



The Influence of Product Exposure on Trendiness and Aesthetic Appraisal

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Designers use product attributes (e.g., trendiness) to design aesthetically appealing products. The relationships of physical properties (e.g., shape) of product designs with product attributes and aesthetic appraisal are often considered to be generalizable over product categories and markets. However, in line with an interactionist view, we show that the product's physical properties in combination with a person's previous exposure to products influence perception and aesthetic appraisal of product designs. Previous exposure to products provides a prototype to which to compare newly encountered product designs. We show that deviating the physical properties from the combination of physical properties that the prototype is made up of makes a product design look more trendy, and therefore, more aesthetically appealing. Because product categories have different prototypes, the physical properties that make a product design look trendy and aesthetically appealing are product-category dependent (Study 1). Moreover, people in a local market perceive product designs from a global brand as more trendy and more aesthetically appealing than people in a global market, because these product designs deviate more from their prototype (Study 2). Hence, in order to create a product design that is trendy and aesthetically pleasurable, designers should take into account product designs that people are exposed to in their daily life.

Keywords – Product Exposure, Trendiness, Aesthetic Appraisal, Product Design, Cultural Differences.

Relevance to Design Practice – This research demonstrates that a product's trendiness is influenced by the experiences people have with products currently found in the market. Designers should therefore take into account the physical properties of the products on the market within a specific product category and market segment in order to design products that are perceived as trendy and thus aesthetically appealing.

Citation: Blijlevens, J., Mugge, R., Ye, P., & Schoormans, J. P. L. (2013). The influence of product exposure on trendiness and aesthetic appraisal. *International Journal of Design*, 7(1), 55-67.

Introduction

People often use the product attribute 'trendiness' to describe product designs (Blijlevens, Creusen, & Schoormans, 2009; Creusen & Schoormans, 2005). More importantly, when people perceive a product as trendy, they will aesthetically appraise it more positively (Creusen & Schoormans, 2005; Hsu, Chuang, & Chang, 2000). Thus, in order to create product designs that are positively aesthetically appraised, designers need to know what trendiness means in the eyes of the consumers and what combination of physical properties can be used to make a product design look trendy. Although trendiness is conceptually well defined, it is difficult to define in terms of physical design properties (Hung & Chen, 2012). This research contributes to the literature by investigating why trendiness is difficult to translate into physical properties of product designs. We argue and show that a product design's trendiness is based on people's previous exposure to product designs in the market. Designers should therefore take into account the physical properties of the products on the market within a specific product category and market to design products that are perceived as trendy and thus aesthetically appealing.

Trendiness

Several researchers have investigated the product attribute trendiness from the viewpoint of consumers. Trendiness is often described by people with similar words such as trendy, modern,

contemporary, avant-garde, and young (Creusen & Schoormans, 2005; Hsiao & Cheng, 2006). Based on these findings, Hsiao and Cheng (2006) suggested that trendiness might be a result of what is currently in vogue. Clearly, trendiness is closely related to the notion of "prevailing styles and fashion" (Bloch, 1995). Accordingly, we define trendiness as an attribute of product designs that deals with the degree to which the product design follows the up-to-date styles and fashion in the market.

Trendiness is closely related to novelty. However, it should be noted that trendiness and novelty of a product design are not the same constructs. Recent research shows that trendiness (traditional-trendy/modern) is only one of the three dimensions that influence the novelty of a product design. Next to trendiness, the dimensions emotion (rational-emotional) and complexity (simple-complex) also influence novelty (Hung & Chen, 2012).

Received April 25, 2012; Accepted February 2, 2013; Published April 30, 2013.

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The three dimensions each have their own contribution to the perception of novelty. Trendiness, emotion, and complexity all had linear relationships with novelty. Next to that, a linear relationship between trendiness and aesthetic appraisal was found, whereas novelty had a curvilinear relationship with aesthetic appraisal (Hung & Chen, 2012). People, thus interpret trendiness and novelty as conceptually different. Emotion and complexity both have curvilinear relationships with aesthetic appraisal. This means that when product designs increase in complexity and emotion, they are more aesthetically pleasing, but only up to a certain point, because too much complexity or emotion is less aesthetically pleasing. The contribution of these latter two dimensions to the construct of novelty provides an explanation for why novelty has a curvilinear relationship with aesthetic appraisal. Summarizing, we can thus conclude that trendiness is conceptually and empirically distinct from novelty.

Designing Trendy Products

From the literature, we know how to define trendiness conceptually. However, for designers, attributes, such as trendiness, are more actionable when they know what physical properties of product designs should be changed in order to make a product design look trendy. It is often assumed that designers are highly capable of using their intuition and creative instincts when designing products to convey certain intended product attributes, such as trendiness. However, designers and laymen may in some cases differ in their perception of product designs (Blijlevens et al., 2009; Hsu et al., 2000). For this reason, previous research has aimed to provide designers with guidelines on how product attributes can be incorporated into product designs (e.g., Dahlgaard, Schütte, Alikalfa, & Dahlgaard Park, 2008; Hsiao & Wang, 1998; Orth & Malkewitz, 2008). For example, it is found that consumers perceive vacuum cleaners and cars that are grey, basic, and robust-shaped

to be serious (Mugge, Govers, & Schoormans, 2009). Hence, designers can use this specific combination of physical properties to incorporate the product attribute serious in a product design. The relationships between product attributes and combinations of physical properties are often assumed to be quite robust. This means that they can be generalized over product categories (e.g., both cars and vacuum cleaners are perceived to be serious as a result of these physical properties).

With regard to some product attributes, such generalizable relationships between physical properties and product attributes can indeed be expected. However, trendiness is less easily defined in terms of physical properties of product designs than other product attributes that are known to influence aesthetic pleasure (Hung & Chen, 2012). Indeed, previous research failed to explain trendiness in relation to physical properties, but rather gave descriptions, such as: “What is in vogue currently?” (Hsiao & Chen, 2006). Whenever a product’s trendiness was linked to the physical properties of the design, this was only the case because a certain shape suited the most contemporary trend (Creusen & Schoormans, 2005). Hence, as Hsiao and Chen (2006) already suggested, perceived trendiness goes beyond simple manipulation of shape elements and features (Hsiao & Chen, 2006; Hung & Chen, 2012).

