), with instead a significant two-way interaction observed between brand name and age (β = -.101, p =.002). To understand the nature of this two-way interaction ($R^2\Delta$ = .041), the PROCESS macro bootstrapping procedure (n = 10 000, Model 1) was employed with simple effects analysis performed. Results show a decrease in effects consistent with phonetic symbolism theory, that is, a scooter depicted with a brand name containing a front vowel sound was perceived to be faster, lighter, and smaller when compared to the scooter paired with a brand name containing a back vowel sound for older ($Age_{\bar{x}}$ = 9.03 : $M_{Front\ Vowel}$ = 4.59, $M_{Back\ Vowel}$ = 3.24, p <.001; $Age_{\bar{x}+1\sigma}$ = 11.54: $M_{Front\ Vowel}$ = 4.59, $M_{Back\ Vowel}$ = 3.01, p <.001), but not younger participants ($Age_{\bar{x}-1\sigma}$ = 6.52: $M_{Front\ Vowel}$ = 4.58, $M_{Back\ Vowel}$ = 4.46, p = .121). Utilizing the Johnson-Neyman technique, one transition point was observed, with the effect of brand name on product evaluations found to transition to non-significance at an age of 8.78 years.

Study 2

Study 2 sought to examine whether phonological awareness tasks can act as a sublexical priming tool, which focus an individual on word segments and, in turn, enhance phonetic symbolism effects. Following the acquisition of parental consent, three hundred and thirty eight Australian children aged six to fourteen years participated in a between-subjects experiment (165 male, 173 female; M_{age} = 10.86, SD = 2.30). Sublexical priming effects were examined in a 2 (task

sequence: task first vs. task last) x 2 (brand name: front vowel sound vs. back vowel sound) x 3 (presentation mode: visual vs. audio vs. visual and audio) factorial design, whereby participants were randomly allocated to one of the twelve experimental conditions. First, participants in the phonological awareness 'task first' conditions completed a phoneme counting task (replicating the procedures employed in Study 1). Participants were then shown a print (visual condition), radio (audio condition) or a simultaneous print/radio (visual and audio) advertisement for an ice-cream, whereby, the sound contained in the brand name (pre-tested, pronounceable two-syllable word; n = 8, M_{age} = 6.38) was manipulated across conditions: Fipple (front vowel) or Fupple (back vowel). Participants were then asked to evaluate the ice-cream in terms of smoothness and creaminess on seven-point scales. Participants in the phonological awareness 'task last' conditions viewed the print advertisement, evaluated the advertised product, and then completed the phoneme counting task (M_{PA} = 16.61, SD_{PA} = 4.98). Finally, simple demographic information was obtained.

An ANOVA model was estimated to verify that neither participant age ($F(1, 326) = .25$, $p = .776$) nor phonological awareness score ($F(1, 326) = .05$, $p = .947$) differed across experimental conditions. A frequency analysis revealed that participant gender was approximately evenly distributed across experimental groups ($\chi^2 = 5.68$, $p = .895$).

Results

We expect to observe a positive linear relationship between age and phonological awareness. Results of regression analysis support our assertion ($R^2 = .230$, $\beta = .35$, $p < .001$). Replicating Study 1, older (younger) children were found to possess higher (lower) levels of phonological awareness.

Next, we argued that the completion of a phonological awareness task prior to phonetic-based judgments will act as a sublexical prime, strengthening phonetic symbolism based-effects irrespective of mode of brand name presentation. Consistent with Study 1, a Product Attribute Index (PAI) was created. In this instance participant's judgments of product smoothness and creaminess were combined.

Main, two-way, and three-way interaction effects. An ANOVA model was estimated with a significant main effect observed for brand name ($F(1, 326) = 41.68$, $p < .001$, $\eta^2 = .904$). Consistent with phonetic symbolism theory, a product paired with a brand name containing a back (front) vowel sound was perceived as more (less) smooth and creamy (Front Vowel Sound: $M_{PAI} = 3.71$; Back Vowel Sound: $M_{PAI} = 4.68$). A significant main effect was not observed for task sequence ($F(1, 326) = .37$, $p = .545$, $\eta^2 = .001$) or presentation mode ($F(2, 326) = .06$, $p = .946$, $\eta^2 < .001$). Further, a significant interaction was found between brand name and task sequence ($F(1, 326) = 8.24$, $p = .004$, $\eta^2 = .025$). Results demonstrated that effects consistent with phonetic symbolism theory were strengthened when participants were exposed to a sublexical prime (i.e., task first) ($M_{\text{Task First/Front Vowel}} = 3.45$; $M_{\text{Task First/BackVowel}} = 4.86$; $M_{\text{Task Last/Front Vowel}} = 3.97$; $M_{\text{Task Last/Back Vowel}} = 4.51$). As expected, a significant three-way interaction between brand name, task sequence, and presentation mode was not observed ($F(1, 326) = .47$, $p = .628$, $\eta^2 = .003$), demonstrating that observed sublexical priming effects did not differ across mode of brand name presentation.

