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The beauty of balance – An empirical integration of the Unified Model of Aesthetics for product design

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Abstract: The Unified Model of Aesthetics provides a comprehensive theory on aesthetics of product design. It posits that aesthetic appreciation derives from the reconciliation of the needs for safety and accomplishment, which manifests itself through the principles of unity-in-variety, most-advanced-yet-acceptable and autonomous-yet-connected. The present study considers the empirical integration of these principles, using a survey that scrutinizes aesthetic preferences of 300 respondents for 20 products. The principles are scrutinized separately, after which we conduct an integrated test to examine their combined effect and relative importance for aesthetic appreciation. We find that the perceptual qualities of unity and variety strongly affect aesthetic appreciation, but the typicality of a design becomes of little importance when taking into account perceptual and social measures.

Keywords: design aesthetics; Unified Model of Aesthetics; safety and accomplishment needs; aesthetic principles

1. Introduction

As the understanding of aesthetics grew, so did the number of factors deemed relevant for aesthetic appreciation. Within psychology the branch of empirical aesthetics initially focused on objects' structural, perceptual features (e.g. Boselie & Leeuwenburg, 1985; Cupchik & Berlyne 1971), but gradually it broadened its scope to aspects of a more cognitive nature – like an object's (proto-)typicality and meaning (i.a. Bornstein 1989; Leder, Carbon & Ripsas 2006; Whitfield 1983). Additionally, research in social psychology and sociology has substantiated the social significance of aesthetic preferences (Temme 1992; Bourdieu 1993). Hence, although much insight has been gained, paying heed to the intricately complex and multidimensional nature of the aesthetic experience, the domain leaves a rather fragmented impression. Moreover, individual strands of research have identified a number of mechanisms to account for observed aesthetic preferences, but a more general theoretical

foundation has so far been largely lacking. Therefore, much can be gained in the domain of object aesthetics from a more comprehensive, fundamental theoretical framework.

In this paper, we will elaborate and empirically test a framework that manages to reconcile diverse factors salient for product design aesthetics – the Unified Model of Aesthetics, originally coined by Hekkert (2006).

2. Safety and accomplishment

The Unified Model of Aesthetics (UMA) starts off from the so-called *by-product hypothesis*, which traces the aesthetic sensitivity back to evolutionary adaptation (Hekkert & Leder 2008; Johnston 2003). The success of our species has depended on its adaptation to varying circumstances. This has entailed reconciling two conflicting urges. On the one hand, we seek safety. Partly, we survive by staying out of harm's way. On the other hand, though, we need to take some risk as well. To find food and places that could provide shelter, our species had to be able to take initiative with uncertain outcome. Therefore, a need for *accomplishment* has evolved to balance out the need for *safety*.

Instrumental to fulfilling these urges are our faculties. They provide information about our environment and thereby enable us to identify possible threats and opportunities. As fluent processing of this information thus entails an evolutionary advantage, it is assumed that we have developed an ability to derive pleasure from this sense-making process – an *aesthetic sense*. The pleasure it provides is *disinterested*. In contrast to emotions, which allow us to evaluate the beneficial or harmful nature of a situation, aesthetic delight is evoked by perceiving in itself and serves no immediate practical function. In that sense, the aesthetic experience can be defined as pleasure that emanates exclusively from sensory-motor understanding as such (Hekkert & Leder 2008; Hekkert 2014).

As the aesthetic sense is a by-product of the faculties that allow us to make sense of our surroundings, it is likely to be triggered primarily in those situations that are conducive to the functioning of these faculties. In other words, the aesthetic experience will be a function of the extent to which a stimulus can be processed smoothly in line with evolutionary needs. It will be determined by the extent to which the senses are able to identify prospects for both safety and accomplishment. Hence, the aesthetic pleasure evoked by a stimulus depends on the perceived balance it strikes between these conflicting urges (Hekkert 2014).

However, as indicated above, the aesthetic experience is a highly complex process, where factors of a perceptual, cognitive as well as social nature come into play. Although different principles can be seen to operate at these levels of stimulus processing, we argue that these can effectively be traced back to evolutionary needs. Therefore, UMA accommodates for multiple dimensions that are considered different manifestations of the fundamental balance between safety and accomplishment.

