The MAYA principle as applied to apparel products

The effects of typicality and novelty on aesthetic preference

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Abstract

Purpose – There are numerous design principles that can guide strategic decisions and determine good product design. One principle that has received considerable attention in the literature is the MAYA principle, which suggests that consumers seek a balance of typicality and novelty in products. The purpose of this paper is to test the MAYA principle specific to various categories of apparel. By drawing from the MAYA principle as a two-factor theory, the effects of specific aesthetic properties (i.e. typicality and novelty) of apparel products on consumer response were examined.
Design/methodology/approach – An experimental design in three phases was implemented.
Findings – Results revealed that typicality is the primary predictor of aesthetic preference relative to pants and jackets, while both typicality and novelty are significant predictors of aesthetic preference relative to shirts, suggesting that the MAYA principle better explains aesthetic preference relative to shirts.
Research limitations/implications – Understanding consumers' reactions to product design provides potential value for academics as well as practitioners.
Practical implications – Consideration of both aesthetic properties is needed when implementing the MAYA principle in apparel design.
Originality/value – Although studies have examined the MAYA principle relative to consumer products, few have examined how the principle operates relative to apparel products. The definition of a design principle, such as the MAYA principle, assumes that the logic proposed should apply to all types of products. Yet, this empirical study reveals that this is not the case when applied across different apparel categories.

Keywords Aesthetics, Preference, Apparel, Novelty, Apparel design, Typicality

Paper type Research paper

Introduction

When linking product design to new product development, there are numerous design principles, consisting of laws and guidelines, that can guide strategic decisions and determine good product design vs bad (Lidwell *et al.*, 2010). To better predict product preference, Berlyne (1971) emphasised certain design principles called "two-factor theories", stating that, "Since the Renaissance, most attempts to specify the conditions making for beauty or aesthetic pleasure have focussed on the necessity of equilibrium between two mutually counterbalancing factors" (p. 125). Berlyne (1971) also cited Descartes who posited that the most agreeable object "is not the one that is perceived by it either very easily or with great difficulty but the one that is not so easy to become acquainted with that it leaves something to be desired in the passion" (p. 125). When considering equilibrium between two factors, a design principle that has received a lot of attention in previous literature is the Most Advanced Yet Acceptable (MAYA) principle, initially coined by Loewy (1951). This principle has been introduced as the logic that explains why consumers prefer a balanced mix of typicality and novelty, and support this mix within the most commercially viable products. That is, both aesthetic properties of typicality and novelty are important for

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determining product design preference, and ultimately, product sales (Hekkert *et al.*, 2003; Hekkert, 2006; Lidwell *et al.*, 2010). Clearly this principle is critical, as the appearance of a product or product design "is an unquestioned determinant of its marketplace success" (Bloch, 1995, p. 16).

Despite the interest in two-factor theories, limited studies have examined both typicality and novelty in apparel products. Most previous studies have utilised other types of stimuli, such as words (Martindale *et al.*, 1988), sanders, telephones, teakettles, medium-size cars (Hekkert *et al.*, 2003), car driver environment (Tractinsky *et al.*, 2011) and urban compact electric concept vehicles (Diels *et al.*, 2013). Although aesthetics research on apparel products has focussed on product characteristics such as complexity (e.g. Cox and Cox, 2002) and categorisation (e.g. DeLong and Minshall, 1988), such studies stop short of examining other aesthetic properties of these products. For instance, some studies (e.g. DeLong and Minshall, 1988) have investigated one part of the MAYA principle (categorisation/preference-for-prototypes) but not the other (i.e. novelty). Fiore *et al.* (1996) acknowledged that studies have contributed to the understanding of the nature of consumers' mental structures of apparel. However, there is a need to not just consider dependence of aesthetic preference on goodness of fit with the cognitive structure (i.e. typicality) but also discrepancy with the cognitive structure (e.g. novelty).

This study seeks to join the discussion within the literature surrounding the aesthetic properties of typicality and novelty, and to examine these properties as they pertain to apparel products. Such properties are particularly relevant when it comes to apparel and for several possible reasons. First, the design of apparel appears to be a more complex task when compared to the design of other consumer products due to the perception that apparel communicates an individual's identity through appearance (Kaiser, 1997; Roach-Higgins and Eicher, 1992) and is used for the purposes of impression management (Goffman, 1959). Second, the purchase of apparel items is classified as a high involvement activity (Fairhurst *et al.*, 1989). Third, consumers' aesthetic sensitivity matters in apparel design evaluation and therefore firms should be aware that novelty – as well as typicality – may be crucial for consumers when judging apparel designs (Seifert and Chattaraman, 2017). Fourth, and last, applying the MAYA principle to the process of apparel design may help to reduce the high costs normally involved in creating distinctive collections (Aktuglu, 2001).

According to the literature, sight is the most influential of the senses for establishing product preference (Crilly *et al.*, 2004; Hekkert and Leder, 2008). This is certainly the case for apparel, as consumers frequently make decisions based on the visual properties of apparel products, and even more so when apparel is purchased online, a phenomenon that is growing in importance. Indeed, according to one source, Amazon's global apparel sales alone were roughly $18bn in 2016 and are expected to reach $85bn by 2020, more than quadrupling in a period of just four years (Hays, 2017). Consequently, developing effective product images is critical to the business of selling apparel and will likely become even more critical as consumers look to purchase more of their clothing online. However, despite the importance of apparel products within the marketplace and within the lives of consumers, empirical investigation into the role of aesthetics as applied to this product category is limited. Thus, the purpose of this study was to explore the MAYA principle specific to apparel. By drawing on the preference-for-prototypes theory (Whitfield and Slatter, 1979) and the MAYA principle (Hekkert *et al.*, 2003), the present study examines the effects of specific aesthetic properties (typicality and novelty) of apparel products on consumer response (aesthetic preference). Understanding consumers' reactions to apparel product design provides firms with additional tools for achieving product differentiation (Cox and Cox, 2002; Leder, 2011; Ravasi and Lojacono, 2005). Thus, testing the MAYA principle relative to apparel products has potential value for both academics and practitioners.

Background

Typicality and novelty in aesthetic preference

Leder (2011) stated, "Although trends drive certain design decisions, scientists have identified fundamental properties of the mind that consistently dictate which products people tend to like or dislike" (p. 43). The MAYA principle therefore is related to the psychological inclination of humans that Berlyne (1971) notes as an "avoidance of extremes" (p. 123). As Hekkert *et al.* (e.g. Hekkert *et al.*, 2003; Hekkert, 2006) explained, consumers want something that is innovative, but not to the point that they might not be able to recognise it. In other words, novelty should not jeopardise typicality, and vice versa. Thus, the most desirable products are novel; yet, they can be still be categorised with similar stimuli and be compared to the goodness-of-example. Lidwell *et al.* (2010) included the MAYA principle in discussing the most relevant universal principles of design in their attempt to explain the motivations behind why individuals are attracted to certain characteristics of designs. Crilly *et al.* (2004) also discussed the importance of stereotypes (e.g. prototypes) and both properties of typicality and novelty when understanding consumer response to visual product design.