In this article, we take an interactionist view, which suggests that perception and aesthetic appraisal of product designs are influenced by physical properties of an object (e.g., colour, texture, and shape) in combination with the characteristics of the perceiver (Moshagen & Thielsch, 2010). The characteristics of the perceiver will depend on many individual factors, like education, gender, as well as the experiences that he or she has had with the world in which he or she lives. In the case of trendiness, experiences with products in the present market will be very important, as they teach the perceiver about the design of products. Products from a product category that a perceiver encounters in the market commonly adhere to a specific combination of physical properties (e.g., color, shape, material, texture). For example, most washing machines are white, angular, and box-shaped, and are made from a smooth shiny material. Repeated exposure to a certain combination of physical properties results in the internalization of this combination as a visual prototype into people’s knowledge system (Veryzer, 1999). When people encounter a new product design, they use this visual prototype as a benchmark of how a product design should look and compare it to this prototype in order to assess the design on its product attributes (Blijlevens, Carbon, Mugge, & Schoormans, 2012; Hung & Chen, 2012). Prototypes are constructed from an ‘average’ of those product designs that are repeatedly encountered. In life, the product designs that people repeatedly encounter are the product designs currently found in the market. Therefore, the prototype will resemble most product designs that have been on the market for a longer time. The product designs that have been on the market for a longer period of time will be viewed as normal or common. However, trendy and fashionable designs deviate from the physical properties found in more common product designs. Accordingly, in an interview performed by Creusen and

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Schoormans (2005), a respondent describes products as modern, and thus trendy, when they differentiate in design from what he has previously often encountered in the market (“All that has a more rounded design than previously, really,” p. 72). Hence, we argue that one way to create a trendy product design is by manipulating the physical properties of a product design to deviate from the physical properties typically associated with a certain product category. Accordingly, we expect that the level of trendiness of a product design depends on the product designs that people are exposed to in the market.

The Present Research

This research contributes to the literature by investigating the effect of product exposure on trendiness and aesthetic appraisal of product designs. In Study 1, we investigate the influence of product exposure by focusing on the relationships of physical properties of product designs with trendiness and aesthetic appraisal. We argue that the relationships between physical properties and trendiness, and thus aesthetic appraisal depend on previous exposure to product designs. Previous exposure to product designs creates a benchmark/prototype. Because the combination of physical properties of prototypes differ between product categories, we expect that the physical properties that make a product design look trendy, are product-category dependent. Consequently, the physical properties that positively affect aesthetic appraisal will differ between product categories. In order to investigate this relationship, we will compare the reactions of respondents towards deviations in physical properties of products that belong to two different categories: toasters and hand juicers.

Study 2 investigates the effect of product exposure by focusing on the market to which a person belongs. In different markets, different product designs are introduced and thus consumers are confronted with a different variety of product designs. These different varieties of product designs will create different prototypes for the same product category. For example, for consumers in Europe the prototype for a washing machine is a front loader, whereas in the US this is a top loader. Therefore, in Study 2, we demonstrate that people’s perception of trendiness and aesthetic appraisal of product designs differs depending on the market to which they are exposed. Figure 1 summarizes how product exposure influences trendiness and aesthetic appraisal.

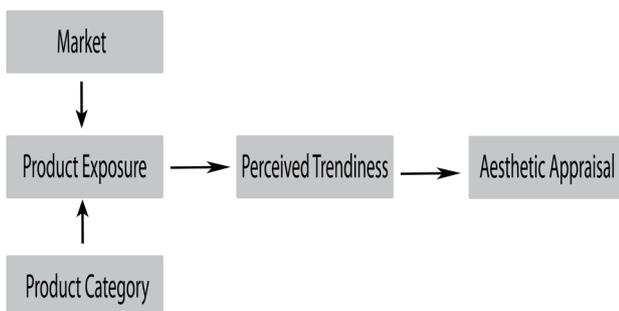


Figure 1. Influence of product exposure on trendiness and aesthetic appraisal of product designs.

Study 1. Trendiness and Aesthetic Appraisal between Product Categories

In Study 1, we will assess how product exposure influences the relationships between physical properties of product designs, trendiness, and aesthetic appraisal. One way to provide insights as to how to design a trendy product is by establishing physical properties that constitute a trendy product. Past research has proposed a number of relationships between physical properties and product attributes (e.g., Dahlgaard et al., 2008; Hsiao & Wang, 1998; Orth & Malkewitz, 2008). For example, Hsiao and Wang (1998) found that heightening the body of a car will result in the car looking more well-bred and showed that this relationship holds for every car model for which the body is heightened. Moreover, it is assumed that the same relationships between physical properties and product attributes exist for different product categories, thereby assuming generalizability of the relationship to other product categories. For example, both vacuum cleaners and cars that are grey, basic, and robust-shaped are perceived as serious (Mugge et al., 2009). Similarly, both wine bottles and perfume bottles that are small, and short bottlenecked are perceived as prestigious (Orth & Malkewitz, 2008). The relationships between these physical properties and the product attributes serious for vacuum cleaners and prestige for wine-bottles thus also apply to the designs of several other product categories. However, we argue that the relationships of physical properties with trendiness are not necessarily generalizable over product categories. As stated before, we propose that previous product exposure provides people with a benchmark to which they compare the appearance of an encountered product design. Because the physical properties that constitute the prototype differ between product categories, it is expected that the effects of these physical properties on trendiness are product-category dependent. For example, the physical property, glass, will probably not be viewed as particularly trendy when incorporated in teapots as glass teapots are often found in the market, while it is likely that people do perceive a never seen glass toaster as trendy (see Figure 2).



Figure 2. Concept for a glass toaster by Inventables Concept Studio.

The above reasoning has its consequences for the effects of the physical properties of product designs on aesthetic appraisal. Prior research has concluded that trendiness has a positive relationship with aesthetic appraisal (Creusen & Schoormans, 2005; Hsu et al., 2000; Hung & Chen, 2012). Hence, we also expect that part of the effects of physical properties on aesthetic appraisal depend on the previous exposure to product designs of that particular product category. In Study 1, we specifically focus on the effect of the physical property curvature. Curvature is a physical property regularly mentioned in the design literature and is often used in design to differentiate from other products on the market (Chuang & Ma, 2001; Fontana, Giannini, & Meirana, 1999). Furthermore, curvature is considered important for creating a trendy-looking product design (Creusen & Schoormans, 2005).

A few studies have indicated that people generally like natural, organic, and thus curved product designs (Bar & Neta, 2006; Silvia & Barona, 2009). This phenomenon is explained from an evolutionary perspective, which states that sharp transitions in contour signal danger or threat, while curved shapes are friendlier and, therefore, appraised more positively (Aronoff, Woike, & Hyman, 1992; Bar & Neta, 2006). However, recent research has suggested that research results attained during the last few years indicating that curvature is preferred, is confounded with the fact that many product designs have become more curved as compared to the preceding prototypically angular designs from the eighties (Carbon, 2010). This is congruent with literature that describes that each fashion trend follows a life cycle with the same phases: introduction, rise, culmination, decline, and obsolescence (Jernigan & Easterling, 1990).

