

## The Joint Effect of Typicality and Novelty on Aesthetic Pleasure for Product Designs: Influences of Safety and Risk

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### Abstract

While some studies have shown that people prefer typical product designs, others have shown that people also like product designs that are new. To reconcile these contradictory findings, the design principle, 'Most Advanced, Yet Acceptable' proposes that people prefer a balance of both typicality and novelty in product designs. As an explanation, we propose that typicality and novelty fulfil basic evolutionary needs for safety and exploration that still drive behaviour today, and that products are most preferred when they satisfy both of these needs simultaneously. We further propose that conditions of safety and risk will drive product preferences towards novelty and typicality, respectively. Overall, this research will provide insights into when and why aesthetic preferences for typicality or novelty occur.

**Keywords:** Aesthetic pleasure; typicality; novelty; design; products; evolutionary psychology.

### Introduction

Aesthetic preferences play a significant part in enriching the quality of our everyday lives. We use such preferences to add order, bring satisfaction, and guide attitude-formation behaviour. While research within the domain of aesthetics has traditionally centered on artworks, any object or landmark can be appreciated aesthetically. Thus, it is no wonder that human-made artefacts such as products are usually deliberately designed to be visually pleasing (Postrel, 2003). However, questions remain regarding what denotes aesthetic pleasure, or 'beauty'. Traditional determinants of aesthetic pleasure include properties such as symmetry, figure-ground contrast, clarity, unity, variety, typicality, and novelty. However, the findings regarding *how* these design properties influence aesthetic pleasure are often contradictory. For instance, the influence of the cognitive determinants, typicality and novelty, on aesthetic preferences has been investigated for a range of natural and man-made stimulus types and the findings are mixed. Several studies show that people prefer typical instances of a stimulus category (Halberstadt & Rhodes, 2003; Purcell, 1984; Whitfield, 1983), while others have shown that we are also drawn to stimulus examples that are new (Bianchi, 2002). Others again suggest striking a thoughtful balance between

both typicality and novelty for maximum appreciation of product designs (Hekkert, Snelders, & van Wieringen, 2003). We contribute to the literature by examining the combined effects of both typicality and novelty on aesthetic evaluations of consumer products. In the sections to follow, we provide an evolutionary psychological account of aesthetic preferences for product designs. We show how product preferences reflect basic opposing evolutionary needs for safety and accomplishment. Then, we show how we expect contextual manipulations of safety and risk to shift preferences towards novelty and typicality, respectively, as a function of these basic evolutionary needs.

### Cognitive Determinants of Aesthetic Pleasure: Typicality and Novelty

Previous research has demonstrated that people prefer typical instances of a stimulus category for a range of stimuli including colour samples (Martindale & Moore, 1988), geometric patterns (Winkielman, Halberstadt, Fazendeiro, & Catty, 2006) furniture (Whitfield, 1983), paintings (Hekkert & van Wieringen, 1990), and other natural and artificial categories such as animals, wristwatches, and automobiles (Halberstadt & Rhodes, 2000, 2003). This preference for the typical or familiar is consistent with the mere exposure hypothesis (Zajonc, 1968); the preference for repeatedly encountered stimuli. This effect has been found for a range of stimuli including meaningless stimuli such as polygons (Kunst-Wilson & Zajonc, 1980) and meaningful real-world stimuli including faces (Peskin & Newell, 2004) and consumer products (Hekkert, Thurgood, & Whitfield, 2013). However, typicality is not the only thing people are always after; people are also often drawn towards the new. A preference for novelty has been demonstrated for a range of consumer products including tea-kettles, sanders, telephones, and product-packaging (Blijlevens, Carbon, Mugge & Schoormans, 2012; Schoormans & Robben, 1997). In contrast to the aforementioned mere exposure studies, a recent study found that people preferred new pictures of scenes and objects over pictures that had been repeatedly encountered (Biederman & Vessel, 2006).