In relation to goodness-of-example, the preference-for-prototypes theory, also called prototype theory, states that categorisation and prototypicality (i.e. typicality) influence product choice (Whitfield and Slatter, 1979). According to the authors, categorisation involves the classification of stimuli as equivalent (i.e. similar). Among those stimuli, the best example of the category is called a "prototype". Hekkert *et al.* (2003) applied the preference-for-prototypes theory positing that humans, especially adults, prefer stimuli that are familiar and equivalent to something that is known, or even closer to the prototype or "goodness of example". However, Hekkert *et al.* (2003) also clarified that younger people, especially children, usually prefer the opposite. That is, children prefer what is novel and what is different, as it helps them in the process of learning new things. Hence, Hekkert *et al.* (e.g. Hekkert *et al.*, 2003; Hekkert, 2006) stated that the MAYA principle is based on evolutionary psychology as it integrates the preference-for-prototypes with the need for novelty, both of which are actually opposites. The MAYA principle suggests that the two apparently opposing characteristics are important for determining the most commercially viable aesthetic for a product.

For the purposes of this study, the working definition of typicality is based on Whitfield and Slatter's (1979) definition, as the degree to which a product matches its prototype. Consequently, the closer the product is to its prototype, the higher the typicality exhibited by the product. While typicality relates to familiarity and being close to the prototype, novelty is about the individual "noting relations of similarity or dissimilarity between something that is present now and something that has been encountered in the past" (Berlyne, 1971, p. 69). Thus, novelty is defined as a product that is perceived as unique, original, different, and unfamiliar. A novel product can have a relative novelty in that the object consists of a combination of both new and previously experienced elements. Despite differences, research in general has utilised the construct of aesthetic preference as a type of aesthetic judgment that measures the desirability of products, which is usually associated with the adjectives "beautiful" and "ugly" (Jacobsen *et al.*, 2004, p. 1257). Therefore, for the purposes of the present study, aesthetic preference is defined as evaluations of liking a product that usually generate associations with beauty. For the sake of clarity, the focus of this study is on apparel products, which are defined by Sproles (1979) as "a body covering, specifically referring to an actual garment constructed from fabric" (as cited by Kaiser, 1997, p. 4). Consequently, the apparel product is the stimulus, referring to "some condition causing a sense organ to be excited" (Berlyne, 1971, p. 35), as well as what the observer perceives during the aesthetic experience.

Hypotheses development

Based on the theory of preference-for-prototypes (Whitfield and Slatter, 1979), product forms that are closer to the goodness-of-example (i.e. prototype) are likely to be preferred.

In fact, DeLong *et al.* (1986) conclude that for apparel, product property configurations that have been previously experienced influence consumer response. Moreover, individuals prefer stimuli that are familiar, comfortable, easy to classify and equivalent to things that are known, such as prototypes (Hekkert *et al.*, 2003). Additionally, typicality is a driver of aesthetic preference (Vartanian, 2014; Whitfield and Slatter, 1979). While some authors have found positive relationships between typicality and aesthetic preference (Hekkert and Wieringen, 1990), others (e.g. Blijlevens, Carbon, Mugge and Schoormans, 2012) report that typicality has a negative effect on aesthetic appraisal. Likewise, typical products may not pose a challenge to the consumer (Desmet, 2003) and therefore may be evaluated as aesthetically unappealing. Despite certain contradictions, most research points to typicality having a positive relationship with aesthetic preference (e.g. Blijlevens, Gemser, and Mugge, 2012; Hekkert and Wieringen, 1990; Vartanian, 2014; Whitfield and Slatter, 1979). Therefore, it is expected that:

H1. Apparel products, such as (a) pants, (b) jackets and (c) shirts, perceived as more typical will have a greater impact on an individual's aesthetic preferences as compared to apparel products perceived as less typical.

While some people prefer typicality because it relates to what is familiar, others may prefer novelty as it signals something that is different (Hekkert *et al.*, 2003). Individuals have an internal drive or motivating force to seek out what is novel, new or unfamiliar as a means of self-preservation and a function to improve problem-solving skills (Hirschman, 1980). Consequently, novel products are usually perceived as involving a challenge and tend to elicit further exploration (Desmet, 2003). In fact, novelty is a determinant of aesthetic preference (Berlyne, 1971). That is, consumers tend to prefer novel products as higher levels of product newness have been found to engender more positive aesthetic evaluations (Radford and Bloch, 2011). This explains why novelty in products has been positively linked to product sales (Cooper and Kleinschmidt, 1987). Specifically for apparel, product novelty is influential during purchase (Dhurup, 2014). Thus, higher levels of novelty in the product will likely be related to higher levels of aesthetic preference for that product. Therefore, it is proposed that:

H2. Apparel products, such as (a) pants, (b) jackets and (c) shirts, perceived as more novel will have a greater impact on an individual's aesthetic preferences as compared to apparel products perceived as less novel.

Method

To address the purpose of the study and test the hypotheses, an experimental design was employed. This section presents the research design in three phases (see Figure 1). The first phase, Stimuli Selection, focussed on selecting the proper stimuli; the second phase, Pre-Test, supported the reduction of stimuli; and the third phase, Main Study, explored the MAYA principle in three apparel categories. Phases are discussed below in terms of stimuli used, procedure, instrument and sample.

Phase I: stimuli selection

Type of stimuli. As Hekkert *et al.* (2003) did not provide details on how the stimuli was selected for their experiments on the MAYA principle, the stimuli selection process started with reviewing the literature to assess how stimuli are utilised in experimental research on aesthetics in general. The idea was to first determine the type of stimuli to be used in this study. Based on this review, the research was classified by whether apparel or non-apparel products were used. In studies using apparel products, stimuli primarily took the form of drawings (also called "silhouettes" or "simplified product form representations of products")

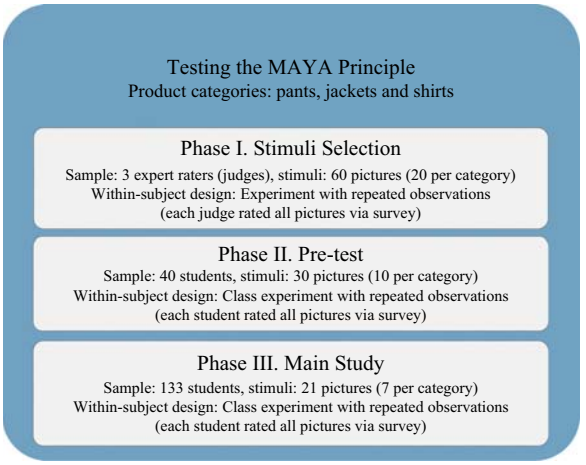


Figure 1.
Research design

(e.g. Cox and Cox, 2002; DeLong *et al.*, 1993; Eckman, 1997; Holbrook, 1986; Wang *et al.*, 2006; Yoo, 2003), while other studies used photographs (e.g. DeLong and Larntz, 1980; Hirschman, 1986; Rahman, 2012). Interestingly, very little research has employed experiments with pictures presenting the product as it is shown to the consumer in an online shopping environment (e.g. Rahman *et al.*, 2010). For non-apparel products, researchers mostly used stimuli consisting of photographs (e.g. Bloch *et al.*, 2003; Giese *et al.*, 2014; Hekkert *et al.*, 2003; Hung and Chen, 2012; Tractinsky *et al.*, 2011), while drawings were used mainly for designs of products that have not yet been produced, such as electric concept vehicles (Diels *et al.*, 2013). Overall, research on the topic has relied on both drawings and pictures, while drawings have been used more often in research on apparel. Because consumers searching for apparel products online generally encounter pictures of the final product rather than drawings, photos of products were used as stimuli.