Summarizing, we believe that the relationship between physical properties and trendiness depends on the combination of physical properties that people have been exposed to and have thus included in their visual prototype of that particular

product category. Specifically, because the prototypes of product categories differ, we propose that the relationship between physical properties and trendiness is product-category dependent. Because trendiness influences aesthetic appraisal, the relationship of physical properties with aesthetic appraisal is also expected to be product-category dependent.

As discussed, we chose curvature as the physical property to be manipulated in Study 1. We believe that if a product design does not match with the combination of physical properties that consumers are regularly exposed to within a product category, it is perceived as trendy. Therefore, we chose to deviate one physical property, curvature, from the prototype as a manipulation for trendiness. If the prototype of a product category is angular, then a product with a curved product design will be seen as trendy. However, if the prototype of a product category is curved, then a product with an angular design will be seen as trendy. Consequently, it is expected that curvature positively influences aesthetic appraisal of a product design when the prototype of that product category is angular, because then the curved design is perceived as trendy. However, we expect that curvature negatively influences aesthetic appraisal of a product design when the prototype of that product category is curved, because then the angular design is perceived as trendy. Our expectations and stimuli are depicted in Figures 3 and 4. Accordingly, we offer the following hypotheses:

- H1: For product categories with an angular prototype, curvature has a positive relationship with trendiness.
- H2: For product categories with a curved prototype, curvature has a negative relationship with trendiness.
- H3: Trendiness is positively related to aesthetic appraisal.
- H4: Trendiness mediates the relationship of curvature with aesthetic appraisal.

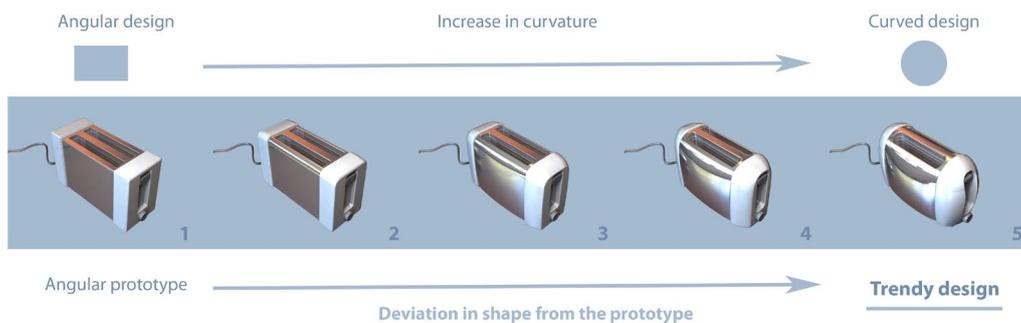


Figure 3. Increasing a prototypically angular toaster in curvature makes it look trendier.

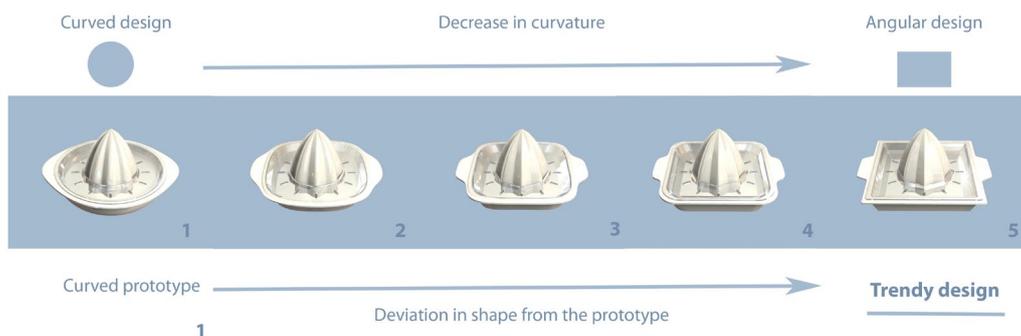


Figure 4. Decreasing a prototypically curved hand juicer in curvature makes it look trendier.

Method

Stimuli

The product categories toasters and hand juicers were chosen to serve as stimuli. These product categories were chosen, because the visual prototype of the product category toasters is angular, while the prototype of the product category hand juicers is curved. A trained designer created digital 3-D models of toasters and hand juicers and changed the shapes of the stimuli in the level of curvature in four steps (see Figures 3 and 4). Specifically, the shapes of the toasters were deviated from the angular prototype by making the original design more curved in four steps, and hand juicers were made more angular in four steps, resulting in 10 stimuli products (including the two originals).

Respondents

A total of 154 respondents (mean age = 51, $SD = 13$, 83 females) from a consumer panel participated in this research. Respondents received EUR 2.20 for participation, a common compensation for respondents from this consumer panel.

Procedure

For this research, a 2×5 mixed design was used with product category as a within-subjects factor and shape deviation as a between-subjects factor. In the form of a web-questionnaire, all respondents received one toaster and one hand juicer similar in level of shape deviation to judge on several constructs that consisted of several items. The constructs were measured on 7-point scales. The item (not) modern was used as a measure for trendiness (Hung & Chen, 2012). Curvature was assessed with the items (not) curved and (not) angular ($r_{\text{toaster}} = -0.50$, $p < 0.001$, $r_{\text{hand juicer}} = -0.60$, $p < 0.001$). Aesthetic appraisal was measured by asking how (not) attractive the design was (Page & Herr, 2002). Where more than one item was used to measure a construct, variables containing the rating on the individual items were averaged to form one measure of that construct.¹

Results

Manipulation Checks

First, manipulation checks were performed to determine whether curvature was manipulated as intended. A mixed ANOVA was performed with shape deviation as the independent between-subjects factor and product category as the within-subjects factor, and curvature as the dependent variable. No significant main effects for shape deviation and product category were found (F 's < 1.0). A significant interaction effect on curvature was found ($F(4, 149) = 75.53$, $p < 0.001$). Post-hoc results for both product categories separately showed a significant increase in curvature for toasters with increasing shape deviation ($F(4, 149) = 49.60$, $p < 0.001$, for means see Table 1) and a significant decrease in curvature as shape deviation increased for hand juicers ($F(4, 149) = 33.33$, $p < 0.001$). This implies that our manipulations of the physical property curvature were successful for both product categories.

Table 1. Means and standard deviations of curvature for all shape deviation levels of toasters and hand juicers.

Product		Curvature Toasters	Curvature Hand Juicers
1	Mean	1.58	5.64
	SD	0.88	1.13
2	Mean	2.47	4.27 ^c
	SD	1.56	1.64
3	Mean	3.95 ^c	3.34 ^{c,d}
	SD	1.49	1.44
4	Mean	4.64 ^{c,d}	2.48 ^{d,e}
	SD	1.07	1.54
5	Mean	5.34 ^d	2.17 ^e
	SD	1.04	1.12

c,d,e Values with the same letter are not significantly different.

