

THE STUDY OF PRODUCTS WITH BIOS FORMS IN CONVEYING PLEASURE

Tyan-Yu Wu ¹ and Wen-chih Chang ²

¹ Department of Industrial Design, Chang Gung University, Taiwan, Tnyuwu@mail.cgu.edu.tw

² Graduate School of Design, National Taiwan University of Science and Technology, Taiwan, wchang@mail.ntust.edu.tw

ABSTRACT

Consumer pleasure evoked by product appearance has been recognized as an important factor in purchasing products. In developing pleasurable products, 'Bios forms' are often used to create product form in order to increase extra value for the consumer market. However, the lack of understanding of consumer pleasure concerning 'Bios form' has led to this empirical research. Therefore, the aim of this paper is to investigate consumer pleasure evoked by 'Bios form'. In this study, a literature review and pretest were performed in order to identify the features of level difference concerning abstract shapes; and furthermore, an experiment was conducted to examine the effect of subsequent consumer pleasure. The result shows that consumers do have a greater pleasure response towards products with less abstractive forms than those with more. It also found that product shapes with life-like animal features may evoke greater pleasure than those without. Moreover, it was found that 'bios form' which mimics human features, particularly using eyes and mouth as part of a product's feature, have a greater affect on consumers' pleasure than those without, and this confirms Lundqvist, Esteves & Öhman's research result.

Keywords: Abstraction, Bios form, Pleasurable products

1. INTRODUCTION

The visual appearance of products is a critical determinant of consumer response and product success (Crilly, Moultrie, & Clarkson, 2004; Bloch, 1995). Therefore it is important to understand, that how a consumer perceives appearances, and to elicit his/ her emotion becomes very critical (Desmet, Tax, and Overbeeke 1999), when developing a product with pleasure. At present, in the aim of enhancing consumer pleasure, Bios form has been broadly used in product

design. In terms of applying knowledge, designers have been very interested in copying technical solutions from nature and often get much inspiration from 'natural forms' (Burgess & King, 2004; Bejan, 2000; Vogel, 1998; French, 1988; Thompson, 1961) such as animal shapes, human figures and natural objects associated with Bios form. Bios form in design applications can be traced back to the early twentieth century, when streamlining of high-speed aircrafts, trains, and automobiles broadly utilized soft, natural forms, which were more human and more humane (Patton, 2005; Sparke, 1987) and emotionally pleasant. Product designers are eager to embed 'pleasurable' elements into product design, in the aim of evoking as many pleasurable consumer responses as possible (McDonagh, 2002). The design of the VW Beetle car is a good example which illustrates a product appearance with pleasure, and received a 54% increase in U.S. sales in the period between 1998-1999 (Kreuzbauer & Malter, 2005; Mitchell & Dacin, 1996; Strategy, 1999). This design's success is partly due to its unique, elegant and cute 'beetle-like' appearance, which attracted many consumers and thus evoked pleasure.

A quantity of consumer behavior research has pointed out, that, individual differences among information recipients may lead to wide variations in the manner in which people respond to emotional advertising appeals (Moore, Harries, and Chen, 1995). Research implies that consumers may have different levels of emotional responses when perceiving different product shapes. We can therefore assume that different levels of abstract shapes may evoke different degrees of pleasurable responses. To date, however, products with this proposition, particularly regarding Bios forms have not been subjected to empirical validation. Consequently, this study intends to focus on consumers' pleasure elicited through visually perceiving 'Bios shape' products and not focus on color or material features due to research limitations.

2. LITERATURE REVIEW

2.1. THE DEFINITION OF PLEASURE

It is very important to establish a precise definition in order to avoid confusion and inconsistency (Wallendorf, 1980). For the purposes of this study, the definition of 'pleasure', according to the Oxford English Dictionary was used both in the pretest and experiment. 'Pleasure' is defined as "the condition of consciousness or sensation by the enjoyment or anticipation of what is felt or viewed as good or desirable; enjoyment, delight, gratification" (Simpson and Weiner, 1989).

