The Effect of a Business-like Personality on the Perceived Performance Quality of Products

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People use the appearance of products as a cue for evaluating functional attributes at purchase. This research provides an understanding of this form-function interdependency by investigating the effect of a business-like personality in product appearance on the perceived performance quality of the product. A business-like personality is associated with competence, professionalism, and trustworthiness. As a result of these associations, people infer from a product appearance with a business-like personality that the product has greater performance quality. Two studies using stimuli from five product categories support this hypothesis. These findings indicate that product personality is another cue that people use to evaluate a product's functional attributes, along with the *What is beautiful is good* principle.

Keywords **–** Product Design, Product Perception, Product Personality.

Relevance to Design Practice **–** The results of this research suggest that people draw inferences about a product's performance quality based on the business-like personality of its product appearance. This implies that designers can use the concept of product personality to encourage particular inferences about the product's functional attributes.

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Introduction

Product appearance has been recognized as an important factor for new product success (Hertenstein, Platt, & Veryzer, 2005). A person may prefer a product alternative over others because it appeals to him or her aesthetically (Bloch, 1995; Crilly, Moultrie, & Clarkson, 2004). To design products that are aesthetically appealing, past research on product appearance has strived to uncover which design characteristics (e.g., symmetry, unity, typicality) in the product appearance can influence people's aesthetic responses (Berlyne, 1971; Blijlevens, Carbon, Mugge, & Schoormans, 2011; Hekkert, Snelders, & Van Wieringen, 2003; Raghubir & Greenleaf, 2006; Veryzer & Hutchinson, 1998).

In addition to this aesthetic value, product appearance can have a functional value (Creusen & Schoormans, 2005). People can use product appearance as an easy-to-spot cue to make judgments on less readily accessible attributes, such as experience and credence attributes (Berkowitz, 1987). Whereas search attributes (e.g., a car's engine power) can be verified relatively easily at purchase, experience attributes (e.g., a car's reliability) can only be verified after product usage. Credence attributes (e.g., a car's safety) are difficult to verify even after an extensive period of usage (Nelson, 1970). Because people often purchase products before using these products beforehand (Thompson & Hamilton, 2006), they need to turn to alternative indicators, such as the brand, price, the sales person's advice, or the product appearance for their evaluations of such experience and credence attributes in a purchase situation (Dawar & Parker, 1994; Kirmani & Wright, 1989). Even though product appearance is only one of various cues that people can use, it plays an important role in evaluating difficult to verify functional attributes. Generally, product appearance is one of the first things that a person inspects when he or she encounters a new product. Based on the product appearance, a person develops a first impression of the product. This impression is of great importance because it can bias the processing of other information.

In light of this, it has been concluded that product appearance can directly prompt important inferences about the product's functional attributes resulting in form-function interdependency (Bloch, 1995; Creusen & Schoormans, 2005; Crilly et al., 2004; Jordan, 2000; Page & Herr, 2002). For example, an aesthetically attractive laptop may be judged to have greater performance quality than an aesthetically unattractive laptop with similar specifications (Page & Herr, 2002). Furthermore, people may use the shape and color of packages for their taste expectations (Berkowitz, 1987; Smets & Overbeeke, 1995). For designers, it is important to have a thorough understanding of this form-function interdependency in order to successfully design products that prompt the desired inferences.

The central objective of this article is to explore whether product personality (i.e., the set of human personality traits that are used to describe a product variant (Govers & Schoormans, 2005) can also explain the inferences about functional attributes that people draw from the appearance. Thus far, scholars have

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only theoretically discussed that product personality can serve as a cue for the perceived functional attributes of a product (Aggarwal & McGill, 2007; Janlert & Stolterman, 1997; Mugge, Govers, & Schoormans, 2009). However, to make optimal use of product personality, designers need more knowledge on the specific product personality traits that have either a positive or a negative effect on the perceived functional attributes of a product. The present research focuses on the value of one specific personality trait, a business-like personality, for prompting positive inferences about the product's performance quality (i.e., the perceived superiority and excellence of the product's performance as compared with competing alternatives (Garvin, 1988)).

The remainder of this article is structured as follows: First, reviews of the literature on the interdependency between form and function and on product personality are provided, resulting in the formulation of a hypothesis. Then, two empirical studies are reported that investigate the effect of a business-like personality on the perceived performance quality. The article concludes with a discussion of the findings for designers and directions for future research.

