

## Effects of Sound Stimuli Applied in Branding: An Empirical Study of Its Antecedents and Consequences

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### Abstract

Intel and Nokia's success in sound branding encouraged followers to implement this branding strategy. This study aims to explore the effects of sound stimuli applied in branding. A questionnaire survey was conducted to measure consumers' perception towards sound stimuli, and its influence towards brand preference. Consumers' perception towards sound stimuli is further examined to identify its influences on attitude towards the brand, brand awareness with brand association, and qualitative perception. Brand loyalty and preference are confirmed to have consequential influences from the antecedents: attitude towards the brand, brand awareness with brand association, and qualitative perception.

Findings of this study suggest that sound trademarks should be carefully selected and designed to help consumers remember the brand and elicit positive awareness, association, attitude and perception. In contrast, slogan-alone sound trademarks, especially those with ambiguous meaning slogans, may lead to negative attitudes and preferences.

**Keywords:** Brand Equity, Brand Preference, Sound Branding, Sound Stimulus, Sound Trademark

**JEL Classification:** M31

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## 1. Introduction

The purpose of sound is not only to recall memory or association but may also be perceived as an indication of quality (Lindstrom, 2005). Several years ago, when the Japanese were seeking to produce a high-quality car, they formed the first unit to be the model of a “branded car sound”. It was specially designed to create a low-frequency vibration sound of “quality”. This phenomenon gave rise to the idea that sound can add extra value to a brand (Lindstrom, 2005). In fact, according to Jackson (2003), after visual communication, audio communication is the second most powerful tool to communicate with customers.

When it comes to brand communication, marketers still prefer to use the visual channel (Fulberg, 2003). To make a brand highly visible, an identity is often used to represent the brand’s personality and values it attempts to communicate with consumers. A trademark is an identity that can be viewed as any visible sign capable of distinguishing goods to help consumers recognise the brand and prevent the unauthorised use of that identity by others (Chin, Tsao, & Chi, 2005; Fombad, 2007).

Apart from being in the visible form, trademarks can also be in the form of sound, which have been admitted for legal registration for many years. Unfortunately, although, a particular sound of a product should be treated as a dominant identity due to its nature of direction – free and longer distance to sense (Fulberg, 2003); marketers, to date, still neglect the importance of the sound trademark which can affect a consumer’s brand preference and purchase decision. This is despite the findings by Lindstrom (2005) that sound stimuli applied in branding or marketing programmes is more impressive than visual components.

Thus, this study aims to investigate how sounds influence and enhance brand preference by affecting consumer perceptions and behaviours. To examine the effects of sounds, we first identify how audiences perceive sound marks and then use it to measure consumers’ perceptions towards sound stimuli.

## 2. Theoretical background and hypotheses development

### 2.1 *Theoretical background*

#### 2.1.1 *Brand and brand equity*

The American Marketing Association (AMA) defines brand as “a name, term, design, symbol, or any other feature that identifies one seller’s goods

or services as distinct from those of other sellers” (www.marketingpower.com). Keller and Lehmann (2006) contend that brands are an asset in the financial sense. Brands serve as markers for the offerings of a firm. For consumers, brands can simplify their decision making process for the choices, give an assurance for a particular quality level, reduce risk, and/or engender trust. Brands also play an important role in determining the effectiveness of marketing efforts. Kotler (2006) claims brand as the consistent attributes, benefits, commitments of products and services to target consumers.

AMA further defines brand equity as “the value of a brand. From a consumer’s perspective, brand equity is based on the consumer’s attitudes about positive brand attributes and favourable consequences of brand use” (www.marketingpower.com). According to Farquhar (1989), brand equity can be viewed as “the added value with which a given brand endows a product” (p. 24). Aaker and Joachimsthaler (2000) point out that brand equity creates value for the firm and the consumers, and it comprises brand loyalty, brand awareness, perceived quality, brand associations, and other proprietary brand assets. Obviously, brand equity can be created, maintained and expanded by strengthening brand awareness, brand association, perceived quality and brand loyalty (Yoo, Donthu, & Lee, 2000).

### *2.1.2 Brand awareness and brand association*

Brand awareness can be viewed as a consumer’s ability to identify a brand in sufficient detail to distinguish it from other brands, while brand associations consist of all brand-related thoughts, feelings, perceptions, images, experiences, beliefs, and attitudes that become linked to the brand node (Kotler & Keller, 2010). Further, Aaker (2004) describes brand awareness as the strength of the brand’s presence in the consumer’s mind that can be measured by recognition, recall and brand name dominance. He also defines brand association as “anything linked in memory to a brand” (Aaker, 1991, pp.109-110). Thus, brand awareness coupled with strong brand association can shape a unique brand image. A unique brand image contributes to a consumer’s perception and preference towards a particular brand. Such perception and preference lead to repurchase intention and behaviour.

### *2.1.3 Attitude towards the brand, brand loyalty and brand preference*

Ajzen and Fishbein (1980) note that a consumer’s attitude towards the brand is instrumental in determining the consumer’s purchase intentions. Brand attitude is a consumer’s overall evaluations of a brand (Keller, 1993).

When deciding to choose or when buying a product among different brands, a consumer will usually evaluate different brands. The evaluation will be either positive or negative. Thus, attitude towards a brand can be viewed as the overall evaluation in determining the consumer's purchase intentions. When a consumer buys a product of a particular brand routinely and resists switching to another brand, brand loyalty occurs (Yoo et al., 2000). Oliver (1999) defines brand loyalty as "a deeply held commitment to repurchase a preferred product or service consistently in the future" (p. 34). That is, a brand-loyal consumer will buy the brand in preference (Wood, 2004). Higie and Sewall (1991) argue that brand preference is a major component of an individual's expressed impression to purchase. Thus, brand preference is the degree of feeling good about the brand and this attitude would affect a consumer's behaviour and purchasing decision (Knox & Walker, 2001).