### Most Advanced Yet Acceptable (MAYA)

We have shown that people sometimes prefer typicality and at other times they prefer the new. However, a preference for typicality seems incompatible with a desire for the new. In an attempt to reconcile these contradictory findings, the design principle, ‘Most Advanced, Yet Acceptable’ (MAYA) proposes that people prefer a balance of both typicality and novelty in product designs. This principle has since been tested experimentally using a range of consumer products, and it has been found that the most attractive product designs are those that maximise both typicality and novelty simultaneously (Hekkert et al., 2003). Subsequent studies using different product categories confirm that typicality and novelty are separate factors that both positively influence aesthetic appraisal (Blijlevens, Gemser, & Mugge, 2012).

### Evolutionary Explanation for MAYA: Influences of Safety and Risk

Our aesthetic preferences for objects are directed by two opposing evolutionary forces that operate simultaneously and still guide our behaviour today. The first is aimed at the preservation of life, and the second, at the furtherance of conditions of growth (e.g. Damasio, 1994). On the one hand, people prefer stimuli that are safe, provide security, and demand little processing capacity. And on the other hand, people are motivated to take risks, engage in exploratory behavior, and to promote learning. Thus, safety/security seeking and explorative behaviours are equally pleasurable because they are both beneficial for the survival of the human species. Hence, product designs that help optimize safety and accomplishment are the most aesthetically pleasing. It can be argued that typical events fulfil the need for safety, while novel events fulfil the need for exploration. It is adaptive to favour stimuli that are typical or familiar because it leads to safer choices, and avoidance of potential harm (Bornstein, 1989). However, we are also drawn towards novelty as this offers discovery and learning (Bornstein, 1989). Hence, when product designs fulfil these needs for typicality and novelty they influence the more basic evolutionary needs for safety and exploration, which consequently positively relates to positive aesthetic pleasure for these designs. We propose that those product designs that optimize both the need for typicality and novelty simultaneously are the most aesthetically pleasing (e.g. MAYA: Hekkert et al., 2003) because people are equally motivated to maximise both safety and accomplishment needs (Hekkert, 2014). However, we also argue that a trade-off between these needs exists and that, under certain conditions, a preference for either typicality or novelty will prevail (Hekkert, 2014). Under one such condition, namely risk, we suggest that people might prefer typical over novel designs, as they are inherently motivated to increase their safety needs, and a novel product design might be considered more risky than a typical design. Correspondingly, when a situation is safe, people might

prefer novel to typical designs, as they are motivated to maximize their learning and accomplishment needs.

Thus, through two experiments, we sought to confirm whether (1) typicality and novelty jointly contribute to aesthetic pleasure for product designs, and to determine whether (2) conditions of safety and risk drive product preferences towards novelty and typicality, respectively.

## Experiment 1: The Balanced Effect of Typicality and Novelty as Joint Predictors of Aesthetic Pleasure for Product Designs

### Introduction

In our first experiment we sought to confirm whether typicality and novelty jointly and equally contribute to aesthetic pleasure for product designs (Hekkert et al., 2003) as people are equally motivated to increase their safety and accomplishment needs. We exposed participants to photographs of lamps covering a wide range of typicality and novelty. Participants rated the different designs according to measures of typicality, novelty, and aesthetic pleasure.

### Method

#### Stimuli Selection

Twelve photographs of lamps sourced from various home-furnishing websites were selected to serve as stimuli. The designs were deliberately chosen to cover a wide variety of typicality and novelty. In choosing the stimuli, one researcher selected a variety of designs from the internet, then four researchers (two with backgrounds in psychology and two in industrial design) independently chose the four designs that they thought were the most typical, the four that they found the most novel, and the four that they thought comprised features of both novelty and typicality simultaneously. As a group, they compared their selections and where there were discrepancies they came to decisions through group discussions until they were all in agreement regarding which stimuli to use.

#### Participants

Forty-eight participants took part in this experiment (mean age = 45.56 years, SD = 13.08 years, 26 females). Participants were recruited from a consumer panel representing the Australian population and received a small token award for completing an internet-based questionnaire. All participants were Australian and reported English as their first language.

