**Seeking the ideal form: Product design and consumer response**
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# Seeking the Ideal Form: Product Design and Consumer Response

The physical form or design of a product is an unquestioned determinant of its marketplace success. A good design attracts consumers to a product, communicates to them, and adds value to the product by increasing the quality of the usage experiences associated with it. Nevertheless, the topic of product design is rarely, if ever, encountered in marketing journals. To bring needed attention to the subject of product design and enable researchers to better investigate design issues, the author introduces a conceptual model and several propositions that describe how the form of a product relates to consumers' psychological and behavioral responses. After presenting this model, the author describes numerous strategic implications and research directions.

> Throughout history and in every known culture, people have found pleasure and meaning in the use of their eyes. They have consciously attempted to produce objects of beauty and have delighted in them (Csikszentmihalyi and Robinson 1990, p. 2).
>
> That shape—flat as a manhole cover and molded to look like the wheeled equivalent of a long, wailing scream—drives people nuts. They wade into traffic with cameras to take pictures, they cut across three lanes of freeway to give the thumbs up (Vaughn 1994, p. 15; on the Lamborghini Diablo).

## Importance of Product Form

The product constitutes one of the classic four P's of the marketing mix, and the most fundamental characteristic of a product is its exterior form or design. Recently, the art of product design has experienced a renaissance. Not since the 1930s has product design been more creatively and strategically employed to gain advantage in the global marketplace (Berkowitz 1987; Nussbaum 1988). In one survey of senior marketing managers, design was mentioned as the most important determinant of new product performance by 60% of respondents; only 17% considered price most important (Bruce and Whitehead 1988). Similarly, an analysis of the performance of 203 new products revealed that product design was the most important determinant of sales success (Cooper and Kleinschmidt 1987). The receipt of design awards is also positively associated with average profit margins and sales growth (Goodrich 1994; Roy 1994).

Marketers charge designers with the task of developing products that have appealing forms. Yet, attempts to produce goods with attractive forms are nothing new. Nearly all civilizations have decorated functional objects such as pottery, weapons, and clothing (Becker 1978). In modern society, aesthetic sensibilities are relevant to all products, regardless of their function (Holbrook 1980; Holbrook and Anand 1992; Holbrook and Zirlin 1985). When given the choice between two products, equal in price and function, target consumers buy the one they consider to be more attractive (Kotler and Rath 1984; Nussbaum 1988).

The form or design of a product may contribute to its success in several ways. First, in cluttered markets, product form is one way to gain consumer notice (Berkowitz 1987; Dumaine 1991; Jones 1991). Yoplait yogurt successfully entered a competitive market by using a container that was narrower at the top than at the bottom, the opposite of every other yogurt package. Swatch used a variety of unusual product forms to successfully stand out in the mature market for wristwatches (Hollins and Pugh 1990). With new product offerings, a distinctive design can render older competitors immediately obsolete and make later competitors appear to be shallow copies (Midgley 1977). For example, the Ford Taurus, launched in 1986 with a unique rounded shape, soon became one of the nation's best selling passenger cars (Goodrich 1994).

Second, the form or exterior appearance of a product is important as a means of communicating information to consumers (Nussbaum 1993). Product form creates the initial impression and generates inferences regarding other product attributes in the same manner as does price (Berkowitz 1987). For example, the 1994 Dodge Ram pickup's front end resembled the cab on an 18-wheeler to suggest strength and power. The first Apple Macintosh possessed a compact, simple form to communicate ease of use and an almost anthropomorphic friendliness. Because product form also helps to develop corporate and brand identities, companies, such as Braun, Smith & Wesson, and Ralph Lauren, have distinctive design philosophies that help them develop and reinforce a recognizable corporate character (Forty 1986).

Third, in addition to managerial considerations, product form is also significant in a larger sense because it affects the quality of our lives. The perception and usage of beautifully designed products may provide sensory pleasure and stimulation. In contrast, objects with unattractive forms may

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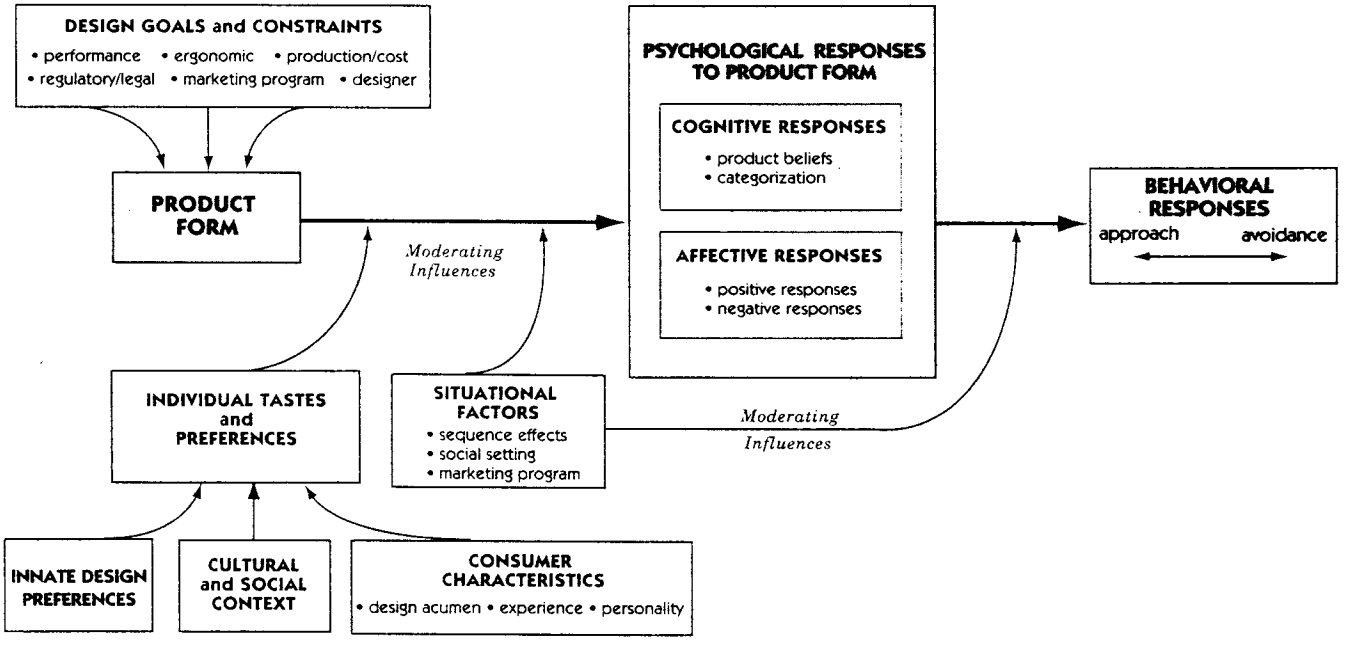
FIGURE 1
A Model of Consumer Responses to Product Form




evoke distaste. Essentially an applied art, product design has a greater impact on our daily lives than do other art forms, because we see products every day (Lawson 1983).