#### *2.1.4 Perceived quality*

Perceived quality is a total judgment of evaluation with respect to a product bearing on the relative superiority of the product. A firm must have a quality product that delivers superior performance to the consumer in order to achieve a positive evaluation of the brand in the consumer's memory (Farquhar, 1989). Bou-Llusar, Camison-Zornoza and Escrig-Tena (2001) say that perceived quality has a positive influence on purchase intentions. Darsono and Junaedi (2006) further indicate that perceived quality is the antecedent of consumer's satisfaction and loyalty.

## **2.2 Hypotheses development**

### *2.2.1 Perception towards a sound stimulus, attitude towards the brand, brand awareness with brand association, and perceived quality*

Music in creating a wide range of emotional responses is unquestionable (Fulberg, 2003), but the effects of non-musical sound in branding are still unknown. A brand which is accompanied by sound stimuli or has sound stimuli as one of its major elements is called 'Sound Branding' (Steiner, 2009), 'Audio Branding' (Ringe, 2005) and 'Sonic Branding' (Jackson, 2003). All these names represent the same concept. Up to now, the effects of sound stimuli towards the dimensions of brand equity (brand awareness, brand association, perceived quality and brand loyalty) have rarely been examined in Taiwan. Aaker (2004) indicates that slogans or jingles are among the marketing elements affecting brand equity. Jackson (2003) believes that jingles and short mnemonic slogans can be viewed as sonic logo. As the

sound stimulus is a tool of advertising, background music in a commercial influences mood and it impacts attitude and behaviour (Alpert & Alpert, 1989). Treasure (2007) indicates that sound can improve almost every facet of business. Favourable music, for example, creates positive attitudes towards the brand (Sung & de Gregorio, 2008). According to Fraedrich and King (1998), a pleasant or novel sound can grab attention, and this attention may evoke the audience's recall of experience, memory and association. Sounds can become as familiar and representative to an audience as the visual brand logo counter parts. That is, sounds are often associated with symbols or objects as well as with feelings. Thus, this study hypothesises that:

- H1: Perception towards a sound stimulus applied in branding is positively related to attitude towards that brand.*
- H2: Perception towards a sound stimulus applied in branding is positively related to the brand awareness with brand association.*

Lindstrom (2005) and Jackson (2003) further discourse upon particular sounds affecting consumer's perception of quality. The distinctive engine sound of Harley-Davidson motorcycle or the sound produced from the closing of an automobile's door is considered as classical paradigm. Dodds, Monroe and Grewal (1991) indicate that brand information positively influences a consumer's perceived quality. As sound stimuli applied in branding or marketing may deliver information about brand in forms of a brand name, slogan, lyrics, and even jingle or tune, we propose that sound stimuli positively affect perceived quality. Thus, we propose that:

- H3: Perception towards a sound stimulus applied in branding is positively related to the perceived quality.*

### *2.2.2 Brand awareness with brand association, attitude towards the brand, perceived quality, and brand loyalty and preference*

Audio and visual stimuli can remind consumers of their experiences of certain product and brand. A consumer easily associates sound trademarks with his/her experiences of commercial or personal, and realises his/her attitude towards that brand. Maison, Greenwald, and Bruin (2004) claim that brand association can create positive attitudes. Yoo et al. (2000) also address that high brand equity implies that consumers have positive and strong associations related to the brand; therefore, brand perception of high quality leads to their brand loyalty.

Awareness and association are usually the antecedents of other dimensions as consumers tend to recall, recognise, and associate with the images first. Esch, Langner, Schmitt, and Geus (2006) contend that strong and unique brand association results in perceived quality and a positive attitude; and they further indicate that brand awareness, association, and perceived quality are key determinants of brand loyalty. Consumers' overall evaluation of a brand is reflected by their attitude, and this attitude consequently affects their behaviour when they choose a brand (Biehal, Stephens, & Curlo, 1992). Suh and Yi (2006) indicate that brand loyalty can be influenced by satisfaction and brand attitude. Wu and Lo (2009) prove that brand attitude influences purchase behaviour and brand loyalty. Usually brand loyalty is created by positive experiences of product use and attitude evoked by awareness and association. According to Darsono and Junaedi (2006), perceived quality also has positive impacts on satisfaction and brand loyalty. Bou-Llusar et al. (2001) further indicate that perceived quality has a positive influence on the consumers' purchase intentions. Therefore, in view of the previous literature, the following hypotheses can be proposed:

- H4: Brand awareness with brand association is positively related to attitude towards the brand.*
- H5: Brand awareness with brand association is positively related to perceived quality.*
- H6: Brand awareness with brand association is positively related to brand loyalty.*
- H7: Attitude towards the brand is positively related to brand loyalty.*
- H8: Perceived quality is positively related to brand loyalty.*

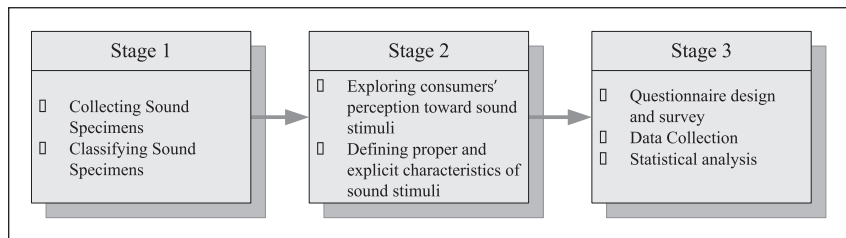
Wood (2004) indicates a brand-loyal consumer would buy a brand in preference. A loyal consumer tends to repeatedly purchase a certain brand due to the fact that high satisfaction derives preference to choose and repeatedly purchase that particular brand (Hoyer & Macinnis, 2009). Bandyopadhyay, Gupta, and Dube (2005) contend that brand loyalty influences a consumer's choice. Also, extant literature demonstrates that brand loyalty is a dimension of brand equity which influences choice, intent and preference (Horsky, Misra, & Nelson, 2006; Heilman, Bowman, & Wright, 2000; Srinivasan, Anderson, & Ponnnavolu, 2002; Wood, 2004). Thus, the following hypothesis can be proposed:

