URBAN DESIGN AESTHETICS
The Evaluative Qualities of Building Exteriors

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ABSTRACT: Design reviewers make judgments based on their opinion of how physical features influence the evaluative quality of the building and its surroundings. What features evoke favorable evaluative responses? Although some people may view aesthetics as qualitative and idiosyncratic, researchers have continued in their search for general principles. This article reviews that research, with particular attention to building exteriors. The article defines and examines three kinds of aesthetic variables—formal, symbolic, and schemas. It highlights the importance of enclosure, complexity, and order as formal variables, of style as a symbolic variable, and of atypicality in relation to schemas. It discusses the relationship of these variables to evaluative response. As different kinds of evaluative responses may be appropriate and desirable for different kinds of places, this article considers the dimensions of evaluative response. The analysis suggests that design review seeking pleasantness should encourage order, moderate complexity, and elements of "popular" styles; design review seeking excitement should encourage high complexity, atypicality, and low order; and design review seeking calmness should encourage high order and naturalness. Acknowledging potential variability across contexts, this article offers aesthetic programming and evaluation as alternate ways to develop and refine guidelines for design review.

New buildings and changes to existing buildings affect the quality of the streetscape. If the individuals altering and delivering buildings produced pleasing results for the public, society would not have opted for design guidelines and design review. Unfortunately, this has not been the case. Design professionals and others involved in both large-scale and small-scale new construction and renovation create public eyesores.

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Concerning large-scale projects, there has been repeated evidence of architects' aesthetic failures (Blake, 1974; Gans, 1974). Research has also shown a rift between what architects like and what the public likes (Devlin & Nasar, 1989; Groat, 1982; Hershberger, 1969; Nasar, 1989b). For example, in one study in which architects and other professionals evaluated 40 houses, the architects most liked the designs that other professionals liked least and vice versa (Devlin & Nasar, 1989). The disparity between design professionals and the public becomes more critical for many large-scale projects in which the client and the user differ, and the designer has little contact with the users.

The potential mismatch of designer and lay preferences is only part of the problem. Design review often deals with small changes (such as a new retail sign, a room addition, or new siding), made without the involvement of a design professional. Other parties to the development process—such as developers, institutions, landlords, homeowners, renters, and merchants—make these choices. In seeking a personal benefit (such as visibility, or reduced cost), they may produce solutions undesirable to the community.

Design controls, such as design guidelines or design review, attempt to control individual acts for the good of the community. Designers, policy makers, and the public agree on the importance of controlling building appearance. U.S. courts have held aesthetics alone as an adequate basis for public controls (Pearlman, 1988). Thus design guidelines and design review have a practical, popular, and legal ground for shaping the design of public places to be more enjoyable. To succeed in this goal, design controls, whether discretionary or administrative, must be based on appropriate appearance guidelines, informed by research.

According to the conventional wisdom, the variability in preference across time and individuals precludes the development of such guidelines. Yet research has repeatedly confirmed commonalities in architectural preferences (Hershberger, 1969; Nasar, 1988a; Wohlwill, 1976). The research reveals certain visual features likely to elicit certain kinds of affective responses. This article reviews some key findings of the research. It first

delineates the domain of concern—urban design aesthetics—and describes a theoretical framework for aesthetics. Then it discusses the empirical findings on urban design aesthetics. It concludes with recommendations for urban design appearance guidelines and a description of a process—visual quality programming—for deriving appearance guidelines for specific contexts.

URBAN DESIGN AESTHETICS DEFINED

Urban designers formulate policies to shape the physical and spatial character of development. This includes a variety of kinds of development, such as large-scale private sector development, public conservation of the environmental quality of communities, and low-cost neighborhood improvement by citizens (Appleyard, 1982; Shirvani, 1985). The development may occur in a variety of urban and nonurban settings, including central business districts, small town commercial strips, neighborhoods, industrial parks, and mixed-use developments. In each case, *urban design* attempts to shape the character of "the exterior of . . . buildings outward" (Shirvani, 1985, p. 6). Thus even the development of a sign ordinance represents an urban design activity. Because the public face of buildings and development comes under public controls such as design review (Pearlman, 1988), this article examines the public appearance of buildings.