Form-Function Interdependency

Despite the relevance to designers of acquiring knowledge on the interdependency between product appearance and the perceived functional attributes, this topic has received only limited research attention to date. In several theoretical articles, the importance of product appearance as a cue for the perception of a product's functional attributes has been discussed (Bloch, 1995; Crilly et al., 2004; Jordan, 2000; Monö, 1997; Vihma, 1995). However, these articles merely focus on making designers aware of this form-function interdependency so that designers can use their intuition to create the desired inferences when designing new products. Accordingly, only individual product examples are discussed in these articles. For example, Jordan (2000) proposed that the perceived speed of ironing is determined by the sharpness of the iron's point. It is likely that this association will only hold for specific product categories, such as irons and speedboats. Nevertheless, general rules concerning the relationship between product appearance and the perceived functional attributes of a product may exist as well. Some of the scarce empirical studies on this topic support this notion. Specifically, it was found that the package shape can bias judgments of product quantity (e.g., Folkes & Matta, 2004; Raghubir & Krishna, 1999). Package shapes that attract more attention are perceived to contain a greater volume of the product than same-sized packages that attract less attention. The bias holds for different sets of containers, for containers placed in different contexts, and for containers with contents varying in desirability. Furthermore, empirical research has concluded that products that are more aesthetically attractive are also perceived to be of higher quality (Page & Herr, 2002; Veryzer & Hutchinson, 1998) and as easier to use than aesthetically unattractive products (Tractinsky, Katz, & Ikar, 2000). The *What is beautiful is good* principle is a general rule that can explain these findings (Dion, Berscheid, & Walster, 1972).

The *What is beautiful is good* principle is widely acknowledged in the literature and suggests that people have a tendency to assert various positive associations to beautiful objects because this will result in a consistent overall judgment of the object. Although research has concluded that this principle is a general rule that explains product perception in many situations, it does not imply that it will hold for every situation. In fact, there are many product examples with aesthetically attractive appearances that are, nevertheless, not associated with greater performance quality. An example is the lemon squeezer Juicy Calif that was designed by Philippe Starck. Even though the appearance of this lemon squeezer is greatly appreciated by many people, its unusual shape is also almost immediately associated with inferior performance quality. Similarly, less aesthetically attractive products may actually be associated with greater performance quality. For example, Creusen and Schoormans (2005) concluded that people infer from a larger hairdryer that it is more powerful, whereas it is questionable whether the greater size will enhance the hairdryer's aesthetic attractiveness. The latter suggests that in addition to the *What is beautiful is good* principle, other (general) rules exist that together determine how people perceive and evaluate products based on their physical appearance. Nevertheless, research on other possible rules that can explain how people use product appearance to draw inferences about the product's functional attributes is currently lacking. The present research explores whether product personality is used as a cue for evaluating functional attributes in addition to the *What is beautiful is good* principle.

Product Personality

Govers and Schoormans (2005) defined product personality[1] as the set of human personality traits that are used to describe a product variant and to discriminate it from other products. Product personality is thus a combination of several personality traits (e.g., cheerful, relaxed, and honest) that together describe a specific product variant. Prior research has concluded that product appearance is a major determinant of product personality and that people will get an idea about the personality of the product just by a casual glance of the product (Brunel & Kumar, 2007; Govers, Hekkert, & Schoormans, 2002; Mugge et al., 2009). For example, based on the product appearance, people judge the personality of a Volkswagen Beetle as cheerful and cute, whereas a Volkswagen Touareg is considered dominant and tough. Different product variants even belonging to the same brand may thus convey diverse personality traits. Hence, product personality is different from brand personality (Aaker, 1997) that deals with the personality traits used to describe a brand, rather than a specific product variant. Research on product personality has concluded that there is a great deal of agreement on how

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people judge the personality traits of a particular product and that designers can purposely facilitate a particular personality trait in the product appearance based on their expertise (Govers et al., 2002). Moreover, products that are described with the same personality traits share similarities in their product appearance, even when these products belong to different product categories (Mugge et al., 2009).