- H9: Brand loyalty is positively related to brand preference.*

### 3. Research design and methodology

Figure 1 shows the three (3) stages of this empirical research. At the first stage, the main task is to collect sound trademarks for this research. The sounds are from those registered sound trademarks in Taiwan or in the United States. We retrieved downloadable sound specimens that were published on the websites of Taiwan Intellectual Property Office (TIPO) and United States Patent and Trademark Office (USPTO). In the second stage, we had to ascertain how audiences perceive and recognise the characteristics of sound stimuli in branding. By way of conducting a qualitative research, it is possible to identify perceived characteristics of sound trademarks, and then define succinct characteristics of sounds that consumers perceived to be used for subsequent questionnaire design. The third stage examines how different sound stimuli influence brand preference.

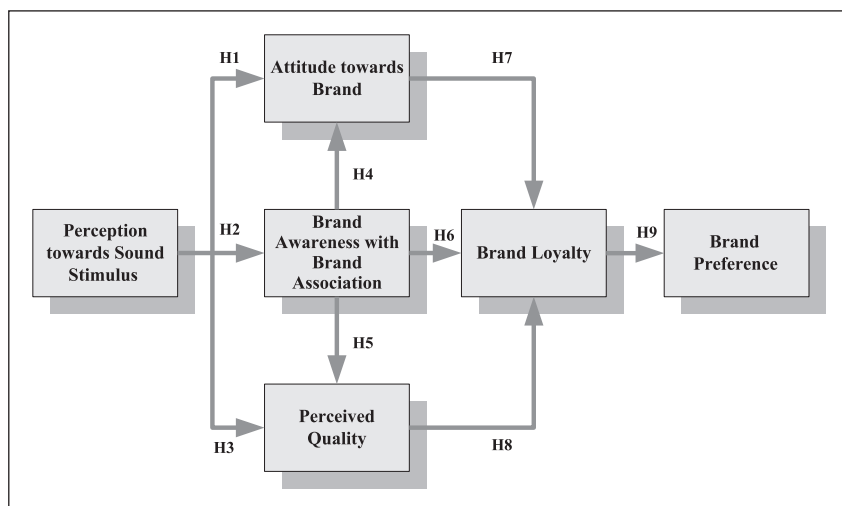
Figure 1: Three stages of this study



#### 3.1 Conceptual model

In this study, the conceptual framework (Figure 2) illustrates the six (6) constructs with their proposed inter-relationships. The first construct, *perception towards a sound stimulus*, is to test the respondents about their perceptions towards the sound stimuli and the last construct is *brand preference* which is being influenced by the sound stimuli that consumers perceived as well as other antecedents. The four (4) remaining constructs are all sub-classes of brand equity, namely, *attitude towards the brand*, *brand awareness with brand association*, *perceived quality* and *brand loyalty*.

Figure 2: Conceptual framework



## 3.2 *Selecting and defining sound stimuli*

### 3.2.1 *Exploratory study about sound characteristics*

Because very few studies have been conducted regarding the characteristics of sound stimuli, there is no convincing evidence of how the sound stimuli can be properly classified and how they are perceived by consumers. For collecting the necessary primary data, we conducted interviews with consumers to explore how consumers perceive those sound specimens.

Fraedrich and King (1998) indicate that pleasant sound increases the listeners' perception of attractiveness and association between sound and counterpart affects recall. Sound with nature association to pairing is easier to remember and implement, though it may be too familiar to command immediate audience attention. In this regard, sound with novelty may establish unique and enduring relationship between sound and its pairing. These notations and supports allow us to assert that there are at least three (3) characteristics of sound that may affect a consumer's perception: pleasantness, relation to brand/product and distinctiveness. In order to identify more characteristics of sound, we selected seventeen (17) sound specimens from TIPO and USPTO and used the convenient sampling technique to obtain ten (10) voluntary participants for in-depth interviews. Five (5) male and five (5) female Taiwanese participants aged 20 to 45 years



old were chosen. Each interviewee was requested to listen to one (1) to three (3) sound stimuli and respond to the stimuli. The interview results were summarised and presented in Appendix 1. From the analysis of the interviews along with related literatures, the characteristics perceived from the sound trademarks by consumers are obtained. They are as follows: 1) pleasantness; 2) relation to brand/product; 3) distinctiveness; 4) length and clarity; and 5) accessibility. These five (5) characteristics were later used to develop the first construct: “*perception towards a sound stimulus*” (see Appendix 1).

### 3.2.2 Selecting sound specimens for questionnaire survey

Based on the interview results, it is suggested that a sound trademark comprising a brand name is one of the major concerns of brand association among consumers. Even though sound trademarks comprising slogan might elicit awareness, association and brand information, they might still confuse consumers and elicit negative attitude in some cases (e.g., AOL – you’ve got a mail). In this regard, two sound specimens (slogan vs. no-slogan) were selected and each was divided by the two factors (no-brand-name vs. brand-name). The other common sound trademark was song-type which comprises brand, slogan and information in melody. As the survey was conducted in Taiwan, we chose ten sound trademarks from TIPO (three of them registered in USPTO) as the sound stimuli for the questionnaire survey. The five (5) categories and sound specimens chosen are listed in Table 1.