Relationships between Curvature, Trendiness, and Aesthetic Appraisal

In order to test whether the relationships of curvature with trendiness and aesthetic appraisal differ between product categories, a moderated mediation analysis was performed using the methodology proposed by Hayes (2012) with a PROCESS macro developed for SPSS (see Figure 7 and 8 for the tested mediation models). The model tested included the independent variable curvature, product category as moderator, trendiness as a mediator, and aesthetic appraisal as a dependent variable. We employed this methodology, because it enables us to test the relationships of curvature with trendiness and aesthetic appraisal simultaneously. In addition, the model assessed whether differences occur between the two product categories. The output from the analysis of the model thus provides details on the relationships of curvature, product category, and their interaction term with trendiness. And also of the relationships of curvature, product category and their interaction term with aesthetic appraisal, while including trendiness as a mediator. The output of this methodology provides first of all information of the conditional direct effect of curvature on aesthetic appraisal: the effect of curvature on aesthetic appraisal while excluding the mediator trendiness for both product categories. The output also provides information of the conditional indirect effects of curvature on aesthetic appraisal: the effect of curvature on aesthetic appraisal including the mediator trendiness for both product categories. This latter output is needed to demonstrate support for trendiness as a mediator of the relationship between curvature and aesthetic appraisal of product designs. In order to conclude there is a mediation effect of trendiness, the point estimate that represents the product of the regression coefficients (a.k.a. the indirect effect) calculated when curvature predicts trendiness, and when trendiness predicts aesthetic appraisal of the product designs should be significant (Preacher & Haye, 2004; Zhao, Lynch Jr., & Chen, 2010).

The model showed a significant main effect of product category and a significant product category \times curvature interaction effect on trendiness ($R^2 = 0.10$, $F(3, 304) = 11.61$, $p < 0.001$;

$B_{\text{product category}} = -0.75, p < 0.05, B_{\text{product category} \times \text{curvature}} = -0.44, p < 0.001$), while the main effect of curvature was deemed insignificant. This means that the effect of curvature on trendiness differed between the two product categories. Furthermore, the model revealed significant effects of trendiness and curvature on aesthetic appraisal ($R^2 = 0.20, F(4, 303) = 18.48, p < 0.001; B_{\text{trendiness}} = 0.39, p < 0.001, B_{\text{curvature}} = 0.09, p < 0.05$). As expected, the effects of product category and the product category \times curvature interaction variable on aesthetic appraisal were insignificant due to the inclusion of the mediator trendiness. Finally, the conditional direct effects of curvature on aesthetic appraisal were not significant for both product categories. However, the conditional indirect effects of curvature on aesthetic appraisal were significant (point estimate = 0.0781, $p < 0.05$), which suggests that trendiness mediated the effect of curvature on aesthetic appraisal.

In order to test the direction of the relationships of curvature with trendiness and aesthetic appraisal for both product categories, mediation models with the independent variable curvature, trendiness as a mediator and aesthetic appraisal as a dependent variable were performed separately for toasters and hand juicers.

Congruent with hypothesis 1, for toasters, the model showed a significant positive effect of curvature on trendiness ($R^2 = 0.05, F(1, 152) = 8.37, p < 0.01; B_{\text{curvature}} = 0.20, p < 0.05$). Furthermore, a significant positive effect of trendiness on aesthetic appraisal was found ($R^2 = 0.16, F(2, 151) = 14.30, p < 0.001; B_{\text{trendiness}} = 0.33, p < 0.001$), which provides support for hypothesis 3 (see Figure 7). As expected, the effect of curvature on aesthetic appraisal diminished to being insignificant when trendiness was included as a mediator. In support of hypothesis 4, trendiness thus significantly mediated the effect of curvature on aesthetic appraisal (point estimate = 0.0653, $p < 0.05$).

For hand juicers, the model showed a significant negative effect of curvature on trendiness ($R^2 = 0.06, F(1, 152) = 10.40, p < 0.01; B_{\text{curvature}} = -0.24, p < 0.01$), which provides support for hypothesis 2. Congruent with hypothesis 3, again a significant positive effect of trendiness on aesthetic appraisal was found ($R^2 = 0.21, F(2, 151) = 20.40, p < 0.001; B_{\text{trendiness}} = 0.44, p < 0.001$, see Figure 8). As expected, the effect of curvature on aesthetic appraisal diminished to being insignificant when trendiness was included as a mediator. Again, trendiness significantly mediated the effect of curvature on aesthetic appraisal (point estimate = -0.1052, $p < 0.05$). Hence, hypothesis 4 was also confirmed for the product category hand juicers.

Summarizing, these results demonstrate that the relationship between the physical properties of a product design with trendiness, and thus aesthetic appraisal can be different between two product categories.

Additionally, we explored the means for each product stimulus per product category. In support of our hypotheses, these results also demonstrated that the more curved a toaster is, the trendier it is perceived to be, and the more positive it is aesthetically appraised (see Figure 5). On the contrary, the more curved a hand juicer is, the less trendy it is perceived to be, and the more negative it is aesthetically appraised (see Figure 6).

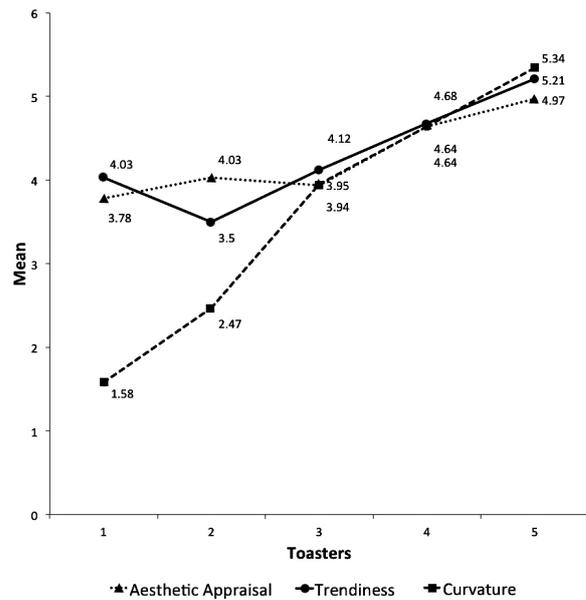


Figure 5. Means of aesthetic appraisal, trendiness, and curvature for all five toasters (1 = angular to 5 = curved).