#### Procedure

**Exposure Phase** Participants were informed that they would be presented with 12 product designs that they would later be asked to rate according to their visual appearance. The lamps were presented one at a time, in random order, at a participant-paced interval. Participants were encouraged to view each lamp briefly without spending too much time on

any particular design, as the purpose was simply to familiarise themselves with the designs.

**Test Phase** Participants were told that they were about to be presented with the same 12 lamps again and that this time they would be asked to indicate the degree to which they agreed with a set of descriptive statements regarding the visual appearance of the lamps. Aesthetic pleasure was measured with three items (“this is a beautiful lamp”, “this is an attractive lamp”, and “this lamp is pleasing to see”), typicality was measured with three items (“this is a typical lamp”, “this is a standard design”, and “this is representative of a lamp”), and novelty was measured with three items (“this is a novel lamp”, “this design is innovative”, and “this design is original”). Three filler items relating to functionality were also used (“this design seems sensible”, “this lamp seems functional”, and “this design seems practical”). All rating scales had seven levels whereby 1 = strongly disagree and 7 = strongly agree. Product designs and order of rating scales were presented in random order, at a participant-paced interval. A principle components analysis with Varimax rotation and extraction based on three factors was performed using all the items for aesthetic pleasure, typicality, and novelty, and revealed them to be separate constructs from one another, explaining a total of 85% of the variance (eigenvalues 4.49, 2.51, and .66, item loadings >.7). Furthermore, all scales demonstrated high reliabilities with Cronbach's  $\alpha = .96$ ,  $.90$ , and  $.85$  for aesthetic pleasure, typicality, and novelty, respectively. Thus, overall variables for aesthetic pleasure, typicality, and novelty were created by averaging the scores of the individual items.

## Results

### Hypotheses Testing

Significant positive correlations were found between typicality and aesthetic pleasure ( $r = .59$ ,  $p < .01$ ) and novelty and aesthetic pleasure ( $r = .43$ ,  $p < .01$ ). The correlation between typicality and novelty did not reach significance ( $r = -.04$ ,  $p > .05$ ).<sup>41</sup>

In order to assess the combined effects of typicality and novelty on aesthetic pleasure, a regression analysis was performed on the mean aesthetic pleasure ratings. As expected, both typicality and novelty positively influenced aesthetic pleasure for product designs ( $R^2 = .55$ ,  $F(2, 573) = 349.87$ ,  $p < .001$ ,  $\beta_{\text{typicality}} = .61$ ,  $p < .001$ ,  $\beta_{\text{novelty}} = .45$ ,  $p < .001$ ). Hence, both typicality and novelty explain aesthetic pleasure.

## Discussion

As expected, both typicality and novelty jointly contribute to aesthetic pleasure for product designs. Product designs are

preferred when they are both typical and novel. We argue that this is the case because people are motivated to increase both their safety and accomplishment needs. Contrary to expectations, typicality and novelty were not negatively related to one another. This was surprising given that the two constructs are assumed to be each other's opposites. However, our findings might be a reflection of the items used to measure the constructs. While the items ‘typical’ and ‘novel’ might be considered directly each other's opposites, the other items for typicality (‘representative’ and ‘standard’) and novelty (‘innovative’ and ‘original’) might not. Indeed, when ‘typical’ and ‘novel’ were used in isolation to measure typicality and novelty, the expected negative relationship was found.