2.1 Perceptual unity-in-variety

People tend to value perceptual input to be orderly and coherent. By presumably allowing easy and efficient perceptual processing *unity* increases aesthetic pleasure. This is most evident in the operation of the Gestalt laws, as documented by behavioural psychology. Stimuli that display symmetry, continuity, closure, repetition, … are found to make a coherent impression, and – for that reason – they are liked more (Arnheim 1971; Wagemans, et al 2012).

However, as our environment is made up from diverse elements, our senses have evolved precisely to cope with this variety of information. If perceptual input would be overly unified, they would get dulled (Berlyne 1971; Biederman & Vessel 2006). Therefore, we like some challenge in the form of *variety* to counterbalance unity, if only to enable us to perceive discrete entities. Thus, on the perceptual level, we derive aesthetic pleasure from stimuli that fulfil our need for both unity and variety.

2.2 Cognitive typicality and novelty

Cognitive processing entails recognizing and meaningfully categorizing perceptual input. To do this we rely on previous experiences. Encounters with similar stimuli provide a frame of reference, so higher similarity allows for smoother processing. In this vein, psychological research has established that appreciation rises with the sheer frequency of confronting a particular stimulus – a mechanism that has come to be known as the 'mere exposure effect' (Zajonc 1968). Moreover, as we have to categorize the things we perceive, stimuli that are clear exemplars of a category can be processed more easily, which again drives appreciation (Whitfield 1983). In other words, we value a degree of *typicality* as this increases recognisability.

On the other hand, stimuli that are somewhat unfamiliar are liked as well for enabling us to learn and enrich our experience (Bornstein 1989). Similar to the account about the evolution of the senses on the perceptual level, Biederman and Vessel (2006) argue that this is due to our brain having adapted to cope with new, atypical information. Hence, some degree of *novelty* offers a counterbalance to the tedium that may be caused by overly typical stimuli. Illustrating the balance between typicality and novelty, Biederman and Vessel (2006) find higher levels of appreciation for novel stimuli, but only on the condition that observers are able to recognise what they are seeing. In the domain of product design, this balance has been subsumed under the acronym MAYA – aesthetic appreciation will be highest for designs that manage to be *Most Advanced, Yet Acceptable* (Hekkert, Snelders & Van Wieringen 2003). In practice, it would seem to imply that we tend to like products that we can easily recognise (say, as a drill hammer, a television set or a car), but that offer a new take on such type of products.

2.3 Social connectedness and autonomy

Apart from the perceptual and cognitive impressions they make on us, often objects also carry some social meaning. Although this applies to any object for which preference can be unfolded, it is particularly salient for consumer products (and the way they are designed). Through expressions of liking, they get associated with certain groups of people. They come to symbolize a group identity and this in turn is likely to affect aesthetic appreciation (Markus & Kitayama 1991).

Again the reasons may be rooted in our species' evolution. Belonging to a group can be assumed to be beneficial because of increased reproductive possibilities and the pooling of resources. Group membership provides a level of security that could not be reached by individuals on their own (Axelrod & Hamilton 1981). Herein lies the reason why we have evolved to find objects that symbolize group membership aesthetically attractive.

However, within the safe confines of the group, we benefit from standing out to some extent. From an evolutionary perspective, this can be explained in the sense that group members individually need to attract mates or make sure that they have their share of the resources. For that reason, we are likely to have incorporated a need to assert our autonomy. Thus, we aesthetically value objects that symbolize uniqueness from our reference group. This is also in line with sociological arguments on the use of cultural taste as a way to assert social status (Bourdieu 1984).

In sum, on the social level, our aesthetic experience of objects may be determined by the extent to which they signal both *connectedness* and *autonomy*.