Fourth, product form can also have long lasting effects. Although many goods are quickly discarded, the aesthetic characteristics of more durable products can have an impact for years on users and non-users alike as products become part of the sensory environment, for good or bad (Pye 1978; Jones 1991). For example, a 1957 Thunderbird, the Rolling Stones's "Satisfaction," or a Tiffany lamp, still bring delight to consumers decades after their creation, whereas an unattractive satellite dish will be painfully endured by neighbors for years.

Despite the centrality of product design to marketing practice and society as a whole, empirical studies of design issues are rare in marketing journals. Furthermore, our discipline has not developed conceptual frameworks for its study (Jones 1991). In attempting to bring needed attention to the subject of product design, this article develops a conceptual model and several propositions that relate the form of a product to consumers' psychological and behavioral responses. The model, shown in Figure 1, draws from a number of disciplines, including engineering, art, psychology, and ethology, as well as relevant work in marketing and consumer behavior. The model is intended to provide a more systematic approach to the study of design issues and to facilitate the undertaking of empirical work on product design. Following the presentation of the model and propositions, several implications for marketing management are proposed and promising avenues for further research on the topic of product form are described.

## Product Form

In examining the proposed model, the first component to be discussed is product form itself. Marketing scholars agree that the term "product" can be applied to a wide variety of goods and services, both tangible and intangible, and all of which are designed. As used here, a *product's form* represents a number of elements chosen and blended into a whole by the design team to achieve a particular sensory effect (Hollins and Pugh 1990; Lewalski 1988). Designers make choices regarding characteristics, such as shape, scale, tempo, proportion, materials, color, reflectiveness, ornamentation, and texture (Davis 1987; Kellaris and Kent 1993). Designers also decide how to mix these elements and determine the level of congruity that should exist among them. For example, the form of a Harley-Davidson Sportster includes the sparkle of its chrome, the prominent V-configuration of its engine, the raked angle of its front shocks, the teardrop shape of its gas tank, the visibility of its mechanical components, and the way in which these elements work together as a visual whole.

Pye (1978) argued that in addition to the previous design elements, workmanship in the execution of a design also has an impact on product form. Just as the form of a music recording depends on both the composer and the musician, the form of a house represents a combined effort of the architect and the contractor. In some cases, workmanship can undermine the form envisioned by the designer. For example, a finely designed table incorporating rich woods and elegant proportions may be compromised by a rough, imperfect surface resulting from the manufacturing process. Such



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threats to form are not lost on designers, who are increasingly selecting design elements to facilitate precise manufacturing.

## Design Goals and Constraints

As Figure 1 shows, a product's form represents one solution to a set of design goals and constraints acted on by the designer and approved by management. Given the purpose of the product, its target market, and its desired performance specifications, the design team attempts to create a product form that will be successful. Complicating matters, however, is the presence of several outside constituencies, such as legal counsel and government agencies, that also contribute to what form a product should take. Thus, designers must produce a product form that is especially pleasing to target consumers while simultaneously satisfying relevant design constraints (Lawson 1983). As design objectives and constraints increase in number, the design process becomes increasingly complex.

### *Performance Objectives and Constraints*

In many design projects, target performance is the central constraint. The product form must take into account the level of performance desired by both the target segment and distributors. Also, objectives regarding the aesthetic performance of a product strongly influence the design process. For a product to be successful, its sensory characteristics must strike a responsive chord in target consumers. For product categories such as jewelry, silk flowers, or musical comedies, aesthetic performance is all that matters. In most product classes, however, aesthetics are not the sole performance criterion.

There are also functional performance goals and constraints that pertain to a number of variables, including service life, horsepower, shelf life, resistance to environmental stress, and maintainability (Hollins and Pugh 1990). In addition, the form of a product must increasingly incorporate and address the environmental aspects of performance, including its ability to be recycled (Nussbaum 1990a). In addition to functional performance targets, designers also must address technical constraints pertaining to making a product work. These technical constraints are common to all projects and include elements such as load bearing, materials technology, and basic geometry (Lawson 1983).

### *Ergonomic Constraints*

Often linked to performance are design constraints pertaining to ergonomics. Ergonomics involves the matching of a product to the target user's capabilities to maximize safety, efficiency of use, and comfort (Osborne 1987). Ergonomic demands often have direct influence on form, affecting characteristics such as weight, texture, and shape. Currently, there has been increasing attention to ergonomic properties because marketers are competing on "ease of use" (Nussbaum 1988, 1993). It is becoming apparent that the ideal product is not necessarily that which is most beautiful. In many cases, the ideal product will be that whose form is most comprehensible and usable. Specifically, home computers sales have only recently approached their early promise because graphical interfaces and "plug-and-play" set-up have become the norm.

Norman (1988) examined ergonomics in the context of usage constraints. He argues that product forms should limit behaviors to what is right. For example, the holes in a pair of scissors show users just where to place their fingers, thus, forcing correct usage. In more complex products, sensory feedback and mapping of controls become relevant. One example is the Mercedes Benz power seat control that offers a natural usage map because it is in the shape of a seat. Norman cites many examples of ergonomic failures, such as door handles that suggest pulling when pushing is required. Because inadequate attention to ergonomics may result in consumer dissatisfaction, designers must be increasingly mindful of these factors when developing a product's form.

### *Production and Cost Constraints*

Production processes and manufacturing costs also influence the form of a product. Managers typically instruct designers to develop products that can be efficiently manufactured at a target cost while meeting quality control parameters (Dumaine 1991; Hollins and Pugh 1990). Designers must choose materials and shapes that are consistent with manufacturing resources and cost targets. For example, a designer's plan for a genuine walnut burl television cabinet may have to yield to cost and resource constraints, resulting in a design that specifies plastic wood instead of the real thing. In general, manufacturing capabilities and the need to trim costs frequently limit the range of form alternatives available to the designer.

### *Regulatory and Legal Constraints*

Regulatory and legal constraints are often the least flexible of all constraints faced by designers (Lawson 1983). Although there are trade-offs in other constraint categories, compromise usually does not occur here. A race car must exactly follow sanctioning body regulations, and packaged foodmakers must follow the Food and Drug Administration's (FDA) guidelines. In Sweden, specific regulations pertaining to the ergonomic characteristics of office machines protect clerical workers. Regulations pertaining to the environment and the disposal of goods when their useful life is over are also becoming increasingly common (Nussbaum 1990a).