## Experiment 2: Influences of Safety and Risk on the Joint Effect of Typicality and Novelty on Aesthetic Pleasure for Product Designs

### Introduction

In our second experiment we aimed to determine whether conditions of safety and risk drive product preferences towards novelty and typicality, respectively, as people are motivated to maximise their accomplishment and safety needs. Situations of safety and risk can be construed in many ways. For instance, certain types of product categories might inherently carry more risk than others: expensive products or socially important products might be considered more risky than less expensive or less socially important products. People can also be primed to perceive certain situations as more risky than others. For instance, situations where people expect their preferences to be evaluated by others (public consumption) might be more risky than situations where no such evaluation is expected to take place (private consumption). Similarly, by repeatedly evaluating products on dimensions related to safety or risk, we might be able to prime participants to engage in a safe or risky mindset. Such a procedure, the Repeated Evaluation Technique (RET: Carbon & Leder, 2005), was used in the current study whereby participants rated products (lamps or clocks) on multiple dimensions that stressed either social safety or risk. Rating stimuli on multiple dimensions provides a deeper level of stimulus elaboration that activates discrete situational or semantic concepts (Faerber, Leder, Gerger, & Carbon, 2010). In the safe context, it is assumed that the participant's mindset is primed towards safety and thus, they are potentially more open to new, ‘riskier’ experiences, including preferences for novelty. Conversely, in the risky context, it is assumed they are primed towards risk, and are therefore likely to gravitate towards safer, typical choices. The RET technique was used in a recent study (Carbon, Faerber, Gerger, Forster, & Leder, 2013) to show that innovative product designs are appreciated following repeated evaluation of their fascinating (‘safe’) aspects of innovation, but not following elaboration of dangerous aspects of

<sup>41</sup> Separate correlation analyses were performed using the individual items “typical” and “novel” to measure typicality and novelty, respectively. This time, the expected negative correlation was found ( $r = -.19$ ,  $p < .001$ ).

innovation. In our case, the intention was to induce a mindset of either (social) safety or risk under which participants' aesthetic evaluations would take place. Following the extended rating phase, measures of typicality, novelty, and aesthetic pleasure were obtained.

## Method

### Stimuli Selection

The same twelve photographs of lamps from Experiment 1 were chosen to serve as stimuli for replication purposes. Twelve photographs of clocks were also chosen to serve as stimuli to ensure our findings are applicable over different product categories. No differences were expected between product categories.

### Participants and Design

Two hundred and eight participants took part in this experiment (mean age = 51.08 years, SD = 16.23 years, 107 males). Recruitment procedures were the same as in Experiment 1. The participants were divided into four subgroups based on a 2 x 2 between-subjects research design with two levels of product stimuli (lamps and clocks) and two levels of social risk (social safety and social risk).

### Procedure

**Exposure Phase** This was identical to Experiment 1.

**Repeated Evaluation Phase** Participants were told that they were about to be presented with the same 12 lamps (clocks) again and that this time they would be asked to indicate the degree to which they agreed with a set of descriptive statements regarding the visual appearance of the design. In order to induce a specific mindset of either safety or risk, they were instructed to think of how the visual appearance of the design makes them feel in relation to other people. When making their ratings, they were encouraged to imagine that they currently owned these products, even if in real life they would not own such designs. To generate safe or risky conditions, participants rated the product designs on eight dimensions emphasising social safety or social risk. In particular, we chose items that reflected social inclusion or exclusion to represent safety and risk, respectively. For example, in the safe condition, we used items such as "this design makes me feel connected to other people," and in the risky condition we used items such as "this design shows that I do not fit in with other people". All rating scales had seven levels whereby 1 = strongly disagree and 7 = strongly agree. Product designs and order of rating scales were presented in random order, at a participant-paced interval.

**Test Phase** The test phase was the same as in Experiment 1, however, in order to reduce the workload and so as not to detract from the manipulation of the RET, aesthetic pleasure was measured with one item, "this is a beautiful lamp/clock", typicality was measured with one item, "this is a typical lamp/clock", and novelty was measured with one item, "this is a novel lamp/clock". These items are representative of their respective constructs theoretically, and were chosen based on the findings of our

first experiment. To be confident that the items still fully captured the constructs of interest, we explained to participants what we meant by typical, novel, and beautiful by using the other relevant items from Experiment 1 (e.g. "by typical, we mean how representative or characteristic you think the given design is for the product category, lamp/clock").