Although empirical research is currently lacking, scholars have proposed that people may use a product's human-like traits as an analogy for their behavior and capabilities (Aggarwal & McGill, 2007; Janlert & Stolterman, 1997; Mugge et al., 2009). As a result of the extensive interaction with other people, a person develops mental schemas for the different personality traits of people. Due to these mental schemas, a person can immediately associate personality traits with specific manners of conduct. For example, one would expect a person with a childish personality to act inappropriately, immature and with lack of self-control. It is concluded that people use these schemas not only in their interaction with people, but are generally willing to transfer them to inanimate objects (Laurel, 1990). When people recognize a certain personality trait in a product appearance, they thus turn to the existing mental schema and use the associations that are constructed through perception of and interaction with people when forming expectations and evaluating this product. As such, people use product personality as a way of understanding products and for anticipating how to interact with them. For example, a product that is described by the personality traits delicate and sensitive will be treated with less force and with a great deal of care and consideration (Janlert & Stolterman, 1997). In a similar vein, people may use product personality as an analogy in a purchase situation to draw inferences about the functional attributes of a product that are difficult or impossible to verify. For example, a product with a delicate personality may prompt inferences that it is a not so robust product that damages and breaks down easily.

The present article contributes to this discussion by empirically investigating whether people indeed use product personality as a cue for evaluating functional attributes. Specifically, this research focuses on the effects of a business-like personality because this personality trait is especially likely to prompt positive inferences about the product's performance quality. The rationale for the proposed effect of a business-like personality originates from research on person perception. It has been demonstrated that physical appearance features, such as clothing, have a strong impact on the perception of a person's personality (Jones, 1990). Accordingly, formal business attire expresses a person's business-like personality. In addition, past research has found that formal business attire communicates that a person is competent, professional, authoritative, trustworthy, and dependable (Cardon & Okoro, 2009; Christman & Branson, 1990; Peluchette & Karl, 2007). This implies that a person with a business-like personality is knowledgeable, reliable, and that you can depend on him or her. In a workplace setting, these particular associations would positively contribute to the perceived quality of the person's job performance. Taking into account the notion that people use their associations based on person perception as an analogy for their perception of products (e.g., Janlert & Stolterman, 1997), the associations concerning people with a business-like personality are passed on to products with a business-like personality. Thus, a product with a business-like personality is believed to be competent, reliable, and dependable as well. For the majority of products, these specific associations are greatly valued and suggest that the product performs gratifyingly and has a superior performance quality. A business-like personality thus seems especially valuable for prompting positive inferences about a product's performance quality. Based on the preceding arguments, the following hypothesis is proposed:

> H1: The business-like personality of a product appearance positively affects the perceived performance quality of the product.

Study 1

Method

Stimuli

In Study 1, a business-like personality was manipulated through the design characteristic curvature, which ranges from very angular designs to very curved designs. It was expected that angular product designs had a more business-like personality than curved product designs. In this respect, Mugge et al. (2009) stated that due to "the spherical shape, the curved grill, and the round shape of its head lights" (p. 297), a Mini Cooper is perceived as cheerful and not serious, whereas the more angular-shaped Peugeot 405 was considered to be serious and not cheerful. Furthermore, as part of this research an investigation of existing product designs was performed by a trained designer with a MSc degree. This investigation revealed that angular product designs are generally associated with a business-like and serious personality, whereas curved product designs are considered to be more cheerful, playful, and childish, which represents the opposite of a business-like personality.

CD players were chosen as the stimulus product category in this study. CD players are gender-neutral and have a high penetration degree. Furthermore, both a wide variety of curved and angular CD players are available in today's marketplace. A trained designer created four different versions of a CD player based on a picture of the front view of a CD player. For the manipulation of curvature, the overall shape and the buttons of the CD player were digitally altered in either a very angular or very curved design. Furthermore, two variants of an angular and two variants of a curved CD player were created that differed with respect to their visual complexity. Based on the investigation of products with a business-like personality, visual complexity (low vs. high) was not expected to influence a business-like personality, but it was employed to enhance the generalizability of the findings. According to Berlyne (1971), a larger number of independently selected elements and less similarity among these elements result in visually more complex objects. To manipulate visual complexity in this study, the number of buttons on the CD player was digitally varied (five buttons vs. 18 buttons). As the majority of functions of existing CD players are solely executed

through buttons on the remote control, varying the number of buttons on the actual CD player does not necessarily result in an objective difference in the number of functions. All other details of the CD player were kept equal between the different conditions, and brand names were removed. Each CD player was presented in photo-quality on an A4 sheet (see Appendix).