Further, we suggested that the completion of a phonological awareness task prior to phonetic-based judgments will act as a sublexical prime, strengthening phonetic symbolism based-effects for younger children. Drawing from the results of Study 1 that show that phonetic symbolism effects manifest at approximately nine years of age, a dichotomous variable was

constructed which represents either younger (6 – 9 years of age) or older (10 – 16 years of age) children.

Four-way interaction effect. We proposed that the priming effect of a sublexical task would be heightened for younger children (irrespective of brand name presentation mode). To test our proposition an ANOVA model was estimated. As expected, a significant four-way interaction was not found between brand name, task sequence, mode of presentation, and age ($F(2, 314) = 1.05$, $p = .351$, $\eta^2 = .007$), with instead a significant three-way interaction observed between brand name, task sequence, and age ($F(1, 314) = 6.22$, $p = .013$, $\eta^2 = .019$). To examine the nature of this three-way interaction, simple effects analysis was performed. Results showed that the interaction (brand name x sublexical prime) did not have a significant effect on product evaluations when participants were older ($F(1, 244) = .21$, $p = .649$, $\eta^2 = .002$), but did have a significant effect when participants were younger ($F(1, 86) = 16.46$, $p < .001$, $\eta^2 = .063$). Summary statistics are reported in Table 1.

Table 1: Brand Name x Task Sequence on Product Attribute Judgments across Younger and Older Children (Study 2)

	Task Sequence	
	First	Last
Younger Children (6 – 9 years of age)		
Brand Name: Front Vowel Sound (Fipple)	3.32	4.30
Brand Name: Back Vowel Sound (Fupple)	4.68	4.38
Older Children (10 – 16 years of age)		
Brand Name: Front Vowel Sound (Fipple)	3.20	3.87
Brand Name: Back Vowel Sound (Fupple)	4.92	5.27

Study 3

Study 3 aimed to demonstrate the effectiveness of sublexical priming in a marketing context, through 1) embedding aspects of a phonological task in an interactive (game-based) print

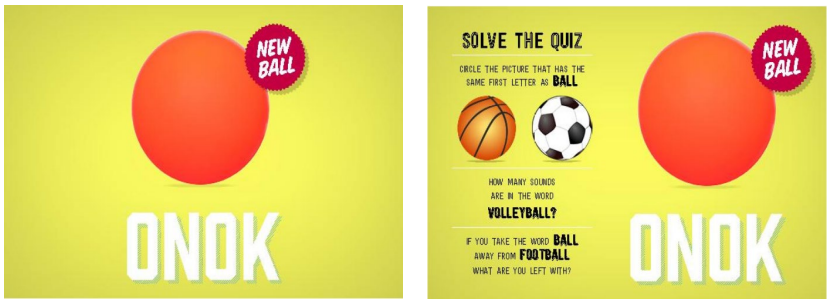
advertisement (Experiment 3A) and 2) employing chunking as a presentation technique within a print advertisement (Experiment 3B). In each instance, the effectiveness of sublexical priming was examined in a 2 (sublexical prime: present vs. absent) x 2 (brand name: front vowel sound vs. back vowel sound) factorial design, whereby participants were randomly allocated to one of the four experimental conditions.

Experiment 3A

One hundred and eighty six Australian children aged six to fourteen years participated in an online experiment (106 male, 80 female; M_{age} = 9.51, SD = 2.57). Only those who obtained parental consent were included in the experiment. Participants were shown a print advertisement for a ball paired with a brand name. The sub-lexical prime (components of phonological task) was either absent or embedded within the advertisement (refer to Figure 1 for an example of Experiment 3A stimuli). The sound contained in the brand name (pre-tested, pronounceable two-syllable word; n = 10, M_{age} = 6.20) was manipulated across conditions: Inik (front vowel) or Onok (back vowel). Participants were then asked to evaluate the ball in terms of: weight (heavy – light) and size (large – small) on seven-point scales and then completed the phoneme counting task (M_{PA} = 16.39, SD_{PA} = 3.39). Finally, simple demographic information was obtained.

An ANOVA model was estimated to verify that neither participant age ($F(1, 185) = 1.40$, $p = .246$) nor phonological awareness score ($F(1, 185) = 1.19$, $p = .315$) differed across experimental conditions. A frequency analysis revealed that participant gender was approximately evenly distributed across experimental groups ($\chi^2 = 2.93$, $p = .087$).