In dealing with the public appearance of buildings, design review should attempt to control the visual character for the public good. This aim fits with the way psychologists have operationalized *aesthetic response*. They define aesthetic response as favorable emotional appraisals or evaluations (Ulrich, 1983; Wohlwill, 1974). By focusing on favorable evaluations, this definition suspends consideration of certain "art" that people may dislike but consider a work of "art." Nevertheless, the definition fits the urban design situation, in which the creation of enjoyable buildings and places for the public represents a realistic aim.

The pursuit of enjoyable surroundings does not imply uniform design criteria to make all buildings and places pleasant. Evaluative response has been found to consist of three components: pleasantness, excitement, and calmness (Nasar, 1988b; Russell, 1988; Ward & Russell, 1981). Pleasantness is pure evaluation. Excitement and relaxation are mixtures of evaluation and arousal/activity. Exciting places rouse higher levels of pleasantness and arousal than do boring places. Relaxing places evoke higher levels of pleasantness and calmness than do distressing ones. If design review aimed for pleasantness everywhere, the broad result might be monotonous. As an alternative, design review should strive to elicit the emotional quality (pleasantness, excitement, or relaxation) appropriate to the social and physical context. As in the graphics code that promoted excitement for development in New York's Times Square, different criteria or guidelines should apply for different building types, contexts, and goals. Thus, in looking at design review aesthetics, this article considers preference, excitement, and calmness.

A THEORETICAL FRAMEWORK

Figure 1 shows a model of aesthetic response in relation to buildings. The aesthetic response results from an ongoing interaction between active humans and their environment. It may vary with biology, personality, social and cultural experience, goals, expectations, associations, internal constructs, and environmental actors (Sonnenfeld, 1966; Wohlwill & Kohn, 1973; Zube, Pitt, & Evans, 1983), but, as we will see, it also has some commonalities across individuals.

The arrows in Figure 1 have probabilities associated with them. Given a set of circumstances (a point in time, a specific group of humans, certain affective states and intentions), aesthetic response has probabilistic relationships to building properties. Perception of the physical properties has probabilistic relationships to the actual physical properties present. Cognition has probabilistic relationships to perception.

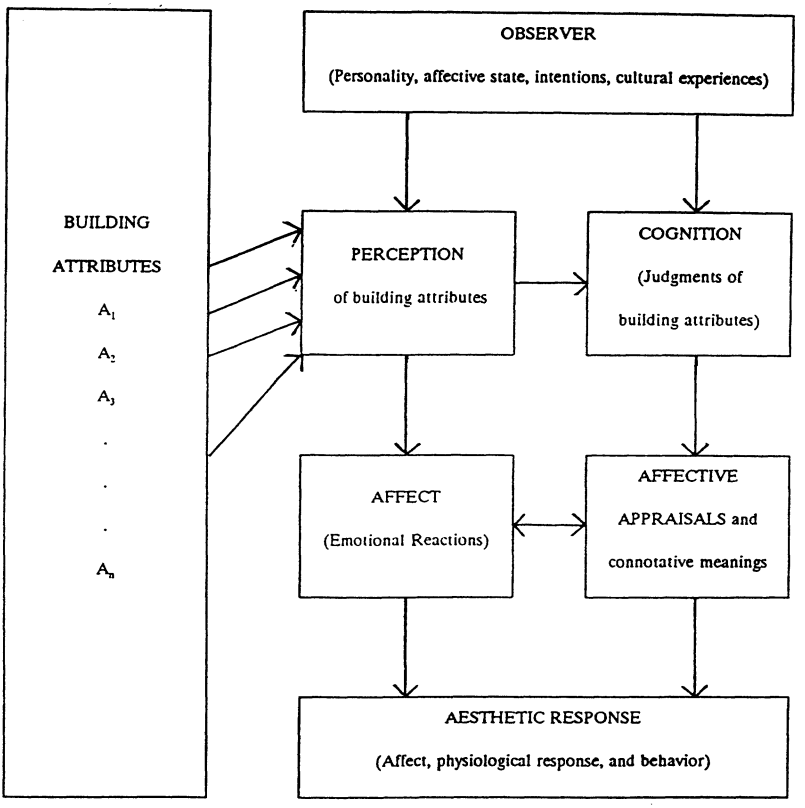

Figure 1: A Probabilistic Model of Aesthetic Response

There has been considerable debate about whether humans can experience emotional responses independent of and before recognition or cognition. Zajonc (1984) presented convincing evidence that rapid initial emotional responses to gross environmental characteristics can occur independent of and before cognition. Certain kinds of aesthetic responses, particularly those referred to in this article as "formal," may well precede and occur independently of cognition. In Figure 1, the arrow from "PERCEPTION" to "AFFECT" shows this kind of affective response as having direct probabilistic relationships to perception.

