Design and the Big Five: Linking Visual Product Aesthetics to Product Personality

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Fusing the ART, SCIENCE, and TECHNOLOGY of Business.
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Abstract

While there have been some important advances in understanding how consumers evaluate specific aspects of visual product aesthetics, there is a lack of a systematic understanding of the processes that link product design aesthetics to broader consumer perceptions. In this research, we show that consumers’ assessment of visual product aesthetics are linked to perceptions of product personality. Across several real products, selected for their aesthetics variations, this research conceptually and empirically links perceptions of seven aesthetic dimensions (simplicity/complexity, harmony, balance, unity, dynamics, novelty and timeliness/fashion) to perceptions of five product personality characteristics (sincerity, excitement competence, sophistication and ruggedness).
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It is arguable that we are now in a postindustrial age with an unprecedented emphasis on design. From its central position in Target’s positioning as the mass retailer that offers “design for all”, to its key role in securing a dominant position for the now ubiquitous Apple iPod, or to our ever growing societal interest for interior design, style and fashion TV programs, there are abundant examples of the importance of design as a central element of consumer culture. Design is not just a cultural phenomenon; it is also a key strategic variable that can assist companies in securing or defending a marketplace advantage. This new emphasis on design should not be surprising as most contemporary products tend to perform as intended, are getting more affordable all the time and rarely break down, and therefore, product aesthetics (i.e., form or design) are now seen as fundamental brand differentiator (e.g., Nussbaum 2000; Schmitt and Simonson 1997). Of course, we do not suggest that design is the only important factor. Even though the 21st century will be marked by a central role of aesthetics in consumers’ everyday life and competitive landscape, “saying that aesthetics is pervasive does not imply that look and feel trump everything else. Other values have not gone away. We may want mobile phones to sparkle, but first we want service and selection. We still care about cost, comfort and convenience. But on the margin, aesthetics matter more and more. When we decide how next to spend our time, money or creative effort, aesthetics is increasingly in our top priorities.” (Postrell 2003, 5).

Although practitioners and consumers have obviously embraced design, consumer research seems to lag behind, and design research as a whole is rather fragmented (Veryzer 1999). Consumer researchers have not systematically investigated this important topic, and even though “there is a range of work that addresses design issues it does not comprise a substantial, well-formulated body of research” (Veryzer 1999, 498). For example, in January of 2003, the Marketing Science Institute held its first conference dealing with product design, and while many marketing practitioners and
designers presented case studies or current research, the voice of consumer researchers was mostly lacking. We believe that design research represents an important opportunity for consumer researchers and that work in this area can make an impact on theory and practice.

It is our hope that this present research will provide some incremental understanding of our consumer design culture. In particular, we wish to further our knowledge of the role that product visual aesthetics play in the formation of product evaluations and preferences. In this research, we argue that visual product aesthetics are marketing variables that can be used to create and influence consumers’ perceptions of brand and product personalities. More specifically, we wish to investigate how visual aesthetic characteristics are linked to specific product personality dimensions. It should be noted that, when it is defined broadly, product design research may address a range of product issues such as ergonomics, production efficiency, strength, recyclability, distribution ease, as well as aesthetics (Bloch, 1995; Davis, 1987). While not minimizing the importance of these other design elements, the scope of this research is limited to visual product aesthetics or those characteristics that create a product's appearance and its visual appeal and have the capacity to affect observers and consumers (Lawson 1983). Such characteristics include materials, proportion, color, ornamentation, shape, size and reflectivity (Lawson 1983). Although product aesthetics may include a range of important non-visual elements (e.g., sound, music, taste of food, scent of a perfume, softness of fabrics), our focus is limited to visual aesthetics because of their prominence in the marketplace and relevance to both tangible goods and servicescapes. In addition, visual culture is particularly relevant to the modern information age (Barnard 2001).

**The role of Visual Aesthetics in Consumer Evaluations of Product Personality**

Visual product aesthetics influence consumers’ perceptions in at least three ways. First, design can be used to differentiate products and gain market recognition (Bloch 1995; Schmitt and Simonson 1997). Second, product visual aesthetics serve a symbolic role that influences product
perception, comprehension, and evaluation. Many of the basic perceptions that consumers form around product encounters (e.g., images of elegance, ease of use, youthfulness, durability, innovativeness) are often determined by the appearance of the product (Forty 1986). Since design is ultimately created through the decisions and work of marketers and designers (and sometimes co-created by consumers themselves), it is critical that the design communicates the intended product essence. Finally, product appearance is a central channel through which consumers might form relationships with products (Hollins 1990), and as such it has been shown to be a source of product attachment (Govers and Mugge 2004).