Subjects and Design

Ninety-five subjects (61 males) were asked to participate in Study 1. Subjects' ages ranged from 16 to 64 ($M = 29$, $SD = 13$) and their educational degree varied from high school (15%), intermediate education (21%), Bachelor's (30%) to Master's (34%). The study used a 2 (curvature: angular vs. curved) × 2 (product variant: high visual complexity vs. low visual complexity) between-subjects design. Each subject was randomly assigned to one of the four conditions.

Procedure and Measures

Subjects were instructed to take a look at the picture of the CD player. Next, they were asked to respond to a series of measures. To assess perceived performance quality, subjects were asked about their expectations regarding the product's performance using three items on 7-point scales (low quality/high quality; unreliable/reliable; not durable/durable; Cronbach's $\alpha = 0.81$) adapted from Grewal, Monroe, and Krishnan (1998). Curvature of the product appearance was measured by asking subjects to rate the product's appearance using a 7-point scale ranging from "curved" (1) to "angular" (7). Visual complexity was measured using a 7-point scale ranging from "simple design" (1) to "complex design" (7). A common way to measure specific personality traits in research on human personality as well as product personality is by using adjectives. Accordingly, the degree to which the product conveyed a business-like personality was measured by asking subjects to rate the product's appearance on an adjective scale from "not business-like" (1) to "business-like" (7).

To check for possible alternative explanations for the effect of curvature on performance quality, measures for aesthetic attractiveness, the expected number of functionalities, and the perceived ease of use were included. Aesthetic attractiveness of the product appearance was measured using two items on 7-point scales (ugly/beautiful; unattractive/attractive; Pearson's $r = 0.84$). The expected number of functionalities was measured using a 7-point scale ranging from "a few functionalities" (1) to "many functionalities" (7). Ease of use was measured by asking subjects about their expectations regarding the usage of the CD player using three items on 7-point scales (difficult/easy, not clear/clear; not user friendly/user friendly; Cronbach's $\alpha = 0.92$).

To control for any effect that differences in subjects' experience with CD players might have on the perceived performance quality of the stimuli products, this variable was measured and included as a covariate in the analysis. Specifically, experience with CD players was assessed with the following two items: (1) "I often make use of a CD player" (1 = strongly disagree; 7 = strongly agree); (2) "My experience with CD players is:" (1 = "very limited"; 7 = "very extensive") (Pearson's $r = 0.26$, $p < 0.05$). A frequency analysis revealed that subjects varied significantly in their experience with CD players ($M = 4.17$, $SD = 1.36$), suggesting that a diverse group of people participated in this study.

Results

Manipulation Checks

Three 2 × 2 ANOVAs were performed in order to check the validity of the manipulations. The results showed that the manipulations were successful. Subjects in the curved design condition perceived the product as more curved than those in the angular design condition ($M_{curved} = 3.12$ vs. $M_{angular} = 6.56$; $F(1, 91) = 166.65$, $p < 0.001$). To test whether the designed variations with respect to curvature resulted in differences in the business-like personality of the product appearance, a 2 × 2 ANOVA was performed using the scores on the business-like personality scale as the dependent variable and curvature and product variant as the independent variables. As expected, a significant main effect of curvature on the product's business-like personality was found, suggesting that the products with an angular design had a more business-like personality than those with a curved design ($M_{curved} = 4.82$ vs. $M_{angular} = 5.76$; $F(1, 91) = 10.03$, $p < 0.01$). Furthermore, subjects in the condition with the high visual complexity perceived the product as having a visually more complex design than those in the condition with the low visual complexity ($F(1, 91) = 4.27$, $p < 0.05$; $M_{low\ complex} = 2.68$ vs. $M_{high\ complex} = 3.38$). No other effects were found, supporting the validity of the manipulations.

Test of the Hypothesis

To test whether a more business-like personality is associated with greater perceived performance quality, a 2 × 2 ANCOVA was performed with perceived performance quality as the dependent variable and curvature and product variant as the independent variables. To control for possible influencing effects of subjects' age, gender, and experience with CD-players, these variables were included as covariates in the ANCOVA. No significant effects were found for these covariates and, therefore, these three variables were excluded from the analyses, resulting in a 2 × 2 ANOVA.