Whereas regulations are externally imposed, the firm may impose additional internal design constraints because of concerns over product liability (Dungworth 1988; Schwartz 1989). During the years 1975 through 1984, product liability suits increased 758% while average verdicts grew from $400,000 to nearly $2 million (Taff 1990). Liability suits are frequently based on only two conditions: (1) an accident occurred and (2) the product was involved. Recent verdicts have established that successful suits do not need to prove manufacturer negligence. Because improper consumer usage is no longer an effective defense in such suits, designers must anticipate how consumers might misuse a product and prevent it from occurring with appropriate design features.



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### Marketing Program Constraints

Design constraints also stem from marketing program considerations. One example is the distribution plan for the product. The ideal product form must be suited to the demands of storage, handling, and transportation. In addition, the manner in which retailers will display and sell the product has implications for form. For example, Hanes developed the original egg-shaped package of L'eggs pantyhose in response to the need to minimize display space and attract consumer attention in a self-service retail setting. Designers are also constrained by the need for new products in a given product line to maintain a family resemblance to the existing models. In some cases, the product's form also may be constrained by communication goals and objectives. In other words, the form may be required to evoke a particular meaning that supports a brand positioning, company reputation, or anticipated promotional themes. An advertising campaign that emphasizes excitement, for example, may lead designers to choose bright, vibrant colors for the product.

### Designer's Constraints

In developing a product's form, designers also provide constraints and objectives of their own. In particular, designers can select or modify form elements to fulfill professional goals and desires for self expression (Lawson 1983). In other cases, a form may be developed with the constraint that it shares certain characteristics with previous projects from the designer or design house (Nussbaum 1990b). Thus, the goals of an individual designer or design team may conflict with other constraints, adding to the overall complexity of the task. For example, a designer may seek a greater level of novelty and impact in a product form than the marketplace is willing to accept.

Because of the large number of constraints and goals present during the design process, marketers must recognize that achieving optimality is a daunting task. There are a limitless number of trade-offs among design constraints, and the task of developing a product form becomes an intricate balancing act characterized by trade-offs. The trade-offs are not a minor consideration and are not solely the concern of the designer. For example, if an automotive stylist wants to improve the aesthetic appearance of a dashboard by moving the controls into a more attractive pattern, it may mean lost lives and millions of dollars in liability claims if the controls can no longer be intuitively located by the driver (Papanek 1984). Marketing management has the ultimate responsibility to make decisions concerning these trade-offs. Thus, a manager must be aware of the design process and how the various constraints interact with the process so that he or she can make successful decisions regarding these trade-offs. Hence:

$P_1$: The form of a product is determined by the set of goals and constraints applicable to the design project. The greater (fewer) the number and complexity of applicable goals and constraints, the more (less) challenging the design task.

## Psychological Responses to Product Form

The product form, once developed, may elicit a variety of psychological responses from consumers (see Figure 1). As suggested by Bitner's (1992) work on architectural design, these psychological responses include both cognitive and affective components. Although it is useful for discussion purposes to distinguish between these categories of psychological response, Bitner notes that cognitive and affective responses interact and may occur simultaneously. A thorough examination of the possible interdependence between cognition and affect is not attempted here. However, for additional insights, see Cohen (1990).

### Cognitive Responses

*Product-related beliefs.* The form of a product affects consumers' beliefs about the product and brand (Bitner 1992; Solomon 1983). Product form may create or influence beliefs pertaining to such characteristics as durability, dollar value, technical sophistication, ease of use, sex role appropriateness, and prestige. Designers often choose particular form elements to proactively encourage the creation of desirable beliefs (Berkowitz 1987). For example, the all-black shell of the NeXt computer system was designed to elicit perceptions of unmatched power compared with other desktop machines (Nussbaum 1990b). Leather upholstery in luxury cars is increasingly being fitted with generous wrinkles to engender perceptions of softness, genuineness, and comfort. However, some consumer beliefs resulting from design elements can be completely unanticipated. A particularly handsome design, capable of winning awards, may lead target consumers to infer that the product is expensive and inappropriate for their evoked set. In addition, product liability suits often result from consumer misperceptions of appropriate product use, which are based on design cues (Dungworth 1988).

There is some debate whether product-related beliefs derive from holistic visual perceptions of the product's form or from linear processing of one design element at a time (Durgee 1988). In support of holistic processing, Gestalt psychologists argue that objects are perceived as a whole rather than atomistically (Ellis 1950; Jones 1991; Katz 1950). In other words, a person comprehends the form of an automobile as a complete entity rather than as a collection of tires, fenders, and headlights. In contrast, Durgee (1988) suggests that reactions to product form are based on atomistic perceptions. Accordingly, consumers attend to individual stimulus elements and the fit among them. Complex designs and those with conflict among elements tend to elicit the most elaborate cognitive processing. For example, consumers may try to understand what assortment of flavors are present in the taste of Dr. Pepper.

One way to resolve these two perspectives is to assume that both Gestalt and atomistic processing occur. The product may first be perceived as a whole. If the form warrants further processing, then individual elements may become salient. For example, a consumer encountering an upholstered chair may first consider the object in its entirety. Among consumers who find the style sufficiently engaging,



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there may be further attempts to analyze the appearance of the chair. Consumers may process design elements, such as scale, fabric, square versus T-cushions, skirt versus feet, and back height, individually when contemplating the design.

*Categorization.* The concept of product categorization is another potentially important type of cognitive response to product form (Loken and Ward 1990; Sujan 1985; Sujan and Dekleva 1987). According to categorization research, consumers try to understand a product by placing it within an existing category. Categorization is based on the perceived similarity between a given product and exemplars of various product categories and sub-categories. Thus, a consumer first encountering an Infiniti Q–40 could categorize the car as a luxury sports sedan because of its design overlap with the Jaguar XJ–6 that has long exemplified this class of automobile. It is expected that such categorizations employ both holistic and atomistic perceptions. In considering design and categorization, marketers should adopt a proactive approach and consider how they want consumers to categorize a new product. Rather than leaving categorization to chance, research with target consumers using preproduction prototypes or illustrations can determine whether the intended categorization is successfully occurring.

When a product's form is highly unusual or novel, the categorization task becomes difficult and possibly frustrating for both seller and consumer (Cox and Locander 1987). Research on categorization suggests that consumers prefer goods that have moderate incongruity with respect to existing products (Meyers-Levy and Tybout 1989). With moderate incongruity, distinctiveness is high enough to warrant further processing, yet the product can still be categorized with relative success. For example, camcorders tend to have a shape that is quite different from single lens reflex still cameras to indicate their unique functional advantages. However, nearly all camcorders possess the materials, outer color, and control mechanisms typical of sophisticated still cameras.