Product appearance is often the first thing about a product that connects with a potential buyer, and subsequent perceptions and evaluations follow from this encounter. Therefore, it seems critical to (1) understand how these impressions and judgments are derived and (2) determine whether or not (and how) consumers’ perceptions of design aesthetics might be aligned with the intended marketing/branding strategy. As such, it would be important to understand specifically how the visual characteristics of a product can be linked to consumers’ perceptions of brand personality. Brand personality is a fundamental brand management construct which has received much research attention over the last decade. It has been defined as the “the set of human characteristics associated with a brand” (Aaker 1997, 347). Brand personality has been linked to consumer self expression, preference and usage of a specific brand, as well as consumer loyalty and trust. Overall, brand personality is well documented and careful attention has been directed towards its validation in the USA and in numerous other cultures. Yet, despite the significant research corpus that has been devoted towards the development of valid and reliable measures and also towards understanding brand personality’s impact on consumers’ behavior, only limited attention has been directed at systematic investigation of how brands or products develop personalities. As pointed out by Aaker, it is necessary to “gain theoretical and practical insights into the antecedents and
consequences of brand personality, which have received a significant amount of attention but little empirical testing. In terms of antecedents, many have suggested that brand personality is created by marketing variables… However the extent to which these variables independently and interdependently influence brand personality has yet to be determined” (1997, 354).

Product design is a basic antecedent of brand personality. For example, it was recently shown that variations in product form (e.g., shape or color of a water bottle or coffee canister) can be linked to changes in overall brand personality perceptions, therefore supporting the contention that consumers’ perceptions of brand personality can be created and influenced by a product overall design (Pantin-Sohier, Decrop and Brée 2005). In this study the authors used unfamiliar (foreign) brands in order to detect the impact of design variations. This approach is of course valid for laboratory studies, however, it is often difficult or impractical to conduct similar analyses, especially if the intent it to gain insights into the management of actual brands. Since brand personality has multiple antecedents besides product design and since a brand may cover multiple product variants and multiple product categories, it might be difficult to detect/separate the influence of product design, especially in lab studies where product experience and exposure is limited and compressed in time. A better unit of analysis is to concentrate on understanding how the physical product itself can be described in terms of human personality characteristics, in other words, assessing the product personality (Jordan 1997, Govers and Schoormans 2005). As such, we view product personality as an antecedent to the overall brand-level personality.

Product personality has recently received some systematic attention from academic researchers. It has been shown that consumers’ perceptions of product personality can be influenced by variations in design shapes (Govers, Hekkert and Schoormans 2004) and material choices (Kesteren, Stappers and Kandachar 2005). Further, it has been evidenced that designers seem able to convert abstract personality descriptions into actual designs and that, downstream, consumers are
able to identify these intended product personalities (Govers, Hekkert and Schoormans 2004). Finally, it was demonstrated that consumers tend to prefer product designs with product personalities congruent with their own (Govers, and Schoormans 2005).

Even though these recent findings provide valuable evidence for the validity and importance of the product personality construct, they did not develop a deliberate understanding of the perceptual processes that link product design aesthetics to product personality perceptions. Therefore, we do not have a systematic understanding of how personalities can be designed into a product form, and we do not really understand how consumers perceive specific elements of a product design as communicating a certain personality trait. In other words, it is one thing to know that a product design is perceived as exciting and another design as sincere, it is all together another issue to understand the design elements and perceptual processes that bring about these exciting or sincere product personalities.

**Understanding Perceptions of Personality Characteristics**

Psychology research can provide us with some fundamental understandings of processes behind personality perceptions from visual appearance. Over the last century, psychologists have devoted considerable attention to researching attributions of human personality traits based on visual cues. Interestingly though, it is sometimes argued that the link between outward appearance and personality perceptions was established as early as the fourth century B.C., with Aristotle’s inquiry of physiognomy (Evans, 1941). Irrespective of original attribution, fairly recent research empirically corroborates the claim that people often use physical appearance to infer personality, particularly the use of facial cues.

For example, split-second personality judgments have frequently been shown to be predicated on the physical appearance of the target. From photographs alone, people have been
shown to be able to make personality perceptions about individuals including self-confidence, ability to make friends, leadership skills, social skills, status in a group, and sense of humor (Rind and Gaudet 2001). People even seem to make personality judgments upon immediately meeting each other, without prior acquaintance with or knowledge of each other. Physical appearance judgments alone have been shown to lead to perceptions of sociability and responsibility (Albright et al 1988).

There appears to be a consensus on the notion that attributions can be made based on facial features and expressions. Facial appearance has been shown to provide information about particular personality attributes such as social evaluation (including cheerfulness, friendliness, and optimism) and intellectual evaluation (including knowledgeable, intelligence, and sensibility) (Warner and Sugarman 1986). More specifically, researchers have demonstrated that facial features that constitute a “babyface” are highly correlated with attributions of honesty, naivety, kindness, and warmth. More specifically, chin width and eye size accounted for the majority of variance in subjective ratings of personality traits (Berry and MacArthur 1985). More recent research also indicates that larger-eyed individuals are more likely to be perceived as being nurturing, likeable, empathic, agreeable, extroverted, honest, and popular. They are also likely to be perceived as being conscientious, intelligent, and more cultured than their narrow-eyed counterparts (Paunonen et al 1999).