Table 1: Sound specimens selected for questionnaire survey

Sound specimen comprises		Category	Sound specimen
No-slogan	No-brand-name	1	Nokia Tune Intel Jingle
	Brand-name	2	Yahoo Yodel Mr. Brown Coffee
Slogan	No-brand-name	3	Cathay United Bank Hokia-Whisbih
	Brand-name	4	Hi-Life
Song		5	Knorr Soup Green Oil Tatung Song

### 3.3 *Measurement instrument*

In this study, the questionnaire has eight (8) sections as listed in Appendix 2. The first section concerns the sound and the brand it represents. The last section is the respondent's profile which includes items on the respondent's age, gender, education and occupation. The other sections in the questionnaire revolve around the six (6) constructs: *perception towards a sound stimulus, attitude towards the brand, brand awareness with brand association, perceived quality, brand loyalty, and brand preference*. The questionnaire items for the six (6) constructs were designed by using the 7-point Likert scale. Respondents were asked to indicate their level of agreement towards each statement ranging from 1=extremely disagree to 7=extremely agree. To measure a respondent's perception towards a sound stimulus, twenty two (22) items were derived from Cheskin (1999) and our findings resulted from the in-depth interviews conducted in the second stage of this study (see Figure 1). Four (4) items of "attitude towards the brand" measurement were adopted from Moore (1993). Four (4) items proposed by Yoo et al. (2000) were also incorporated to measure the "brand awareness with brand association". Based on Aaker (2004) and Yoo et al. (2000), four (4) items were selected and added to measure "perceived quality". For the "brand loyalty", five (5) items were adopted directly from Yoo et al. (2000). The three-item measurement of Olson and Thjomoe (2003) regarding brand preference was also added to the questionnaire.

The respondents were requested to listen to the sound stimuli before answering the questions. If a respondent could discern the brand origin of this sound, he/she would be asked to write down the brand first, before completing the questionnaire. However, if the respondent could only associate the sound to certain products or he/she could not recognise the sound specimen, he/she would be required to answer only the question items regarding "perception towards a sound stimulus" and the respondent's profile, as his/her answers about attitude, awareness, association, loyalty, preference and quality perception would not be relevant.

### 3.4 *Sampling plan and data collection*

To examine how sound stimuli influences brand preference, we used the designed questionnaire accompanied with ten (10) sound trademarks (two sounds for each of the five (5) categories, as shown in Table 1) to test how respondents perceived sound stimuli and to measure each construct. As mentioned in part 3.2.2 of this paper, the sound specimens applied in this survey were from those registered sound trademarks in Taiwan. Taiwanese

respondents were chosen as they were familiar with the culture and able to recognise those brands and their corresponding sound trademarks.

To conduct the survey, the questionnaire was prepared in both web and paper versions. In the web version of the questionnaire, there were ten (10) buttons linked to ten (10) sound specimens for respondents to randomly choose (with the click of a button, the sound was played). After listening to the sound stimuli, the respondents were requested to answer the questionnaire items based on their perceptions towards the sound stimuli. For the paper version, we conducted an on-the-street survey to collect the consumers' responses. To proceed with sound stimulation, we used an MP3 player to play chosen sound trademarks for the respondents to listen to before starting to fill out the questionnaires. Then we asked the respondents to answer the questionnaire according to their discernment and perception of the sound stimuli. Ultimately, a total of three hundred seventy three (373) responses from web and paper survey were collected. Excluding twenty (20) responses with missing values, there were three hundred fifty three (353) valid responses ready for data analysis.

## **4. Research analysis and results**

### **4.1 Sample description**

Ten (10) sound specimens were selected to test the consumer's perception on the research constructs. Thirty (30) to forty (40) responses were obtained from each sound specimen. Table 2 lists the discernment result: the sound trademarks failed to be discerned were mainly those which did not comprise brand name such as Nokia tune, Intel jingle, Cathay United Bank slogan, and Whisbih slogan. Out of three hundred fifty three (353) respondents, two hundred sixty five (265) were able to recognise the sound mark and discern the pairing brand; twenty eight (28) respondents knew the sound trademark and could associate it with related products but were not able to discern the brand; and the remaining sixty (60) respondents neither knew the sound nor were able to discern the associations with any brand or products. Because eighty eight (88) respondents failed to discern the brands, they were not asked to answer the remaining questionnaire items regarding attitude towards the brand, brand awareness with brand association, perceived quality, brand loyalty and brand preference. Two hundred sixty five (265) out of three hundred fifty three (353) valid responses were used to measure the six (6) constructs.

Table 2: Result of brands discerned – by sound specimens (N=353)

Category	Sound specimen comprises	Sound specimen	Brand discerned		Related product discerned		Failed to recognise	Sum
			Correct	Incorrect	Correct	Incorrect		
1	No-slogan No-brand-name	Nokia Tune	23	0	2	1	8	34
		Intel Jingle	7	5	5	2	15	34
2	No-slogan Brand-name	Yahoo Yodel	29	0	0	0	9	38
		Mr. Brown Coffee	34	0	0	0	0	34
3	Slogan No-brand-name	Cathay United Bank	4	5	9	1	16	35
		Hokia – Whisbih	13	8	4	1	8	34
4	Slogan Brand-name	Hi-Life	34	0	3	0	1	38
		Knorr Soup	31	0	0	0	2	33
5	Song	Green Oil	34	0	0	0	1	35
		Tatung Song	38	0	0	0	0	38
Subtotal			247	18	23	5	60	
Sum				265		28	60	353

Among the two hundred sixty five (265) valid responses, 46.74 per cent of the respondents are male and 47.59 per cent are aged from twenty seven (27) to thirty five (35) years old. More than 94 per cent of the respondents have at least college degrees. Approximately 41 per cent of the respondents are working in industrial or commercial sectors. Only 17.56 per cent of the respondents are full-time students.

#### 4.2 Factor analysis

Principal component with orthogonal varimax rotation was conducted in this study. Based on Hair, Black, Babin, Anderson, and Tatham (2006), the criteria for factor analysis are: (1) factor loading  $\geq 0.6$ ; (2) eigenvalue  $\geq 1$ ; and (3) cumulatively explained variance  $\geq 60$  per cent. Factor analysis was

used to identify the internal consistency and reliability of the construct measurement. The reliability of the construct with the item-to-total correlation  $\geq 0.5$  and internal consistency analysis with Cronbach's alpha  $\geq 0.7$  were examined.