Figure 1: Experiment 3A Stimuli – Back Vowel Brand Name



Results

Consistent with Study 1 and Study 2 we expected to observe a positive linear relationship between age and phonological awareness. Results of regression analysis supported our assertion (R^2 = .358, β = .47, p <.001), whereby older (younger) children were found to possess higher (lower) levels of phonological awareness.

Next, we suggested that exposure to a sublexical prime would strengthen phonetic symbolism based-effects. Consistent with Study 2, we expected effects to heighten for younger children. Again a Product Attribute Index (PAI) was created based on a combination of participant's evaluations of product size and weight, and a dichotomous measure of age was constructed.

Main and two-way interaction effects. An ANOVA model was estimated with a significant main effect observed for brand name (F(1, 186) = 9.67, p = .002, η^2 = .050). Consistent with phonetic symbolism theory, a product paired with a brand name containing a front (back) vowel sound was perceived as more (less) small and light (Front Vowel Sound: M_{PAI} = 4.04; Back Vowel Sound: M_{PAI} = 3.39). A significant main effect was not observed for sublexical prime presence (F(1, 186) =.32, p = .570, η^2 = .002). Further, a significant interaction was found between brand name and sublexical prime (F(1, 186) = 4.55, p = .034, η^2 = .024). Results demonstrated that effects consistent with phonetic symbolism theory were strengthened

when participants were exposed to a sublexical prime ($M_{\text{Sublexical Prime Present/Front Vowel}} = 4.32$; $M_{\text{Sublexical Prime Present/BackVowel}} = 3.34$; $M_{\text{Sublexical Prime Absent/Front Vowel}} = 3.23$; $M_{\text{Sublexical Prime Absent/Back Vowel}} = 3.55$).

Three-way interaction effect. Next, to examine the moderating role of age on the effect of the interaction (brand name x sublexical prime) on product attribute evaluations (three-way interaction) and ANOVA model was estimated. As expected, a significant three-way interaction between brand name, sublexical prime, and age was found ($F(1, 178) = 4.88$, $p = .028$, $\eta^2 = .027$). Consistent with Study 2, results of simple effects analysis demonstrated that the interaction (brand name x sublexical prime) did not have a significant effect on product evaluations when participants were older ($F(1, 92) = .47$, $p = .495$, $\eta^2 = .005$), but did have a significant effect when participants were younger ($F(1, 86) = 13.50$, $p < .001$, $\eta^2 = .128$). Summary statistics are reported in Table 2.

Table 2: Brand Name x Task Sequence on Product Attribute Judgments across Younger and Older Children (Study 3, Experiment 3A)

	Sublexical Prime	
	Present	Absent
Younger Children (6 – 9 years of age)		
Brand Name: Front Vowel Sound (Inik)	4.44	3.82
Brand Name: Back Vowel Sound (Onok)	2.80	3.46
Older Children (10 – 16 years of age)		
Brand Name: Front Vowel Sound (Inik)	4.16	4.14
Brand Name: Back Vowel Sound (Onok)	3.49	3.69

Experiment 3B

One hundred and ninety five Australian children aged six to fourteen years, who obtained parental consent, participated in an online experiment (117 male, 78 female; $M_{\text{age}} = 9.27$, $SD = 2.66$). Participants were shown a print advertisement which featured a biscuit (cookie) paired

with a brand name. The sound contained in the brand name (pre-tested, pronounceable single-syllable word; n = 10, M_{age} = 6.20) was manipulated across conditions: Gerps (front vowel) or Gorps (back vowel). The sublexical prime was delivered through the visual presentation of the brand name, whereby the brand name was presented as either a continuous string (GERPS/GORPS) or as five chunks (G E R P S/G O R P S). Participants were then asked to evaluate the biscuit (cookie) in terms of: chewiness and thickness on seven-point scales and then complete the phoneme counting task (M_{PA} = 14.96, SD_{PA} = 4.90). Finally, simple demographic information was obtained.

An ANOVA model was estimated to verify that neither participant age (F(1, 191) = .01, p = .938) nor phonological awareness score (F(1, 191) = .36, p = .550) differed across experimental conditions. A frequency analysis revealed that participant gender was approximately evenly distributed across experimental groups (χ^2 = .31, p = .958).

Results

Consistent with Study 1 and Study 2 we expected to observe a positive linear relationship between age and phonological awareness. Results of regression analysis again supported our assertion (R^2 = .400, β = .70, p <.001). Results provided further evidence that older (younger) children possess higher (lower) levels of phonological awareness.

Next, we expected that exposure to a sublexical prime would strengthen phonetic symbolism based-effects. Consistent with Study 2, we expected effects to heighten for younger children. Again a Product Attribute Index (PAI) was created; combining participant's judgments of chewiness and thickness, and a dichotomous measure of age was constructed.