When investigating how personality perceptions are derived from physical cues, we might consider an ecological approach. It has been argued that because human are inundated with stimuli and information in their social environments, they use physical stimulus information to form as accurate an impression as possible, as quickly as possible, particularly when people have no prior acquaintance with the target (Ambady and Rosenthal 1993). Evolutionary psychological theory contends that physical stimulus information affords individuals with social information, such as who can and cannot be trusted, and that this process has adaptive consequences. In this sense, perceptions of personalities act as social affordances that people can leverage. In order to screen and
identify the individuals which present desired social affordances, people often rely on cues of physical characteristics (Baron and Boudreau 1987).

Also, some psychologists are of the opinion that personality traits inferred from physical cues serve as cues of social competence (Bassili 1981). As such, physical attractiveness signals social vitality as well as intellectual competence. In this sense, in a situation of unfamiliarity and uncertainty, individuals might use physical appearance to make attributions of competence (Bassili 1981). Further, it is has been argued that social and cultural factors (e.g., portrayals of physically attractive people as socially adept in entertainment media) might help individuals establish a mental connection between social competence and attractiveness (Feingold 1992).

Other researchers have extended this idea and proposed that the underlying process for such personality attributions is best explained by implicit personality theory (Ashmore and del Boca 1979). They argue that inference of personality from physical appearance is stereotyped-based, and that people use personality stereotypes to decipher others’ behavior. According to implicit personality theory, individuals build expectations of people’s personalities and group certain traits as corresponding to particular physical cues (Ashmore and del Boca 1979). Not only are such implicit comparisons prevalent, but they can often be generalized to entire groups of individuals, thus creating an implicit stereotype (a knowledge structures about a group) (Ashmore and del Boca 1979).

Obviously, because of the fundamental differences between humans and products, it is always a challenge to extend psychological research about interpersonal and social relationships into the product domain. However, there are some important insights from this work that can be used to illuminate our understanding of the link between product design and product personality. First of all, it seems that attributions of personality traits based on visual judgments are not only prevalent, they are also efficient. Therefore, we should expect that such decision making efficiencies can also be found with respect to product judgments. Second, although there might be a “hard-wired” ability to
perform these personality judgments in social settings, it seems that learning and experience also play a key role. We would expect that in the product domain, the same situation would be found. For example, personality attributions could be driven through some evolutionary preferences for some basic aesthetics aspects such as shapes or colors, however, internalized experiences, learning and features of the socio-cultural setting might also be the source product personality perceptions.

Finally, it seems that these attributions or perceptions might happen automatically and without direct awareness of their sources. This explanation based on implicit stereotyping and automatic judgments seems also applicable to our situation. First of all, there is an increasing body of consumer research dealing with the role of implicit processes in consumer behavior (e.g., Brunel, Tietje and Greenwald 2004). Further, product design scholars have argued that even though consumers are aware of their response to a product design, they might not be fully aware of the processes that drove their judgments (Veryzer 1999). For example, it has been argued that consumers draw on implicit product schemas to make inferences about certain product aspects (Pinson 1986). Further, Veryzer (1999) proposed that “the formulation of responses to designs would seem to involve both conscious and nonconscious processing. The conscious level involves attending to an object (product design) and registering feeling or a response to it. The nonconscious level of awareness involves perceiving the object and determining its consistency with the rules that have been acquired (primarily through nonconscious learning) over time. The result of the nonconscious processing is then registered as a conscious response to a design” (504).

**Research Objective**

Although direct research into automatic or nonconscious processes is fundamentally difficult, Veryzer’s perspective also underscores that the nonconscious processes that drive design evaluations are based on perceptions of facets (or constellations of facets) of the product design and
then some automatic evaluation of the facets according to some implicit schema or rule. This suggests that advances in our understanding of the processes behind product personality perceptions can be informed by research that would systematically gather both explicit product personality perceptions (personality ratings) and also ask participants for explicit evaluations of the facets of the product designs. Although respondents might not be aware of the details of the implicit rules or schemas that they automatically use in making personality perceptions, they can nonetheless reveal to us what their personality perceptions are and we can also ask them to explicitly articulate evaluations of the design facets. With these two sets of data, across individuals and products, we can analyze and reveal the correspondences between design facet evaluations and product personality perceptions. Thus, this approach can provide insights into the sources and processes behind product personality assessment. Therefore, in this study, we investigate how visual aesthetics dimensions (facets) are linked to specific product personalities. We seek to uncover some general relationships (across several designs, brands and product categories) between perceptions of seven visual aesthetics facets (as measured by Ellis’ 1993 scale) and the big five personality constructs (Aaker 1997). Because of the lack of previous research in this area, we are unable to make specific hypotheses on the nature and significance of the relationships between the seven predictors and the five personality traits. This is something that might be possible in future research.