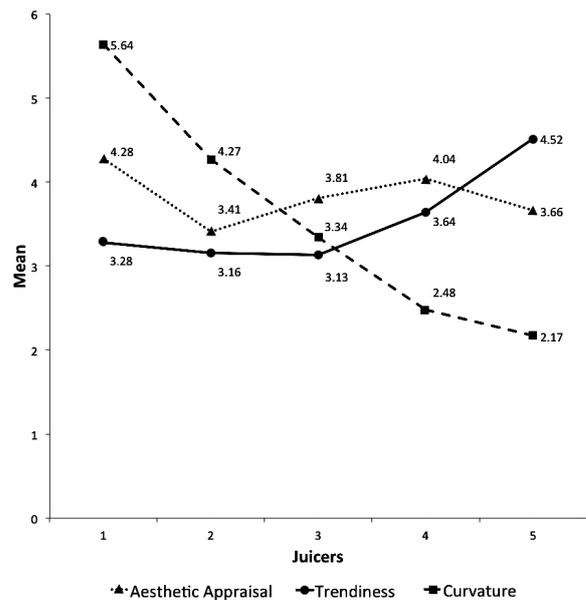


Figure 6. Means of aesthetic appraisal, trendiness, and curvature for all five hand juicers (1 = curved to 5 = angular).



Figure 7. Mediation model for testing the effect of curvature on aesthetic appraisal when mediated by trendiness for toasters.



Figure 8. Mediation model for testing the effect of curvature on aesthetic appraisal when mediated by trendiness for hand juicers.

Discussion

The results in Study 1 are compliant with our hypotheses. Our results show that for product categories that have an angular prototype, curvature positively influences whether these products are perceived as trendy, while for product categories that have a curved prototype, curvature negatively influences whether they are perceived as trendy. People compare a newly encountered product design with the visual prototype they have for a certain product category. When the shape of a product design deviates from the shape that people have mostly been exposed to for that particular product category, it is perceived as more trendy. In addition, trendiness positively influences aesthetic appraisal and thus both angular and curved products can be positively aesthetically appraised. As expected, the relationships between the physical properties of a product design, trendiness, and consequently, aesthetic appraisal, depend on previous product exposure. Because the combinations of physical properties that products are made of are product-category specific, we cannot generalize the relationships of physical properties with trendiness over product categories. Consequently, the indirect effect of physical properties on aesthetic appraisal of product designs, through perception of trendiness, is product-category specific as well.

In Study 1, we focused on the influence of product exposure within one market. We provide empirical proof for the proposition that previous product exposure influences trendiness and aesthetic appraisal of product designs. The differences in the relationships of physical properties of a product design with trendiness and aesthetic appraisal between product categories are a consequence of the product designs that are introduced into the market. In Study 2, we extend our findings to the influence of product exposure between two different markets. We assume that the prototype that somebody has of a product design within a product category is built based on what product designs he or she is exposed to in daily life. Depending on the market that a person is in, the product designs that he or she is exposed to will vary and thus what is perceived as the prototype to people differs between markets as well. Consequently, we expect that those product designs that are perceived as trendy and thus aesthetically appealing will differ between people in different markets. We empirically test this assumption in Study 2.

Study 2. Trendiness and Aesthetic Appraisal between Markets

When a European tourist travels to rural China, he or she will be exposed to different product designs than he/she is used to in his/her home market. Hence, people in different markets are exposed to different product designs. Because repeated exposure to various product designs within a market provides people with a prototype for a certain product category, people in different markets will differ in the prototypes that they have in their minds for the same product category. As shown in Study 1, trendiness for product designs is influenced by the combination of physical properties that people have been exposed to for a product category. Consequently, we propose that people in different markets will perceive the exact same product design differently in level of trendiness and aesthetic appraisal. Study 2 tests this proposition.

Globalization has brought the same products to many different markets and consumers. However, globalization has not reached all markets yet. Therefore, people in different markets are exposed to different products, which will affect their perception and appraisal of newly encountered product designs. On a global scale, we find markets in which global brands and their products are abundantly present. People in global markets therefore have a lot of knowledge and experience with global brands and their products. In contrast, in other markets the industrialized and global brands are less dominant and people are more exposed to products from local brands than to products from global brands. Because people in these more local markets are exposed to products of global brands to a much lesser degree, their idea of which physical properties a design within a product category is typically made up is primarily influenced by products from local brands. For people in a local market, a product design from a global brand will thus have a combination of physical properties that deviate more from their prototype of that product category than for people in a global market. When exposed to a product design from a global brand, we thus expect that people in a local market will perceive that product design to be more trendy than people in a global market. Following from this, we expect that aesthetic appraisal of product designs from a global brand will be more positive for people in a local market than for people in a global market. Accordingly, we hypothesize:

- H5: People from a local market perceive the same global product design as more trendy than people from a global market.
- H6: Trendiness mediates the effect of the local/global market on aesthetic appraisal.

Method

Stimuli

In Study 2, we decided to use IKEA products as stimuli. IKEA is a global brand that introduces the same product designs all over the world. In addition, we selected respondents from the Netherlands to represent consumers in a global market and respondents from rural China to represent consumers in a local market. IKEA is a well-known brand in the Netherlands. In 1978, the first IKEA store opened in the Netherlands, while it was 20 years later in 1998 that IKEA launched its first store in the Chinese market. Today, IKEA has twelve very successful stores in the Netherlands, one store for about every 1.5 million people and reachable for every person within a maximum of one hour driving. By contrast, in China, there are only eight IKEA franchises in the entire country, one store for about 120 million people. Most Chinese cities do not have IKEA stores, and thus IKEA stores are difficult to reach for many Chinese people. This means that the familiarity with the global brand IKEA and its products varies greatly between these two markets. A total of eight IKEA products (two from each of the following product categories: shelf, clock, chair, and lamp) were used as stimuli (see Figure 9). We included eight different product stimuli in order to assess the effects for product exposure on a broad range of product stimuli. In order to reduce workload, respondents were assigned to one of two versions of the questionnaire. In addition, the two groups of stimuli differed in the level of trendiness. We were interested to see whether the effect of product exposure on

trendiness and aesthetic appraisal can be generalized across a broad range of product stimuli. Therefore, within each version of the questionnaire, respondents were presented with one product from each product category (four product stimuli in total). Stimuli group 1 included product designs that contain the basic forms of what a product within a product category would look like. For functional reasons, shelves are generally straight, vertical, and wooden; clocks are generally round; and chairs generally have four legs, a backrest, and armrests. The second group of stimuli, however, deviated more from that basic form with regard to its physical properties (e.g., the chair had one leg, and the shelf was wavy instead of straight). Because stimulus group 1 contains the basic forms expected for the product category these designs resemble the traditional furniture more than the second group of stimuli. Indeed, the designs in the first stimuli group resemble the more traditional Chinese and European chairs than the second stimuli group. It is very likely that the prototype that people have in their minds resembles that basic form. Hence, when comparing the product designs with the prototypes that people have in their minds for that particular product category, the product designs of stimulus group 1 will most likely differ less in their physical properties from these prototypes than the product designs of stimulus group 2. Designs from stimulus group 1 will therefore be perceived as less trendy.