2.2. BIOS FORMS IN EVOKING CONSUMER PLEASURE

The term, 'Bios form' is the thesaurus of 'biomorphic', 'organic' and 'freeform' (Patton, 2005) and has been used in design for many years. This unlimited resource inspires designers' minds during the creation of a beautiful and functional object. In design, Bios form is often used as 'the form mimicking animals, human figures, or natural objects

intended to interest and fascinate the viewers'. Worringer (1980) further states, that because of empathic psychological response, viewers' pleasures are evoked from observing naturalism and realism arts. In the same manner of perceiving a beautiful flower, consumers may feel pleasure through the strong links between nature and the human desire of appreciating a beautiful object. Consumers experience this type of visual sensation when perceiving a product with aesthetic qualities. Using car design as an example, designers are frequently inspired by animal imagery, and the resulting image encourages users to make associations between the car and a particular animal (Burgess & King, 2004). The BMW Z3, for example, uses the imagery of fish gills to suggest their features in the car's body, and whilst this delivers a beautifully detailed car body, it also encourages viewers to make an association with fish gills. Through interview research, Chang & Wu (2007) identified three types of Bios form: 'human/figure', 'animals' and 'objects'. Based on these three types, stimuli were created for the experiment and used to test if they could consistently evoke pleasure to users. The first hypothesis in this paper proposes the following:

H1: A consumer's pleasure evoked by products with Bios shape has a greater intensity than those without Bios shape.

2.3. THE ABSTRACTIONS IN BIOS FORM AND ITS FEATURES

Holt (2005) believed that design challenges previously considered inherently linear, rigid and rational shapes, result in 'blobjects' (see Note 1). This implies that Bios form seems to have a better chance to represent consumers' innate desires in the current market. This is because these objects have taken on the qualities of our own 'curvaceous-ness' and completely abstracted translations of our body's most favored parts. Hence, this abstraction process has created an association between favored body form and object shapes, which make consumers experience pleasure. This abstractive process can be described as the transformation of the 'realistic' to the 'abstractive', and this is widely used in Bios form design. But what is abstraction?

Generally, 'abstraction' is the process of reducing 'content' or 'concept' information or an 'observable phenomenon', in order to retain the most relevant information for a particular purpose (<http://en.wikipedia.org/wiki/abstraction>). Isamu Noguchi, a Japanese-American sculptor, states that even purist geometry is not completely abstract, because the presence of geometric forms in nature evokes human responses and changes them with vital associations (Lovegrove, 2004). Noguchi asserts that all artificial shapes have associations or mimicry with Bios forms. The boundary between concrete and abstract shapes can be described as how many similarities or differences there are between the actual objects being mimicked. In other words, it is about the levels of abstraction in composing product forms. What is the best description of abstractive levels?

Ocvirk et al. (1997) pointed out, that abstractive development process can be identified with four steps: Naturalism, Realism, Semi-Abstract and Abstract. Both Naturalism and Realism focuses on depicting the details of concrete objects. Arnheim (1969) also states, that image abstract levels following low to high degree are replicas, stylized objects and

non-mimetic forms. He further explained that non-mimetic form makes for a rigid geometry. According to the above theories, three levels of abstraction: 'less abstractive', 'moderately abstractive' and 'most abstractive' were concluded in the later experiment.

Regarding developing abstraction from Bios shape, Arnheim defined abstraction in two principles: (1) 'disassociated from any specific instance' and (2) 'expressing a quality apart from an object' (Hsu, C. C. & Wang, W. Y. 2005). These two principles have provided a reference to create an abstractive form simply by reducing its visual elements or gleaning significant and representative features to develop the representation of objects. In summation, we identified Bios form with three levels of abstraction, 'less abstract', 'moderately abstraction' and 'most abstract', and utilized two previous principles to develop the shapes of stimuli in the experiment. Based on the abstraction differences, the second hypothesis proposed in this paper is as follows:

H2: A consumer's pleasure evoked by product with less abstractive Bios form has a greater pleasure response than those with more abstractive form.

Note 1: A blobby object, shortly called 'blobject' is purposefully engineered, physically as well as psychologically, to appeal to our senses, our sense of self, and our appetites (Holt and Skov, 2005).