This 2 × 2 ANOVA revealed a main effect of curvature on the perceived performance quality ($F(1, 87) = 10.22$, $p < 0.05$). In support of the hypothesis, the products with an angular design, and thus a more business-like personality, were expected to have higher performance quality than the products with the curved design ($M_{curved} = 4.78$ vs. $M_{angular} = 5.50$). No other effects were found.

Finally, to control for possible alternative explanations for these findings, three additional 2 × 2 ANOVAs were performed with aesthetic attractiveness, number of functionalities, and ease of use as the dependent variables and curvature and product variant as the independent variables. No significant effects for curvature and product variant on the product's aesthetic attractiveness were found (p's > 0.20). Based on these findings, it can be ascertained that the *What is beautiful is good* principle cannot explain the

effect of curvature on the product's perceived performance quality. Furthermore, no effects of curvature were found for the expected number of functionalities and the perceived ease of use (p's > 0.20), suggesting that these constructs cannot provide alternative explanations for the presented findings concerning the effect of curvature on the perceived performance quality. Table 1 displays the mean values for the variables in this study.

Discussion

The findings of Study 1 support the proposition that people use product personality as a cue to draw inferences about a product's perceived performance quality in addition to the *What is beautiful is good* principle. Although it is shown that a business-like personality is associated with positive perceptions about a product's performance quality, these findings are expanded in four ways in Study 2. First, Study 1 was limited to the investigation of the effect of a product's business-like personality by systematically manipulating only the design characteristic curvature. However, evidence that curvature influences the business-like personality of a product appearance is scant and further validation of this relationship is desirable. Consequently, Study 2 validates the manipulation of Study 1 by providing an additional test that angular product designs evoke a more business-like personality than curved ones. Second, in addition to curvature, other design characteristics may encourage the business-like personality of a product appearance. For example, certain colors (e.g., grey, black) will be more business-like than others (e.g., red, pink). Accordingly, Study 2 aims to replicate the positive effect of a business-like personality on the perceived performance quality for a wide range of product variants that differ on various design characteristics. Third, the first study was performed on only the product category CD-players. In order to generalize the presented results, a replication study is needed using product variants from several product categories with different functionalities that are used in various contexts. Fourth, Study 1 only used front views of CD players as stimulus material. CD players are generally presented to consumers using such front views. Nevertheless, it is valuable to replicate the results using photographs of entire products as those are common for the communication of most product categories.

In summary, Study 2 aims to replicate the finding that the business-like personality of a product appearance is a positive cue for the product's performance quality using a wide range of product variants from different product categories that are available in the market.

Study 2

Method

Stimuli

Two experts with Master's degrees in Industrial Design Engineering selected 120 pictures of digital compact cameras, electric water kettles, alarm clocks, and toasters as stimuli that represented the existing variety in product designs in the market for each category. These product categories were selected because they have very diverse functionalities, are used in different contexts, and have high penetration levels, suggesting that they are highly relevant for the subjects in this study. Furthermore, the product categories have different prototype shapes. All pictures were digitally altered to minimize brand identification as much as possible. Furthermore, the pictures were standardized with respect to size, perspective, and background.

Participants

Four hundred and seventy-four members of a consumer panel participated in Study 2 (initial sample = 850; response rate = 56%). This consumer panel is composed of approximately 1700 inhabitants of a mid-sized European city and thus includes a diverse group of people. Fifty-one percent of the subjects were male, and

Table 1. Mean values for the two curvature conditions.

Variables (ranging from 1 to 7)	Curved design		Angular design		
	Mean	SD	Mean	SD	*p*-value
Curvature (curved/angular)	3.12	1.61	6.56	0.78	< 0.001
Business-like personality (not business-like/business-like)	4.82	1.83	5.76	0.93	< 0.01
Performance quality (low/high quality; unreliable/reliable; not durable/durable)	4.78	1.17	5.50	0.90	< 0.01
Aesthetic attractiveness (ugly/beautiful; unattractive/attractive)	4.23	1.63	4.25	1.56	> 0.20
Visual complexity (simple design/complex design)	2.90	1.67	3.18	1.75	> 0.20
Number of functionalities (a few functionalities; many functionalities)	3.96	1.76	3.89	1.76	> 0.20
Ease of use (difficult/easy; not clear/clear; not user friendly/user friendly)	5.24	1.49	5.06	1.38	> 0.20

ages ranged from 20 to 70 (M = 49; SD = 12). Their educational degree varied from high school (29%), intermediate education (13%), Bachelor's (30%) to Master's (28%). All subjects received a small financial compensation for their participation.