Stimuli selection procedure and scales. After clarifying the type of stimuli to be used, researchers did a pre-selection of photos of 60 apparel products with different levels of typicality and novelty (20 each per category of pants, jackets and shirts). Following item selection procedures used by Whitfield and Slatter (1979), the initial criteria governing the selection of pictures were: complete products without prints; compatible orientation and perspective of pictures; products not exhibited on a mannequin or body form (2D exhibition); products included different levels of novelty and typicality; products were selected from different websites, brands and various prices. For determining various levels of typicality, the selection of stimuli was based on a series of preliminary studies that included determination of the most typical products that consumers have in their minds (i.e. prototypes) for pants, jackets and shirts. Lower levels of typicality were achieved by choosing items different from the prototype. Selected product pictures with high levels of novelty included items reflecting the latest fashion trends. Defined as "the degree to which a product design follows the up-to-date styles and fashion in the market", trendiness is a concept closely related to novelty (Blijlevens *et al.*, 2013, p. 55). As novelty is also related to complexity and emotion (Hung and Chen, 2012), lower levels of novelty were achieved by selecting pictures displaying simple, basic (as opposed to trendy) products.

Once the 60 pictures were pre-selected, three expert judges were asked to evaluate them in order to reduce the set of 20 products per category to 10. Based on the recommendations of Freeman *et al.* (2014), judges or expert raters were comprised of individuals familiar with the domain of apparel with academic and/or industry experts. The judges selected to

evaluate pre-selected pictures were three individuals with degrees related to apparel design and design experience of at least five years (up to 24 years). Two of the three judges also had a master's degree and one had a PhD degree, all of which were related to apparel design. The pictures were evaluated by the judges in relation to their perceptions of typicality, novelty and attractiveness. To rate each one of the 60 pictures, judges were asked to assess perceived typicality with a single-item scale adopted from Radford and Bloch (2011). The scale included "looks very different from the prototype" (0), "looks somewhat similar to the prototype" (1), and "looks very much like the prototype" (2). To assess perceived novelty, a single-item scale was also adopted from Radford and Bloch (2011). The scale included "does not look novel at all" (0), "looks somewhat novel" (1) and "looks very novel" (2). To assess attractiveness, a single-item scale was also adopted from Radford and Bloch (2011). The scale included "unattractive" (0), "somewhat attractive" (1), and "highly attractive" (2).

Stimuli selection results. Drawing upon the data from the judges, the pictures employed in Phase II were selected. Based on the recommendation that stimuli with similar attractiveness ratings should be selected (Radford and Bloch, 2011), those pictures that received the highest attractiveness ratings were chosen. The mean attractiveness for pictures was calculated and used to select at least 13 of the most attractive pictures per category to be employed in the analysis. Per Radford and Bloch's (2011) recommendations, the analysis of the judges' ratings was conducted visually. That is, the pictures rated most attractive per category were positioned in a graph, with novelty on one axis and typicality on the other (see Figures 2–4, for pants, jackets and shirts, respectively). Based on the resulting product-picture distribution, a reduced set of ten pictures per category was selected to be used in Phase II. These sets are indicated in the figures by ovals.

As seen in the analysis of the most attractive pants (Figure 2), pictures no. 12, no. 17, no. 5 and no. 13 form a cluster because these pictures have similar ratings. Two of the four were retained for the reduced set. Other clusters of pictures were identified: pictures no. 3 and no. 6; pictures no. 7 and no. 14; and pictures no. 1 and no. 2. Only one picture per cluster

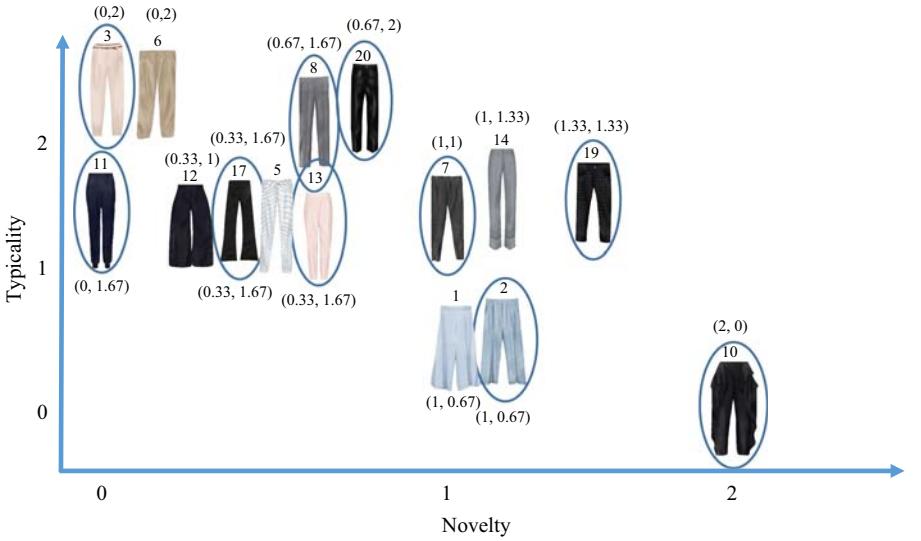


Figure 2.
Ratings of typicality and novelty for most attractive pants: evaluation of pictures by judges – Phase I

Notes: The ovals indicate the reduced 10-picture set selected. No copyrights for pictures. Pictures were replaced with drawings. Please contact main author for actual stimuli

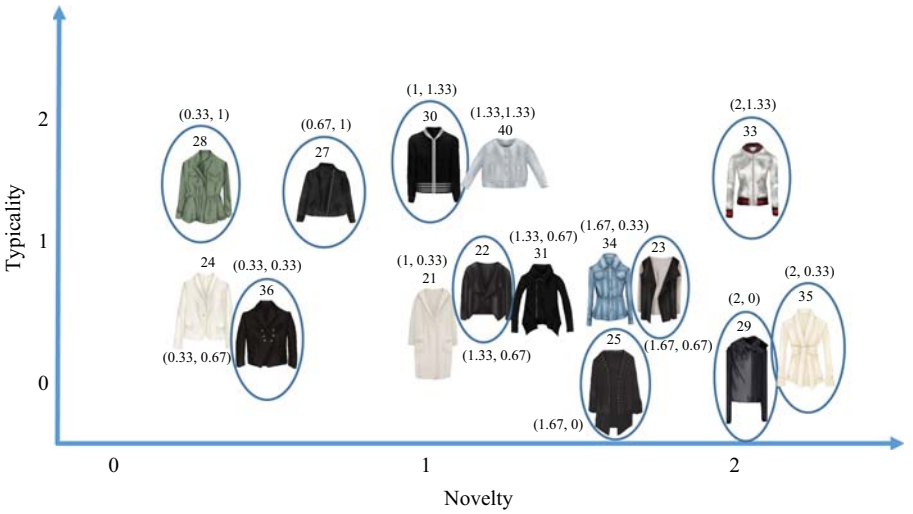


Figure 3.
Ratings of typicality and novelty for most attractive jackets: evaluation of pictures by judges – Phase I