Researchers agree and the empirical record confirms that cognition also affects emotion (Lazarus, 1984; Zajonc, 1984).

The cognition need not involve rational calculation. It can involve categorization and inference without conscious thought and metaphoric responses as a result of a schema (Kaplan, 1988; Neisser, 1976). Certain kinds of aesthetic responses, such as those called "symbolic" herein, may reflect this cognitive component. In Figure 1, the arrows from "COGNITION" to "AFFECTIVE APPRAISALS" and from there to "AESTHETIC RESPONSE" show the probabilistic relationship of aesthetic response to cognitive processes.

TWO KINDS OF AESTHETIC VARIABLES

The previous discussion suggests two kinds of building features as relevant concerns for urban design aesthetics: those that relate to the *structure* of forms for their own sake and those that relate to *content* of forms. The study of the structure of forms has been called *formal aesthetics*, and the study of human responses to the content of forms has been called *symbolic aesthetics* (Lang, 1988).

Attributes of formal aesthetics include shape, proportion, rhythm, scale, complexity, color, illumination, shadowing, order, hierarchy, spatial relations, incongruity, ambiguity, surprise, and novelty (Groat & Despres, 1990; Lang, 1988; Wohlwill, 1976). Although architectural discussion of formal aesthetics often neglects human experience (Groat & Despres, 1990, pp. 32-33), my use of the term encompasses human responses to the formal attributes.

Concerning symbolic aesthetics, humans experience building exteriors through mediating content variables. These variables relate to but are not defined solely by physical attributes. These content variables reflect the individual's internal representation of the building and meanings associated with that representation and building. Some judgments place objects into content categories without evaluating them. Such judgments have *denotative* meaning. For example, when an observer classifies a building into content categories by type (such as

bank, courthouse, or prison) or style (such as modern or traditional), this represents a denotative meaning.

Other judgments refer to inferences about the quality and character of the building and its users. For example, a person might judge one building as looking friendlier than another. Such judgments represent *connotative* meanings. Content variables can have both denotative and connotative meanings. For example, an observer can recognize a style (its denotative meaning) and like the style (its connotative meaning). In the present article, symbolic aesthetics refers to the latter set of meanings. In particular, it refers to favorable connotative meanings associated with the content of the formal organization. Thus symbolic aesthetics depend on a cognitive process in which the individual recognizes a denotative meaning (the content of the formal structure) and infers connotative meaning about it. For architecture, style represents an important symbolic variable.

What makes a set of designs recognizable as a style? According to Norberg-Schulz (1965), when we first experience an example of a particular formal structure, it stands alone and lacks meaning as a formal structure. As we experience and interact with other examples of the same or similar formal structures, we categorize them internally in terms of similarities and dissimilarities. The probability that we will recognize a formal structure as a style depends on two things: the frequency with which we have encountered various formal structures and the degree to which the building has the probable attributes and relations of the style.

Research confirms that people recognize styles and that those styles have formal properties associated with them (Devlin & Nasar, 1989; Espe, 1981; Groat, 1982; Wilson & Canter, 1990). The connotative meaning of and aesthetic response to a style depend on the viewer seeing a style or "characteristic formal organization" and on the fit of the style to the viewer's expectations in relation to the building type (Norberg-Schulz, 1965).

Formal and symbolic variables interact. On the one hand, we have seen that a particular set of formal variables takes on

stylistic content. On the other hand, stylistic content, by organizing experience, can affect judgments of formal properties. Consider the formal variable complexity. An observer might judge the complexity in a recognizable style as lower than a similar level of complexity in an unrecognizable style. As most research treats formal and symbolic variables separately, the following sections review the findings on each in separate sections.

FORMAL AESTHETICS

Of the formal variables that researchers consider as relevant to aesthetic response (Berlyne, 1971; Kaplan & Kaplan, 1982; Nasar, 1989a; Wohlwill, 1976), several have emerged as prominent in humans' experience with their physical surroundings (Garling, 1976; Geller, Cook, O'Connor, & Low, 1982; Horayangkura, 1978; Herzog, Kaplan, & Kaplan, 1976, 1982; Nasar, 1988b; Oostendorp, 1978; Oostendorp & Berlyne, 1978a; Ward & Russell, 1981). They include

- enclosure (openness, spaciousness, density, mystery)
- complexity (diversity, visual richness, ornamentation, information rate)
- order (unity, order, clarity)

This article centers on these variables because of their relevance to human environmental experience.