Procedure and Measures

Thirty online questionnaires were created using the software program of NetQ®. These online questionnaires were created in such a manner that each questionnaire included one product variant for each of the four product categories. All participants were randomly assigned to one of the online questionnaires and were asked to answer the questions for all four products. The number of respondents that responded to each questionnaire ranged from 12 to 22. Perceived performance quality was measured using the following three 7-point items: (1) "This digital camera/water kettle/alarm clock/toaster is of high quality"; (2) "This … is reliable"; (3) "This … will last a long time", ranging from "strongly disagree" (1) to "strongly agree" (7) (α's ranged from 0.87 to 0.92). Aesthetic attractiveness was measured using the same two items as used in Study 1 (ugly/beautiful; unattractive/attractive; Pearson's r's ranged from 0.78 to 0.86). Similar to Study 1, a business-like personality was measured using the 7-point adjective scale: "business-like". Subjects were asked to what extent this personality trait was descriptive for the product appearance, ranging from "not at all descriptive" (1) to "very descriptive" (7).

As a final step to validate the manipulation of Study 1, 107 designers with at least a Bachelor's degree in Industrial Design Engineering were asked to rate a maximum of eight product stimuli from one of the four product categories on various design characteristics. The approach to obtain ratings on the design characteristics of the product appearance from designers, and ratings on the perceptions of the product from the participants of a consumer panel was used and accepted in prior research on consumer responses towards design (e.g., Henderson, Giese, & Cote, 2004; Orth & Malkewitz, 2008). The design characteristic curvature was measured from "angular" (1) to "curved" (7).

Results and Discussion

Validation of the Relationship between Curvature and a Business-like Personality

In the first analytical step of Study 2, the manipulation of a business-like personality, as this was employed in Study 1, was validated by testing the relationship between the design characteristic curvature and the business-like personality of the product appearance for the wide range of product stimuli of Study 2. The relationship between the scores on curvature (as rated by the designers) and the business-like personality (as rated by the participants from the consumer panel) was analyzed on the stimulus level (n = 120). So, for each product stimulus, the scores for curvature and business-like personality were calculated by averaging the individual ratings of both the designers and the participants from the consumer panel. A correlation analysis on these two variables revealed a significant and negative relation between curvature and a business-like personality (Pearson's r = -0.37, $p < 0.001$). These findings provide additional support for the manipulation that was used in Study 1. As expected, angular product designs are perceived to have a more business-like personality than curved ones.

Test of the Hypothesis

In the second analytical step, the effect of a business-like personality on the perceived performance quality was tested for the stimuli in Study 2. A regression analysis was performed on the original data from the subjects of the consumer panel (n = 474) to test this effect for each separate product category. In each regression analysis, perceived performance quality was included as the dependent variable, and the business-like personality and aesthetic attractiveness of the product appearance as the independent variables. The case-wise diagnostics were checked for outliers and those responses that problematically affected the regression line were deleted. A maximum of three cases were deleted. Table 2 presents the regression results for the four product categories separately.

Significant positive effects were found for both a business-like personality and the aesthetic attractiveness of the product appearance on the perceived performance quality for all four product categories. Taken together, these results provide support for the hypothesis that the business-like personality of a product appearance positively affects the perceived performance quality of the product.

To explore other possible design characteristics that may evoke a business-like personality, the product stimuli of Study 2 that scored either relatively high or low on this personality trait were examined. Table 3 presents some examples of these product stimuli, together with their mean scores on the business-like personality and perceived performance quality. Taken together, these product stimuli again support the notion of Study 1 that one possibility for designers to encourage a business-like personality

Table 2. Effects of a business-like personality and aesthetic attractiveness on the perceived performance quality.