Notes: The ovals indicate the reduced 10-picture set selected. No copyrights for pictures. Pictures were replaced with drawings. Please contact main author for actual stimuli

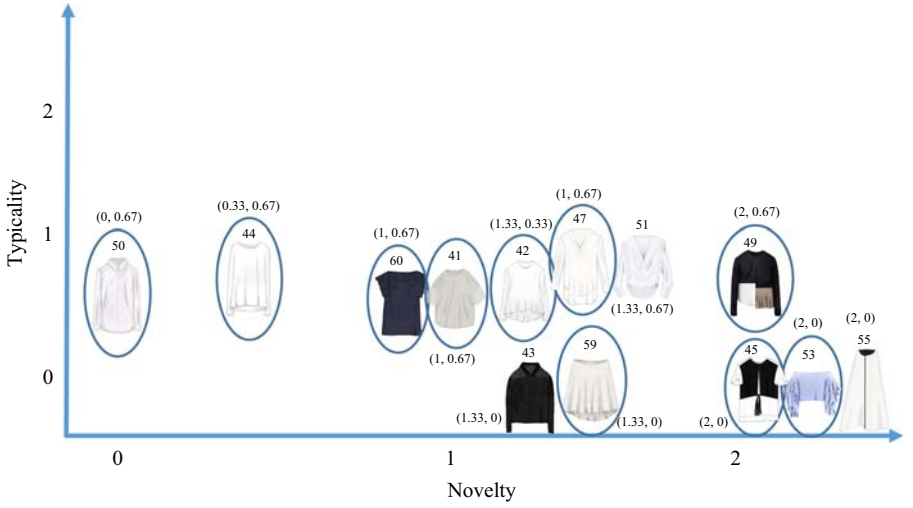


Figure 4.
Ratings of typicality and novelty for most attractive shirts: evaluation of pictures by judges – Phase I

Notes: The ovals indicate the reduced 10-picture set selected. No copyrights for pictures. Pictures were replaced with drawings. Please contact main author for actual stimuli

was retained for the final set. The other pictures retained were those that had unique ratings, such as pictures no. 10, no. 11 and no. 20, allowing for a variety of typicality and novelty in the reduced set of pictures. When choosing which picture to select from a group of pictures, the picture rated the highest in attractiveness was chosen first, however, in some cases, the picture of best quality or the least formal option was selected. The same procedure was followed for selecting the reduced set of jackets and shirts.

Phase II: pre-test

Pre-test procedure and scales. Based on the judges' ratings and before the pre-test was conducted, per Farnand (2013), Photoshop was used to modify the selected 30 pictures in the following manner: image sizes were standardized; colours of fabrics were converted into white and/or black, and grey colours were avoided; textures were diffused when possible; backgrounds were made all white; and hangers were erased. A pre-test using a student sample was then conducted to assess the stimuli selected from Phase I. Based on responses to the pre-test, the stimuli were further reduced from 30 to 21 (seven pictures per category).

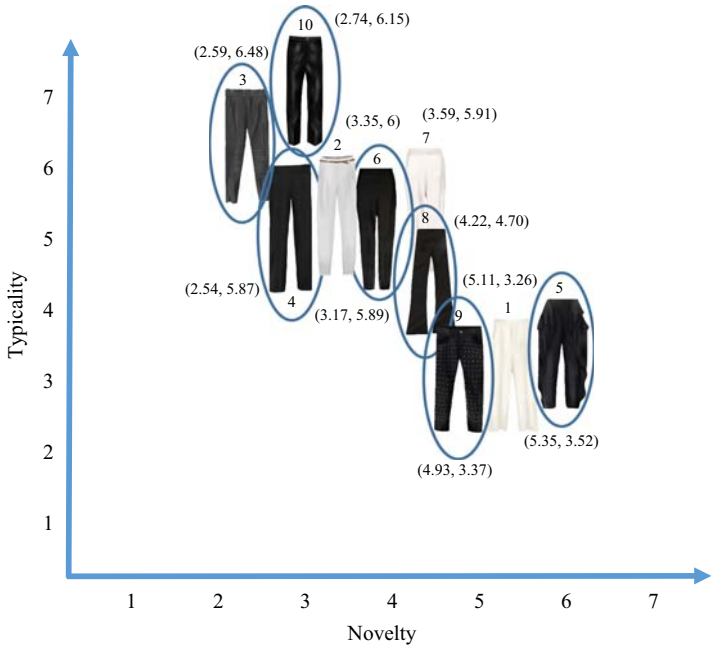
Following a similar research design used by Hekkert *et al.* (2003), the experimental design for the pre-test consisted of asking respondents to rate product pictures in accordance with typicality, novelty and aesthetic preference. Respondents consisted of students in an undergraduate course within an apparel programme at a state university located in the southeastern region of the USA. First, each stimulus was shown via computer projector for 3 s to familiarise participants with stimuli sets consisting of pictures of apparel products in three categories: pants, jackets and shirts. Second, participants were again presented with the images, for 20 s per picture, and were asked to rate each picture. Instructions on how to complete the survey, as well as explanation of the properties of typicality and novelty, were given to respondents prior to completing the survey. Students were given extra credit for participating in the pre-test.

The survey included three sections: evaluation of pictures, demographic information and additional items. In the first section, to assess typicality, a semantic differential single-item scale was adopted from Hekkert *et al.* (2003). The scale ranged from "Poor example" (1) to "Good example of the category" (7). To assess novelty, a semantic differential single-item scale was also adopted from Hekkert *et al.* (2003). The scale ranged from "Not original" (1) to "Original" (7). To assess aesthetic preference, a semantic differential single-item scale was also adopted from Hekkert *et al.* (2003). The scale ranged from "Ugly" (1) to "Beautiful" (7). Because respondents evaluated numerous designs, and because scale measures using a single item are common practice in product design studies (e.g. Hekkert *et al.*, 2003), single-item measures for typicality, novelty and aesthetic preference were deemed most appropriate. In the second section, respondents were asked to provide demographic information. The third section contained two items assessing the clarity of instructions and the effort invested in the task.

Pre-test results. Of the 48 total completed surveys, 46 were deemed usable. The majority of the sample was comprised of females ($n = 42$, 91.3 per cent) with ages ranging from 18 to 30, and a mean age of 20 years. The greatest number of participants was Black or African American ($n = 21$, 45.7 per cent). Participants were in different years of school, with an equal number of Freshmen ($n = 14$, 30.4 per cent), Sophomore ($n = 14$, 30.4 per cent), and Juniors ($n = 14$, 30.4 per cent). Most respondents indicated a monthly income of \$300–\$499 ($n = 26$, 56.5 per cent). The pre-test data were analysed and the means of typicality and novelty per picture are illustrated for each category in Figures 5–7. Based on pre-test responses, from the ten pictures per category that were tested, seven pictures were retained for the Main Study (a total of 21 pictures and again indicated by ovals). As the experimental design involved repeated observations, the pre-test also served to assess the manipulated variables of typicality and novelty. That is, the visual analysis of the pre-test data and the retained pictures (see pictures in ovals in Figures 5–7) ensured that the stimuli per category had different levels of typicality and novelty.