2.4. PRODUCT FORM WITH HUMAN FACIAL FEATURES

Paul & Davidson (1994) state that people in differing cultures produce very similar facial expressions in response to certain situations (Scherer, 1994; Eibl-Eibesfeldt, 1972; Ekman, 1972). Dimberg (2000) demonstrated that people spontaneously and rapidly expressed happy emotion when they were exposed to pictures of happy stimuli. Lundqvist, Esteves and Ohman (1999) also commented that facial features including shape of eyebrows, eyes, mouth and nose can convey psychologically useful information. Particularly, eyebrows, mouth and eyes which have a stronger emotional impact on subjects. These researches imply that eye or mouth features can affect users' emotions when they are integrated to an object correctly. Demirbilek (2004) also agreed that comic/cartoon featured objects may evoke consumers' emotions. Observing the current market, we can see that these concepts have appeared in product designs. The 'Anna G', corkscrew, for example, manufactured by Alessi, mimics the shape of a lady with a skirt. Her smiling face appears on the product surface and delivers a friendly looking image. Chang & Wu (2007) state that consumers were fascinated by the idea of using human shape with facial imagery in some of the designs which elicited their pleasure. Furthermore, they commented that Bios form had a tendency to connect with viewers' imagination and inspiration and elicited their humor and interest to evoke their pleasure. These results imply that the facial expressions of eyes and mouth features are useful to apply to Bios form design for the enhancement of 'happy emotions'. To examine this theory with regards to pleasure, we can assume that products with human features such as eyes, mouth

and ears may affectively increase pleasure intensity. Two types of stimuli were used, both with surface eye or mouth detailing. The Hypothesis below is proposed:

H3: Through Bios form, products embedded with life-like animal features, such as eyes or mouth, should manifest significantly stronger pleasurable responses than those without.

3. METHODS

In the selection of representative stimuli for the experiment, a pretest was performed in order to confirm the levels of abstraction mentioned previously, and to further identify the representative features of each level of abstraction. Based on the 'pretest' results, stimuli were then generated for experiment. The experiment was conducted to test hypotheses H1, H2, and H3.

3.1. PRETEST

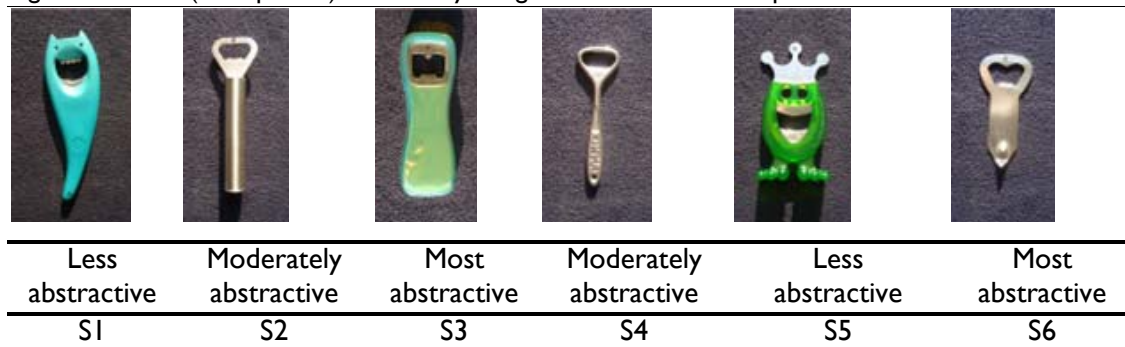
The Pretest was conducted to identify the features of each level of abstraction. According to Ocvirk et al. (1997) and Arnheim's (1969) abstract theory, Bios form was classified into three levels of abstraction: 'less abstractive', 'moderately abstractive' and 'most abstractive'; and the features of each level of abstraction were identified for further stimuli development for the next experiment.