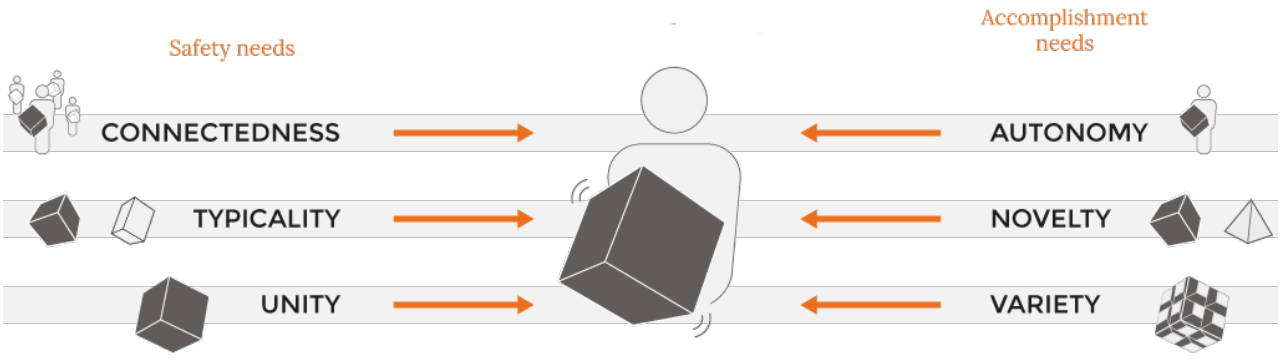

Figure 1 Unified Model of Aesthetics – Safety and accomplishment needs on the perceptual, cognitive and social level of stimulus processing

3. Unifying the unified model

In figure 1 it can be seen how a single set of conflicting needs for safety and accomplishment is instantiated through different principles on various levels entailed in the processing of stimuli (like designed objects). In the present study, our aim is to empirically establish the effects on aesthetic appreciation proposed by UMA. This is specified throughout a number of hypotheses.

Although the principles constituting the three levels of UMA have individually been tried and tested in the course of various studies (i.a. Post, Blijlevens & Hekkert 2012 ; Blijlevens & Hekkert 2014; Thurgood, Hekkert & Blijlevens 2014), we will test whether these effects can be replicated on our data. Therefore, the first hypothesis is as follows.

Hypothesis 1

At separate levels conflicting qualities, although negatively related, both increase aesthetic appreciation.

The strength of UMA lies in the fact that it goes beyond a unidimensional explanation of aesthetic appreciation. The various levels it comprises exert an effect on aesthetic appreciation in combination. As the principles of UMA refer to different aspects of the product experience and therefore to different qualities of the product, they are expected to have a unique effect on aesthetic appreciation. This means that we do not expect any of the levels to entirely comprise any of the others. Therefore, taking into account three levels will provide a better explanation for aesthetic appreciation than only accounting for a single or two levels. As a consequence, the main goal of this study can be captured by the following hypothesis.

Hypothesis 2

The various levels of UMA contribute independently to the aesthetic appreciation of products.

However, this does not necessarily imply that no overlap could occur. On the contrary, it is to be expected that the added value of the levels declines. The reason for this is quite straightforward. If unity, typicality and connectedness are to be considered instantiations on various levels of a single underlying need for safety, it makes sense to assume that they are interrelated. For example, it is imaginable that the elements comprising a familiar (and therefore typical) design get firmly associated. As a consequence, they may come to be considered as making up a more unified whole. Likewise, the urge for accomplishment is assumed to manifest itself through the valuation of variety, novelty as well as autonomy. Hence, on that side too some overlap is likely to occur. For instance, novel designs may express a higher degree of autonomy, whereas typical designs could be considered as generally more socially safe.

Hypothesis 3

The net effect of a level decreases when taking into account qualities at the other levels.

The preceding hypotheses are tested through a survey in which respondents are requested to evaluate a set of products on aesthetic quality as well as the factors accounted for by UMA. In the following section we will address the methodological specificities of the research design.

4. Methodology

4.1 Stimuli

The data for the present analyses were collected in the course of a survey in which images of products were presented to respondents. The stimuli were taken from prior research conducted on distinct levels of UMA (Post, Blijlevens & Hekkert 2012 ; Blijlevens & Hekkert 2014; Thurgood, Hekkert & Blijlevens 2014). The set consists of images of twenty products belonging to five product categories (1. bicycles, 2. sunglasses, 3. dining tables, 4. espresso makers, 5. table lamps – four products per category). The product categories were chosen to obtain a broad enough range of products – comprising electrical appliances, fashionable accessories, furniture and vehicles. Particular products were selected that had previously garnered high, moderate as well as low levels of aesthetic appreciation and varying scores on the principles under scrutiny in the studies they were taken from. This was done exclusively to ensure sufficient dispersion on the variables under scrutiny. By no means the results of prior studies were considered as some form of pre-test to validate the stimuli.