Through factor analysis, four (4) factors were extracted from twenty two (22) question items of perception towards a sound stimulus which cumulatively explained variance of 68.24 per cent for three hundred fifty three (353) samples. Four (4) factors were labelled as 'experience evoking', 'pleasantness', 'length' and 'accessibility.' Again, through factor analysis, four (4) factors were extracted from twenty two (22) question items of perception towards a sound stimulus which cumulatively explained variance of 72.99 per cent for two hundred sixty five (265) samples. These four (4) factors were named: 'distinctiveness and relation', 'length', 'accessibility' and 'experience evoking'. Table 3 tabulates the factors extracted, the content items, and the detailed reliability test results on the six (6) constructs. In this study, the internal consistency and the reliability of each construct measurement are acceptable.

#### *4.3 Comparing mean difference on the factors among sound stimuli discernment*

This analysis is to compare the measurement differences among brand discernment to sound stimuli. The discernment falls into three (3) result-categories: (1) respondents answering that they can recognise or likely to recognise the sound and counterpart brand (immaterial whether the pairing is correct or wrong); (2) respondents answering that they can associate the sounds with related products but not the brand; and (3) respondents that are not aware of the sounds or any related products and brands. To compare the discernment differences on the four (4) factors ('distinctiveness and relation', 'length', 'accessibility', and 'experience evoking'), we use one-way ANOVA to compare the means of each factor and examine its significance. The results show that the respondents who can discern the brand have significantly higher scores on factors "Experiences evoking" ( $F=114.23, p<0.000$ ), "Pleasantness" ( $F=16.18, p<0.000$ ), and "Accessibility" ( $F=16.30, p<0.000$ ). The results indicate that "Experience evoking" and "Pleasantness" are two key factors in determining whether the respondents can recall and discern the brand behind the sound trademarks or not. Among the three (3) discernment results, there is no significant difference on "Length"; thus "Length" does not matter as to whether the respondents are able to discern the brand behind the sound trademark. Table 4 lists the mean differences and the results of ANOVA analysis.

Table 3: Results of factor analysis

Category	Content item	Factor loading	Eigen value	Exp. variance %	Item-to-total correlation	Cronbach's $\alpha$
AI. Perception towards Stimulus (n=353)						
Experience evoking	PSS19,PSS18,PSS20, PSS22,PSS21, PSS17, PSS16, PSS15, PSS08	0.73~0.78	4.9	68.24	0.54~0.77	0.90
Pleasantness	PSS01,PSS02,PSS03	0.84~0.89	2.67		0.77~0.87	0.91
Length	PSS10, PSS11, PSS12	0.79~0.84	2.03		0.54~0.64	0.75
Accessibility	PSS13, PSS14	0.86~0.89	2.01		0.75~0.75	0.86
BI. Perception towards Stimulus (n=265)						
Distinctiveness and relation	PSS05,PSS06, PSS07,PSS08	0.76~0.86	2.54	72.99	0.57~0.69	0.81
Length	PSS10,PSS11,PSS12	0.79~0.85	2.04		0.54~0.65	0.76
Accessibility	PSS13, PSS14	0.90~0.93	1.81		0.75~0.75	0.85
Experience evoking	PSS21, PSS22	0.86~0.88	1.65		0.61~0.61	0.76
II. Attitude towards the Brand (n=265)						
AttB01, AttB02, AttB03, AttB04		0.73~0.92	2.86	71.56	0.57~0.84	0.86
III. Brand Awareness with Brand Association (n=265)						
BAA01,BAA02,BAA03,BAA04		0.87~0.92	3.26	81.29	0.77~0.85	0.92
IV. Perceived Quality (n=265)						
PQ01,PQ02,PQ03,PQ04		0.90~0.94	3.38	84.57	0.82~0.88	0.94
V. Brand Loyalty (n=265)						
BL01,BL02,BL03,BL04,BL05		0.83~0.91	3.81	76.17	0.58~0.84	0.92
VI. Brand Preference (n=265)						
BP01,BP02,BP03		0.91~0.94	2.55	85.06	0.80~0.85	0.91

Note: The description of each content item is provided in Appendix 2.

#### 4.4 Hypotheses testing

##### 4.4.1 The influence of perception towards a sound stimulus on attitude towards the brand

Through simple regression, the relation of perception towards a sound stimulus and attitude towards the brand can be revealed. Among the four (4) factors of perception towards a sound stimulus, "Distinctiveness and

Table 4: Brand discernment results on factors of perception towards a sound stimulus

Discernment result	Factors	Experience evoking	Pleasantness	Accessibility	Length
1. Discerned brand (n=265)		5.36	4.97	5.09	5.38
2. Discerned related product (n=28)		3.60	3.93	4.68	5.15
3. Failed to recognize sound (n=60)		3.28	4.21	4.02	5.13
F		114.23	16.18	16.30	1.49
P		.000	.000	.000	.227
Duncan		(1,23)	(1,23)	(12,3)	(123)

relations" ( $R^2=0.3$ ,  $F=110.3$ ,  $p=0.000$ ,  $D-W=1.87$ ) and "Experience evoking" ( $R^2=0.3$ ,  $F=111.2$ ,  $p=0.000$ ,  $D-W=1.97$ ) have a significant impact on the attitude towards the brand, whereas "Length" ( $R^2=0.01$ ,  $F=2.86$ ,  $p=0.000$ ,  $D-W=1.89$ ) and "Accessibility" ( $R^2=0.06$ ,  $F=18.04$ ,  $p=0.092$ ,  $D-W=1.86$ ) do not have any significant impact on the attitude towards the brand. However, by using the four (4) factors of perception towards a sound stimulus as independent variables, the overall model is significant ( $R^2=0.43$ , Adjusted- $R^2=0.43$ ,  $F=49.91$ ,  $p=0.000$ ,  $D-W=2.00$ ). These results suggest that respondents who perceived higher levels of the sound stimulus in terms of "Distinctiveness and relations" and "Experience evoking" tend to have higher levels of attitude towards the brand. Thus, for H1, 'distinctiveness and relations' and 'experience evoking' are supported, while 'length' and 'accessibility' are not supported.