Phase III: Main Study

Main Study procedure and scales. The Main Study employed the same experimental design and scales that were used in the pre-test (Phase II). Based on results of the pre-test, minor



Notes: Ovals indicate the final set. No copyrights for pictures. Pictures were replaced with drawings. Please contact main author for actual stimuli

Figure 5.
Ratings of typicality and novelty for pants: pre-test – Phase II

changes were made to the survey that were designed to simplify the instructions for respondents and to address the reduced number of pictures (7) per category resulting from the pre-test. Data for the Main Study were collected in four classes of undergraduate students (all were different from the pre-test sample) at the same university.

Main Study respondent characteristics. In total, 157 participants completed the survey, resulting in a total of 133 usable responses (see Table I). The majority of the sample was comprised of 101 females (75.90 per cent) with ages ranging from 18 to 30, and a mean age of 20.50 years. The greatest number of participants was White or Caucasian ($n = 56$, 42.10 per cent). All participants were majoring in either apparel merchandising and design ($n = 107$, 80.5 per cent) or Hospitality and Tourism ($n = 26$, 19.2 per cent). Respondents were in different years of school, with the majority being Sophomores ($n = 50$, 37.60 per cent). Most respondents indicated a monthly income of less than $300 ($n = 69$, 51.90 per cent), which is about 7 per cent of the monthly average wage of Americans (Social Security, 2016). Results from the Main Study are discussed in the next section.

Results and discussion

Data from the Main Study were initially analysed to examine whether the students' typicality and novelty rating scores were consistent with those of the judges (Phase I). Based on the judges' initial mean evaluations of typicality and novelty of individual product pictures per category, each picture was assigned a value of 1 (high), 2 (medium) or 3 (low) for typicality and the same for novelty. The value of 1 corresponded to the lowest 30 per cent of the judges' ratings. The value of 2 corresponded to the middle 40 per cent of the judges' ratings, while the value of 3 corresponded to the highest 30 per cent of the judges' ratings. Students' ratings were grouped using one-way analysis of variance (ANOVAs) across the

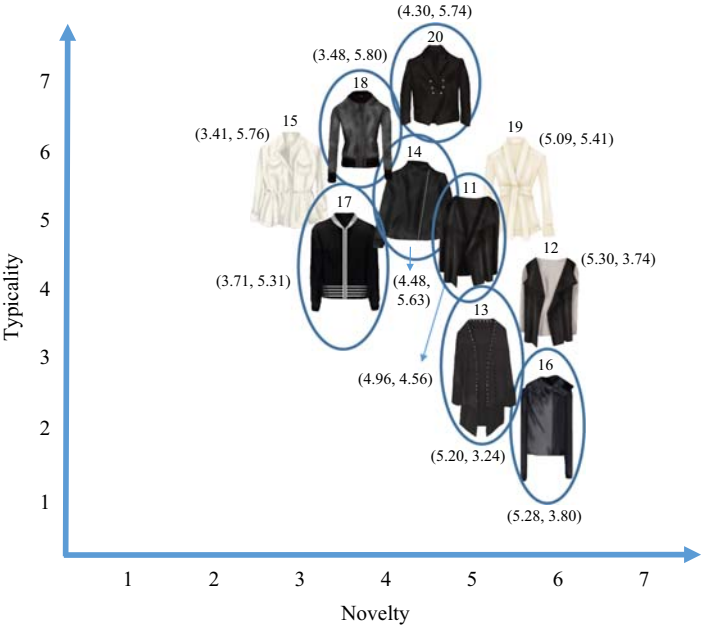


Figure 6.
Ratings of typicality and novelty for jackets: pre-test – Phase II

Notes: Ovals indicate the final set. No copyrights for pictures. Pictures were replaced with drawings. Please contact main author for actual stimuli

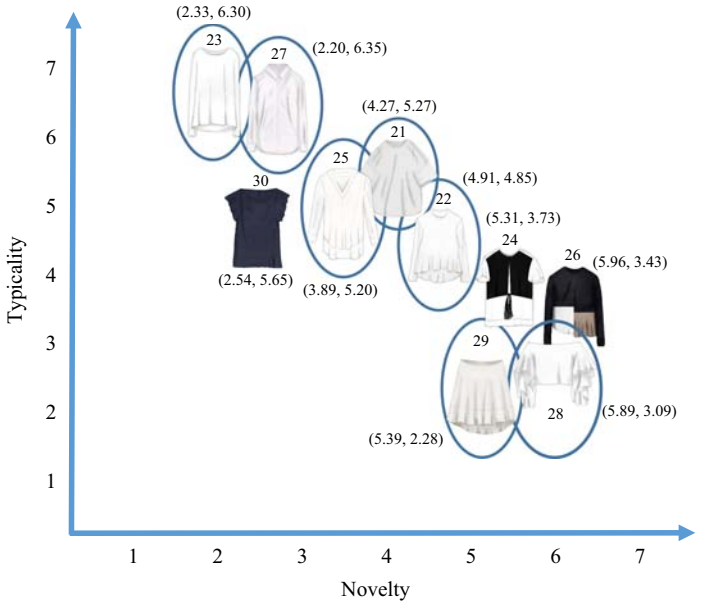


Figure 7.
Ratings of typicality and novelty for shirts: pre-test – Phase II

Notes: Ovals indicate the final set. No copyrights for pictures. Pictures were replaced with drawings. Please contact main author for actual stimuli

Respondent characteristics	Frequency	%	Mode	SD
Demographics				
Gender			Female	0.42
Female	101	75.90		
Male	32	24.10		
Age			19 years old	1.85
18–20 years old	76	57.20		
21–24 years old	52	39.10		
25–30 years old	3	2.30		
More than 30 years old[a]	0	0		
Missing	2	1.50		
Ethnicity			White	1.36
American Indian	2	1.50		
Asian-American	6	4.50		
Asia or Pacific Islander	3	2.30		
Black or African American	46	34.60		
Hispanic or Latino	7	5.30		
White	56	42.10		
Other	10	7.50		
Missing	3	2.30		
Year in school			Sophomore	0.92
Freshman	16	12.00		
Sophomore	50	37.60		
Junior	43	32.30		
Seniors	24	18.0		
Monthly income			Under $300	1.28
Under $300	69	51.90		
$300–$499	21	15.80		
$500–$749	23	17.30		
$750–$999	6	4.50		
$1,000–$1,299	3	2.30		
$1,300 or more	4	3.00		
Missing				
Major			Apparel Merchandising and Design	0.39
Tourism and Hospitality	26	19.50		
Apparel Merchandising and Design	107	80.50		

Note: [a] Based on a suggestion from an anonymous reviewer, five responses from students with more than 30 years old were not retained for the analysis to improve the homogeneity of the sample

Table I. Respondent characteristics ($n = 133$) – Phase III

high/medium/low picture categories. Findings indicated that the students' ratings were positively associated with the judges' levels for both typicality and novelty in all categories. For instance, results of the students' ratings for pants were positively associated with the judges' levels for both typicality ($M_1 = 4.38 < M_2 = 5.15 < M_3 = 5.52$, $F_{(2,987)} = 25.10$, $p < 0.001$) and novelty ($M_1 = 3.58 < M_2 = 3.76 < M_3 = 4.91$, $F_{(2,986)} = 60.87$, $p < 0.001$).