	Digital camera	Electric water kettle	Alarm clock	Toaster
Business-like personality	b = 0.15**	b = 0.14**	b = 0.18**	b = 0.17**
Aesthetic attractiveness	b = 0.24**	b = 0.29**	b = 0.28**	b = 0.37**
	$F(2, 470) = 71.8$, $p < 0.001$ $R^2 = 0.23$	$F(2, 468) = 113.4$, $p < 0.001$ $R^2 = 0.33$	$F(2, 469) = 152.6$, $p < 0.001$ $R^2 = 0.39$	$F(2, 469) = 173.5$, $p < 0.001$ $R^2 = 0.43$

Note: **$p < 0.001$; *$p < 0.05$

in a product appearance is by employing angular shapes. Furthermore, a business-like personality is more likely to be recognized in a product appearance when the product appearance has a harmonious, unified design with straight and clear lines, a grayish and/or black color, and a relatively static shape. In contrast, people are less likely to judge product appearances that are unharmonious, curved, colorful, and have indistinct lines as having a business-like personality.

General Discussion

The present research contributes to the literature by identifying a business-like personality in a product appearance as a cue for the perception of a product's functional attributes. Specifically, the findings indicate that because a business-like personality is associated with competence, reliability, and trustworthiness, products with a business-like personality in the product appearance are more likely to prompt positive inferences about the product's performance quality. As performance quality is considered to be an important determinant of people's evaluation of products, this may result in a competitive advantage. Although the present research only focused on the effect of a business-like personality, it is likely that other product personality traits will affect the perceived functional attributes as well. For the success of a product, it is important that the desired functional attributes are encouraged and that undesired ones are prevented as much as possible. When designing new products, designers should thus systematically consider the product personality traits that are conveyed by a specific product appearance and contemplate how these product personality traits may evoke positive or negative inferences about various functional attributes, such as performance quality, ease of use, and technological advancement.

Table 3. Examples of product stimuli used in Study 2 with a high or low score on business-like personality.

	High score		Low score	
Digital cameras				
Business-like personality	5.06[2]	4.92[3]	2.41[4]	2.40[5]
Performance quality	4.38	4.49	3.82	3.78
Electric water kettles				
Business-like personality	5.38[6]	5.29[7]	2.83[8]	2.59[9]
Performance quality	4.81	5.29	4.50	3.92
Alarm clocks				
Business-like personality	5.88[10]	5.54[11]	2.38[12]	2.14[13]
Performance quality	4.94	4.82	3.92	4.29
Toasters				
Business-like personality	5.13[14]	4.83[15]	2.83[16]	2.71[17]
Performance quality	4.92	4.94	3.57	3.92

Furthermore, more research is needed to empirically examine the effects of other product personality traits on the perceived functional attributes. More knowledge on these issues will contribute to our theoretical understanding of product perception and can help designers to purposely encourage particular positive inferences about the product's functional attributes through the product appearance in order to create successful products.

This research focuses specifically on the effect of a business-like personality on the product's performance quality as it is predicted in a purchase situation by merely looking at the product appearance and without actual usage. Nevertheless, this does not necessarily imply that the positive perceptions concerning the product's performance quality that are evoked by a business-like personality will not endure during ownership and usage. In this respect, Rao (2005) demonstrated the placebo-effect that a lower-priced product yields lower objective performance ratings during ownership than a higher-priced, physically identical one. Similarly, within some range of performance, it is likely that a business-like personality will even enhance the performance ratings during ownership.

Even though the findings of this research support that a business-like personality positively affects the perceived performance quality of the product, it is acknowledged that the perception of the product also depends on other factors. For example, the perceived performance quality of a new compact car model may increase as a result of the more business-like personality of the product appearance, but will not reach the level of an executive car, even if the latter car's appearance may have a less business-like personality. The relative increase in performance quality will thus depend on the subcategory (e.g., compact car, SUV, executive car) to which the product belongs and the specific context.

Future Research and Limitations

In the present research, the specific personality of the subjects was not taken into consideration. Based on the self-congruity theory that people prefer products with a personality that is similar to their own (Sirgy, 1982), it is likely that a product with a congruent personality will prompt positive inferences through product personality as well as through the *What is beautiful is good* principle. Accordingly, it is possible that the effect of a business-like personality on the perceived performance quality is stronger when a person has a business-like personality him or herself. Hence, future research should investigate the personality of the person as a potential moderator for the relationship between product personality and the inferences about the product's performance quality.