The research on enclosure and related variables suggests that people prefer defined open space to wide-open spaces or highly enclosed spaces (see Kaplan & Kaplan, 1989; Ulrich, 1983). However, other variables relating to the surface and shape of buildings have more relevance to design review than do these spatial variables. Therefore, the discussion of formal variables concentrates on complexity and order.

Complexity involves a comparison in which more independent elements, larger difference between them, and less redundancy and pattern produce greater complexity. In relation to the environment, researchers have replaced the term com-

plexity with *diversity*, or *visual richness*. Wohlwill (1976) used the term diversity to differentiate complexity from structural organization (sometimes called structural complexity). Kaplan and Kaplan (1989) refer to visual richness to suggest the removal of negative contents of environmental complexity, such as clutter and other factors that reduce order. The present article uses complexity to refer to diversity and visual richness.

Order refers to the degree to which a scene hangs together or makes sense (Kaplan & Kaplan, 1989). Several formal variables, including familiarity, redundancy, and compatibility may affect perceptions of order. People experience familiarity, as a formal variable, when an instance fits their experience with similar elements, relationships, and compositions; redundancy represents elements or combinations of elements that occur more often than others. Compatibility represents low contrast between the elements or between the building and its surroundings. Several symbolic or content variables may also affect judgments of order because they help organize the scene. For example, both style and naturalness may contribute to order.

Psychological theories on aesthetics (Berlyne, 1971; Gaver & Mandler, 1987; Kaplan & Kaplan, 1989; Wohlwill, 1976) differ in their emphasis on cognitive factors and arousal, but they agree on certain predictions: Increased complexity or atypicality evokes interest. Increases in order decrease interest but increase preference. Moderate levels of complexity or atypicality with high order evoke high preference.

According to Berlyne (1971), interest increases with uncertainty and arousal generated by complexity, and preference has an inverted U-shaped relationship to arousal. It increases with arousal up to a point (peaking at a moderate level of arousal) and then decreases at higher levels of arousal. In a low arousal state, individuals should favor increased uncertainty through reduced structure and increased complexity. In a high arousal state, individuals should favor reduced uncertainty through increased structure and decreased complexity.

Kaplan and Kaplan (1982) replace arousal with information-processing. According to this theory, humans prefer places that are involving and make sense or promise to make sense. More

specifically, individuals should prefer complexity or mystery for their involving qualities. As these variables are involving, they should also evoke interest. Concerning making sense of the environment, individuals should prefer legibility or coherence. These variables help make places understandable. Because of the importance of wayfinding in real environments, these sense-making variables should have a greater impact on preference than do complexity and mystery. For the same reason, the anticipation of information (from coherence or mystery) should have a greater impact than available information (from legibility or complexity).

What does the research record show? Most studies confirm an increase in interest associated with complexity (Nasar, 1983, 1987; Oostendorp, 1978; Oostendorp & Berlyne, 1978a, 1978b; Wohlwill, 1976). For example, in on-site responses to 20 buildings in Toronto, interest increased with complexity (Oostendorp, 1978). Nasar (1983, 1987) found interest (or the related variable excitement) to increase with complexity for two sets of 30 Pittsburgh housing scenes and with complexity of retail signscapes. Purcell and Nasar (1992) found increases in interest associated with increased discrepancy or atypicality of buildings.

The findings on preference and complexity have been less consistent, but this may result from artifact. Some studies have found preferences to vary with the complexity of various content categories (Herzog et al., 1976, 1982; Kaplan & Kaplan, 1989; Whitfield, 1983; Wohlwill, 1974). Others have found linear relationships between complexity and preference (Devlin & Nasar, 1989; Geller et al., 1982; Herzog et al., 1976; Kaplan, Kaplan, & Wendt, 1972; Nasar, 1983, 1984; Wohlwill, 1974). A variety of artifacts may confound these results. Categories differ from one another in content and other factors beyond complexity. The use of the same observers to rate both complexity and preference may confound the interpretation of relationships between the variables. Some samples of natural scenes lack enough complexity to get a downturn in preference. In some samples of scenes, other variables, such as land use intensity, that affect preference may naturally covary with complexity. Finally, many studies fail to test for nonlinear relationships.