Additional items from the third section of the survey were used to assess the clarity of the procedure of the experiment. Students reported that the instructions were clear ($M = 5.33$, SD = 1.33) and that they put an important amount of effort into rating the pictures ($M = 6.12$, SD = 1.20), thereby confirming that instructions were perceived as clear and that the task of rating the pictures required high concentration. For the sake of clarity, as the experiment is a within-subjects design and all participants rated all levels of the independent variables (i.e. typicality and novelty), the manipulation of those levels was assessed during the pre-test. Reliability testing of the data from the Main Study took the form of Intraclass Correlation Coefficients (ICC) (Shrout and Fleiss, 1979) for assessing rater reliability. ICC was calculated on the mean ratings per category for typicality, novelty and

aesthetic preference. Mean results for each category, as well as the overall mean for all categories showed reliable results. ICC values varied from the lowest $ICC_{(2,133)} = 0.96$ for the aesthetic preference ratings of pants, jackets, shirts and all categories to the highest $ICC_{(2,138)} = 0.99$ for the typicality of pants, jackets, shirts and all categories.

After reliability tests were confirmed, correlation analyses were performed. Contrary to results indicated by Hekkert *et al.* (2003), the mean typicality and the mean novelty did not show negative correlations for any of the three apparel categories (see Table II). Instead, the Pearson Product-Moment correlations were low in value and positive, and reported 0.14 for pants, 0.05 for jackets, 0.12 for shirts and 0.11 for all categories; none of which reached statistical significance ($p \geqslant 0.05$). The Pearson correlations between the mean typicality and the mean aesthetic preference scores ($r = 0.19$ for pants, $r = 0.29$ for jackets, $r = 0.29$ for shirts and $r = 0.29$ for all categories) were all significant ($p < 0.05$). However, only Pearson correlations between the mean novelty and the mean aesthetic preference scores for shirts and all categories ($r = 0.32$, and $r = 0.21$, respectively) were significant ($p < 0.05$). Pearson correlations between the mean novelty and the mean aesthetic preference scores for pants and jackets ($r = 0.13$, $r = 0.14$, respectively) were not significant ($p \geqslant 0.05$). As suggested by Hekkert *et al.* (2003), partial correlations were also calculated, as the logic of the MAYA principle states that both aesthetic properties (typicality and novelty) influence each other. However, partial correlations were very similar to those of the original correlations. As most partial correlations were higher than the original correlations, it can be said that neither typicality nor novelty functioned as suppressor variables.

Due to the unexpected positive Pearson product-moment correlations between the mean typicality and the mean novelty in all categories, correlation results were further analysed by individual pictures per category (see Table III). Out of 21 pictures, only one (pant picture no. 1) reported a significant correlation at the 0.05 level (two-tailed). Out of all 21 product pictures, 14 pictures (66.66 per cent of total products) showed negative correlation between the mean typicality and the mean novelty. That is, the lower the perceived level of typicality, the higher the perceived level of novelty. Conversely, the highest perceived levels of novelty reported the lowest levels of typicality. For example, pant picture no. 3 reported a mean typicality of 3.19 and a mean novelty of 5.77, for a −0.08 correlation.

Table III also indicates that jackets pictures reported the highest levels of standard deviation in the mean novelty ratings (see italic values). That is, participants have more consistent novelty evaluations for pants and shirts, while the subjective evaluation of novelty for jackets varies more and is less consistent than those of pants and shirts. When analysing the variation in novelty ratings, it is important to note that differences in product exposure influence the types of product form consumers are most familiar with (Blijlevens *et al.*, 2013). That is, it is expected that there will be variation in the novelty ratings. Based on the standard deviation of the overall mean of the typicality in all categories in Table III, shirts (SD = 1.59) registered the highest standard deviation above pants (SD = 0.85) and

Table II.
Pearson correlations and partial correlations between rating scale scores – Phase III

	Typicality – novelty	Typicality – aesthetic preference		Novelty – aesthetic preference	
Category	Correlation	Original correlation	Partial correlation	Original correlation	Partial correlation
Pants	0.14	0.19*	0.18	0.13	0.10
Jackets	0.05	0.29**	0.28	0.14	0.13
Shirts	0.12	0.29**	0.27	0.32**	0.30
All categories	0.11	0.29**	0.28	0.21*	0.18

Notes: *,**Correlation is significant at the 0.05 and 0.01 levels, respectively (two-tailed)

Category	Picture		Typicality		Novelty		Aesthetic Preference		Typicality – Novelty
			Mean	SD	Mean	SD	Mean	SD	Correlation
Pants	Picture no. 1		5.68	1.27	3.62	1.68	4.36	1.36	**–0.21***
	Picture no. 2		5.91	1.09	3.35	1.46	4.01	1.48	–0.01
	Picture no. 3		**3.19**	1.51	**5.77**	1.56	3.68	*2.01*	**–0.08**
	Picture no. 4		**6.24**	1.09	**3.01**	1.74	4.70	1.44	**–0.12**
	Picture no. 5		4.92	1.56	4.00	1.61	3.47	1.69	0.01
	Picture no. 6		3.56	1.75	5.35	1.70	2.74	1.79	**0.14**
	Picture no. 7		5.51	1.39	4.14	1.47	4.68	1.44	**–0.08**
	All Pictures		5.00	0.85	4.17	0.78	3.95	0.91	0.14
Jackets	Picture no. 1		3.89	1.40	5.23	1.35	4.47	1.73	**–0.02**
	Picture no. 2		3.44	1.72	5.71	1.53	4.51	1.91	0.06
	Picture no. 3		5.81	1.06	4.59	1.57	5.48	1.42	0.05

(*continued*)

Table III.
Means, Standard Deviations (SD), and Correlations of Scale Scores – Phase III

	Picture no. 4		**3.24**	1.71	**5.86**	1.65	3.37	1.82	–0.00
	Picture no. 5		5.88	1.33	4.06	*1.79*	4.63	1.50	**–0.14**
	Picture no. 6		5.74	1.31	4.50	1.49	4.05	1.97	**–0.06**
	Picture no. 7		**5.93**	1.19	**4.02**	*1.82*	5.28	1.49	0.04
	All Pictures		4.84	0.89	4.89	*0.99*	4.54	0.91	0.05
Shirts	Picture no. 1		5.20	1.61	3.97	1.92	3.98	1.72	**–0.08**
	Picture no. 2		4.84	1.53	4.32	1.63	4.53	1.76	0.08
	Picture no. 3		**6.07**	1.20	**2.77**	1.87	4.52	1.60	**–0.03**
	Picture no. 4		5.23	1.40	4.44	1.51	5.09	1.51	0.01
	Picture no. 5		**6.30**	1.21	**2.78**	*2.12*	4.84	1.50	**–0.09**
	Picture no. 6		**2.62**	1.78	**5.88**	1.86	4.03	2.10	**–0.03**
	Picture no. 7		**2.20**	1.46	**5.39**	*1.84*	4.02	*2.03*	**–0.01**
	All Pictures		4.77	*1.59*	4.23	0.89	4.44	*1.07*	0.11
All Categories	All Pictures		4.87	0.91	4.44	0.73	4.31	0.80	0.11

Notes: Lowest and highest mean scores on typicality and novelty, as well as negative correlations, are in bold. Highest levels of SD are Italic. No copyrights for pictures. Pictures were replaced with drawings. Please contact main author for actual stimuli. *Correlation is significant at the 0.05 level (two-tailed)

Table III.

jackets (SD = 0.89). This means that participants' ratings on typicality differ more when evaluating shirts than when evaluating pants or jackets.