#### 4.4.2 The influence of perception towards a sound stimulus on brand awareness with brand association

Using each factor of perception towards a sound stimulus as an independent variable to test hypothesis two (H2), "Distinctiveness and relations" ( $R^2=0.2$ ,  $F=66.37$ ,  $p=0.000$ ,  $D-W=1.72$ ) and "Experience evoking" ( $R^2=0.31$ ,  $F=120.2$ ,  $p=0.000$ ,  $D-W=1.91$ ), it was found that both variables have significant impact on brand awareness with brand association. "Length" ( $R^2=0.01$ ,  $F=3.5$ ,  $p=0.63$ ,  $D-W=1.74$ ) and "Accessibility" ( $R^2=0.09$ ,  $F=24.58$ ,  $p=0.000$ ,  $D-W=1.71$ ) are statistically significant. However, the overall model is significant ( $R^2=0.40$ , Adjusted- $R^2=0.39$ ,  $F=43.44$ ,  $p=0.000$ ,  $D-W=1.91$ ). These results suggest that respondents who perceived the sound stimulus in terms of "Distinctiveness and relations"

and “Experience evoking” tend to have higher levels of brand awareness with brand association. Thus, H2 is partially supported.

#### *4.4.3 The influence of perception towards a sound stimulus on perceived quality*

To test the relation of perception towards a sound stimulus on perceived quality, each factor of perception towards a sound stimulus was used as an independent variable. “Distinctiveness and relations” ( $R^2=0.27$ ,  $F=98.34$ ,  $p=0.000$ ,  $D-W=1.69$ ) and “Experience evoking” ( $R^2=0.24$ ,  $F=80.76$ ,  $p=0.000$ ,  $D-W=1.90$ ) are significant, but “Length” ( $R^2=0.01$ ,  $F=1.46$ ,  $p=0.229$ ,  $D-W=1.76$ ) and “Accessibility” ( $R^2=0.03$ ,  $F=8.5$ ,  $p=0.000$ ,  $D-W=1.71$ ) are not. However, the overall model is significant ( $R^2=0.37$ ,  $\text{Adjusted-}R^2=0.36$ ,  $F=37.43$ ,  $p=0.000$ ,  $D-W=1.82$ ). These results suggest that respondents who perceived “Distinctiveness and relations” and “Experience evoking” sound stimuli believe that the product is of high quality. Thus, H3 is partially supported.

#### *4.4.4 The influence of brand awareness with brand association on attitude towards the brand*

The analytical results show that the influence of the brand awareness with brand association on attitude towards the brand is significant ( $R^2=0.32$ ,  $\text{Adjusted-}R^2=0.31$ ,  $F=121.78$ ,  $p=0.000$ ,  $D-W=2.03$ ). Respondents who perceived higher levels of brand awareness with brand association tend to have a favourable attitude towards the brand. Thus, H4 is supported.

#### *4.4.5 The influence of brand awareness with brand association on perceived quality*

The influence of brand awareness with brand association on perceived quality is also significant ( $R^2=0.27$ ,  $\text{Adjusted-}R^2=0.27$ ,  $F=98.51$ ,  $p=0.000$ ,  $D-W=1.94$ ), therefore, respondents’ brand awareness with brand associations leads to perceived quality of that brand. Thus, we can conclude that H5 is supported.

#### *4.4.6 The influence of brand awareness with brand association on brand loyalty*

Brand awareness with brand association significantly influences brand loyalty ( $R^2=0.10$ ,  $\text{Adjusted-}R^2=0.10$ ,  $F=29.60$ ,  $p=0.000$ ,  $D-W=1.93$ ). The result suggests that respondents’ brand awareness and associations lead to their brand loyalty. Thus, H6 is supported.



#### *4.4.7 The influence of attitude towards the brand on brand loyalty*

The analytical results show that the influence of attitude towards the brand on brand loyalty is significant ( $R^2=0.42$ , Adjusted-  $R^2=0.41$ ,  $F=186.25$ ,  $p=0.000$ ,  $D-W=1.69$ ). This result suggests that respondents having positive attitude towards the brand tend to increase their brand loyalty. Thus, we can conclude that H7 is supported.

#### *4.4.8 The influence of perceived quality on brand loyalty*

The influence of perceived quality on brand loyalty is significant ( $R^2=0.53$ , Adjusted-  $R^2=0.52$ ,  $F=186.25$ ,  $p=0.000$ ,  $D-W=1.81$ ). This result suggests that respondents who perceived higher quality of a particular brand tend to have higher brand loyalty. Thus, H8 is supported.

#### *4.4.9 The influence of brand loyalty on brand preference*

The influence of brand loyalty on brand preference is significant with  $R^2=0.68$ , Adjusted-  $R^2=0.68$ ,  $F=553.89$ ,  $p=0.000$ , and  $D-W=1.54$ . This result suggests that respondents who perceived higher levels of brand loyalty tend to have higher brand preference. Thus, H9 is supported.

From the regression analyses above, the results confirm that each proposed relationship is evident of its significant influence. Therefore, the conceptual model of this research is supported by the fact that the perception towards a sound stimulus will influence attitude, awareness and association and quality perception.

### **4.5 Comparing construct mean difference among categories of sound**

As the respondents were tested under different categories of sound stimulus, we wanted to ascertain the effects on the dependent variables ('attitude towards the brand', 'brand awareness with brand association', 'perceived quality', 'brand loyalty' and 'brand preference') caused by different categories of sound. To compare the mean differences among the five (5) categories of sound trademarks, we employed ANOVA to test the measurement differences caused by the five (5) categories of sound trademarks: (1) no-slogan with no-brand-name; (2) no-slogan with brand-name; (3) slogan with no-brand-name; (4) slogan with brand-name; and (5) only song.