Several studies have tried to control for these artifacts. They have examined complexity independently *within* content domains and have tested for nonlinear relationships. These studies have found preference associated with moderate complexity. For example, in a study using a variety of scenes independently scaled for complexity, Wohlwill (1976) reported finding the expected inverted-U-shaped function between complexity and preference. Similarly, for a set of urban scenes independently scaled for diversity, he found preference to be highest for moderate complexity (Wohlwill, 1974).

Two other studies experimentally manipulated complexity while controlling for extraneous effects often present in photographs of real places. In each, people responded most favorably to moderate complexity. In one of these studies, researchers filmed a model of a street manipulated for complexity and found the expected preference for moderate complexity (see Wohlwill, 1976). In the other, Nasar (1987) obtained evaluative responses to retail signscapes at three levels of complexity. Respondents liked the scene with the moderately complex signscape best.

Now consider order. Most studies confirm preference for organizing variables (such as order, coherence, fittingness, congruity, legibility, and clarity). The Kaplans (1989) cited several studies in which organizing variables such as legibility, identifiability, and coherence predict preference. Ordering variables, such as clarity or low contrast, have emerged as preferred features of the cityscape and key variables preferred in both urban street scenes and housing scenes (Devlin & Nasar, 1989; Nasar, 1984, 1987, 1990). In a study using photos of architectural exteriors from around the world, Oostendorp and Berlyne (1978a) found preference associated with order. This finding has generalized to on-site responses and building exteriors (Oostendorp, 1978). Wohlwill (1982) found preference related to increases in the congruity of buildings to their natural surroundings, Groat (1982) found preference related to increases in the compatibility of buildings to neighboring buildings, and Nasar (1987) found preference related to increases in the compatibility of retail signs to their surroundings. In sum,

for pleasantness, design review might encourage moderate diversity (visual richness) or atypicality within coherence (clarity, compatibility). For interest or excitement, design review might try to encourage high diversity and low coherence.

Complexity and order represent broad constructs. As design review addresses specific features of buildings and sites, reviewers need to know how changes in specific features relate to the broader constructs. Unfortunately, few studies have examined the physical bases for people's judgments of complexity or order, and few studies have made the environmental referents explicit. Complexity has a clear environmental referent—the number of different elements and the contrast between them. Although these features could be measured directly, studies often rely on trained observers' ratings of complexity. Do the number of elements and contrast affect judged complexity? One study suggested that they do. It showed that variation in the size, color, placement, and angles of signs affected judgments of complexity in the expected way (Nasar, 1987). Presumably, ordering factors such as compatibility and style may reduce perceived complexity, but the actual effects of these factors on perceived complexity has not been adequately tested. Research does suggest, however, that low contrast between elements or between objects and their context, and identifiability via a focal point do enhance order (Nasar, 1987; Ulrich, 1983; Wohlwill, 1982). In addition, Groat (1984) found that replication of facade features (such as materials, total shape, roof line, height, and windows) affected judgments of contextual fit (an ordering variable). Groat (1988) also found that, unlike designers, the public notices the facade more than massing and space. This suggests that design review for complexity or order should stress the character of the facade.

SYMBOLIC AESTHETICS

An individual's experience of a building depends on an interaction between its features and the individual's knowledge structures of experience related to the particular class of build-

ing. Through interacting with the environment and developing knowledge structures, individuals from different places, cultures, and subcultures would develop different meanings and preferences across content (or symbolic) categories. Several content variables have emerged as salient in humans' experience of their environment (Garling, 1976; Geller et al., 1982; Herzog et al., 1976, 1982; Horayangkura, 1978; Nasar, 1988a; Oostendorp, 1978; Oostendorp & Berlyne, 1978a; Ward & Russell, 1981). These variables include

- naturalness
- upkeep
- intensity of use
- style

Research confirms differences in aesthetic experience across the categories. The first three variables—naturalness, upkeep, and intensity of use—fit under a more inclusive variable involving comparisons between natural and artificial influences. Many studies have found artificial content (such as poles, wires, signs, vehicles, dilapidation, and intense uses such as industry) to depress preference (Anderson, Mulligan, Goodman, & Regen, 1983; Appleyard, 1981; Cooper, 1972; Herzog et al., 1976, 1982; Marans, 1976; Nasar, 1983, 1984, 1987, 1990; Winkel, Malek, & Thiel, 1970; Wohlwill, 1982). They have also confirmed a preference for the natural over the artificial (Kaplan & Kaplan, 1989; Nasar, 1983, 1984). For example, Thayer and Atwood (1978) found that the addition of natural material to urban areas increased preference. Others have documented a relaxing and restorative value of nature (Ulrich, 1984; Ulrich et al., 1991). The preference for nature may relate to other untested factors (such as foliage, or formal instead of content aspects of natural materials). Nevertheless for design review, increases in natural elements (trees, shrubs, water) and the removal or buffering of nuisances and artificial elements with nature might contribute to preference and relaxation.