**Study**

This manuscript reports on a laboratory study designed to test that systematic relationships between visual product aesthetics and brand personality can be established. Real products (without identifiable brand names) were used. No brand names were mentioned in the study in order to avoid confounding the effect of design and branding on perceptions of product personality and product aesthetics.
Participants and Procedure

Two hundred fifty one undergraduate business students, members of a subject pool at a large US university, participated in the study. Each participant was randomly assigned two products (not in the same category) to evaluate. Each experimental booklet contained a black and white picture of one product followed by a series of scale measures: overall product attitude, overall aesthetic evaluation, Ellis’ aesthetic facets scale, and Aaker’s product personality scale. The same presentation order and questionnaire was then repeated for a second product. Covariates like age, gender and Centrality of Visual Product Aesthetics (Bloch, Brunel and Arnold 2003) were also collected in a third booklet, but are not discussed in this analysis. This data collection design resulted in (251*2) = 502 sets of product aesthetic facets and product personality evaluations.

Stimuli

We selected products in four categories (automobiles, telephones, TV sets, and wall-clocks) and with varying design executions. These categories are all familiar categories for our participants, and therefore we expected that participants would have well-defined (implicit) product design schemas for each category. For each category pictures of two different designs were selected. Based on qualitative pre-testing, products were selected in order to create design style variance and have two distinct levels of design for each category (see Table I for pictures of the stimuli).

Measurements

We used Aaker’s (1997) 42-item scale to assess the big five product personalities. The five dimensions are sincerity (down-to-earth, honest, wholesome, cheerful), excitement (daring, spirited, imaginative, up-to-date), competence (reliable, intelligent, successful), sophistication (upper class, charming) and ruggedness (outdoorsy, tough). We framed the questions in product terms as opposed to brand terms. We used Ellis (1993) 43-item scale to measure the different product design facets. This scale was originally developed to measure the “truthful nature of an object’s aesthetic
properties.” The scale covers seven dimensions of product aesthetics: simplicity, harmony, balance, unity, dynamics, timeliness/fashion, and novelty (there is also an overall aesthetic assessment that we did not use for the analysis). The seven aesthetic facets/dimensions illustrate laws of organization, and represent sources of aesthetic properties.

**Results**

Analysis of variance and multiple regressions were used for this analysis. Table 1 reports the means for each product design for: overall evaluation of the style of product (as measured by Hirschman’s 6 item semantic differential scale, 1986), overall attitude toward the product (as measured by a 3-item semantic differential scale: unfavorable-favorable, bad-good, negative-positive), the seven product aesthetic facets, and the five dimensions of product personality. For every scale, we assessed the reliability of the measures (Cronbach’s alpha) and concluded that satisfactory reliability levels had been achieved. All scales are measured out of 7 points.

Manipulation checks based on the overall product style measure and overall affective evaluation (attitude) confirmed that the products selected for this study reflected different levels of design. Based on analysis of variance results across the eight designs, we found significant differences in style evaluations (F(7,501) = 44.95, p < .001) and product attitudes (F(7,501) = 44.80, p < .001). Further, we also found differences within each product category, confirming that not only did we have design variance across categories we also had captured different product design styles within each product category. The product design with the highest style rating was the high-tech TV (mean = 5.74) and the lowest style evaluations went to the “boxy” car and old-fashioned phone (mean = 2.56 and 2.60, respectively).