The ANOVA analysis shows that sounds from different categories influence subjects on each construct. The ANOVA analysis confirmed that the difference is significant. Duncan analyses are not consistent on the five (5) constructs to group the effects caused by categories of sound. From the

results (see Table 5), it is apparent that the mean values of category 3 (slogan X no-brand-name) are always low for each construct (e.g. attitude towards the brand, perceived quality, and so on), while the mean values of category 1 (no-slogan X no-brand-name) and category 5 (song) are always high. Further, category 3 is always grouped apart from category 1 and category 5. Also, category 4 (slogan X brand-name) is relatively low but not as significant as category 3. Based on Table 5, these results confirmed that the recall of brand name is not necessarily required by brand awareness. Thus, repeating exposures to jingle or tune (as category 1) are able to evoke association and to influence consequences if respondents perceive positive attitude.

Table 5: Comparison of construct measurement among different sound categories

Construct	Attitude towards the brand	Brand Awareness with Brand Association	Perceived Quality	Brand Loyalty	Brand Preference
1. no-slogan X no-brand-name	5.50	6.07	5.62	4.54	5.07
2. no-slogan X brand-name	5.25	5.95	5.05	4.38	4.61
3. slogan X no-brand-name	4.26	5.45	4.33	3.90	3.87
4. slogan X brand-name	4.69	5.45	4.84	4.11	4.33
5. song	5.32	6.22	5.47	4.54	5.01
F	9.4	7.8	10.16	2.16	6.44
P	.000	.000	.000	.074	.000
Duncan	(3,4,251)	(34,215)	(3,42,51)	(342,4251)	(34,42,251)

#### 4.6 Comparing construct mean differences between brand discernment results

Through the independent-samples t-test, the analytical results as shown in Table 6 indicate that consumers' brand loyalty and brand preference are not significantly different between correct and false brand discernment, although attitude towards the brand, brand awareness with brand association and perceived quality are different. Referring to Table 6, consumers who are able to discern the brand of corresponding sound trademarks tend to present a higher level of attitude towards the brand, brand awareness with brand association and perceived quality; but not towards brand loyalty and preference.

Table 6: Comparison of brand discernment

Factors	Brand Discernment		T-value	p-value
	Correct (n=245)	False (n=18)		
Attitude towards the Brand	5.10	4.50	2.20*	0.029
Brand Awareness with Brand Association	5.89	5.36	2.16*	0.032
Perceived Quality	5.16	4.44	2.79**	0.006
Brand Loyalty	4.37	3.93	1.43	0.153
Brand Preference	4.69	4.07	1.94	0.053

Note: \*: Significant at 5%; \*\*: Significant at 1%

## 5. Conclusions and suggestions

### 5.1 Research conclusions

This study identified the characteristics of sound specimens applied in branding, examined how sound trademarks influence brand preference and revealed the relationships among perception towards a sound stimulus, brand attitude, brand awareness with brand association, perceived quality, brand loyalty, as well as brand preference.

Based on the analytical results of this study, six (6) of the nine (9) hypotheses are fully supported as showed in Table 7. The analytical results provide a tenable evidence of the conceptual model designed to consider relationships among the six (6) constructs (perception towards sound stimuli, attitude towards the brand, brand awareness with brand association, perceived quality, brand loyalty and brand preference). Although few studies (Cody & Bickford, 1969; Pan & Schmitt, 1996) have focused on the influences of sound stimuli in branding, the analysis of the interrelationships as proposed appears evident in this research. Consumers can be stimulated by various sounds. Upon the perceptions of sound stimuli, the subsequent awareness, association, attitude, quality perception would be evoked to influence brand loyalty and preference.

### 5.2 Implications and recommendations

The analytical results of this study demonstrate that sound trademark together with brand name can lead to remarkable marketing results. The sound trademark without brand name (e.g. jingle, tune, or slogan-alone sound trademarks) should be selected carefully. If the sound is too short,

Table 7: Results of hypotheses testing

Hypothesis	Result
H1 Perception towards a sound stimulus applied in branding is positively related to attitude towards the brand	Partially supported
H2 Perception towards a sound stimulus applied in branding is positively related to brand awareness with brand association	Partially supported
H3 Perception towards a sound stimulus applied in branding is positively related to perceived quality	Partially supported
H4 Brand awareness with brand association is positively related to attitude towards the brand	Supported
H5 Brand awareness with brand association is positively related to perceived quality	Supported
H6 Brand awareness with brand association is positively related to brand loyalty	Supported
H7 Attitude towards the brand is positively related to brand loyalty	Supported
H8 Perceived quality is positively related to brand loyalty	Supported
H9 Brand loyalty is positively related to brand preference	Supported

noisy or not directly related to the product or brand, consumers may be confused and may have difficulty comprehending what the sound really attempts to communicate to them. As a result, such irrelevant sound trademarks may become a noise or would annoy audiences and cause them to form negative attitudes towards the sound and consequently the brand. Consistent with Cheskin (1999), audio can have a negative impact on brand imagery. Although sound trademark is an effective instrument for branding purposes or for making a strong brand, to prevent its negative effects, the sound stimulus should be selected carefully.

“Experiences evoking” and “pleasantness” factors are significantly different in the brand discernment. The pleasantness of the sound is an important attribute which should be considered when selecting or choosing a sound trademark. This study also reveals that respondents who have higher levels of perception towards a sound stimulus in terms of ‘distinctiveness and relations’ to the brand/product will have favourable attitude towards the brand. That is, distinctive and relation sound is easier to remember, implement and build a relationship to its product or brand.

This implies that it is important for marketers to select a sound trademark that consumers can pair with its brand.