Now consider style. Figure 2 shows six homes that vary in style. Research on style has found differences in response as

a function of style. This confirms style as a content variable that conveys meanings. For example, Nasar (1989b) found that respondents made judgments about the character of the residents from looking at the houses shown in Figure 2. Across four U.S. cities, three different sets of housing stimuli and response measures, several studies of house styles (Langdon, 1982; Nasar, 1989b; Tuttle, 1983; Whitfield, 1983) converge on the desirability of vernacular over high (or modern) styles. In particular, these studies showed popular preferences for farm and tudor style houses. The findings of stylistic preferences do not imply that design review should require replication of the desired styles. Instead, design review could encourage variety within certain cues to the style.

The experiential model suggests that stylistic meanings vary with individual experience and building types. Various studies have confirmed idiosyncrasies in response related to experiential factors (Gifford, 1980; Nasar, 1989a; Snodgrass, Russell, & Ward, 1988; Wohlwill & Kohn, 1973). Humans also regularly group buildings into content categories (Groat, 1982; Herzog et al., 1976, 1982), attend to denotative meaning, or building type—school, or store (Tversky & Hemenway, 1983), and base evaluations on those categories (Groat, 1982; Michelson, 1976). Building type and experience may act as moderating variables setting the condition under which the observer prefers certain styles. Thus, for example, Nasar (1989b) found differences in symbolic meanings of house styles across various sociodemographic groups, and Nasar and Kang (1988) found symbolic meanings of office styles to differ from those for single-family house styles. In response to such variability, design review must consider the relevant environmental content categories and associated preferences for formal and symbolic attributes. Although people infer connotative meanings from stylistic content, meanings may vary with experience and the context. Nevertheless, the findings suggest that to achieve pleasantness design review should encourage the use of cues from popular or vernacular styles.

Figure 2: Six Houses of Different Styles (clockwise from upper left: farm, contemporary, spanish, tudor, salt box, and colonial)

Source: Renderings courtesy of Home Planners, Inc., Tucson, AZ. Complete plans available. 1-800-322-6797.

A MERGING OF FORMAL AND SYMBOLIC AESTHETICS: TYPICALITY

One theory replaces the formal variables complexity and order with one construct—typicality—that blends formal and symbolic variables. According to this theory, knowledge struc-

tures (or representations in memory) for the built environment develop through an active process in which individuals select and organize from experience (Mandler, 1984). Confronted with a new building instance, individuals test it against their knowledge structure for that category of building. If they find a discrepancy, they may do one of three things: expand their knowledge structure to include the instance, place the instance in a different category, or create a new or fuzzy category. This theory predicts and research confirms that, within a category, instances should vary in typicality from best to worst examples of the category. For example, Figure 3 shows two houses varying in typicality, with one representing a good example and the other representing a bad example of the category house. Research has found homes, churches, and natural scenes to vary in judged typicality (Purcell, 1984, 1986; Purcell & Nasar, 1992), and it has found perceived typicality to relate to style (Purcell & Nasar, 1992).

In theory, humans find familiarity, typicality, or a fit to a knowledge structure to be pleasant. As discrepancy increases, positive feelings increase up to a point, after which they dwindle. As in Berlyne's (1971) theory, this model posits preference as a product of cognitive comparisons, moderate arousal, and interest. Atypicality explicity deals with the interaction between content, such as style, the character of the building instance, and the mind of the observer. The model also suggests a way to achieve, for building facades, the qualities of involvement and coherence cited by the Kaplans (1982). By organizing experience, a fit to knowledge structure increases coherence. Moderate mismatches evoke involvement because they promise additional information through cognitive activity to classify the mismatch. Extreme discrepancies would lose involvement when they no longer made sense. They would also be disliked as chaotic. Moderate discrepancies, the most preferred, may offer involvement (moderate atypicality) within coherence (a recognizable knowledge structure) or variety within order. Although research on responses to environmental typicality has been limited, studies of churches and single-family homes provide tentative support for the theory. They revealed higher