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With respect to the evaluations of individual aesthetic characteristics (facets), the results also yielded significant differences across products (see Table 1 for means on each dimension and for each product design). Regarding design *simplicity*, results from the analysis of variance showed that simplicity perceptions differed across products ($F(7,501) = 18.32, p<.001$). The modern clock and the high-tech TV received the highest scores for simplicity of design (means = 5.94 and 5.89 respectively) and indeed, a closer look confirms that these designs have little ornamentation and are rather streamlined. The “boxy” car received the smallest score (mean=4.39) as this design appears rather complex, and has a lot surface details. Regarding design *harmony*, results from the analysis of variance yielded that harmony perceptions differed across products ($F(7,501) =25.32, p<.001$). The modern clock received the highest score (mean = 5.06) and the “boxy” car received the lowest score (mean = 3.10) for design harmony, as respondents perceived that the design lacked general concordance between its elements. Results for design *balance* also showed significant differences across products ($F(7,501) = 24.77, p<.001$). The modern TV was perceived as the most balanced design (mean = 5.89). It is probable that the symmetry of the two satellite speakers and the legs for each of the three TV elements contributed a perception of stability and equilibrium in the design. On the other end, the “boxy” car was perceived as the least balanced design closely followed by the old-fashioned phone, as neither design conveys a good sense of equilibrium or symmetry (mean = 3.71 and 3.99, respectively). Regarding design *dynamism*, significant differences were also found across products ($F(7,501) =50.67, p<.001$). The sport car was evaluated as the most dynamic design (mean = 5.34), and this should not be surprising given the shape car design but also the product class. The old-fashioned phone was perceived as the least dynamic design (mean = 2.55). With respect to design *unity*, results from the analysis of variance showed that unity perceptions differed across products ($F(7,501)=27.69, p<.001$). For most products, these results were close to the harmony findings. The high-tech TV and modern clock received the highest scores for unity of
design (mean = 5.41 and 5.10, respectively) and the “boxy” automobile received the lowest score (mean = 3.73). Products were also perceived to vary with respect to design *timeliness* (the extent to which the design represents fashionable versus old-fashioned characteristics) \( F(7,501) = 66.68, p<.001 \). The modern phone, high tech TV, and sports car were perceived as the most fashionable products (means = 5.57, 5.38, 5.34 respectively). The old-fashioned phone and traditional clock (mean = 2.66 and 2.75) were perceived as the most old-fashioned designs. For the most part, these results were similar to the design *novelty* findings, where we found that products were perceived to offer different design novelty levels \( F(7,501) = 52.16, p<.001 \). The sports car and modern phone (mean = 5.26 and 5.20, respectively) were perceived as the most novel products. Both products conveyed a new-to-the-world and distinctive look, and offered respondents a fresh visual experience. The traditional TV and telephone were perceived as the most typical products (means = 2.85 and 2.40, respectively). Finally, we would like to point out that even though there is probably some impact of the product category on the aesthetic facets’ assessments, the differences in aesthetic facets cannot be explained just by product category differences as we found differences both across and within categories. Also, it should be noted that these seven dimensions are not orthogonal or independent and therefore it is not surprising that we uncovered some similar result patterns across dimensions.

The second step in our empirical data analysis involved the analysis of respondents’ perceptions of product personalities. Based on the big five dimensions from Aaker (1997), we conducted an analysis similar to the one reported for product aesthetics. Across all five personality dimensions, significant differences were found (see Table 1 for personality dimensions means for each product.) While not unexpected, this is a rather remarkable result as respondents had no other information about the products besides the physical appearance as shown in a two-dimensional black and white picture reproduced through a copy machine. In particular no brand or feature
information was provided. This consideration alone seems to confirm that consistent, visually-based assessments were made across individuals. With respect to product *sincerity*, it appears that there are systematic differences across the eight products ($F(7,501) = 21.66, p<.001$). In particular, the product that was rated the least sincere was the sports car (mean = 2.67). Also, the most sincere product appears to be the traditional clock (mean = 3.66) - this product had been perceived as particularly low in novelty, timeliness, and dynamism. This seems to suggest that the clock was perceived to exhibit down to earth, wholesome and cheerful qualities that the more aggressive sports car, or simple and cold modern clock or TV did not. From an *excitement* perspective, the results also showed significant differences across products ($F(7,501) = 65.09, p<.001$), and it is the not-so-sincere sport car that scored the highest on the excitement dimension (mean = 3.94), followed by the high-tech TV (mean = 3.87) and the modern phone (mean = 3.80). Further, it is the traditional phone and clock that scored the lowest (mean = 2.23 and 2.30, respectively). A similar pattern was also observed for product *competence*. Significant differences were found across all eight products ($F(7,501) = 25.01, p<.001$). The high-tech TV scored the highest on this personality trait (mean = 3.91), and the traditional clock the lowest (mean = 2.54). On the whole, competence seems to be connected to the technological sophistication or advanced looking style of the design. With respect to the personality trait of *sophistication*, significant differences were also found across products ($F(7,501) = 33.50, p<.001$). In particular, the modern phone, modern clock, and high-tech TV were all perceived as equally sophisticated and refined (mean = 3.55, 3.50, and 3.48 respectively), and the “boxy” car along with the traditional phone were perceived to be the least sophisticated products in the set (mean = 2.36 and 2.49, respectively). Finally, *ruggedness* perceptions were also different across the eight products ($F(7,501) = 17.30, p<.001$), but differences were slightly less pronounced. None of the products were perceived as particularly rugged, with the boxy car (mean = 3.07) being the product perceived as the most rugged.
Although, the above results demonstrate that the respondents showed consistent differences in their evaluations of the eight products both from aesthetic evaluations and from product personality perspectives, it is important to investigate further how evaluations of product aesthetics are linked to perceptions of product personality -- the main premise of this article. In order to inform this part of the analysis, we used multiple linear regressions to investigate the relationships between each personality trait (as dependant measure) and the design perceptions on the seven aesthetic facets (used as independent measures in the regression). In Table 2, we report the results of five multiple regression models where each of the product personality variables is used as dependent variables in five consecutive models, with the seven aesthetic dimensions used as simultaneous predictors. These five regression models allow us to isolate the unique contribution of each aesthetic facet to the perception of product personality. Overall, it should be noted that all five models were significant at the p < .001 levels. This result is supporting evidence for our contention that product aesthetic evaluations are linked to product personality perceptions, and that our research approach can allow us to uncover the underlying perceptual processes in the product personality perceptions. Further, it should be noted that for at least three personality traits, the variance in product personality explained is rather large (large adjusted $R^2$ for excitement: .811; sophistication: .588; and competence: .385).