Respondents

Rural Chinese respondents were selected to represent consumers in a local market and Dutch respondents were selected to represent consumers in a global market. Chinese respondents were employees of Qingdao beer manufacturer located in Taizhou, Zhejiang province ($N = 67$, age: 14% between 20-24, 24% between 25-29, 10% between 30-34, 9% between 35-39, 1% between 40-44, 8% between 45-49, 1% between 50-54, 36 males).

The nearest IKEA store is located in Shanghai, 390 km away, which suggests that Taizhou is a local market. The questionnaires intended for the respondents in a local market were printed out in the Netherlands and packaged to China by flight express. Each respondent received a copy of the questionnaire together with a pen of Delft University of Technology in the Netherlands, as an incentive for participating in the survey. Our contact from the Qingdao beer manufacturer collected and returned the completed questionnaires to the Netherlands.

After receiving the Chinese respondents' questionnaires, we selected the Dutch respondents from a consumer panel representative of the Dutch population to fill in a web-questionnaire with the exact same questionnaire as the Chinese ($N = 61$, age: 13% between 20-24, 11% between 25-29, 5% between 30-34, 11% between 35-39, 3% between 40-44, 12% between 45-49, 5% between 50-54, 1% between 55 and over, 33 males).

Great care was taken to select the sample of Dutch respondents. Specifically, we selected those Dutch respondents from the consumer panel that matched the gender and age of the Chinese respondents as much as possible to prevent possible effects of socio-demographic target groups. Dutch respondents received EUR 2.20 for their participation. The questionnaires were worded in Chinese and Dutch for the Chinese and Dutch respondents, respectively.

Procedure

The main study employed a mixed design with two levels of product exposure (local market vs. global market), and two groups of product stimuli (group 1 vs. group 2) as between-subjects factors, and the four product categories as a within-subjects factor. Respondents were asked to rate the design of four product stimuli on several 7-point scales. The level of trendiness was assessed with



Product stimuli group 1: more traditional product designs



Product stimuli group 2: less traditional product designs

Figure 9. Two groups of shelves, clocks, chairs, and lamps used as stimuli in Study 2.

the same item as used in Study 1: (not) modern. In this study, we chose to use a more comprehensive measure of aesthetic appraisal than in Study 1. Specifically, the following four items were used to measure aesthetic appraisal in Study 2: ugly/beautiful, not favorable/favorable, negative/positive, and unattractive/attractive (Cronbach's α 's ranged from 0.90 to 0.96). Overall functionality was measured with the items (not) functional, (not) easy-to-use, and (not) user-friendly (Cronbach's α 's ranged from 0.82 to 0.92). Again, overall functionality was measured in order to control for a possible influence of overall functionality on aesthetic appraisal. By including overall functionality as a covariate in an ANCOVA testing the effect of the independent variable on aesthetic appraisal such a possible influence is eliminated from the data. When more than one item was used to measure a construct, variables containing the rating on the individual items were averaged to form one measure of that construct.

To check whether our two groups of respondents (local market vs. global market) were exposed to different product designs of product exposure, we presented all respondents with a list of 12 global brands that produce a variety of product categories (i.e., Toyota, Audi, Volkswagen, Porsche, Chanel, Louis Vuitton, Shell, Philips, Apple, Sony, Unilever, and Proctor & Gamble). For each brand, respondents were asked to indicate whether they knew the brand with yes (1) or no (0). The responses were summed for each respondent to form an overall global brand score. We can use the two sample groups in a variable product exposure when respondents in the assumed global market know significantly more global brands than respondents in the assumed local market. To prevent any order effects, two versions of each questionnaire were created differing in the order in which the stimuli were presented to the respondents. The order of stimulus presentation was randomly generated through lottery. This resulted in a total of four versions of the questionnaire. No order effects were detected.

Results

Manipulation Check

An independent t-test was performed in order to test whether people in a local market in China are exposed to fewer global brands than people in a global market in the Netherlands. As hypothesized, people from the Netherlands knew more global brands than people from rural China ($M_{\text{global}} = 11.38, SD = 0.61$ vs. $M_{\text{local}} = 10.42, SD = 1.34, t(126) = -5.29, p < 0.001$). Accordingly, we succeeded in finding two respondent samples with different product exposure by selecting samples from different markets.

Comparing the Respondent Groups on Their Use of the Rating Scales

In order to reliably determine whether differences in trendiness and aesthetic appraisal exist between people from a local and a global market, it is important to first verify whether the Chinese and Dutch respondents use the 7-point scales in a similar way. For this means, we compared the scores on overall functionality between the two respondent groups. For the product stimuli used in this study, no effect of product exposure on the products' overall

functionality was expected. Accordingly, comparing the scores for this variable could verify a similar usage of the rating scales by both respondent groups. A mixed ANOVA was performed with the between-subjects factors, product exposure (local market vs. global market) and product stimuli group (group 1 vs. group 2), and the within-subjects factor, product category (shelf, clock, chair, and lamp), as the independent variables, and overall functionality as the dependent variable. As intended, no main effect was found for product exposure and thus no differences were observed between the people from a local and a global market on the products' overall functionality ($M_{\text{global}} = 5.17, SD = 0.92$ vs. $M_{\text{local}} = 5.04, SD = 0.99, F(1, 123) < 1, p > 0.30$). Based on these findings, we can conclude that the Chinese and Dutch respondents used the 7-point scales in a similar way.

Effect of Product Exposure on Trendiness

A mixed ANOVA was performed with the between-subjects factors, product exposure (local market vs. global market) and product stimuli group (group 1 vs. group 2), and the within-subjects factor, product category (shelf, clock, chair, and lamp), as the independent variables, and trendiness as the dependent variable. First, a main effect was found for product stimuli group ($F(1, 124) = 113.50, p < 0.001$), indicating that people perceived the product stimuli from group 2 as trendier than those in group 1. Second, a main effect was found for product category ($F(3, 372) = 13.56, p < 0.001$), indicating that the shelves and chairs were perceived as more trendy than the clocks and lamps. More importantly, a main effect was found for product exposure ($F(1, 124) = 21.79, p < 0.001$). Congruent with hypothesis 5, people with global product exposure perceived product designs from a global brand as less trendy than people with local product exposure ($M_{\text{global}} = 3.95, SD = 1.17$ vs. $M_{\text{local}} = 4.68, SD = 1.35$). In addition, the results showed an interaction effect between product exposure and product category ($F(3, 372) = 3.43, p < 0.05$), indicating that for the product category lamps, the greatest differences in perception of the product's trendiness were found between people from local and global markets. Finally, an interaction effect was found between product stimuli group and product category ($F(3, 372) = 4.79, p < 0.01$), suggesting that when the two product designs of each product category are compared, the differences in trendiness between these product designs vary depending on the product category.