4.2 Operationalization of UMA

Participants were requested to rate the stimuli on a number of items referring to aesthetic appreciation and the various principles comprised by UMA. These items were presented in the form of statements, to which the participants could indicate their level of agreement on a seven-point scale (1= 'fully disagree', 7= 'fully agree' – intermediate scores were not labelled). The following items were used.

Aesthetic appreciation

- This product is pleasing to see.
- The design of this product is beautiful.
- This product has an attractive design.

Unity

- The product is unified.
- The product is coherent.

Variety

- The product conveys variety.
- The product is rich in elements.

Typicality

- The design is typical for this kind of product.
- This is a standard design for this type of product.

Novelty

- This product is original.
- The design of this product is novel.

Connectedness

- The design of this product makes me feel connected to people like me.
- People like me own this or a highly similar product.

Autonomy

- This product design helps me to be unique in reference to people like me.
- The design of this product helps me to distinguish myself from others.

The statements on aesthetic appreciation, unity, variety, novelty and typicality were taken from a battery of items that has been validated to measure these concepts (Blijlevens, et al 2014). The items on autonomy and connectedness were adapted from a study establishing the effect of social considerations on aesthetic appreciation (Blijlevens & Hekkert 2014).

For the purpose of analysis, variables were calculated by averaging the scores on the items referring to a particular concept.

We should stress that the results from the study at hand are based on subjective evaluations from its participants. We have not systematically manipulated the stimuli to a certain effect. We expect relations between aesthetic appreciation and the principles of unity-in-variety, MAYA and connected-yet-unique to manifest themselves mainly on an individual level, so it would make little sense to attempt to objectify certain product characteristics.

4.3 Sample and data collection

The survey was administered through the crowdsourcing platform Amazon's Mechanical Turk. Given the nature of the research question, we did not consider the lack of control over

participants in this sampling frame to be an issue. We do not formulate specific expectations concerning subjects' background characteristics, we merely needed sufficient heterogeneity in terms of age and expertise (for this reason we preferred an online sample over a student sample). Moreover, a growing body of literature vouches for the response quality of this platform for psychological research (for more information on the operation and quality of data collection on Amazon Mechanical Turk, we kindly refer the reader to Buhrmester, Kwang & Gosling 2011; Paolacci, Chandler & Ipeirotis 2010). To further ensure data quality, we built in a number of attention checks. Respondents who failed these, could not finish the survey. Also, it could only be taken from a desktop or laptop computer to ensure adequate viewing conditions and it was only accessible for people located in the United States. This was done to avoid effects of varying cultural sensitivities (Hekkert & Leder 2008). Although we are well aware that the United States are culturally quite heterogeneous, we do assume that people living in this country are aware of similar aesthetic norms and have access to similar products.

The order of the stimuli was randomized between respondents to rule out effects of sequence. Per stimulus, respondents saw an image of a product together with the list of statements on a single web page. For their convenience, the image was repeated underneath the list of items. The items were presented in a randomized order as well. Before evaluating the stimuli, the respondents had to grant their informed consent, after which they could indicate their age and sex. To get acquainted with the procedure, they had to rate a trial product. This product was a watch and therefore did not belong to any of the product categories involved in the actual study. The data obtained from this trial were left out of the analyses.

In this way, we recruited a sample of 300 individual participants (43.3% female – mean age 33.22, SD=9.65), who were paid 4.00 USD (which was considered a fair amount in view of the effort required).

5. Results

5.1 Identifying UMA patterns

As a first step of the analyses, we calculated Pearson's correlations among the principles and aesthetic appreciation. Inspection of the coefficients leaves a mixed impression. As expected, typicality and novelty are negatively related. However, unity and variety show a merely mild – although significant – negative correlation. Rather unexpectedly, autonomy and connectedness show a mild positive correlation. Also, contrary to the other principles, it is interesting to note that typicality appears to be negatively related to aesthetic appreciation.