Specifically, perceptions of product *sincerity* appear to be driven by the combination of increased harmony (beta=.207), unity (beta=.330), and novelty (beta=.441) in the product design but are negatively affected by increases in design timeliness (beta=-.655) (see Table 2). In other words, the greater the harmony, unity, and novelty and the less fashionable a product is, the more sincere it appears. At first sight one could think that there is a contradiction between the positive effect of
novelty and the negative effect of timeliness on sincerity. However, upon closer consideration, one can interpret these results in the following way: a product is sincere, wholesome or honest when it has higher level of oneness, increased level of innovativeness (which might mean progress and new benefits), but not in a trendy or fashion orientation (which might be perceived as shallow and superficial and therefore not sincere). On the other end, a product is perceived to have an exciting personality when the design facets convey a sense of timeliness (beta=.587) (e.g., fashion) and dynamism (beta=.292) (motion, tension). Increased timeliness stems from a perception of the product being forward-looking and fresh. Further, dynamism brings about a sense of energy and vigor and therefore as the design conveys greater amounts of these two aesthetic facets, increased perceptions of an exciting product personality can be found. With respect to competence, personality perceptions are based on three aesthetic evaluations: dynamism (beta=.294), unity (beta=.471), and novelty (beta=-.229). The greater the perception that a given design evokes oneness and the better the elements fit together to create a holistic unit, the more competent the product is perceived. In contrast, designs that are perceived as stagnant or lifeless (the opposite of dynamic) would contribute to overall perception of decreased product competence. Finally, the more distinctive (less typical) a design was perceived, the less competent it was perceived. From our results, we see that sophistication is a product personality dimension which is driven by the combined positive effect of harmony (beta=.341), dynamism (beta=.132), unity (beta=.167), and timeliness (beta=.370) and the negative effect of simplicity (beta=-.091) and novelty (beta=-.161). A product is perceived to have a sophisticated personality when facets of the design are assessed to be well-put together and dynamic, but not assessed as too simple or too different from the norm. Theses results suggest that while a sophisticated product personality is linked to a product design being fashionable, there is a fine line that gets crossed when the design is perceived as just too different from the norm (i.e. “weird”) and therefore not sophisticated. Finally, product ruggedness is based on perceptions that the product
design has harmony (beta=.301) and low timeliness (beta=-.248) and higher dynamism (beta=.493). In other words, when a product design is perceived as maybe a bit unrefined or crude, ordinary and energetic, it is associated with a more product rugged personality.

In summary, it should be noted that three main sets of findings emerged: 1) there are systematic differences in aesthetic facets and personality evaluations across the eight products, suggesting that consumers are able to produce convergent assessments based solely on the visual information about the product; 2) the regression analyses provided convergent evidence that evaluations of product aesthetic facets are linked to perceptions of product personality, and in some cases it seems that this association is very strong and explains a large portion of the variance, but 3) there is a need for further research into the linear combinations of different aesthetic facets in order to uncover their potential interactive effects.

**Discussion**

The empirical investigation in this research has confirmed the theoretical considerations that were discussed earlier, and has offered new perspectives for both marketing practice and basic research in this area. We were able to show systematic relationships between assessments of visual aesthetics dimensions (facets) and perceptions of product personalities. For each product personality trait, we uncovered product design bases for the differences. Further, we were able to establish these relationships across varied design styles and across product categories. It seems that both sets of measures, Ellis 1993 scale and Aaker 1997 scale, were appropriate in this investigative context.

Because this study used self report measures for both the dependent and independent measures, one may question the causal nature of the relationships we just discussed. We do not claim that we prove causation. We are however confident that the diverse results obtained and the fact that fine nuances were evidenced across products would suggest that common method variance
is not a critical issue. However, in order to put aside this and other concerns that might stem from
the cross-sectional nature of these results, we would recommend that future research manipulate
some of the factors, in particular the aesthetic facets and show that they are indeed antecedents to
predictable product personality perceptions. The results from the present study can be used as
foundational evidence in order to conduct these types of more controlled experiments.