$P_2$: The form of a product elicits beliefs about product attributes and performance.

$P_3$: The form of a product influences how the product is categorized within and among product classes.

$P_4$: Product forms with a moderate degree of incongruity with respect to existing forms elicit more positive cognitive responses than forms with low or high levels of incongruity.

### Affective Responses

*Aesthetic and other positive responses.* As indicated in Figure 1, perceptions of a product's form evoke several affective responses from consumers. In some cases, product form perceptions can lead to a moderately positive response such as simple liking, or they can evoke stronger aesthetic responses similar to those for works of art. John Zoccai, of Reebok, explains that good design "makes you fall in love with the product" (Dumaine 1991, p. 86). Holbrook and Zirlin (1985, p. 21) define aesthetic response as a "deeply felt experience that is enjoyed purely for its own sake without regard for other more practical considerations." Aesthetic responses are formed on the basis of intrinsic elements of the stimulus, and they encompass strong attention and involvement (Lewalski 1988; Veryzer 1993).

It is possible to conclude that products can elicit at least a moderate level of aesthetic responses in consumers, including an engagement of attention and strong positive emotions. Aesthetic responses derive from the design and sensory properties of the product rather than its performance or functional attributes. For example, buyers of fine china are more concerned with appearance than with the durability of the pieces. It is not uncommon, however, for aesthetic value and utilitarian value to occur together. The most successful products offer both benefits to the consumer. Just as a racehorse may appear most beautiful while running, Holbrook and Zirlin (1985) posit that the experience of aesthetic value can be best realized during the functional usage of a product. Although intense aesthetic reactions may be more commonly seen in art (Holbrook 1980), products with particularly resonant designs can produce very strong emotional reactions among consumers.

*Negative affect.* Aesthetic responses are typically associated with positive affect and pleasurable experiences. Certainly, it is the goal of product designers to evoke positive reactions among consumers encountering their creations. However, managers must also recognize the possibility of negative affective reactions to product form perceptions. In looking at furniture, for example, a consumer may deride a particular sofa as being in poor taste; additionally, a number of automotive and apparel designs have failed because of negative reactions to design elements. The goal of product design is to elicit more positive than negative responses among consumers, especially those in the target segment. These affective responses may be in response to the overall form (i.e., Gestalt processing) or may relate to individual design elements. For example, a prospective buyer may like the appearance of a new car except for the design of its aluminum wheels.

$P_5$: The intensity and valence of affective reactions to a product are a function of its perceived form.

## Behavioral Responses

The primary, horizontal path shown in Figure 1 indicates that psychological responses to design lead in turn to behavioral responses. Following the perspective employed in research on architectural spaces and retail atmospherics (Bitner 1992; Donovan and Rossiter 1982; Mehrabian and Russell 1974), behavioral responses to design can be described as either approach or avoidance. Approach behaviors reflect an attraction to a design and include spending time in a site and exploring it. Avoidance behaviors represent the opposite of approach responses.

Behavioral responses to product designs can be considered along an approach-avoidance continuum. When a particular form elicits positive psychological responses, the consumer will tend to engage in approach activities, such as extended viewing, listening, or touching of the product. Approach responses are part of the aesthetic experience and indicate a desire for deeper exposure to the product's pleasing form (Csikszentmihalyi and Robinson 1990; Mehrabian and Russell 1974). Approach behaviors also include seeking in-



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formation about the product and willingness to visit retailers selling the product. Window shoppers often become store visitors in order to approach an attractive item displayed in a shop window. For many marketers, the most important approach behavior is purchase (Berkowitz 1987; Nussbaum 1988; Roy 1994).

However, there are other approach activities that occur after a product has been purchased: After purchasing a product with a pleasing form, consumers frequently display it prominently (Belk 1988). One consumer may position an attractive new food processor visibly on a kitchen counter, just as another consumer may give a grandfather clock a place of honor in the living room. A related approach response involves showing an attractive good to others. Part of the ritual of a dinner party, for example, includes taking guests on a house tour to reveal all the objects that the owners consider especially beautiful. In addition to the propensity to display objects thought to be beautiful, consumers who own such goods may take special care of them. Careful product maintenance serves as yet another approach response to product form.

Avoidance behaviors are an outgrowth of negative feelings about a design (Bitner 1992; Donovan and Rossiter 1982; Mehrabian and Russell 1974). When a product form elicits negative beliefs and affect, the consumer may distance him- or herself from the object. Such products are unlikely to be extensively viewed or perused. Of most concern to managers is the avoidance manifested by an unwillingness to purchase. In response to disappointing sales, manufacturers frequently change sheet-metal on cars, alter the graphics on packages, and revise furniture shapes.

When a consumer owns or acquires an unattractive product, other avoidance activity may occur. Family gifts that offend aesthetic sensibilities are frequently relegated to attics or basements and only displayed when the donor visits. In some cases, negative psychological reactions can elicit coping strategies that do not entail avoidance in the literal sense. One strategy is to camouflage a product that has an unattractive form, such as when a consumer hides a television with an unappealing design in an antique armoire. Another strategy involves restoration or facelifting. A sofa with an unattractive fabric can be reupholstered and a sickly wallpaper pattern can be painted over.

$P_6$: The stronger the positive (negative) psychological responses to a product's form, the greater the propensity to approach (avoid) the product.

## Tastes and Preferences as Moderators of Consumer Response

As shown in Figure 1, consumer reactions to product form do not occur in isolation. Rather, consumer reactions are moderated by several variables, including consumers' tastes. Products forms that are congruent with individual tastes and preferences are evaluated positively, whereas negative reactions occur when there is low congruence. Jones (1991, p. ix) states that taste is "the discrimination of beauty from deformity and is shown in the preference for one object over another." Yet, despite the importance of taste issues to marketing managers, "conventional marketing theory has little useful comment to make about taste" (Jones 1991, p. x).

### *Innate Design Preferences and Tastes*

Some preferences appear to be innate or, at least, acquired early in life (Lewalski 1988). There are over one hundred Gestalt principles that constitute the most well known formalizations of innate design preferences (Ellis 1950; Katz 1950). According to Gestalt theorists, humans delight in order. People inherently prefer objects with symmetry, unity, and harmony among elements (Papanek 1984). For example, one Gestalt law posits that people hold preferences for rhythmic forms that involve repetition of similar design elements. Thus, the repeating threads on a bolt are naturally pleasing to the eye. Veryzer (1993) empirically confirmed that consumers prefer product designs that follow Gestalt laws of proportion and unity over designs that violate the laws.