**Manipulation Check** In order to check whether participants in the safe condition did feel more safe following the RET than those in the risky condition, and vice versa, at the end of the questionnaire participants were asked to indicate how safe they felt, with the following items: "I feel at ease", and "at the moment, I feel the sense of safety of being included by other people"; and how at risk they felt, with the following items: "at the moment, I feel aware of the risk of being excluded by other people", and "I feel uncomfortable". Again, all rating scales had seven levels whereby 1 = strongly disagree and 7 = strongly agree, and their order was presented in a random fashion. Composite variables for safety and risk were created by averaging the scores of the individual items (Cronbach's  $\alpha = .44$  for safety, and  $.54$  for risk).

## Results

### Manipulation Check

Independent samples t-tests between the safety and risk groups were used to test for differences between perceived safety and risk. Contrary to expectations, following the RET, there were no significant differences in perceived safety between safe ( $M = 5.06$ ,  $SE = .13$ ) or risky ( $M = 5.00$ ,  $SE = .11$ ) groups ( $t(206) = .39$ ,  $p = .70$ ), nor in perceived risk between safe ( $M = 2.71$ ,  $SE = .15$ ) or risky ( $M = 2.41$ ,  $SE = .13$ ) groups ( $t(206) = 1.53$ ,  $p = .13$ ). However, it might be possible that participants were not consciously aware of the safe/risky mindset, and hence we proceeded with data analyses as planned.

### Hypotheses Testing

As with Experiment 1, significant positive correlations were found between typicality and aesthetic pleasure overall ( $r = .26$ ,  $p < .001$ ) and novelty and aesthetic pleasure overall ( $r = .12$ ,  $p < .001$ ). This time, a significant negative correlation was found between typicality and novelty overall ( $r = -.52$ ,  $p < .001$ ).

In order to assess whether safety and risk moderated the effects of typicality and novelty on aesthetic pleasure, a hierarchical regression analysis was performed on the mean aesthetic pleasure ratings, with the independent variables typicality and novelty entered in Step 1, a dummy variable for level of risk (safe, risk) and its interaction terms as independent variables in Step 2, a dummy variable for product category (lamp, clock) and its interaction terms as independent variables in Step 3, and all three-way interactions as independent variables in Step 4. The first regression model was statistically significant, indicating that

both typicality and novelty positively contribute to aesthetic pleasure for product designs. The second regression model showed no significant change in  $\Delta R^2$ , which indicates that there are no differences in the effect of typicality and novelty on aesthetic pleasure between safety and risk conditions. The third regression model was statistically significant, indicating that there might be differences in the effect of typicality and novelty on aesthetic pleasure between product categories. The fourth regression model did not show any change in  $\Delta R^2$ , indicating no three-way interaction effects.

In order to explore these interactions more closely, a new hierarchical regression model was fitted on aesthetic pleasure as the dependent variable and the independent variables typicality and novelty entered in Step 1, and the dummy variable for product category (lamp, clock) and its interaction terms as independent variables in Step 2. The first regression model was statistically significant ( $R^2 = .16$ ,  $F(2, 2493) = 239.46$ ,  $p < .001$ ). The second regression model showed a significant change in  $R^2$  ( $\Delta R^2 = .02$ ,  $F(5, 2490) = 109.70$ ,  $p < .001$ ). Both typicality and novelty positively influenced aesthetic pleasure ( $\beta_{\text{typicality}} = .54$ ,  $p < .001$ ,  $\beta_{\text{novelty}} = .33$ ,  $p < .001$ ). A significant interaction effect between typicality and product category on aesthetic pleasure indicated that the effect of typicality on aesthetic pleasure significantly differed between product categories ( $\beta_{\text{productcategory}} = -.10$ ,  $p < .001$ ,  $\beta_{\text{typicality} \times \text{productcategory}} = -.12$ ,  $p < .001$ ,  $\beta_{\text{novelty} \times \text{productcategory}} = .04$ ,  $p = .235$ ). Separate regression analyses revealed that typicality had a significantly larger effect on aesthetic pleasure for lamps ( $R^2 = .45$ ,  $F(2, 1245) = 158.42$ ,  $p < .001$ ,  $\beta_{\text{typicality}} = .51$ ,  $p < .001$ ) than for clocks ( $R^2 = .38$ ,  $F(2, 1245) = 104.25$ ,  $p < .001$ ,  $\beta_{\text{typicality}} = .40$ ,  $p < .001$ ).