To get some additional insight on these findings, regression analyses were conducted for the distinct levels proposed by UMA. These may also serve as a point of reference for analyses comprising multiple levels. For a proper estimation of fixed effects, we have to account for

the fact that individual respondents have rated multiple products and individual products have been rated by multiple respondents. Hence, data are nested in two ways. Therefore, the regression analyses were conducted using cross-classified multilevel models, including random intercepts for both stimuli and respondents.

Table 2 Correlations of UMA principles and aesthetic appreciation

	Aesthetic	Unity	Variety	Typicality	Novelty	Connectedness	Autonomy
Aesthetic	1	0.32***	0.55***	-0.15***	0.42***	0.32***	0.48***
Unity		1	-0.05***	0.37***	-0.15***	0.40***	-0.02
Variety			1	-0.52***	0.74***	0.05***	0.71***
Typicality				1	-0.70***	0.38***	-0.53***
Novelty					1	-0.08***	0.73***
Connectedness						1	0.14***
Autonomy							1

*** p<0.001

On the perceptual level, both unity and variety bear a positive effect on the aesthetic score attributed to product designs (unity *b*=0.46, p<0.001, variety *b*=0.52, p<0.001). Variance in random intercepts is significant at alpha=0.01, meaning that average scores that were attributed differ between respondents and between particular stimuli. In multilevel analyses, calculating R^2 as an indication of goodness-of-fit is quite uncommon as its interpretation is not straightforward. However, to obtain an idea of the proportion of variance explained by the fixed effects of the models we calculate Ω^2 as 1 minus the ratio of the residual error of a model containing both fixed and random effects and a model containing only random effects (as proposed by Xu 2003). We thus find that 34% of variance in aesthetic appreciation is explained by the fixed effects of unity and variety. These findings can also be visualized by plotting the average scores of individual products on unity and variety. The position of a particular design is indicated by its score on aesthetic appreciation.

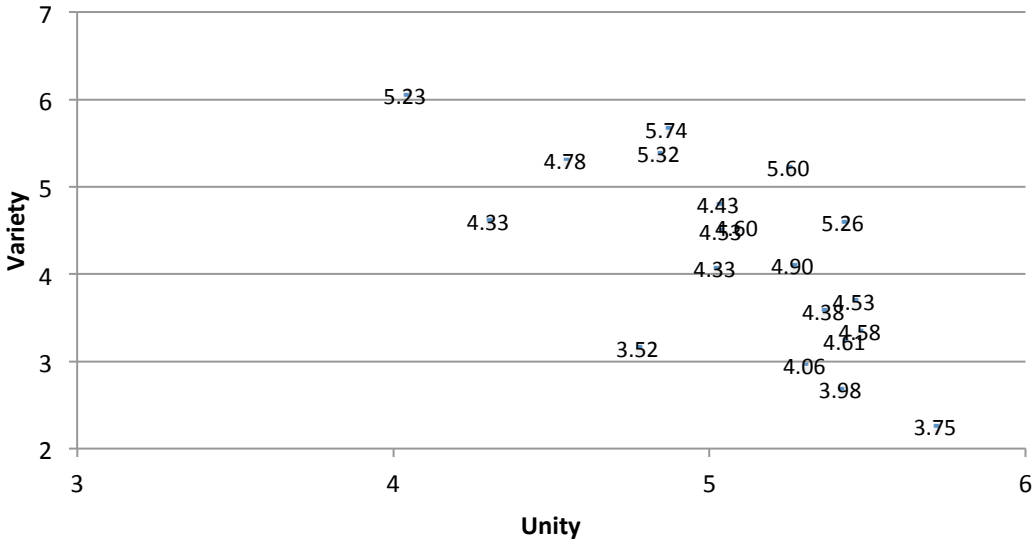

Figure 2 Average scores of stimuli on unity and variety

In the graph one can easily recognize a negative relation between the principles. Interestingly, the highest scores can be found in the top right. This is in line with UMA propositions, because it implies that a maximization of both unity and variety leads to high aesthetic scores.