Although there may be an innate preference for orderly, unified designs, Berlyne (1974a, b) posits that too much unity at the expense of variety becomes boring and generally unwelcome. According to Berlyne's perspective, novelty, complexity, and variety produce arousal. Thus, forms that closely follow Gestalt laws should result in low levels of arousal (Holbrook and Zirlin 1985). Because most people prefer a moderate level of arousal, as suggested by the Wundt curve, product forms that have a moderate degree of irregularity and disorder should be most preferred (Jones 1991). Objects that are highly conventional will not provide enough stimulation to be satisfying, whereas extremely novel, irregular objects evoke too much arousal. According to Gombrich (1979), delight comes somewhere between boredom and confusion.

A few scholars have attempted to understand innate design preferences using a teleogical perspective. According to this view, there are innate, hardwired preferences for forms that follow natural, organic principles (Mayall 1968; Papanek 1984). These scholars note the inherent visual appeal of a DNA spiral, a snowflake, or a honeycomb. Hence, manmade objects that resemble organic forms tend to be preferred (Mayall 1968). For example, supports with wide bottoms are thought to be visually attractive because they mimic a person standing with legs apart. Streamlining also may be innately preferred because it calls to mind sleek fish or birds. In recognition of these preferences, advertisements introducing the 1995 Chevrolet Monte Carlo pair abstract photos of the car with similar forms of the human body.

As do Gestalt theorists, teleogical scholars argue that proportion is particularly significant among innate design preferences (Doczi 1981). The Classical Greeks originated the concept of the Golden Section, which is a proportion that humans seem to naturally prefer (Williams 1981). The Golden Section results when a line is divided into two line segments, so that the smaller segment is in the same proportion to the larger segment as the larger segment is to the whole. Although there is some disagreement on this issue, a number of scholars have argued that rectangles based on the Golden Section (length:width=1: .618) offer a uniquely attractive proportion (Benjafield 1985; Doczi 1981). The front



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elevation of the Parthenon has this proportion; and Neo-Classical forms that rely on the Golden Section have been some of the most enduringly popular architectural forms. Some believe that preferences for the Golden Section are due to its prevalence in nature. For example, a number of fish, seashells, and plants have forms that incorporate Golden Section proportions (Doczi 1981). In general, it could prove useful for managers involved with design decisions to be acquainted with Gestalt principles and related teleogical theory. In fact, some firms may find it useful to include these considerations in their initial set of design constraints.

### Cultural and Social Influences on Taste

Preferences for product form are also shaped by cultural and social forces (McCracken 1986). The acceptance of a particular style by a culture or subculture may have much to do with that culture's values or preferences (Kron 1983). For example, cleanliness is a pervasive design preference rooted in modern American culture (Forty 1986). In fact, refrigerators became more accepted when wood exteriors were replaced with sanitary looking white enamel. Alexander (1979) argues that cultural norms regarding design are particularly important because they tend to overwhelm inner feelings and individual preferences. Cross-cultural differences in design tastes are also common. Colors, materials, and shapes desirable in one culture may be unattractive to consumers in another (Armstrong 1991). To respond better to cultural differences in visual preferences, nearly all Japanese auto manufacturers have set up design studios in California.

One way culture influences design preferences is through the mechanisms of prevailing styles and fashion. Artists and designers have always worked using the styles of their time. If the design community, marketers, and mass media together promote a particular style, it can become a significant shaper of individual tastes. Solomon (1988) addressed the process by which products of a particular style are selected and advanced to the public. Although designers can select from a nearly limitless pool of possible product forms, Solomon reminds us that there is a significant filtering of these available forms, and, at a given time, there is a surprising consensus in the designs presented to the market. This consensus is partially attributable to the wide dissemination of secondary market research data, such as color forecasts. Cultural gatekeepers can also drive designers toward a consensual look in their products. In home decor, for example, the editors of shelter magazines set design standards and form the central basis for retail buyers' decisions that ultimately affect what the consumer finds for sale (Kron 1983; Solomon 1988).

In addition to providing consensual styles of visual form, the culture also affects design tastes on the basis of semiotic considerations (Jones 1991). According to the perspective advanced by McCracken (1986), designers encode in their creations a meaning derived from the culture, which they intend the consumer to extract. Designers expect consumers to prefer products that communicate meanings that are desirable within a particular culture or subculture. If a culture values high technology, forms that communicate technical sophistication should be preferred. Sony offers a line of bright yellow "sports" radios and tape players to capitalize on cultural acceptance of fitness pursuits and active lifestyles.

Marketers and designers also should recognize the potential impact of social class, age, region, and ethnic subcultures in the creation of design preferences. Different market segments can have substantially different tastes because of their specific associations with various groups or subcultures (Reingen, Foster, and Brown 1984). Membership in such groups typically involves socialization in matters of taste, and it is not uncommon for subculture members to prefer particular styles and reject others. For example, young urban consumers may have tastes for apparel and home decor that differ considerably from those common among older Americans living in rural areas; and Fussell (1983) posits that upper social class Americans tend to prefer classic designs and those with British origins. Market segmentation analyses employed before the product development process is completed can prove very useful in identifying subcultural and social group influences on design preferences.

### Consumer Characteristics Influencing Tastes

Even within a culture or social setting, people vary in their tastes or preferences. Some of the potential causes of these variations are design acumen, prior experience, and personality.

*Design acumen.* Csikszentmihalyi and Robinson (1990) suggest that design acumen is something with which certain people are born. These people make quicker sensory connections and exhibit more sophisticated preferences regarding the design of things than do those with little design acumen. In consumer research, several authors (Childers, Houston, and Heckler 1985; Holbrook et al. 1984) investigated individual differences in information processing style and found that some consumers favor visual over verbal processing (see also Bamossy, Scammon, and Johnston's 1983 work on aesthetic judgment ability). In subsequent research, Holbrook (1987) found that aesthetic judgments differed among respondents representing the two forms of processing. Visualizing consumers attend more closely to visual design elements and have clearer preferences in making product choices than do those low in visualizing.

*Experience.* Rather than focusing on design related aptitude alone, some researchers have examined how taste is cultivated According to Osborne (1986), the development of design connoisseurship requires education, exposure to beautiful things, and motivation. For example, a person may develop design skills in the area of home decor by reading shelter magazines and browsing in furniture stores. Through such experience, a person learns what to look for in a product design and what the important determinants of attractiveness are. During the product design process, it is vital that levels of design acumen and experience for the target segment are ascertained to guide resource commitment to design, as well as to stylistic choices. It would be pointless to allocate significant design-related resources to the pursuit



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of a low acumen and experience segment. Marketers should also monitor the average level of design acumen present in the marketplace as a whole. In an era of MTV (Music Television) videos, sophisticated advertising imagery, and shelves stocked with award-winning designs, nearly everyone is becoming more design oriented.