Next, the pattern of means was explored for the eight product designs separately (see Table 2). Specifically, the means for the variable trendiness were in the predicted direction: People with local product exposure perceived all eight product designs from the global brand as trendier than people with global product exposure.

Effect of Product Exposure on Aesthetic Appraisal

A mixed ANCOVA was performed with the between-subjects factors, product exposure and product stimuli group; and the within-subjects factor, product category, as the independent variables, aesthetic appraisal as the dependent variable, and overall functionality measures for each product category as covariates.

Results showed significant effects of the covariates overall functionality for product category 1 ($F(1, 116) = 5.51, p < 0.05$), product category 3 ($F(1, 116) = 11.09, p < 0.01$), and product category 4 ($F(1, 116) = 8.49, p < 0.01$), indicating that overall functionality influenced aesthetic appraisal. Furthermore, a main effect was found for product stimuli group ($F(1, 116) = 70.07, p < 0.001$), indicating that people had a higher aesthetic appraisal for the product stimuli in group 2 than for the product stimuli in group 1. More importantly, a main effect was found for product exposure ($F(1, 116) = 36.61, p < 0.001$). As expected, people with global product exposure had a lower aesthetic appraisal for the product designs from global brands than people with local product exposure ($M_{\text{global}} = 3.90, SD = 0.88$ vs. $M_{\text{local}} = 4.52, SD = 1.03$). Finally, an interaction effect was found between product stimuli group and product category ($F(3, 348) = 3.29, p < 0.05$), suggesting that when the two product designs of each product category are compared, the differences in aesthetic appraisal between these product designs vary depending on the product category.

Next, the pattern of means was explored for the eight product designs separately (see Table 2). Specifically, the means for the variable aesthetic appraisal were in the predicted direction: People with local product exposure had a higher aesthetic appraisal for all product designs from a global brand than people with global product exposure.

Mediation Analysis

In order to test whether the effect of product exposure (local market vs. global market) on the aesthetic appraisal of product designs is due to differences in trendiness of these product designs, a mediation analysis was performed using the methodology proposed by Preacher and Hayes (2004) and Zhao et al. (2010). Respondents' ratings were first standardized. Next, the scores for aesthetic appraisal, trendiness, and overall functionality were averaged across product categories. In the bootstrap analysis, a product exposure dummy variable (0 = global market; 1 = local market) was included as the predictor variable, trendiness was designated as the mediator, aesthetic appraisal as the dependent variable, and overall functionality was included as a covariate.

The bootstrap analysis replicated the ANOVA results concerning the effects of product exposure on trendiness ($B = 0.43, t = 3.39, p < 0.001$) and aesthetic appraisal ($B = 0.49, t = 4.52, p < 0.001$). Furthermore, trendiness had a significant effect on aesthetic appraisal ($B = 0.58, t = 9.89, p < 0.001$). The conditional direct effect of product exposure on aesthetic appraisal was significant ($B = 0.25, t = 2.87, p < 0.05$). More importantly, the bootstrapping results revealed that trendiness significantly mediates the effect of product exposure on aesthetic appraisal (point estimate = 0.2490, $p < 0.05$). Consistent with hypothesis 6, these results imply that local (vs. global) product exposure positively affects aesthetic appraisal for product designs of global brands, and trendiness mediates this effect of product exposure (see Figure 10).

Table 2. Means for trendiness and aesthetic appraisal for all product stimuli and product exposure.

Product category	Product stimuli group	Local product exposure		Global product exposure		
		Trendiness	Aesthetic appraisal	Trendiness	Aesthetic appraisal	
Shelf	1	Mean	4.24	4.01	3.56	3.86
		SD	1.72	1.52	1.46	1.14
	2	Mean	5.73	4.92	5.52	4.34
		SD	1.46	1.30	1.06	1.20
Clock	1	Mean	3.73	3.94	2.88	3.73
		SD	1.64	1.10	1.16	1.11
	2	Mean	4.70	4.32	4.07	3.67
		SD	1.80	1.56	1.60	1.40
Chair	1	Mean	4.14	4.00	3.59	3.50
		SD	1.80	1.33	1.39	1.22
	2	Mean	5.80	5.20	5.45	4.66
		SD	1.40	1.53	1.35	1.68
Lamp	1	Mean	3.70	4.47	2.22	3.07
		SD	2.03	1.31	1.13	1.16
	2	Mean	6.03	5.58	4.69	4.48
		SD	1.38	1.18	1.17	1.23



Figure 10. Mediation model for testing the effect of product exposure (local market vs. global market) on aesthetic appraisal when mediated by trendiness.

Discussion

The results in this study support our hypotheses. As expected, people in the global market of the Netherlands perceive product designs from the global brand IKEA to be less trendy than people who only have access to the more local Chinese market. Moreover, results show that aesthetic appraisal of products is higher when products are perceived to be trendier. Consequently, people in a local market appraise the product designs from global brands more positively than people in a global market. A mediation analysis shows that this effect of product exposure on aesthetic appraisal is mediated by perceived trendiness. Hence, the effect of product exposure on aesthetic appraisal of product designs is due to differences in trendiness between the two markets. The results from this study again show that trendiness depends on the products to which people are exposed, and therefore, should not be generalized across markets.

Next to differences, we also found similarities between the different markets. Respondents from both the global and local markets considered stimulus group 1 less trendy and aesthetically pleasing than stimuli group 2. Stimuli group 1 included product designs that resembled the more traditional product designs, because they contain the basic forms of what a product within a product category would look like. The second group of stimuli, however, deviated more from that basic form with regard to its physical properties. Hence, we find that the product designs in stimulus group 1 are perceived as less trendy than stimulus group 2. Even though the product designs from the first stimuli group follow the basic form and more closely resemble the prototype than the second stimulus group, prototypes can still differ between markets. Indeed, product designs are different for China and Europe. This explains, why, even though stimulus group 1 is considered less trendy than stimulus group 2, differences are found in trendiness between markets within both stimulus groups.