On the cognitive plain, consistent with the theory of UMA, both typicality (b=0.14, p<0.001) and novelty (b=0.43, p<0.001) significantly and positively contribute to aesthetic appreciation. However, given the negative correlation found earlier between typicality and aesthetic appreciation, it is quite remarkable that the effect now turns out positive. We seem to be encountering an instance of statistical suppression – given the strong negative correlation between novelty and typicality, a part of the large positive effect of novelty on aesthetic appreciation is translated into a negative effect running through typicality. As the effect is larger than that of typicality, the simple correlation between typicality and the aesthetic score becomes negative. However, when controlled for the effects of novelty, the net impact of typicality does turn out to be positive. Hence, the MAYA principle is corroborated by these findings, as products are liked to be novel, while maintaining some typicality.

Again, variance in random intercepts for both stimuli and participants is significant (p<0.01), indicating that the use of multilevel linear models is warranted. Calculating Ω^2 as before tells us that 12% of variance can be attributed to fixed effects of typicality and novelty.

When presented graphically on the level of individual products, again the negative relation between typicality and novelty is striking. The linear shape of the relation seems to suggest that typicality and novelty are merely opposite poles on a single scale. By contrast, the regression analysis indicates that typicality does positively contribute to aesthetic appreciation independently. When inspecting this graph, it should however be borne in

mind that scores are aggregated on the stimulus level. Such an aggregation in a sense objectifies stimulus features as it uses an average of the scores from various respondents, neglecting interpersonal differences. Therefore, although a graphical presentation of averages may offer some insight, it should be interpreted with caution, bearing in mind its inherent limitations.

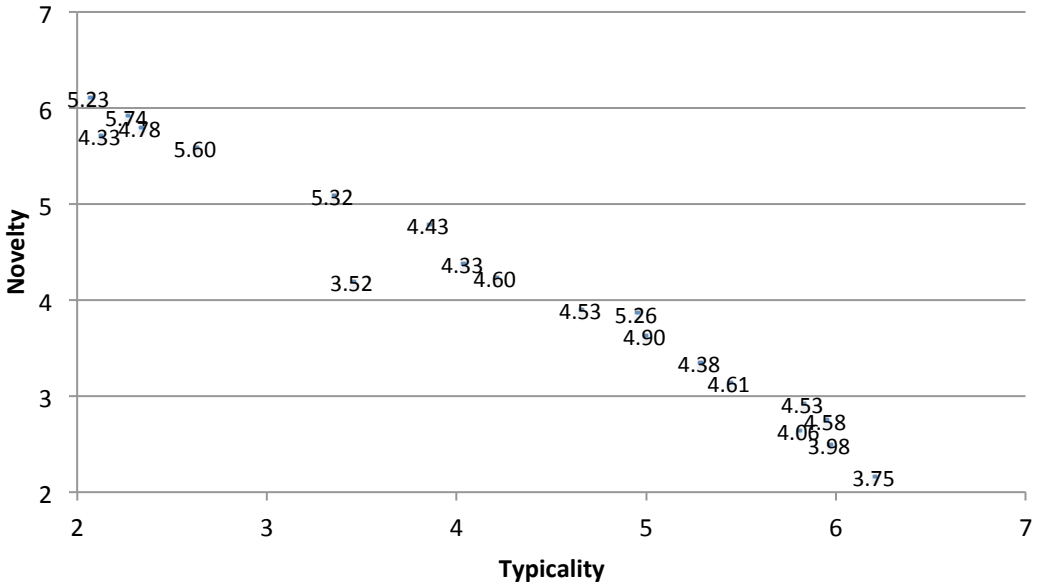

Figure 3 Average scores of stimuli on typicality and novelty

These analyses were repeated once more for the principles assumed to be at play at the social level. Multilevel regression analysis again renders significant positive effects of connectedness (0.34, $p<0.001$) and autonomy (0.39, $p<0.001$) on aesthetic appreciation. Once more, variance in random intercepts for stimuli and respondents is significant at alpha=0.01. Ω^2 indicates that 28% of variance is explained by the fixed effects of the model.