Subjects: Judgment sampling was adapted for this study. This was applied because 'well-being' research demonstrates that young people tend to focus more on emotional response, while older people tend to focus more on satisfaction (Campbell, & Converse, 1976). This result implies that younger people have a stronger emotional response towards a product than older people do. 35 volunteered college students were asked to participate in the pretest. 15 subjects were male and 20 female. All participants were between the ages of 18 to 20.

Stimuli. A can opener was selected as stimulus for the experiment. This object was selected because: (1) the function of can opener is simple and participants would not be easily distracted while visually focusing on the product's appearance; and, (2) there are many varieties of can opener available on the current market, and this object also relates to consumers' daily life experiences.

Thirty can opener images were collected from catalogues, books and the internet. To identify the representative stimuli, three professional designers were asked to sort and identify typical can openers, which represented the three levels of abstraction concerning Bios form based on Arnheim's two principles. Of the 30 images, six were selected to represent 'less abstractive x 2', 'moderately abstractive x 2' and 'most abstractive x 2' for the 'pretest' (see Fig. 1). This 'pretest' was conducted to confirm that (1) the six stimuli covered three different level of abstraction; and (2) consumers' pleasure responses corresponded with their abstractive level difference sequence.

Fig. 1 six stimuli (can openers) selected by designers and used for the 'pretest'



Measure of pleasure and abstraction: The scale for the assessment of consumer pleasure evoked by product appearance' developed by Wu and Chang in 2007 was used to measure the effects of these six stimuli in the test (see Appendix I). The scale contained 17 items along with 7-point Likert scales and included two dimensions: 'gratification' and 'pleasure', which confirmed the finding of Seligman's happiness category (Seligman, 2002). The item pool of this scale was collected by combining information from Jordan's pleasurable measurements, developed for Philips in 1995, and data from Taiwanese college students, collated through questionnaires. The final scale was tested and deemed adequate regarding validity and reliability. In the examination of parallel validity with three stimuli, this was carried out through a Spearman correlation between a three stimuli rank order and their means score of 17 items scale in each with a coefficient $r = .47-.58$ ($p < .01$). The internal consistency was confirmed with Cronbach's and ranged between .85 and .95 in each factor over the three stimuli. Repeated tests were also carried out with a three week interval, and resulted in Pearson correlation coefficient - from .71 to .78. The scale therefore is sufficiently reliable to utilize in the measurement of consumers' pleasure for this study. Additionally, for this particular research, an 18th item was added to the questionnaire in order to test abstractive level differences by asking participants to identify ranges from 'less' abstractive to 'most' abstractive and to indicate this on 7-point Likert scale.

Procedures: The test was conducted in a Computer Laboratory. Each participant sat in front of a computer monitor, at a comfortable visual distance, whilst the stimulus was displayed. Upon experiment commencement, the Oxford English Dictionary definition of 'pleasure' was explained to the participants. The stimulus was then displayed on the screen, and after perceiving the image, participants were asked to check on 7-point Likert-scale, the level they thought most closely indicated their 'pleasure' feeling.

Results and Discussion: In the examination of the 6 sample types, hierarchical cluster method was used to cluster the samples by calculating the 'pleasure' and 'abstraction' scores. The result revealed that there were three major clusters when the cutting point was located at 8 scales shown in Fig. 2. In cluster 1, containing S3 and S6, designers considered this as the most abstractive. Cluster 2 contained S2 and S4, which were considered as moderately abstractive. Cluster 3 contained, S1 and S5, and was considered as less abstract. Moreover, in the examination of the abstraction mean of

the three clusters, this showed that students' ranking order illustrated the same as the designers', which is cluster 1 > cluster 2 > cluster 3 followed by the sequence most Abstractive to less abstractive (see table 1).