The present research was limited to consumers' first impressions of a product in isolation. Because of this restriction, two other issues need further inquiry. First, future research is needed on whether product appearance affects the perceived functional attributes in choice tasks. In purchase situations, products are often presented together and consumers can easily compare several products on their technical information as well as their appearance. Future research should empirically investigate the importance of a business-like personality in such choice situations. Second, for certain product categories, consumers are allowed to directly experience the product at purchase (e.g., television). It would be interesting to investigate whether first impressions caused by the product appearance will affect the perceived performance quality when objective evidence is provided directly afterwards.

Another limitation of this research is that it does not address the importance of potential moderating factors, such as context and product category. Even though the effect of a business-like personality is replicated across different product categories, it remains questionable whether it is always reasonable to design a product appearance with a business-like personality. Dependent on the context and product category, a person may consider a business-like personality in the appearance of a product more or less important. An example of a context wherein a business-like personality is of great importance is a person who is shopping for a new mobile phone or laptop that will be used in the business context, rather than at home. Future research should investigate whether such a business context will further stimulate the positive effect of a business-like personality on the perceived performance quality of the product. On the other hand, will there still be a positive effect of a business-like personality when the product category and context merely relate to leisure, for example, when shopping for sports gear? Then, the symbolic associations of a business-like personality in a product appearance may actually be detrimental for creating an optimal leisure experience. Designers should consider the various consequences related to using a business-like strategy and possible other personality traits before implementing it in the design of new products.

Conclusion

The present study suggests that people use product personality, such as a business-like personality, as a cue for evaluating functional attributes that are difficult or even impossible to verify. In order to design successful products, designers thus need to consider the specific product personality traits that are conveyed by the product appearance and their specific consequences for the perceived functional attributes. Furthermore, a product should be consistent in communicating a particular personality trait to effectively create the desired effects. In this respect, it could be interesting for designers to move beyond the product's appearance. Past research has concluded that sound (Ludden & Schifferstein, 2007), person-product interaction (Desmet, Ortiz Nicolas, & Schoormans, 2008), material, and texture (Chen, Shao, Barnes, Childs, & Henson, 2009; Karana, Hekkert, & Kandachar, 2009) are also important for evoking a specific personality or expression. Designers should thus pay attention to the coherence of all facets of the product design when designing a product with a particular product personality. A small detail that may be associated with a different personality trait could spoil the desired product personality that the designer is striving to create.

Acknowledgments

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Endnotes

[1] The concept of product personality has also been referred to as "character" (Janlert & Stolterman, 1997).

[2] Casio S100, reprinted with permission from Casio.

[3] Olympus SP700, reprinted with permission from Olympus.

[4] Canon Powershot E1, reprinted with permission from Canon.

[5] Casio EX G1, reprinted with permission from Casio.

[6] Kenwood SJM100, reprinted with permission from Kenwood.

[7] Philips HD4690, reprinted with permission from Philips.

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[17] Tefal Delfini, reprinted with permission from Tefal.

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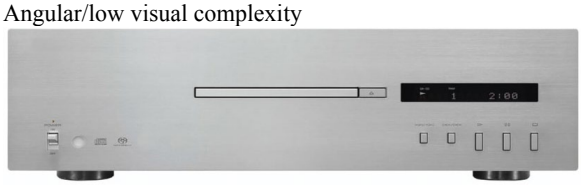
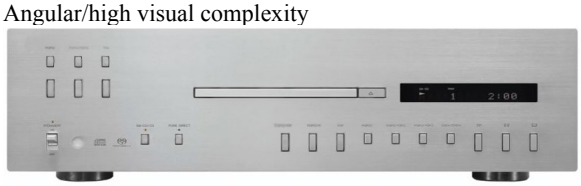
Appendix: Stimuli of Study 1

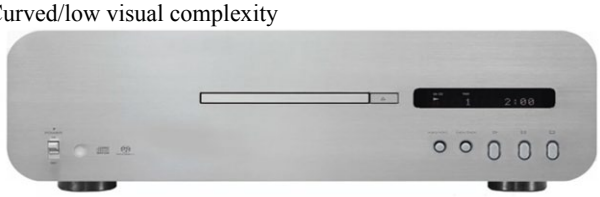
Angular/low visual complexity



Angular/high visual complexity



Curved/low visual complexity



Curved/high visual complexity