Also, as empirical evidence gets accumulated, it should be possible to develop a more
contingent theoretical approach to this research. For example, future research should investigate
how the aesthetics predictors might interact and contribute to product personality perceptions. This
is probably critical if someone is interested in understanding the personality perceptions at a finer
level than the big five. Understanding the nuances between subordinate personality traits will
undoubtedly require even more specific understanding of the patterns and conditions of interactions
between facets. We also need to investigate further how these processes might interact with
consumer or situation factor. We believe “that sensory pleasure and meaning are fundamental,
bio-logically based human wants but that their particular expressions vary; that people make different
trade-offs among goods depending on the alternatives they face; and that esthetics is not a value set
off the rest of life.” (Postrell 2003, p.XV). Therefore, one important consideration should be to
understand the extent to which the processes that were evidenced in this research are generalizable
across other segments or other cultures. Also, within one population, do consumers high in
centrality of visual product aesthetic (CVPA, Bloch, Brunel and Arnold 2003) make the same types
of evaluations as other consumers low in CVPA? We recommend that future research includes
broader and more representative segments of the population, and tests the relationships with other
product categories as well. However, because theory development and basic psychological processes
were the focus the present study, we consider that the use of a student sample was adequate four our
purpose at this time.
Finally, we should point out that we did not design our research to settle any debate around the conscious versus nonconscious bases for design evaluations. However, we showed that by measuring consumers’ evaluations of abstract design facets, we can establish linkages with overall product assessments and perceptions such as product personality. We believe that this type of approach has much potential in addressing some of the suggestions from previous research (Veryzer 1999). However, we also recognize that more sophisticated research design, using implicit measurement techniques might be necessary in order to fully understand how consumers truly evaluate design.
REFERENCES


| MANIPULATIONS | Dependent Measures | Overall Style | 2.95 | 4.61 | 3.80 | 5.74 | 2.56 | 4.44 | 2.6 | 4.77 |
| Product Attitude | 3.44 | 5.17 | 4.87 | 6.25 | 3.17 | 4.86 | 3.44 | 5.50 |
| AESTHETIC DIMENSIONS | Simplicity | 5.38 | 5.94 | 5.64 | 5.89 | 4.39 | 4.60 | 5.27 | 4.76 |
| Harmony | 4.26 | 5.06 | 4.30 | 4.90 | 3.10 | 4.31 | 3.57 | 4.91 |
| Balance | 4.66 | 5.45 | 4.87 | 5.89 | 3.71 | 4.66 | 3.99 | 4.80 |
| Dynamism | 3.10 | 4.08 | 3.31 | 4.78 | 4.20 | 5.34 | 2.55 | 4.86 |
| Unity | 4.31 | 5.10 | 4.55 | 5.41 | 3.73 | 4.64 | 4.05 | 4.88 |
| Timeliness | 2.75 | 5.16 | 3.63 | 5.57 | 4.32 | 5.34 | 2.66 | 5.38 |
| Novelty | 3.14 | 4.21 | 2.85 | 4.86 | 4.91 | 5.26 | 2.40 | 5.20 |
| PRODUCT PERSONALITY | Sincerity | 3.66 | 2.95 | 3.10 | 2.82 | 3.26 | 2.67 | 2.99 | 3.24 |
| Excitement | 2.30 | 3.40 | 2.86 | 3.87 | 3.16 | 3.94 | 2.23 | 3.80 |
| Competence | 2.54 | 3.32 | 3.23 | 3.91 | 2.91 | 3.18 | 3.02 | 3.08 |
| Sophistication | 2.88 | 3.50 | 2.93 | 3.48 | 2.36 | 3.13 | 2.49 | 3.55 |
| Ruggedness | 2.44 | 2.25 | 2.50 | 2.78 | 3.07 | 2.86 | 2.19 | 2.10 |
| Aesthetic Facets | Product Personality Measures |   
|-----------------|-----------------------------|---
|                 | Sophistication | Sincerity | Excitement | Competence | Ruggedness |
| Simplicity      | -.091*         | .028      | -.030      | -.023      | -.053      |
| Harmony         | .341**         | .207**    | .061       | -.104      | -.301**    |
| Balance         | .066           | -.129     | -.027      | .096       | .089       |
| Dynamism        | .132*          | -.051     | .292**     | .294**     | .493**     |
| Unity           | .167**         | .330**    | .001       | .471**     | .139       |
| Timeliness      | .370**         | -.655**   | .587**     | .129       | -.248**    |
| Novelty         | -.161**        | .441**    | .047       | -.229**    | -.023      |
| Adjusted $R^2$  | .588           | .136      | .811       | .385       | .122       |
| $F(7,501)$      | 103.31         | 12.22     | 307.34     | 45.83      | 10.97      |

* $p<.05$  ** $p<.01$
Design and the Big Five: Linking Visual Product Aesthetics to Product Personality

Summary

Design is not just a cultural phenomenon; it is also a key strategic variable that can assist companies in securing or defending a marketplace advantage. Even though practitioners and consumers have embraced design, consumer research seems to lag behind, and design research is rather fragmented (Veryzer 1999). We believe that this is an important area for consumer researchers and that design research can impact theory and practice.