Fig. 2 the result of cluster analysis of product types

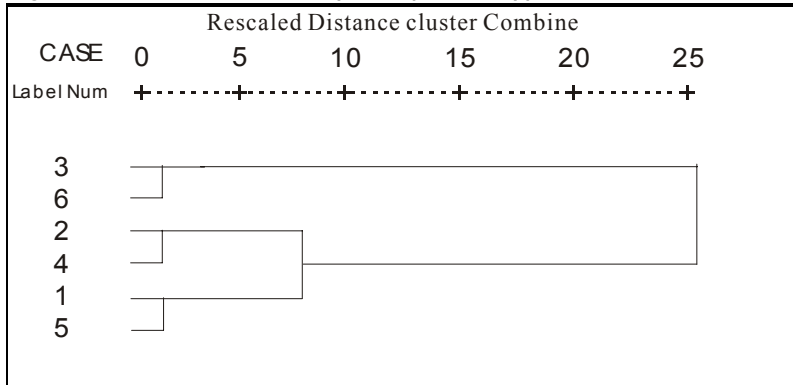


Table 1 means of Pleasure & abstraction over Cluster 1-3

Average Linkage		Samples	Pleasure Means	Abstraction Means
Cluster 1	Pleasure/	S3	4.34	4.43
	Abstraction	S6	3.80	4.57
Cluster 2	Pleasure/	S2	3.14	3.31
	Abstraction	S4	3.57	3.51
Cluster 3	Pleasure/	S1	5.89	2.69
	Abstraction	S5	6.17	2.40

In the examination of the pleasure means of the three clusters, the scores ranking were cluster 3 > cluster 1 > cluster 2 followed with the sequence from 'most pleasure' to 'less pleasure' (see Table 1). The data displays that Cluster 1 and 2 had very closed scores, although theoretically cluster 2 should have had greater pleasure than cluster 1's. It was noticed that S3 in cluster 1 illustrated 'quite' a high mean than others in cluster 1 and 2. This could be because S3 was composed of a green transparent material which caught participants' eye attention more strongly and evoked 'stronger' pleasure. This has been proved in Cheng & Wu's (2007) research when they commented that a product with a bright, colorful and transparent material has an affective impact on a user's pleasure response. Therefore this result may describe the possible reason why S3 had a greater means value than samples 2, 4 and 6, which were composed of a zinc plated finished. However, as previously noted, color and material are not the main focus of this research, and further experiments would be required to test the relationship between abstraction and pleasure on their shapes.

Based on 'pretest' results and Arnheim's theory, the professional designers were asked to develop principles to generate the shape of the stimuli for the subsequent experiment. Two principles were concluded: (1) less abstracted shapes contain more detailed features or elements which mimic life-like objects. And, conversely, the most abstractive

shapes contain less detailed features or elements in mimicking life-like objects. Between less and most abstractive, there is a moderately abstract shape; and (2) less abstractive objects carry more representative features, which describe life-like objects. Following these principles, moderately abstractive and most abstractive objects should have less representative features which appear when mimicking shapes of objects.

To sum up, participants exposed to less abstractively shaped products manifested stronger levels of pleasure response than those with more abstractive shapes. This result confirms H1's assumption. However, the pleasure response between 'moderately' and 'most' abstractive shape does not clearly support the hypothesis and based on the 'pretest' results, the subsequent experiment was conducted to further test the hypothesis.

3.2. EXPERIMENT (3 X 3)










This experiment was conducted to test the hypothesis to discern if; (1) different levels of abstractive shapes result in a different intensities of pleasure responses, and (2) if different types of Bios objects (i.e. figure, animal and object) are embodied with different levels of pleasure intensities.

Experimental design and participants. The design of experiment is a 3 (abstraction: less abstraction vs. moderately abstract vs. most abstract) x 3 (types: figure vs. animal vs. building). 94 college students (46 male and 48 female) volunteered to serve as participants. Their mean age was 19.5 years of age with a range between 18 to 22.

Measure of pleasure. The same 17 item scale used for the pretest was utilized for this experiment (see Appendix 1).

Stimulus Material. Based on Chang & Wu's (2007) three types of Bios form and two abstractive principles concluded in the pretest, three types of products (can opener, toothpick container and coffee pot) were selected to represent three types of characters (human, animal and building). Three levels of abstractive shapes were created for each variation and finally a total of nine stimuli were developed. Amongst them, S1, S4 and S7 were identified as most abstractive shape and were composed of less line elements appearing in a geometrical style, S3, S6 and S9, identified as less abstractive shape. were composed of more curvaceous lines and appeared as a concrete shape, while S2, S5 and S8 identified as moderately abstractive shape, were composed of shape styles between 'less' and 'most' abstractive. These nine stimuli were built in 3D computer software and rendered with a gray tonal quality (see Fig. 3).