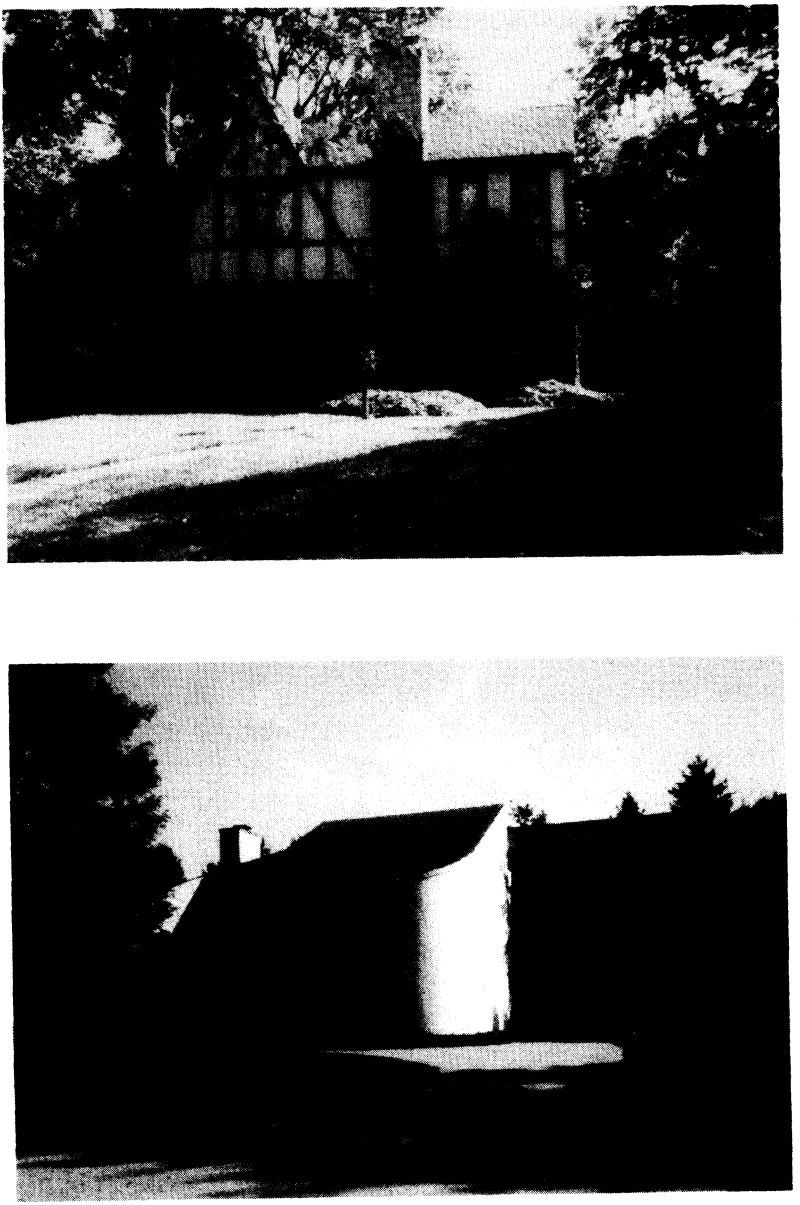

Figure 3: Houses Varying in Typicality—One Good Example and One Bad Example of the Category House

preferences for moderate discrepancies from the best examples (Purcell, 1986; Purcell & Nasar, 1992).

LIMITATIONS

There are limits in applying the empirical findings to design review. Design review must deal with long-term experience and the experience of individuals moving through space, but most studies neglect these factors. They use cross-sectional data and responses to static scenes. These shortcomings raise important questions for the development and use of design guidelines based on the research.

LONG-TERM EXPERIENCE

The results from cross-sectional data may not predict long-term patterns of response. Initial reactions to a building may change over time for an individual or over generations for a population. On this basis, some may conclude that the cross-sectional findings are irrelevant. They may point to initial negative reactions to popular designs such as the Eiffel tower. We need better evidence than such anecdotal arguments. As Gans (1974) pointed out, such arguments selectively compare the successes of high culture with the failures of popular culture. Without a full comparison, including both high culture failures and popular culture's successes, we lack an empirical basis for comparing the quality of the products from high culture values and popular values. Researchers have begun to apply the scientific method to longitudinal data on aesthetics. Although serious questions remain about long-term effects, the cross-sectional results find some support in the longitudinal studies. Looking at longitudinal data for music, Simonton (1984) found moderate complexity or atypicality (labeled novelty) associated with long-term success, as measured by frequency of performance over time. Of more relevance to design review, Rapoport's (1990) cross-cultural and longitudinal study of public spaces identified complexity as a desirable

feature. Design review could benefit from further inquiry into long-term patterns.