*Personality variables.* Individual personality factors can also potentially influence design tastes and preferences. Holbrook (1987) provides one example—a bipolar trait termed romanticism/classicism. Romanticists tend to value artistic inspiration and prefer more ornate, lush designs, such as those found in Victorian decor. Classicists prefer craftsmanlike perfection and gravitate toward spare, modern designs. Personality traits relating to stimulation seeking may also be associated with design tastes. Persons with high optimum stimulation levels may prefer novel, irregular, or unconventional designs that violate Gestalt laws and offer greater arousal potential (Goldsmith, Frieden, and Kilsheimer 1993).

Similarly, Venkatraman and Price (1990) distinguish between sensory and cognitive innovativeness. Consumers with high cognitive innovativeness tend to be rational and enjoy finding out how things work. In contrast, those with high sensory innovativeness tend to seek greater stimulation of their senses and emotions. Also, sensory innovativeness is associated with visual processing and enjoyment of fantasy, whereas cognitive innovativeness encourages a taste for precision and intricacy in design, such as that found in high technology products. Sensory innovativeness may also be linked to a preference for sensuous, organic shapes and vibrant colors.

Design preferences may also be influenced by the need for uniqueness. In their book on the subject of uniqueness, Snyder and Fromkin (1980) argue that persons vary in their need to feel distinct from others. Because people classify others and themselves by the types of products they display and use, persons with high uniqueness needs tend to prefer novel or unusual products. The uniqueness of a product serves as a vehicle for differentiating the user from the majority of consumers. Design is a central element in differentiating unique from common products. Thus, consumers with high uniqueness needs should prefer distinctive product designs, even when there are significant costs involved. Hence,

$P_7$: The relationship between product form and psychological responses to that form is moderated by the perceived aesthetic fit between the product's form and individual design tastes.

$P_8$: Individual design tastes are a function of innate design preferences, cultural and social context, level of design acumen, experience with design, and personality variables.

## Situational Moderators of Consumer Response

As shown in Figure 1, situational variables moderate both psychological and behavioral responses to product form. The effects of situational factors are well established in consumer research (Belk 1975), and the subsequent sections discuss three variables in particular: sequence effects, social surroundings, and marketing program influences.

### *Sequence Effects*

In many instances, a product serves as one component of a consumer's larger assortment of goods, and reactions to a specific product design can be modified by perceptions of fit with this assortment. Forty (1986) posits that a design can be positively received in isolation, yet be ultimately disliked and avoided because of its poor fit with previously acquired objects. For example, a sleek European coffee maker may evoke positive responses in a store, but not be purchased because it does not mesh with a consumer's country kitchen. Industrial goods may also be selected on the basis of their visual fit within a preexisting factory or office environment.

Recently, several researchers have explored this moderating effect using the concept of ensemble (Bell, Holbrook, and Solomon 1991; Holbrook and Anand 1992). According to this perspective, the possession of one product affects the desire to own other objects. Designs that provide a pleasing aesthetic relationship with already owned objects will be positively appraised and vice versa. Bell, Holbrook, and Solomon (1991) argue that consumers evaluate ensembles of products, not in terms of individual components, but in terms of the aesthetic value of the group to which they belong. Research demonstrates preferences for apparel collections and furniture groups that are stylistically harmonious. Although the notion of ensemble has a clear connection to fashion products, it also appears to be relevant to a growing number of product classes. For example, the design of a stereo component, kitchen appliance, office desk, or computer monitor may be evaluated on its fit with equipment previously purchased.

$P_9$: The relationship between product form and psychological responses to that form is moderated by the perceived aesthetic fit between the product's form and that of other objects in relevant ensembles.

$P_{10}$: The relationship between psychological and behavioral responses to product form is moderated by the perceived aesthetic fit between the product's form and that of other objects in relevant ensembles.

### *Social Setting*

The social setting in which a design is encountered is another moderator of consumer response. Because a product's appearance helps shape the image of the user, opinions of referents can be a significant influence on consumers' design appraisals (Solomon 1983). Thus, the persons who are present during an encounter with a product, its purchase, or display may help shape a consumer's reactions to that object (Belk 1975). A consumer who might hold an unfavorable reaction to a particular form in private might express more positive responses in the presence of peers who express appreciation of the form, or vice versa. When a target segment is particularly susceptible to social influence (e.g., teenagers), it is imperative that managers and designers understand relevant group preferences so that design efforts are not nullified.



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$P_{11}$: The relationship between product form and psychological responses to that form is moderated by the social setting in which a product is encountered.

$P_{12}$: The relationship between psychological and behavioral responses to product form is moderated by the social setting in which a product is encountered.

### *Marketing Program Moderators*

Product reactions may also be shaped by the marketing program that surrounds the product. The portrayal of the product in advertising may complement and enhance the psychological responses to the product form itself. For example, a consumer may see an advertisement for a whirlpool tub that shows the fixture in a lavish bathroom complete with a romantic couple enjoying a bubblebath. The extent to which consumers recall this advertising when seeing the tub in a plumbing showroom may enhance responses evoked by the design of the tub.

Another potentially important moderator of consumer reactions is the manner in which distributors display the product. Even the most beautiful object may fail to delight if it is sold in a dirty, dimly lit store or department. In terms of ensemble effects, reactions to a particular design may also be moderated by reactions to products that surround it in a retail display. In apparel, effective coordination of goods into complete outfits can have a synergistic effect on evaluations of any one garment. Similarly, a sofa can elicit noticeably different responses depending on whether it appears on the warehouse floor of a discounter or as part of a well accessorized living room mockup in a full service furniture store. Recognizing the importance of display moderators, some design-oriented producers use in-store boutiques to more effectively control how consumers experience their designs.

Another moderating effect relevant to retail display can be inferred from research on physical attractiveness. One recent study found that exposure to photos of beautiful fashion models depressed attractiveness evaluations of average persons (Richins 1991). In other words, exposure to uncommon beauty appears to elevate aesthetic expectations. A similar effect can be posited for products. When a consumer has recently been exposed to products of extraordinarily fine design, subsequent evaluations of more typical goods may be depressed. Placing top of the line, superior design items in retail displays could depress consumer evaluations of retailers' "bread and butter" mid-range goods.

$P_{13}$: The relationship between product form and psychological responses to that form is moderated by the marketing program that surrounds a product.