Fig. 3 Stimuli: figure x animal x building (3x3)

	V1	V2	V3
L1 Most abstraction			
	S1	S4	S7
L2 Moderately abstraction			
	S2	S5	S8
L3 Less abstraction			
	S3	S6	S9

Procedures: 94 participants were divided into nine groups. Each group had approximately ten participants and performed the test separately in a Computer Laboratory. Each participant viewed the stimuli on a computer screen at a comfortable distance. Before the test began, the definition of ‘pleasure’ from the Oxford English Dictionary was described to them. Participants were also informed that 7 USD would be paid as a reward for their participation. Nine stimuli were then displayed on the screen in nine different sequences to reduce confusion. Each group began with a different image and a different sequence. Group 1 began with stimulus 1 and group 2 with stimulus 2. After perceiving each image, participants were asked to check on 7-point Likert-scale the level they thought most closely indicated their feeling on the 17 item scale. There was a 20 second dark screen interval between images, and this process was repeated until the nine stimuli were completed.

Statistical analysis

ANOVA analysis: Data was analysis by 3x3 ANOVAs (Abstraction x Types of Bios form), Within-Subjects and Repeated measures test for follow-up tests on overall effects. Analyses were performed separately for each type of product: can openers (S1, S2 and S3), toothpick container (S4, S5 and S6), and coffee pot (S7, S8 and S9).

Main effects. The significant effects of the ANOVAs are shown in Table 2, 3, 4 & 5. To determine the relative contribution of the independent on the dependent variables, a measure of the relative strength of associations of the statistically significant effects was required. As such a measure η^2 (eta-square) was preferred to the more conventional ω^2 (omega-square) because this provides an additive estimation of the proportion of the variance that each significant effect accounted for (Tabachnik & Fidell, 1989). Three types of Bios forms used in this experiment resulted in significant main effects.

Can Opener: In Table 2, it was found that three levels of Bios form showed a significant main effect on pleasure difference ($M=57.90$ vs. 68.91 vs. 90.39 , $F(2, 186) = 88.97$, $p < .001$). This indicates that participants’ pleasure response to each level of abstractive shape were different. When compared with pairs of three can openers, the result shows the intensity ranking of pleasure response is $S3 > S2 > S1$. This means that participants’ pleasures evoked by can opener shapes display the intensity ranking followed with the sequence: less abstractive > moderately abstractive > most abstractive.

Table 2 mean, stand deviation, F-values, levels of significance and η^2 for the main effect on can opener ($n=94$)

	M	SD	F	p	η^2
S1 Most abstractive	57.90	20.31	88.97	<.001	.49
S2 Moderately abstractive	68.91	21.76			
S3 Less abstractive	90.39	19.87			
S3 > S2 > S1 (By checking pairs comparison)					

Toothpick container: In Table 3, it was found that three levels of Bios form showed a significant main effect on pleasure difference ($M=69.76$ vs. 87.87 vs. 90.36 , $F(2, 186) = 57.659$, $p = .000 < .001$). This indicates that participants' pleasure responses to each level of abstractive shape were different. When compared with pairs of three levels, the result shows the intensity ranking of pleasure response is $S6 > S5 > S4$. This means that participants' pleasures evoked by the toothpick container display the intensity ranking sequence: less abstractive > moderately abstractive > most abstractive.

Table 3 mean, stand deviation, F-values, levels of significance and η^2 for the main effect on Toothpick container. (n=94)

	M	SD	F	p	η^2
S4 Less abstractive	69.76	20.80	57.66	<.001	.38
S5 Moderately abstractive	87.87	20.01			
S6 Most abstractive	90.36	20.94			
S6 > S5 > S4 (By checking pairs comparison)					

Coffee pot: In Table 4, it was found that three levels of Bios form showed a significant main effect for abstraction difference ($M=59.65$ vs. 67.08 vs. 75.17 , $F(2, 186) = 22.584$, $p = .000 < .01$). This indicates that participants' pleasure responses to each level of abstraction were different. Furthermore, when compared with pairs of three levels, the result shows the intensity ranking of pleasure response is $S9 > S8 > S7$. This means that participants' pleasures evoked by coffee pot shapes display the intensity ranking sequence: less abstractive > moderately abstractive > most abstractive.