MOVEMENT

The static nature of scenes in most studies neglects the important influence of human movement through place on their experience of the place. For example, for an observer moving at 55 miles per hour, judgments of complexity would be affected by large-scale elements (such as full buildings). For an observer moving at walking speed, the relevant information may come from smaller-scale details, such as an ornament. Movement through the environment can also introduce surprise: Movement can set up an expectation that is then disrupted to create surprise. In theory, people should prefer surprise, like complexity, at moderate levels (Wohlwill, 1976), but surprise has not been adequately tested. Similarly, the Kaplans (1989) have examined the effect of deflected vistas (mystery) on preference and interest, but all of their studies have relied on responses to static stimuli. We do not know whether this pattern of response would apply to someone moving through a deflected vista.

AESTHETIC PROGRAMMING AND EVALUATION

The shortcomings point to a need for further inquiry toward the development of guidelines reflecting real experience. In addition, the effects of review guidelines on building products and human responses should undergo regular systematic evaluation. Through such testing, design reviewers can improve the guidelines and strengthen the knowledge base for design review.

As an alternative to using general prinicipals gleaned from research findings, design review could use *aesthetic programming* to develop guidelines for specific situations. Aesthetic programming would involve the applied study of visual qualities desired for the particular context and population under ques-

tion. The programmer would investigate, develop, gather, and organize information to produce an aesthetic program. The program need not specify *the* solution. It could present guidelines within which the solution must operate. To develop an aesthetic program, a variety of approaches could be employed. The programmer must make methodological decisions about respondents, stimuli, measures of environmental features, and measures of aesthetic response. These would involve tradeoffs between practicality (time, resources, and convenience), external validity (the degree to which the results apply to the population, settings, and measures of interest), and internal validity (the degree to which rival hypotheses about causal relationships between variables can be eliminated). A more detailed discussion of methodological issues can be found in texts on environmental design research methods, such as Zeisel's (1981) *Inquiry by Design*. Briefly, with an eye toward application, the programmer should seek realistic and relevant stimuli and measures, while minimizing loss of control of extraneous variables. Respondents should typify those who will experience the building. Multiple measures of aesthetic response should be used and they should tap pure evaluation, excitement, and relaxation. As for the stimuli and experimental manipulation of physical features, "image capture technology" has its merits. It allows the programmer to digitize and alter scenes to produce realistic photo-quality simulations (see Vining & Orland, 1989).

RECOMMENDATIONS AND CONCLUSIONS

Although the present research on building aesthetics has limitations, it reveals shared preferences and processes underlying aesthetic response. It suggests directions for design and a set of physical and human characteristics worth further attention. Serious questions remain, but the research points to certain formal and symbolic attributes that will likely enhance urban design aesthetics. Design review need not produce

Figure 4: A Scene With Many Preferred Attributes

uniformity and boredom. It can encourage variety by having different criteria for different context.

For pleasantness, design review might encourage

- ordering elements (compatibility, connections to the typical, and styles or stylistic elements that appear to fit a purpose)
- familiar and historical elements
- moderate complexity
- moderate discrepancies from the prototypical
- popular over "high" styles
- reductions in artificial nuisances (traffic, dilapidation, litter, billboards, poles and wires, and incompatible land uses)

Figure 4 shows a scene that has many of these elements. The houses are compatible with one another, they refer to typical styles, they use familiar and historical elements, they have moderate complexity, they use popular styles, and they have vegetation and an absence of nuisances.

For interest and excitement, design review might encourage higher complexity and higher atypicality.

For relaxing places, design review might encourage natural materials, ordering elements, and familiar elements.

These recommendations should not be seen as final but rather as hypotheses to carry out and test. Aesthetic programming and evaluation represent processes that can go beyond the general guidelines to generate practical directions for specific projects and a database for future guidelines. With the careful development of criteria based on the research or programming and systematic evaluations of the effects of the guidelines, design review can be refined to satisfy goals for community appearance.

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