The graphical presentation of the individual products shows a negative relation between connectedness and autonomy, which seems to be at odds with the mild positive correlation reported earlier. A possible explanation for this is that connectedness and autonomy are in fact related in a curvilinear way. Hence, the positive correlation may have been an artefact of a curvilinear relation being estimated by a linear function. The high scores on aesthetic appreciation are again situated in the top right, indicating the expected effect on aesthetic liking of a maximization of both connectedness and autonomy.

In sum, these initial explorations of the data seem to largely lend support to the theory proposed by UMA, with positive effects on aesthetic appreciation of both conflicting qualities that constitute the individual levels. Also, pairs of conflicting qualities are related negatively, as indicated by correlations or graphical presentation.

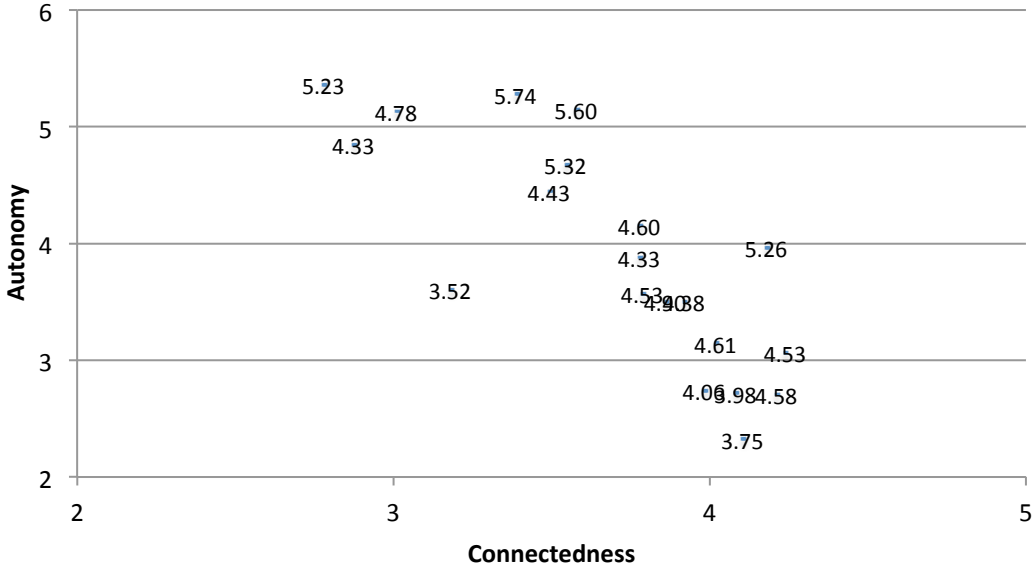

Figure 4 Average scores of stimuli on connectedness and autonomy

5.2 Combining UMA principles

To assess the combined effect of the principles constituting UMA, a multilevel regression analysis was conducted of aesthetic appreciation on unity, variety, typicality, novelty, connectedness and autonomy, again accounting for random intercepts for individual respondents and stimuli. On the basis of Ω^2 we find that fixed effects of this model account for 42% of variance in aesthetic appreciation. The combined model thus explains a substantially larger proportion of variance as compared to the models containing only pairs of variables from a single level. However, even without looking at parameter estimates, the proportion of explained variance already gives an indication that the effects of UMA principles will not be additive. That is to say, the increase in explained variance is not as big as would be expected if effects of principles would not overlap. The parameter estimates are reported in the table below.

It is striking that the effect of typicality diminishes and no longer reaches significance as a result of accounting for variables at the other levels of UMA. A series of hierarchical regression analyses (not reported) indicates that this is due to both the inclusion of unity at the perceptual level and connectedness at the social level, as both variables account for about half of the original effect of typicality.

The other variables in UMA do maintain a more substantial positive effect on aesthetic appreciation, but the effects decrease considerably when compared to the analyses where only variables belonging to a single level were included. Stated differently, there is a substantial overlap between the principles contained in the model. The various principles do add to aesthetic appreciation in their own right, but their added value decreases. It is apparent, though, that the variables at the perceptual level (unity and variety) remain the

strongest. It would seem that for a design to be aesthetically pleasing, the degree of unity and variety it features is a lot more decisive than whether it is novel or bears social significance.