Table 4 mean, stand deviation, F-values, levels of significance and η^2 for the main effect on Coffee pot. (n=94)

	M	SD	F	p	η^2
S7 Most abstractive	59.65	16.86	22.58	<.001	.20
S8 Moderately abstractive	67.08	20.22			
S9 Less abstractive	75.17	20.48			
S9 > S8 > S7 (By checking pairs comparison)					

Three types of Bios form product: In Table 5, it was found that three types of Bios form showed a significant main effect on pleasure difference ($M=90.40$ vs. 90.36 vs. 75.17 , $F(2, 186) = 31.11$, $p = .000 < .01$). This indicates that participants' pleasure responses to each level of abstraction were different. When compared with pairs of three product types, the result shows that participants' pleasures evoked by three product types display the intensity ranking following the sequence: can opener > toothpick container > coffee pot.

Table 5 mean, stand deviation, F-values, levels of significance and η^2 for the main effect for products. (n=94)

	M	SD	F	p	η^2
Can opener	90.40	19.87	31.11	<.001	.25
Toothpick container	90.36	20.94			
Coffee pot	75.17	20.48			
Can opener > Toothpick container > Coffee pot (By checking pairs comparison)					

In Table 5, the results demonstrate that the means of pleasure response concerning the can opener and toothpick container (M=90.40 & 90.36) were very closed, whilst the coffee pot had far lower mean scores (M=75.17) than the previous two. Further, the pairs comparison results indicate that both the can opener and toothpick container had no significant differences ($p=.988 > .05$). This result demonstrates that participants' pleasure responses evoked by the can opener and toothpick container had a very similar intensity. This therefore implies that product form embodied with both figure and life-like animal features display a similar pleasurable response to consumers.

4. DISCUSSION

The product appearance appeared to be the most powerful determinant of pleasure impact (Creusen & Schoormans, 2005; Crilly & Clarkson, 2004; Creusen & Snelders, 2002; Jordan, 1998). According to several researches and current market observation, 'Bios form' plays an important role in the enhancement of product pleasure. In developing product shape, Bios form concept has been used often in design and has a strong impact on a product's appearance. In the pretest, cluster 3, can openers (S1 and S5), were identified with less abstractive form and were rated with a score higher on pleasure than those with most abstractive form (see Table 1). The appearance of S1 can be identified easily as a cartoon Ghost figure, which looks cute and funny. The shape of S5 presents a king-looks person with a crown on its head; this also looks funny and is an interesting can opener. Consequently, both S1 and S5 can be easily associated with life-like images and immediately evoke consumers' pleasure. However, in the pretest, the colors may have confused participants' judgments in pleasure response and this area is ripe for future examination. The experiment demonstrated that samples with gray tonal shapes showed a consistent result, and products with less abstractive form can evoke pleasure more than those without.

Furthermore, in the experiment, S3, S6 and S9 were considered as less abstractive Bios form and had a greater pleasurable response than S1, S4, and S7 considered as most abstractive form (see Table 2, 3 and 4). These consistent results support Chang & Wu's (2007) and Burgess & King's (2004) researches. Comprehensively, this also explains why pleasurable products with Bios form can be successful in the current market, especially those products aimed at the 'younger' age category.