Finally, based on Hekkert *et al.* (2003), multiple regressions were conducted to test the MAYA Principle. Both hypotheses were tested for pants, jackets and shirts. For the

regressions, the independent variables of typicality and novelty were treated as continuous, as was the dependent variable of aesthetic preference. See Table IV for multiple regression results for pants, jackets, shirts and all categories. For *H1a* and *H2a*, the mean scores of pant pictures indicated that aesthetic preference was positively influenced by typicality ($\beta = 0.17$, $p < 0.05$), but not by novelty ($\beta = 0.10$, $p = 0.22$). Thus, *H1a* was supported and *H2a* was not supported. Similarly, for *H1b* and *H2b* (Table IV), the mean scores of jacket pictures indicated that aesthetic preference was influenced by typicality ($\beta = 0.28$, $p < 0.001$), but not by novelty ($\beta = 0.13$, $p = 0.11$). Thus, *H1b* was supported and *H2b* was not supported. For *H1c* and *H2c* (Table IV), the mean scores of shirt pictures indicated that aesthetic preference was influenced by typicality ($\beta = 0.26$, $p < 0.001$) and novelty ($\beta = 0.29$, $p < 0.001$). Thus, both *H1c* and *H2c* were also supported. For all categories (Table IV), the mean scores of pictures showed that aesthetic preference was influenced by typicality ($\beta = 0.27$, $p < 0.001$) and novelty ($\beta = 0.18$, $p < 0.05$).

Results of multiple regressions also provide further explanation when analysing variance. Based on the multiple regression results for each category (specifically the adjusted R^2), the predictor variables (typicality and novelty) explained 3.30, 8.70 and 15.80 per cent of the variance in the aesthetic preference ratings for pants, jackets and shirts, respectively. These values appear to be very low in comparison to values between 56 and 70 per cent found for sanders, telephones and teakettles (Hekkert *et al.*, 2003) and 66 per cent for driver environments (Tractinsky *et al.*, 2011). However, the results are more similar to those of Diels *et al.* (2013), reporting that the amount of variance in the preference ratings for electric concept vehicles can be explained by the two predictors with 23 per cent of variance.

Lastly, *post-hoc* analyses in the Main Study data were performed to additionally test for differences in aesthetic preference ratings by gender. ANOVA results indicated that females report significantly higher aesthetic preference ratings than males for pants ($M_{Female} = 4.08$ vs $M_{Male} = 3.57$, $p < 0.001$), shirts ($M_{Female} = 4.58$ vs $M_{Male} = 3.85$, $p < 0.001$), and all categories ($M_{Female} = 4.42$ vs $M_{Male} = 3.93$, $p < 0.001$). However, aesthetic preference for jackets did not indicate significant differences by gender ($M_{Female} = 4.58$ vs $M_{Male} = 4.36$, $p = 0.22$). Because these results were based on unequal sample sizes by gender ($n_{Female} = 101$ vs $n_{Male} = 32$), this issue was addressed by initially checking the equality of variance by gender and then performing another ANOVA with equal sample sizes.

For verifying the equality of variance by gender, a series of independent sample *t*-tests were performed. There was equality of variance by gender for pants ($SD_{Female} = 0.87$ vs $SD_{Male} = 0.87$, p (two-tailed) < 0.00), shirts ($SD_{Female} = 1.01$ vs $SD_{Male} = 1.06$, p (two-tailed) < 0.00), and all categories (SD_{Female} 0.76 = vs $SD_{Male} = 0.79$, p (two-tailed) < 0.00). However, there was not equality of variance by gender for jackets ($SD_{Female} = 0.89$ vs $SD_{Male} = 0.91$, p (two-tailed) $= 0.22$). To address the issue of unequal samples sizes by gender ($n_{Female} = 101$ vs $n_{Male} = 32$), the female data were randomly sampled in SPSS in order to generate equal

Category	Hypotheses	Independent variable	Standardized β	*t*-value	*p*-value	R^2	Adjusted R^2	*F*
Pants	*H1a*	Typicality	0.17	2.03	0.04*	0.048	0.033	$F_{(2,131)} = 3.27$,
	H2a	Novelty	0.10	1.23	0.22			$p < 0.05$
Jackets	*H1b*	Typicality	0.28	3.37	0.001***	0.100	0.087	$F_{(2,131)} = 7.26$,
	H2b	Novelty	0.13	1.60	0.11			$p < 0.001$
Shirts	*H1c*	Typicality	0.26	3.14	0.002***	0.171	0.158	$F_{(2,131)} = 13.26$,
	H2c	Novelty	0.29	3.67	0.000***			$p < 0.001$
All	*H1*	Typicality	0.27	3.28	0.001***	0.118	0.105	$F_{(2,131)} = 8.66$,
categories	*H2*	Novelty	0.18	2.17	0.031*			$p < 0.001$

Notes: Dependent variable: aesthetic preference. *$p < 0.05$; ***$p < 0.001$

Table IV. Hypotheses testing: results of multiple regressions for pants, jackets, shirts and all categories – Phase III

sample sizes ($n_{Female} = 32$ vs $n_{Male} = 32$). ANOVA was performed again with the equal sample sizes. Results in Table V indicated that females report significantly higher aesthetic preference ratings than males for pants ($M_{Female} = 3.97$ vs $M_{Male} = 3.57$, $p < 0.05$), and shirts ($M_{Female} = 4.39$ vs $M_{Male} = 3.85$, $p < 0.05$). This result is supported by the results for pants and shirts that reported equality of variance by gender when analysing data with unequal samples sizes. However, ANOVA with equal sample sizes additionally reported that aesthetic preference is not significantly different by gender for jackets ($M_{Female} = 4.31$ vs $M_{Male} = 4.36$, $p = 0.83$) and all categories ($M_{Female} = 4.22$ vs $M_{Male} = 3.93$, $p = 0.08$). In conclusion, ANOVAs with both unequal and equal sample sizes reported similar results, in that females rated aesthetic preference for product pictures significantly higher than males for the categories of pants and shirts, but not for jackets.

Results by gender confirm that, generally, females reacted more positively to most of the apparel pictures than males. This significant difference may be explained by the higher relevance of the stimuli to females than males due to the gendered nature of the stimuli. This finding is not surprising *per se*. Appraisal theory may be helpful in explaining this, particularly through the notion of motive consistency, which suggests that the situation is appraised as consistent with what the person wants (Demir *et al.*, 2009). It is expected that females have a positive motive consistency when evaluating the stimuli, as women are able to identify with them, possibly seeing themselves buying and/or wearing them. On the contrary, males are able to perceive the items' beauty, but the motive consistency is likely not present, or is negative and therefore counteracts the response, resulting in a lower overall aesthetic evaluation of the stimuli as measured in the aesthetic preference scale by males as compared to females.