Table 3 Multilevel regression effects on aesthetic appreciation scores

Fixed effects

Independent variables	B	Std. Error	t
(intercept)	-0.59	(0.13)	-4.694 ***
unity	0.36	(0.01)	25.983 ***
variety	0.33	(0.01)	22.892 ***
typicality	0.02	(0.01)	1.533
novelty	0.10	(0.01)	7.203 ***
connectedness	0.22	(0.01)	18.080 ***
autonomy	0.16	(0.01)	12.362 ***

Random effects

	Variance	Std. Error	Wald Z
residual	0.97	0.02	53.206 ***
intercept (participant)	0.27	0.03	10.033 ***
intercept (stimulus)	0.07	0.02	3.002 **

*p<0.05 **p<0.01 ***p<0.001

6. Discussion

By and large, the present study corroborates the Unified Model of Aesthetics. However, regarding the relative weight of various dimensions of product experience, these results are particularly insightful. Although a decrease in effect sizes was expected as a result of controlling the levels for one another, the impact on typicality is quite striking. When controlled for other qualities, a product's typicality becomes irrelevant. People do appreciate typical products (as indicated by the uncontrolled effect), but mainly for making a unified impression and being socially safe. By contrast, they do like a level of unfamiliarity in a design and this is not just due to other – social or perceptual – reasons. Given the fact that the effect of typicality has been documented extensively before, these results are interesting and warrant further attention.

Also, the large effects of perceptual qualities are worth noting. For designers this finding may be quite instructive. Compared to social significance and cognitive processing, where complex processes of categorization come into play, manipulation of perceptual features like unity and variety is arguably more straightforward. Thus, it may be possible to make substantial improvements to a design's aesthetic quality by just focusing on the balance between unity and variety.

Although these findings do expand our understanding of how the aesthetic experience is affected by various dimensions, much work has still to be done. For one, in the frame of this paper we could not go into differences between product categories. We could imagine, though, that certain design aspects become more or less salient depending on the type of product that is being considered. Therefore, in follow-up analyses, we will account for product category to see whether the observed effects hold independently of product type or whether they are determined by characteristics that are category-specific.

Second, these findings were based on subjective ratings by respondents. It is therefore possible that some relations between UMA principles and aesthetic appreciation mainly hold subjectively. To illustrate, although the needs for connectedness and autonomy affect the aesthetic liking, different people may very well experience that these needs are fulfilled by different products. Moreover, it is conceivable that this differs depending on the level that is being considered, for it might be expected that the experience of perceptual features is more stable across people than cognitive or social meaning is. In future research, we should thus also explore the extent to which preferences are stable over respondents, as this is highly relevant to the applicability of these principles for designers. That is to say, qualities that are experienced similarly by various people can be optimized to a particular aesthetic effect. By contrast, for those qualities that are experienced in a substantially different way by various people, it will be a lot harder to determine how they should be optimized aesthetically.

7. Conclusion

In the present study our aim was to test the Unified Model of Aesthetics empirically. The model posits that aesthetic appreciation of an object – and of a designed product in particular – is a function of it displaying perceptual unity-in-variety, of it being typical, yet novel (or MAYA) and of it symbolizing both social connectedness and autonomy. Throughout a series of multilevel regression analyses, we found that conflicting qualities at separate levels have an impact on aesthetic appreciation. These findings are in line with previous research on UMA. Thus, the first hypothesis is corroborated.

Although the principles of UMA are manifestations of a single set of conflicting urges, they effectively refer to distinct product characteristics and are therefore expected to have an independent effect on aesthetic appreciation. As proposed by the second hypothesis, we found that they do – the principles comprised by UMA have unique effects on aesthetic appreciation. However, these effects decrease when controlled for one another, as was

expected by the third hypothesis. The perceptual qualities of unity and variety maintain the largest effect. By contrast, whether a design is considered typical turns out to be unimportant for aesthetic appreciation when controlled for qualities at the perceptual and social level. This finding could be interpreted in the sense that typicality does contribute to the aesthetic quality of product design, but mainly if it displays sufficient unity and it signals similarity to a social reference group. If these conditions are not met by a design in the eyes of a perceiver, typicality hardly adds aesthetically. We do derive added pleasure from the cognitive processing of a product, but primarily if we experience it to be novel.

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