What types of Bios shape transforms a product's shape into a pleasurable one? The form developing process is more or less like the development of a piece of 'artwork'. Some designers approach this subject with a less abstractive (concrete) shapes, some with more. This study found that a consumer's pleasure evoked by a product with less abstractive Bios form had a greater pleasure response than those with more abstractive forms. In Table 2, 3, 4, can opener, toothpick container and coffee pot showed consistent results; in which participants scored higher on these three products with less abstractive form, lower on the same series product with moderately abstractive form and lowest on the same series product with most abstractive form. This result implies that participants can distinguish Bios abstraction form 'difference' and further indicates the levels of pleasure responses to products. It would seem that, among three types of products less abstractive Bios forms have a greater pleasure response than those without, and this also supports the theories of Burgess & King, (2004). It is therefore suggested to use as little abstractive Bios form in design as possible when designing pleasurable products, instead it is encouraged to use either representative features or more detailing to composite a product silhouette which mimics natural shapes.

In Table 5, ANOVAs results show that, in comparison with abstraction of product form, participants illustrated that product image (i.e., S3, S6, S9) with less abstraction (1) appealed more strongly to their pleasure responses ($x = 90.40, 90.36, 75.17$, $F(2, 186) = 31.11$, $p = .000 < .001$), and (2) was more 'design-features' oriented. Among these three samples, both the can opener (S3) and the toothpick container (S6) embodied eye features more than 'figure' or 'animal' features, while S9 did not embody eye features on its surface. This result suggests that S9, without eye details on the product, may result in less pleasure than S3 and S6 with eye features. In table 2, the pleasure intensity of the can opener series followed the sequence of $S3 > S2 > S1$. In Table 3, the toothpick container series, followed the sequence of $S6 > S5 > S4$, even though S6 also embodied eye features. Based on these results, it can be concluded that S3 and S6, appearing with surface eye features, can evoke more pleasure than S1, S2, S4, S5 and S9 without eye features. Consequently, it can be concluded that a product shape embodied with noticeable life-like animal features such as eyes or mouth manifests significantly stronger pleasure responses than those without noticeable features. The result confirms Dimberg's (2000) research, that people spontaneously and rapidly expressed happy emotion when exposed to pictures of happy stimuli. In product design, it can be suggested that the correct integration of human features, such as eyes or a mouth, as design details can enhance pleasure.

In summation, it was found that products with Bios form had a greater chance to evoke consumers' pleasure than those without. The result of this paper can conceivably provide designers with a guideline when developing Bios form products for the enhancement of consumers' pleasure, particularly when designing kitchenware for the 'younger' consumer market. The four guidelines have been discussed and shown as follows: (1) A consumer's pleasure evoked by products with Bios shape has a greater intensity than those without. (2) A consumer's pleasure evoked by products with less abstractive Bios form has a greater pleasure response than those with most abstractive form. (3) Bios form

products embedded with life-like animal features manifest significantly stronger emotional responses than those with fewer features.

Therefore, it is suggested that designers take advantage of Bios forms, such as figures, animals and other objects, when designing, and use these elements in the development of pleasurable products. To manipulate product form, designers should understand that less abstractive form is a sensible factor to increase pleasure, and further life-like animal and cartoon shapes are capable and effective directions in creating 'pleasurable' products. It is also suggested 'to understand' consumers' life values regarding objects, and try to embed these values into designs. However, pleasure response is a complicated process and involves many factors. Throughout this research, focus was placed on product shape, however, color, material and culture are also important characteristics that influence pleasurable responses; and this area is ripe for future investigation.

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Appendix I

A Scale for the Assessment of Consumer Pleasure evoked by Product Appearance (17 items scale)

1. I feel attached to this product.
2. Having this product gives me a sense of freedom.
3. I feel excited when using this product.
4. This product gives me satisfaction.
5. I would miss this product if I no longer had it.
6. I am proud of this product.
7. I enjoy having this product.
8. Using this product helps me feel relaxed.
9. This product makes me feel enthusiastic.
10. I feel that I should look after this product.
11. I think this product is funny.
12. This product surprises me.
13. I feel like sharing this product with others.
14. I feel I want to have this product.
15. I feel I am appreciating this product.
16. I like to play with this product.
17. I feel entertained when using this product.

Extra 18th item was added to this questionnaire for this particularly survey related to abstraction.

18. How do you feel the stimulus related to abstractive levels on Bios shape, please indicate the abstractive levels, which you think most closed to the scale you feel?