A summary of the hypotheses testing results is presented in Table VI. Based on the results, the preference-for-prototypes theory helps to explain the results relative to pants and jackets, while the MAYA principle explains the results relative to shirts. In other words, it appears that typicality is more important than novelty for determining aesthetic preference for the apparel categories of pants and jackets. However, because respondents' ratings were determined by both typicality and novelty, the MAYA principle guides the aesthetic preference ratings for shirts. Shirt results are similar to results for sanders, telephones and teakettles in Hekkert *et al.*'s (2003) study, while pant and jacket results are similar to those of sweaters reported in DeLong *et al.*'s (1986) study. Shirt results are also similar to those of electric concept vehicles evaluated by design experts; however, pants and jacket results are more similar to those of electric concept vehicles evaluated by non-experts, in that non-experts preferred restrained design and exhibited lower tolerances for novelty (Diels *et al.*, 2013). Respondents in the present study exhibited similarly lower levels of tolerance for novelty in categories such as pants and jackets and expected higher levels of novelty in the category of shirts.

Table V.
Results of ANOVA with equal sample sizes for aesthetic preference by gender – Phase III

Category	Independent variable	*n*	Mean	SD	Sum of squares	df	*F*-value	*p*-value
Pants	Female	32	3.97	0.66	2.76	1	4.55	0.03*
	Male	32	3.57	0.87				
Jackets	Female	32	4.31	0.92	0.036	1	0.04	0.83
	Male	32	4.36	0.91				
Shirts	Female	32	4.39	0.856	4.84	1	5.21	0.02*
	Male	32	3.85	1.06				
All categories	Female	32	4.22	0.59	1.49	1	3.05	0.08
	Male	32	3.93	0.79				

Notes: Dependent variable: aesthetic preference. The original female sample size ($n = 101$) was randomly selected in SPSS to make it equal to males ($n = 32$). *$p < 0.05$

Category	Hypothesis	Result	Interpretation
Pants	*H1a*: pants perceived as more typical will have a greater impact on an individual's aesthetic preferences as compared to pants perceived as less typical	Supported	Preference-for-prototypes holds for pants
	H2a: pants perceived as more novel will have a greater impact on an individual's aesthetic preferences as compared to pants perceived as less novel	Not supported	
Jackets	*H1b*: jackets perceived as more typical will have a greater impact on an individual's aesthetic preferences as compared to jackets perceived as less typical	Supported	Preference-for-prototypes holds for jackets
	H2b: jackets perceived as more novel will have a greater impact on an individual's aesthetic preferences as compared to jackets perceived as less novel	Not supported	
Shirts	*H1c*: shirts perceived as more typical will have a greater impact on an individual's aesthetic preferences as compared to shirts perceived as less typical	Supported	The MAYA principle holds for shirts
	H2c: shirts perceived as more novel will have a greater impact on an individual's aesthetic preferences as compared to shirts perceived as less novel	Supported	

Table VI.
Summary of hypotheses testing – Phase III

Conclusions and implications

In this study, the MAYA principle was examined relative to three types of apparel. Specifically, relationships between the properties of typicality, novelty and aesthetic preference were examined relative to the categories of pants, jackets and shirts. Thus, the relative importance of typicality and novelty in explaining aesthetic preference per category was assessed. Results initially indicated unexpected positive Pearson product-moment correlations between the mean typicality and the mean novelty in all categories. However, when the correlations were calculated on individual pictures, a great majority revealed negative correlations between the mean typicality and the mean novelty in all categories. This suggests that with respect to most stimuli, lower levels of typicality implied higher levels of novelty. Additionally, findings indicate that for the majority of respondents, typicality was the primary predictor of aesthetic preference relative to pants and jackets. That is, there is no evidence that novelty was significantly influential in the aesthetic preference for those products. Nonetheless, both typicality and novelty were significant predictors of aesthetic preference relative to shirts. These findings imply that the preference-for-prototypes theory holds for pants and jackets, while the MAYA principle better explains the relationships between typicality, novelty and aesthetic preference relative to shirts.

Because the findings indicate that the MAYA principle does not hold for all categories of apparel, applying Diels *et al.*'s (2013) term, pants and jackets would likely generate higher aesthetic preference if created through "restrained design", wherein the resulting designs are simple or similar to prototypical images because the designer was restrained from incorporating higher levels of novelty. In contrast, results suggest that novelty is a property more influential in consumer preference for shirts than pants and jackets. There may be several reasons for this. One possibility is that consumers may be looking for novelty in apparel, but not in every category of apparel that they wear. For instance, the individual may be indirectly considering the whole ensemble and that novelty may be expected from one or two categories (e.g. shirts), but not from all of them. Such issues may be explored in future research, specifically qualitative studies on the topic, as such approaches would allow for more in-depth understanding of consumer preference relative to novelty vs typicality.

In regards to theoretical contributions, this empirical study proposed relations between variables that were verified via hypotheses testing, which allow for extending theory.

The MAYA principle was tested within a particular context, specifically apparel products, thereby offering examination of a specific phenomenon that furthers understanding of a design principle relative to products that have yet to be tested. Results also provide a further conceptual understanding of the individual properties involved in the MAYA principle. Most importantly, results confirm that, in the majority of cases, typicality and novelty exhibit a negative correlation, as there is indication that lower levels of typicality imply higher levels of perceived novelty. Findings offer managers a better understanding of how the product form influences consumer response and shed light on how the MAYA principle varies relative to different categories of apparel.

Limitations and future research directions

There are limitations of the method used in this study, mainly related to the selection and characteristics of the stimuli. Product pictures selected only addressed part of the typicality/novelty spectrum, in that most pictures were between highly typical and highly novel. For instance, despite efforts to include an appropriate range of stimuli that covered all possible levels of typicality and novelty, pictures with products that were simultaneously perceived as high in both typicality and novelty were not considered. As the experiment controlled for colour and texture of the fabrics in the pictures, it also controlled for the possibility of some extreme ratings. That is, when controlling for colour and texture in the pictures, the experiment generated a floor and ceiling effect, in that extreme ratings on the properties of novelty and typicality were not achieved. The same floor and ceiling effect in the selection of stimuli was experienced by other researchers testing the MAYA principle with non-apparel products, including Diels *et al.* (2013) and Hung and Chen (2012). Future studies applying the principle to apparel may consider incorporating colour and texture in the stimuli to generate higher novelty ratings.

Due to the experimental design of the study and the use of a student sample, caution needs to be taken when generalising the results. Results cannot be generalised to the entire population, as there may be a certain percentage of consumers for whom novelty in fact influences their aesthetic evaluations of pants and jackets. For example, according to Kasriel-Alexander (2017), the number of "extraordinary consumers", or those who are looking for novelty in most of the products they use, and especially fashion-related categories, are on the rise. Specific consumer characteristics may be included in future studies, such as fashion adopter categories (Rogers and Shoemaker, 1971), wherein further testing of the MAYA principle may consider independent observations via a between-subjects experimental design.

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