$P_{14}$: The relationship between psychological and behavioral responses to product form is moderated by the marketing program that surrounds a product.

## Managerial Implications

### *Design and the Total Marketing Program*

There is general agreement that adaptability is a central element of marketing strategy success (McDaniel and Kolari 1987; Walker and Reukert 1987). A strategy that works one year may fail the next because of changing environmental conditions, thus, marketers attempting to use design as a strategic tool must be prepared to adapt designs as situations change. With shifts in technology and cultural variables, consumer perceptions of what is acceptable in product design may also change. Marketers must formally monitor the environment to identify as early as possible those shifts that are likely to influence design tastes. By reacting quickly to produce novel designs tailored to changing conditions, marketers will be able to maintain their position or possibly gain advantage over slower competitors. Recently, lengthy design cycles placed American car manufacturers at a disadvantage with respect to the Japanese, who allow less time to elapse between model updates.

The relationship between the Product Life Cycle (PLC) and design strategy also appears worthy of managerial attention. As a product moves through the PLC, the role of design may change. During introduction, a unique design may be essential to attract attention in a crowded market; later in the cycle, uniqueness in design may be eclipsed by other criteria, such as user friendliness or reliability. During the maturity phase of the PLC, design may again become significant in repositioning efforts or in emphasizing performance improvements. Again, adaptability and environmental monitoring will be useful in tailoring design elements to the life cycle context.

When considering the place of design in the marketing program, note also the interrelationships among products in a line. The design of one product often begets the design of another. Designers sometimes attempt to create a family of related designs just as Frank Lloyd Wright designed a series of Prairie Style houses in Oak Park, Illinois. With modern Computer Aided Design (CAD) technology, the ability to generate variations on a theme is readily available. These variations in design allow firms to serve several segments with relative economy. These variations also may span product classes, such as when computer printers are developed that complement the design of the base system (Nussbaum 1990b).

Marketers also must consider their overall aesthetic mix and the interdependence among its constituent elements. In addition to product design, the aesthetic mix includes the graphics used in promotions, the interior design of retail settings in which the product is sold, and the physical appearance of sales personnel. For greatest effectiveness, all of these elements must be considered together rather than in isolation. For example, Ralph Lauren offers a unified aesthetic suggesting "old money society" in the interior design of its Polo Boutiques, multi-page advertisement inserts, and designs for apparel and home furnishings. Southwest Airlines reinforces a casual, fun design theme by painting some planes as whales and attiring flight attendants in shorts outfits during the summer. Some firms seek a similar consistency of aesthetic elements, which extends to business cards and annual reports. In general, marketers must be aware that the design task does not end with the product.



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### *Responsibilities that Accompany Product Design*

For over twenty years, theorists have expressed concern that the Marketing Concept overemphasizes the short term satisfaction of individual consumers. In response to this concern, the Societal Marketing Concept was advanced as a modified philosophy requiring marketers to satisfy consumer needs in ways that preserve and enhance the well-being of society as a whole (Kotler 1994). As part of the marketing mix, product design also carries societal responsibilities. Stylistic and aesthetic objectives may need to be compromised to fulfill these responsibilities. For example, to produce a lawnmower that minimizes noise pollution, designers may need to clutter the design with a large muffler that detracts from the mower's appearance. Similarly, large refillable packages that encourage reuse may be beneficial to society as a whole, though they appear less attractive than compact single-use designs.

Raymond Loewy believed that designers also have an obligation to elevate the aesthetic sensibilities of the mass market (Loewy 1979). Similarly, Pye (1978) emphasized a designer's responsibility to people of the future and the long-term material culture. Because many products are extremely durable, poor design can bother our senses for decades. Everyone had seen a building that he or she wishes could be leveled because it seems ugly, yet such buildings will likely outlive our criticism.

Another complex issue questions whether consumer acceptance is in fact an appropriate goal of design. Many consumers initially resist a significant design change, yet come to embrace it years later, as in the case of component-style audio equipment. Some designers believe that their responsibility is not to please the mass of consumers, but to move design tastes forward. Placing this enlightenment function in the hands of designers remains a lofty and sometimes unrealized responsibility, however.

## Future Research Directions

### *Research on the Design Process and Constraints*

Based on the model and propositions introduced here, there are a number of promising directions for design research. One question that could be addressed is the role of channel members in the design process. Little is known about how distributors perceive the importance of design and how they compare it with other issues, such as promotional support from manufacturers. Researchers could also examine the extent to which producers consider channel members' interests in developing design constraints.

Another question worth investigating is the extent to which managers in different industries are aware of and consider the various constraints noted perviously. Are particular types of firms (e.g., high market share, high technology, high fashion) likely to consider a wider set of constraints during the design process than are manufacturers as a whole? In addition, organizational culture could be studied to determine whether companies with different management styles differ in their approach to designing products.

### *Research on the Consumer Responses*

Research is also needed to determine which product form elements trigger particular cognitive responses among consumers. Because product newness is a vital selling point, it would be particularly intriguing to discover the design attributes that trigger perceptions of newness among a variety of product categories. Such investigation could also determine the extent of change from previous designs that is necessary to be categorized as new. With computer scanners and CAD software, researchers can manipulate design elements with high levels of realism while attempting to identify newness triggers. The effect of the change rate on newness perceptions also warrants attention. Jaspersen (1986) argued that constant changes in product form in the pursuit of perceived newness may be counterproductive. Frequent change could alter consumers' expectations and lead to an increasingly demanding spiral of innovation.

Differences in newness perceptions based on freshness versus true novelty is another potentially rewarding research topic. Automakers, lighting manufacturers, and apparel firms frequently introduce new goods that have design elements drawn from the distant past. These "retro" form elements offer freshness because they are notably different from previous designs, yet the elements are not innovative (Lorenzo 1992). The question remains whether recycled older forms can rival the perceived newness of the truly original forms.

The erosion of perceived novelty over time is also worthy of study (Jaspersen 1986). Zajonc's (1980) mere exposure hypothesis predicts that with increasing exposure to a particular design, consumer reactions should become more positive. However, some authors (e.g., Jones 1991) suggest that there will be an erosion in perceived novelty after wide acceptance of a new form. Therefore, a design that is favorably received may lose its appeal if it becomes too common or overexposed. Successful new forms are often copied and become established or modal. When everyone offers a similar design, its perceived novelty may diminish, regardless of time on the market. A garment or sports coupe that once excited the senses will lose its marketplace support as the design cycle nears its end. Thus, researchers could try to model the satiation effect and changes over time in consumer reactions to a given design.