Main and two-way interaction effects. An ANOVA model was estimated with a significant main effect observed for brand name (F(1, 191) = 28.55, p < .001, η^2 = .130).

Consistent with phonetic symbolism theory, a product paired with a brand name containing back (front) vowel sound was perceived as more (less) chewy and thick (Back Vowel Sound: M_{PAI} = 4.55; Front Vowel Sound: M_{PAI} = 3.68). A significant main effect was not observed for sublexical prime presence ($F(1, 191) = .63$, $p = .430$, $\eta^2 = .003$). In addition, a significant interaction was found between brand name and sublexical prime ($F(1, 193) = 9.87$, $p = .002$, $\eta^2 = .049$). Results demonstrated that effects consistent with phonetic symbolism theory were strengthened when participants were exposed to a sublexical prime ($M_{\text{Sublexical Prime Present/Front Vowel}} = 3.36$; $M_{\text{Sublexical Prime Present/BackVowel}} = 4.74$; $M_{\text{Sublexical Prime Absent/Front Vowel}} = 4.00$; $M_{\text{Sublexical Prime Absent/Back Vowel}} = 4.36$).

Three-way interaction effect. Next, to examine the moderating role of age on the effect of the interaction (brand name x sublexical prime) on product attribute evaluations (three-way interaction) an ANOVA model was estimated. As expected, a significant three-way interaction was observed between brand name, sublexical prime, and age ($F(1, 187) = 7.73$, $p = .006$, $\eta^2 = .040$). Replicating Study 2 and Study 3A, results of simple effects analysis demonstrated that the interaction (brand name x sublexical prime) did not have a significant effect on product evaluations when participants were older ($F(1, 97) = .02$, $p = .903$, $\eta^2 < .001$), but did have a significant effect when participants were younger ($F(1, 90) = 12.94$, $p = .001$, $\eta^2 = .139$). Summary statistics are reported in Table 3.

Table 3: Brand Name x Task Sequence on Product Attribute Judgments across Younger and Older Children (Study 3, Experiment 3B)

	Sublexical Prime	
	Present	Absent
Younger Children (6 – 9 years of age)		
Brand Name: Front Vowel Sound (Gerps)	3.13	3.70
Brand Name: Back Vowel Sound (Gorps)	4.86	3.80
Older Children (10 – 16 years of age)		
Brand Name: Front Vowel Sound (Gerps)	3.63	3.58
Brand Name: Back Vowel Sound (Gorps)	4.46	4.45

General discussion and conclusions

This research makes an important contribution to the developing literature on phonetic symbolism effects in branding by building on the current understanding of the process underlying sound symbolism effects. Findings from this research show that age (children's level of phonological awareness) affects product attribute evaluations, whereby older children (those higher in phonological awareness) will infer brand names with back (front) vowel sounds as possessing big and heavy (small and light) attributes, than younger children (with lower levels of phonological awareness). While results of this research reveal that younger children have an inability to formulate phonetic-based judgments consistent with phonetic symbolism theory, we provide evidence that sublexical priming can aid children in overcoming developmental phonological-based barriers.

Results of this research provide marketers with a means to overcome boundaries of phonetic symbolism effects in branding activities and advertising communications targeted towards younger children (such as the language tasks used by the brand *Post* for their product, *C is for Cereal*). Activation of the sublexicon through phonological tasks, which are typically used to assess a child's ability to recognize syllables and sounds contained in words (Stanovich et al. 1984), were shown to prime phonetic-based judgments. We show that the inclusion of

phonological tasks in print advertising can enhance phonological effects, resulting in judgments of product attributes in line with phonetic symbolism. In other words, sublexical priming enhances judgments that brand names with back vowel sounds are larger, heavier, thicker, chewier, smoother, and creamier than front vowel sound brand names, in younger children (i.e., those low in phonological awareness). For older children, who are already high in phonological awareness, sublexical priming does not enhance, nor reduce, pre-existing phonetic symbolism effects.

Our research examines phonetic-based product judgments for children who are likely to be in the initial, or more advanced reading stage. To ensure the testing of phonetic symbolism effects (i.e., sounds in words) this study controlled for audio frequency and tone. Drawing from research in evolutionary psychology which has demonstrated that animals (human and non-human) communicate meaning via variations in tone and frequency (e.g., Seyforth and Cheney, 2003), it is expected that changes in the frequency (pitch) in which a brand name is presented may influence product-based judgements. We suggest future research investigate this proposition. Finally, with this research employing fictitious brand names (e.g., Vipiz) we propose that future research be undertaken in the context of real brand names. For example, Merida bikes may be perceived as lighter and smaller than Mongoose bikes.

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