## Discussion

Contrary to expectations, we did not find our conditions of safety and risk to drive product preferences towards novelty and typicality, respectively. Instead, our results again confirmed that people prefer a balance between typicality and novelty for aesthetic pleasure for product designs. Our manipulation check did not reveal any significant differences in perceived risk or safety between the safety and risk groups. Thus we are left to conclude that our manipulation was not successful for adequately inducing conditions of safety or risk; and whether or not safety and risk do direct preferences towards novelty and typicality is still therefore unknown. Upon consideration of our safety and risk items used in the RET, it may be that our items, being social in nature, were too unrelated to our cognitive constructs of interest, namely typicality and novelty.

Unexpectedly, the effect of typicality on aesthetic pleasure was greater for lamps than for clocks. Although we did not anticipate the product-types to differ in initial level of risk, it might be that lamps are actually a more risky product-type than clocks because they are harder to process on a cognitive level. Lamps come in a variety of shapes and sizes and could therefore be less easy to identify or recognize than the more distinctive-looking product-type, clocks. This is consistent

with the findings of the current study and with an evolutionary account for aesthetic preferences: the need to fulfil safety needs was greater for lamps than for clocks. This, and other ideas will be further explored in our future research and are described in more detail in the following section.

## General Discussion

As expected, our first experiment revealed that both typicality and novelty jointly and positively explained aesthetic pleasure. The results are consistent with past research (Blijlevens et al., 2012; Hekkert et al., 2003) and support an evolutionary explanation for aesthetic preferences – product designs are preferred when they strike an optimal balance between typicality and novelty, as people are equally motivated to increase their safety and accomplishment needs.

Contrary to expectations, our second experiment did not find our manipulation of safety and risk to drive product preferences towards novelty and typicality, respectively. Instead, our results again confirmed that people prefer a balance between typicality and novelty for aesthetic pleasure for product designs. This may have been caused by the fact that our manipulation of safety/risk was too weak: our manipulation check did not reveal any significant differences in perceived risk or safety between the safety and risk conditions. Thus, future research is still required to ascertain whether or not safety and risk do direct preferences towards novelty and typicality.

As mentioned, our choice of social RET items might have been too far-removed from our cognitive constructs (typicality and novelty) to have sufficiently induced conditions of safety and risk. Given that the RET aims to encourage deep elaboration of the inner qualities of consumer products, in our future research, we endeavour to repeat the process again but to create associative contexts using items that directly pertain to safe and risky aspects of typicality (e.g. “familiar”, “normal”) and novelty (e.g. “dangerous”, “unpredictable”). We also plan to repeat the existing social risk RET procedure with product categories that differ in initial level of social risk (e.g. sunglasses might be more socially risky than lamps or clocks, and thus more susceptible to our social risk manipulation).

Furthermore, another conceptualization of risk that we plan to explore is the idea that (cognitive) risk refers to being prevented from achieving what we want to do at the level of cognitive processing. As already indicated, risk might manifest when we are not able to readily categorize/identify stimuli. ‘Risky’ products might be harder to immediately identify or recognize than safe products because they look like/share common features with other product-types (e.g. product-types such as food processors, blenders, and juicers share a strong familial resemblance compared to other more distinctive product-types such as clocks).

This continuing research will provide insights into the relationships among typicality, novelty, and contextual influences on aesthetic evaluations of product designs. Thus, not only will this research provide substantial theoretical

contributions, but it will also have practical implications within areas such as advertising and product design.

### Acknowledgments

Project UMA was supported by MAGW VICI grant number 453-10-004 from The Netherlands Organization for Scientific Research (NWO), awarded to Prof. Dr. Paul Hekkert.

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