This research concentrates on visual product aesthetics or those characteristics that create a product's appearance and have the capacity to affect observers and consumers (Lawson 1983). Such characteristics include materials, proportion, color, ornamentation, shape, size and reflectivity. Visual product aesthetics influence consumers’ perceptions in at least three ways. First, product design distinguishes products from competitors and helps gain market recognition (Bloch 1995; Schmitt and Simonson 1997). Second, product aesthetics serve a symbolic role that influences product perception, comprehension, and evaluation. Finally, product appearance is a central channel through which consumers might form relationships with products (Hollins 1990; Lewalski 1988), and as such it has been shown to be a source of product attachment (Govers and Mugge 2004).

In this project, we contend that visual product aesthetics are marketing variables that can be used to create and influence consumers’ perceptions of brand and product personality. We focus our investigation on understanding how visual aesthetic characteristics are linked to product personality perceptions (how the physical product is described in terms of human personality characteristics) (Jordan 1997). It has been shown that consumers’ perceptions of product personality can be influenced by variations in design shapes (Govers, Hekkert and Schoormans 2004) and material choices (Kesteren, Stappers and Kandachar 2005). Further, it has been evidenced that designers seem able to convert abstract personality descriptions into actual designs and that downstream, consumers are able to identify these intended product personalities (Govers, Hekkert and Schoormans 2004). Finally, it was demonstrated that consumers prefer product designs with product personalities congruent with their own (Govers, and Schoormans 2005). Yet, even though these findings provide valuable evidence for the importance of the product personality construct, they do not provide a systematic understanding of the perceptual processes that link product design aesthetics to product personality perceptions.

Based on psychological studies on interpersonal personality judgments, we know that attributions of personality traits based on superficial visual judgments are not only prevalent, they are also efficient. Second, although there might be a “hard-wired” ability to perform these personality judgments, it seems that learning and experience also play a key role. Finally, it has been advanced that these attributions or perceptions are implicit and might happen automatically, without direct awareness of their sources.

Though consumers might not be aware of the implicit processes that they automatically use in making product personality perceptions, they can nonetheless reveal to us what their product personality perceptions are and we can also ask them to explicitly articulate evaluations of the design facets of target products. With these two sets of data, across individuals and products, we uncover the relationships between design facets evaluations and product personality perceptions. Following this research approach can provide insights into the sources and processes behind product personality assessment.

To this end, we conducted a laboratory study designed to test that systematic relationships between visual product aesthetics and product personality could be established. Real products
(without identifiable brand names) were used. We selected products in multiple categories (automobiles, telephones, TV sets, and wall-clocks) and with varying design executions. Two hundred fifty one students participated in this study. Each participant was randomly assigned two products (not in the same category) to evaluate. We used Aaker’s (1997) 42-item scale to assess the five dimensions of product personality (sincerity, excitement, competence, sophistication, and ruggedness), and we used Ellis (1993) 43-item scale to measure seven design facets (simplicity, harmony, balance, unity, dynamics, timeliness/fashion, and novelty). Manipulation checks based on an overall product style measure confirmed that the products selected for this study reflected different levels of design.

With respect to evaluations of the individual aesthetic characteristics (facets), the results showed significant differences across and within product categories. We also found significant differences for all five product personality dimensions. Although not unexpected, this is a rather remarkable result as respondents had no other information about the products besides the physical appearance as shown in a black and white picture (no brand or feature information was provided). This seems to confirm that consistent and visually-based assessments are made across individuals.

In the second part of the analysis, we used multiple linear regressions to investigate the relationships between each product personality trait (as dependent measure) and the seven aesthetic facets (used as independent measures in the regression). All five models were significant. This result alone is supporting evidence for our contention that product aesthetic evaluations are linked to product personality perceptions, and that our research approach can uncover underlying perceptual processes that drive perceptions of product personality. Further, it should be noted that for at least three personality traits, the variance in product personality that was explained was rather large (adjusted $R^2$ for excitement: .811; sophistication: .588; and competence: .385).

In summary, three main sets of findings emerged: 1) there were systematic differences in aesthetic facets and personality evaluations across the eight products, suggesting that consumers are able to produce convergent assessments based solely on the visual information about the products; 2) the regression analyses provided convergent evidence that evaluations of product aesthetic facets are linked to perceptions of product personality, and in some cases it seems that this association is very strong and explain a large portion of the variance, but 3) there is a need to further research the linear combinations of different aesthetic facets in order to uncover their potential interactive effects.