Despite the quest for newness, some product forms are perennially successful over decades or even centuries (Papanek 1984; Williams 1981). In these cases, consumers continually prefer the product's form over newer alternatives. Weber barbecues, Zippo lighters, rear-engine Porsches, and Beethoven symphonies are such cases. A producer associated with a classic design benefits greatly, both in long term sales and lower production costs. Therefore, another promising avenue of research concerns the characteristics of those designs that sell well over the years without noticeable form changes. Possible reasons for such success include symbolic meanings that hold continuing appeal, nostalgia among consumers, a highly efficient form that follows superior function, or strong fit with innate form preferences (Fishwick 1985; Holbrook and Schindler 1989). Long term appeal also occurs among forms that appear to improve with



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age, as do leather jackets, bluejeans, or copper gutters. Researchers could approach this problem by content analyzing the forms of both long run and transitory design successes. Gestalt laws pertaining to form itself could be examined here, as well as symbolic or performance features. Comparisons among multiple product classes may prove to be particularly insightful.

### Research on Consumer Tastes and Preferences

Also promising is further research exploring individual characteristics as moderators of design preferences. Some persons place disproportionate emphasis on the aesthetic characteristics of products. The challenge is to identify these persons and determine the scope of their design involvement. In examining this question, researchers must first develop reliable and valid instruments to assess design acumen and experience. It remains unclear whether such instruments would most profitably examine design acumen, per se, or some underlying trait concerning information processing. Previous work by Holbrook (1987) and Bamossy, Scammon, and Johnston (1983) can serve as useful starting points in this endeavor. In the process of developing such measures, researchers should also investigate the product specificity of design acumen.

Once researchers effectively measure design acumen, they can proceed to examine the extent to which design-focused consumers influence others and the forms this influence takes. In addition, it would be useful to determine predictors of concern with design. Researchers could investigate the importance of traits, such as product involvement (Bloch and Richins 1983; Zaichkowsky 1985), materialism (Richins and Dawson 1992), or market mavenism (Feick and Price 1986), as underpinnings for design acumen.

### Research Methods and the Study of Design

Firms vary in their reliance on consumer research during the design process. Kotler and Rath (1984) distinguished between design-driven firms that use little research and firms that are marketing dominated with strong ties to research data. Some critics lament that many of today's designs are too cautious and consensual. For example, Edsall (1991) suggests that sedans in the 1990s are nearly indistinguishable because automobile manufacturers are all receiving essentially the same market research data. In trying to balance a design focus with a consumer focus, some firms conduct non-traditional research. Sony management relies on social forecasting as input in the design process rather than standard design clinics. Sony believes that traditional market research is past-oriented rather than future-oriented and is less suitable for the creation of leading edge designs (Lorenz 1986).

When design research is undertaken, there are several methodological issues to be considered. Recently, conjoint analysis has been used extensively in evaluating product designs and the technique is associated with the relatively few studies of design issues that appear in marketing journals (Green, Carroll, and Goldberg 1981; Keeney and Lillien 1987; Page and Rosenbaum 1987). Under a conjoint approach, product forms are segmented into discrete elements or attributes, which are arranged into varying combinations. Evaluations of the different combinations enable researchers to determine preference weights for each form element.

Several researchers have criticized the conjoint approach to studying design reactions. Holbrook and Moore (1981) note that conjoint studies typically employ verbal descriptions of products, which are less useful than visual cues for examining design reactions. This problem is especially acute in situations that involve aesthetic elements of form. Huber and Holbrook (1981) further suggest that photos are superior to line drawings for developing research stimuli. As noted previously, it is likely that the availability of color scanners and computer rendering software will allow conjoint approaches to increasingly employ sophisticated visual stimuli in place of verbal descriptions.

Holbrook and Moore (1981) also argue that conjoint techniques are more appropriate as the study of utilitarian product features than for aesthetic elements. Compared with such attributes as price, weight, or speed, the aesthetics of a product are more difficult to isolate. Many believe that aesthetic impressions relate to a unified configurative Gestalt rather than to a sum of individual elements. Accordingly, objects should be examined as cohesive wholes, not as combinations of discrete elements. Hence, when interest focuses on aesthetic aspects, conjoint analysis should use real products or realistic product prototypes rather than mere verbal descriptions. (For examples of studies that have used real stimuli in the study of music forms, see Holbrook 1981; Holbrook and Havlena 1988; Kellaris and Kent 1993.)

Finally, Hirschman (1983) questioned the use of conjoint analysis because of its emphasis on rational choice. She argues that responses to products are typically quite emotional, and feelings may be more appropriate as dependent variables. Consumers often characterize a given product form using subjective terms such as "cute," "boring," "macho," or "sexy." Thus, researchers may benefit from considering qualitative approaches to the study of design reactions. Encouraging consumers to express the feelings engendered by a particular form may provide a rich source of insights. Researchers could ask consumers to talk about products they consider to be beautiful and those they find undistinguished or ugly. Other questions might explore the ways in which people enjoy beautiful goods. Responses to these types of questions may prove to be an important addition to experimental, survey, and conjoint approaches. In studying design, researchers may find great success by employing a portfolio of holistic and atomistic, traditional and interpretive approaches.

## Conclusions

Seeking the "ideal" form for a product remains a significant goal for both designers and marketing management. The ideal form is a theoretical concept, however, similar to a vanishing point in the distance. It is unlikely that a designer will ever produce the ideal form for a given product. What, then, is the appropriate outcome of the design process? Based on the model presented here, the ideal form is that form which is superior to alternatives in its ability to evoke positive beliefs, positive emotions, and approach responses



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among members of the target market. This form will be sympathetic with consumers' aesthetic tastes and will complement their existing assortment of goods.

The ideal product form must accomplish all of this, while simultaneously satisfying numerous design constraints. The form must be superior in its quality, performance, ergonomic efficiency, "manufacturability," and safety. It must adhere to all applicable regulations, complement other elements of the marketing program, and meet cost targets. Seeking the ideal form remains a challenge, but one with a significant payoff. Trade-offs and conflicts among the different ideals of designers, marketers, production people, and engineers may enhance the overall outcome of the process, leading to more successful products. Conflict may purify a design by working out its "bugs" and ultimately improving the product. Even after a form is developed, marketers and designers must constantly evaluate it in hopes of making continued progress toward the theoretical ideal. As in biological settings, products should evolve over time in pursuit of optimal suitability for marketplace conditions. Although the ideal form may never be reached, its pursuit will yield benefits to the marketer.

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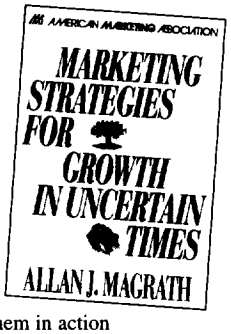


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