The sound specimen in the category of “song” is a type of common sound trademark, but unique from other categories. The two (2) sound specimens for this research are both from long-established and well-known leading brands, so there is a possibility that the result is biased by the respondents’ level of experience with the brands. However, the result is meaningful to show significantly higher measures on attitude towards the brand, brand awareness with brand association, perceived quality, brand loyalty and brand preference. This may be that a song is composed with melody, meaningful lyrics, brand name, brand information and so forth. As this type of sound trademark is easier to remember and recognise, consumers may be able to pair the sound with its brand.

The sound trademark is a noteworthy instrument in branding. Modern technology converges on digital devices and provides a platform for communication by audio and visual. A sound trademark helps consumers to build awareness, association, loyalty and preference. An adequate sound trademark is not only able to communicate with the consumers its brand name, but it is also able to build an emotional connection through its positive perceptions and attitudes.

### *5.3 Research limitations and further research direction*

There are few sound trademarks that are registered in Taiwan. As a consequence, the samples of sound specimen are not well diversified. It is difficult to completely analyse the interactions among the different levels of each characteristic of sound stimuli by using experimental design. This resulted in the limitation of this research to explore and ascertain how detailed characteristics of sound stimuli influence consumers.

However, this research has demonstrated that perception towards a sound stimulus would eventually influence brand preference, and there exists statistical differences that different sound trademarks influence brand preference in different ways. Further validations are encouraged to consider a thorough experimental design to examine the characteristics of sound stimuli, and the result of brand discernment.

Finally, to eliminate the effects of the respondents’ familiarity with the brand, it is possible to implement fictitious brands and self-composed sound trademarks in an experimental design. By manipulating factors and comparing treatments, further research may identify more detailed sound stimuli characteristics on how to equate sound trademarks to its counterpart brand.

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## Appendix 1

### Interview conclusion

- (1) Interviewees showed there is a relation between preferences of perception towards sound and brand of counterpart.
- (2) Sounds reinforce memory about the branding activities.
- (3) Sounds can easily recall experiences especially the visual imagery received from TV advertisements.
- (4) Ubiquitous sound, without visual items or not directly related to product/brand, failed to build the connection between the sound and its counterpart.
- (5) Complex, noisy, implicit or short sound bite is not easy to recognise. → Length and Clarity
- (6) Distinctive and exclusive sound impresses more than flat one. → Distinctiveness
- (7) Sound comprises the brand name, with a short melody, is effective to be aware and build a correlation between sound and brand. The sound style should also equate to its brand image. → Relation to product/brand
- (8) Pleasant sound usually makes audience like it, but not always necessarily, its brand. However, when the sound becomes a noise or a non-pleasant sound, a negative emotion can be elicited. → Pleasantness
- (9) Long-term, repeating, and frequent exposure of sounds reinforce memory and attentions; and also make consumers familiar with the sound and communication information. It also elicits past memories especially good time and experiences. → Accessibility

## Appendix 2: Questionnaire

### *I. Sound Bite and Its Brand Behind*

1. I am sure this is (        ) brand (Please write down the brand).
2. I believe this is (        ) brand (Please write down the brand).
3. I do not know the brand, but I know it belongs to (        ) product (Please write down the product category).
4. I never hear the sound (Please answer sections II and VIII).
5. I heard the sound before, but I don't know which brand and product it belongs to (Please answer sections II and VIII).

### *II. Perception towards a Sound Stimulus*

- PSS 01. The sound is appealing.
- PSS 02. I felt pleasant with this sound.
- PSS 03. I felt I like this sound.
- PSS 04. The sound is annoying.
- PSS 05. The sound matches the product/brand personality or characteristics.
- PSS 06. The sound presents the product/brand adequately.
- PSS 07. The sound is distinctive.
- PSS 08. I can distinguish this sound from others.
- PSS 09. The sound impresses me a lot.
- PSS 10. The sound seems too long in advertisement.
- PSS 11. I could not wait till the sound ends.
- PSS 12. The sound is too short to be recognised or aware.
- PSS 13. I heard this sound frequently.
- PSS 14. I can hear this sound everywhere.
- PSS 15. I heard this sound since a long time ago.
- PSS 16. The sound bring my memory to past time.
- PSS 17. I am familiar with this sound.
- PSS 18. I recognise brand name in this sound.
- PSS 19. From this sound, I recognise slogan about product or brand features.
- PSS 20. This sound is a complete song.
- PSS 21. Hearing this sound, I could recall the advertisement using it.
- PSS 22. Hearing this sound, I could recall experiences I had about related products.

### ***III. Attitude towards the brand***

- AtTB 01. This sound is from a leading brand.
- AtTB 02. This sound is from a brand I trust.
- AtTB 03. This sound is from a brand suits me well.
- AtTB 04. This sound is from a brand worth its price.

### ***IV. Brand Awareness with Brand Association***

- BAA 01. When I heard this sound, some characteristics of the brand behind this sound comes to my mind quickly.
- BAA 02. When I heard this sound, I can quickly recall the symbol or logo of the brand behind this sound.
- BAA 03. I can recognise the brand behind this sound among other competing brand.
- BAA 04. I am aware of the brand behind this sound.

### ***V. Perceived Quality***

- PQ 01. The brand behind this sound is of high quality.
- PQ 02. The quality of brand behind this sound is satisfactory.
- PQ 03. The brand behind this sound would be functional well.
- PQ 04. The brand behind this sound must be reliable.

### ***VI. Brand Loyalty***

- BL 01. I consider myself to be loyal to the brand behind this sound.
- BL 02. The brand behind this sound would be my first choice.
- BL 03. Even existing other choices, once the brand behind this sound is available I would never choose other brands.
- BL 04. I would buy the brand behind this sound at next opportunity.
- BL 05. I would be glad to inform others an advantage of the brand behind this sound.

### ***VII. Brand Preference***

- BP 01. The brand behind this sound is appealing to me.
- BP 02. When needed, I would prefer to purchase this brand but not anyone else.
- BP 03. In total, I prefer this brand.

### ***VIII. Respondent Profile***

Gender, Age, Education level, and Occupation