General Discussion

Prior studies have researched the importance of product attributes, such as trendiness, on aesthetic appraisal. In this research, we have made a first step to understanding how exposure to products within the market may influence trendiness, and consequently, aesthetic appraisal. From an interactionist view, not only the physical properties of a product design itself, but also the characteristics of the perceiver and the world he or she lives in influences perception and aesthetic appraisal of product designs (Moshagen & Thielsch, 2010). In that light, we show that trendiness and thus aesthetic appraisal are dependent on people's prior product exposure. Specifically, we argued that a product design is perceived as trendy when its physical properties deviate from the combination of physical properties that product designs are made of to which people are often exposed to and thus used to. Our results indeed show that if a physical property deviates more from the physical properties that are common for a product category, it positively influences the relationships between physical properties and trendiness, and consequently, aesthetic appraisal. Both curved and angular product designs can be perceived as trendy and can be aesthetically appealing as long as the physical property deviates from the prototype. In addition, we demonstrate that people in a local market differ in the perception of trendiness and aesthetic appraisal of product designs from people in a global market. People who are exposed to fewer global brands have a different idea in their minds of how a product within a certain product category should look like and thus their perception of trendiness differs from people who have extended experience with these global product designs. Summarizing, our findings demonstrate that the combinations of physical properties that make a product design look trendy, and therefore, aesthetically appealing cannot be generalized over product categories or markets, because they depend on the combination of physical properties with which people are most familiar.

Our findings have implications for how results of prior research can be used in design practice. What makes one product design look trendy can make a product design from another product category look traditional. Guidelines given in, for example, Kansei engineering or other physical-emotional mapping techniques (e.g., Dahlgaard et al., 2008) may thus not always hold for all product categories. These techniques wherein product attributes are mapped to the product's physical properties are based on extensive databases of the physical properties and product attributes of many different kinds of product categories. Knowing that the relationships between physical properties and product attributes, such as trendiness, are not always generalizable over product categories and markets suggests on the one hand that such general guidelines should be implemented with great care. On the other hand, it must be noted that relationships that were found generalizable over different product categories in prior research are not necessarily incorrect. Physical properties that may evoke a specific product attribute for wine bottles may also do so for perfume bottles (Orth & Malkewitz, 2008). For example, the physical properties glass finish and relief/molding influence product attributes, such as sincere, excited, and sophisticated. For both wine and perfume bottles, product designs are often shiny and smooth suggesting that the physical properties common for wine bottles and perfume bottles have similarities. Accordingly, a generalized relationship between these product attributes and physical properties for wine and perfume bottles was found (Orth & Malkewitz, 2008). In addition, for other product attributes, the relationship may be less dependent on the prototype of the product category. For example, a product attribute, such as playful, will most likely have some curvature whatever the product category is, because it refers to the anatomy of babies or young animals. After all, babies and young animals are regarded to be playful and not very rational. Similarly, the same curved product design will most probably be perceived as playful in local as well as global markets. More research in what factors influence whether product attributes are dependent on product exposure would be valuable.

When striving to communicate a specific brand attribute or product attribute throughout the total product line, designers should deliberate whether the product attribute is expected to depend on the typical physical properties of a product category (e.g., trendy, stylish, hip, innovative). If so, it is valuable to first gain insights into what physical properties currently constitute the visual prototypes for these product categories within a certain market. This may help a designer to decide whether the same combination of physical properties will provide a similar perceptual result in other product categories or other markets or whether different combinations of physical properties need to be selected.

Next to differences in trendiness between different product categories and markets, it can be argued that differences exist between people within the same market for the same product category as well. Some people have more design acumen (Bloch et al., 2003) or are even design experts and therefore more actively seek exposure to a high variety of designs. Consequently,

they are also exposed to more contemporary designs that are in vogue. The picture that these people have of what is a 'normal' or 'common' product design may deviate from lay-men and therefore it can be expected that what is deviant for lay-men may be 'common' for people with a higher design acumen. However, again the differences that could be argued in trendiness between these groups of people boils down to the product designs they have previously been exposed to in daily life. Future research could address the differences between consumers and other personality or country effects on trendiness and aesthetic appraisal.

Our research has its implications for companies that wish to expand their product lines globally. Many present markets have a strong global character; shopping malls in many big cities all over the globe show us the same brands and the same products. A striking example of this development is the Chanel No. 5 perfume. This perfume in its defining bottle is sold all over the world, underscored by the same advertising campaign. By promoting this perfume all over the world for many years, Chanel No. 5 has become one of the most prototypical designs in the perfume market worldwide. However, despite this globalization effect, local markets with different products in their market still exist. Companies are nowadays well aware of cultural differences that may influence perception and appraisal of product designs and take that into account when expanding their brands to a more global level. However, within one culture markets may also differ in the degree to which people are exposed to global product designs. Within the same culture, people can still be exposed to different product designs in daily life depending on their market, and therefore, differences may exist in perception and aesthetic appraisal of product designs. It is thus questionable whether globalization strategies are always beneficial. In some cases, it may be more beneficial to launch a product that is considered outdated in a global market into a more local market because it is likely that people in such a local market will still consider the product design to be trendy and thus aesthetically appealing.

Endnotes

1. Even though designing the stimuli was performed with great care, it is difficult to create realistic stimuli without influencing aesthetic appraisal in more ways than intended. Specifically, changing the curvature of a product design may also influence the product's functionality or prototypicality. Because functionality and prototypicality may have an effect on aesthetic appraisal, we also tested a moderated mediation model, while including functionality and prototypicality as covariates. Prototypicality was measured with the item 'bad example of the product category – good example of the product category' (Veryzer & Hutchinson, 1998). Functionality was measured with the items (not) functional and (not) easy to use ($r_{toaster} = 0.49$, $r_{juicer} = 0.68$, $p \leq 0.001$). The moderated mediation model showed that functionality and prototypicality had no significant effects on trendiness, but functionality and prototypicality did have significant effects on aesthetic appraisal when the mediator trendiness

was included ($R^2 = 0.28$, $F(6, 301) = 19.45$, $p < 0.001$; $B_{trendiness} = 0.36$, $p < 0.001$, $B_{prototypicality} = 0.20$, $p < 0.001$, $B_{overall\ functionality} = 0.10$, $p < 0.001$). More importantly, including functionality and prototypicality as covariates did not change the effects of curvature on trendiness and aesthetic appraisal. Hence, functionality and prototypicality did have positive effects on aesthetic appraisal, but because they did not interfere with the mediated effect of curvature on aesthetic appraisal by trendiness, we can conclude that trendiness is different from prototypicality and that trendiness has their own unique explanatory value for aesthetic appraisal of product designs. Moreover, our shape deviations were a valid manipulation to assess the effect of product exposure on aesthetic appraisal.

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