THE ARCHITECTURAL CONNOTATIVE MEANING OF BUILDINGS AND ITS RELATION TO BUILDING CHARACTERISTICS

by

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"Field, wood, and garden
were to me only a space,
until you, my beloved,
transformed them into a place".

Goethe

Con cariño para
Quety y Daniel

CHAPTER I

INTRODUCTION

Social Acountability of the Design Professions

Society is forcing design careers to change their social - role. The demand exists for designers to go beyond their traditional responsibilities of providing shelter for human activities within certain aesthetic, functional, and economical principles. It is a demand to accept a more sensible and accountable role in relation to the considerable social and psychological effects that the presently built environment has on people. In its more general sense, this can be interpreted as a request by society and architects alike to create an enjoyable, adaptable, stress-relieving architecture, as opposed to an art-based architecture that may eventually become an additional source of enviromental stress (Rapoport and Hawks 1970).

Architectural Meaning

This role requires design careers to focus on a new perspective, and brings up a great number of questions and implications seldom explicity contemplated by designers before. One -- such question is: how do people perceive, interpret and classify architectural objects encountered in the environment? How do people attribute meaning to architectural stimuli?

Definition

Often in architecture, words like expression, symbolism, - message, intention and context are used with an equivalent meaning. For some designers, meaning is a mental phenomenon, for -- others it is a function of form, and for others, meaning is - - something inherent in architectural objects (Hershberger 1969). None of these conceptualizations interpret the way meaning - - will be regarded in this study.

In this study meaning is conceptualized as a characteristic attributed by people to a mental representation of an architectural object, a characteristic that may, or may not, coincide with reality, or with the intentions of the designer. As - - Hershberger (1969) explains.

> "The forms, spaces, colors, etc. of buildings do not contain any meaning whatsoever. Architects intend meaning for what they design; laymen attribute meaning to what they experience."

Meaning can also be regarded as part of a communication -- process (Dorfles 1970) in which users try yo interpret a mes- - sage "encoded" in the architectural object. The message should contain information about the nature and the function of the object, how to use it, etc. People (consciously or unconsciously) will look for this message, regardless of whether or not the designer intended to send it, or how clearly it is sent, because it is part of the information necessary to understand, use, -- and-if possible- enjoy the environment.

In this study, meaning in architecture will be understood as the interpretation of a message conveyed by the characteristics of the mental representation of an architectural object resulting in the attribution of some purpose, use, value, or identity to the real object.

Reasons for Concern

The relevance of the study of meaning in the environment - has been stated by a number of researchers in different areas. Kevin Lynch (1960) indentifies three major components of an - - "environmental image": identity, structure, and meaning. al---- though he studied only the first two, the influence of meaning was confirmed in latter studies by Appleyard (1969) and Steinitz (1968). Appleyard suggests:

> "all elements in the urban environment(point, linear, and aereal) are known by some combination of their form, visibility, use, and significance; the latter directly related to -- meaning".

Steintz notes that imageability as defined by Lynch, is -- highly dependent upon meaning, and that the forms of places are not evaluated "as being highly noticeable unless they were associated with significant activites".

The influence of meaning on man's behavior has been pointed out by Hershberger (1969) who explains that behavior

> "depends...on an ever changing web of meaning gained through sensory and verbal interaction

> with man and environment. It is a cyclic affair in which behavior tends to beget meaning which in turn tends to influence behavior and so on."

Osgood (1967) has also stressed the significance of mean-- ing as "one of the most important determinants of human behav-- ior".

Allport (1958) suggests that meaning has an influence in - man's personality, stating that it

> "consists largely on the meanings that are characteristic of a particular individual; aside from purely automatic habits and re flexes, there is scarcely any part of the whole field of behavior into which meaning does not enter."

Hershberger (1969) summarizes the reasons for concern ---- about the role of meaning in architecture when he states:

> "It seems clear that if a person's perception, behavior, and feelings are to a large extent dependent on his attribution of mean ing to those he finds, it is time that those who create the forms...begin seriously to - study the nature of this meaning to deter-- mine how best to proceed to create a phys- ical environment which can be satisfactori- ly perceived, felt, and used".

The possibility to respond to this challenge will depend - to a great extent on giving proper answers to three key issues involved: 1) the ability of designers to predict how people --- will perceive, interpret and respond to designed forms; 2) the designer's knowledge about the process through which users at-- tribute meaning to physical forms; and 3) knowing what meaning they attribute to which forms, and why.

Need For Systematic Research in the Design Careers

Reliable and comprehensive answers are likely to be found through a coordinated effort of systematic research specifica- lly oriented to the study of meaning in architecture, which is -- one of the motivations of the present study.

Equally important is the need to integrate these studies - towards the goal of formulating and testing a comprehensive the ory of meaning. Not only will this help clarify the nature of - architectural meaning, and its effects on people, but it will - help the designer relate knowledge about meaning to other phe-- nomena (ie. legibility, territoriality, adaptation, etc.), al-- ternately allowing theorists to formulate a new theory of envi- ronment-behavior relationships.

Objective of the Study

The main objective of the study is to examine the relationship between connotative meaning of architectural stimuli (i.e., buildings) and specific building features or characteristics.

Connotative Meaning vs. Denotative -- Definition

In every significant stimulus - response situation two different phases of meaning are present: denotative, and connotative. In the denotative phase the stimulus is identified and interpreted resulting in a direct, specific kind of meaning of a descriptive nature often expressed in terms of a noun or a verb. For example, a person responding in a denotative fashion when looking a house, may say "that's a house", or perhaps that the house has a red door, round windows, etc.

The connotative phase refers to ideas or associations added to the denotation attributed to the stimulus, and is often expressed by adjectives. In the example used above a person responding in a connotative fashion may say that the house is "small, welcoming, and warm".

The connotation of a stimulus may be affected by personality, values, past experience, and even prejudice and sterotypes. For example, the same stimulus (house) may denote "home" to two different persons, "but for one it may connote misery, estrangement, and abuse." (Webster's Dictionary, 1977)

The two phases of meaning appear to be complementary and mutually interactive. The denotative delimiting the connotative by defining the base upon which the connotative judgement is made. Conversely, connotations attributed to certain stimuli -

experienced in the past may condition the way similar stimuli - are perceived thereafter, consequently affecting and to some -- extent determining the denotative meaning given to them.

Need for Empirical Evidence

Studies related to architectural meaning have been aimed - at the extremes of the meaningful stimulus-response process. On the one hand, there are studies analyzing the interpretation of architectural "signs" such as forms, colors, texture, etc. and on the other hand, there are studies focused on the connotative response to buildings as whole.

Attempts to analyze the interrelation of the two areas, as stressed by Choay (1970) have been made mostly at the hypothetical and sometimes speculative level. It is therefore necessary to conduct empirical studies that: 1) analyze the architectural "signs" in the context of the specific buildings in which they are embedded; 2) to study the origins of the meaning attributed to the building as a whole looking back at the response to its elements, and 3) search for correlations that may exist between the response to whole buildings, and the response to --- their parts.

Nature of the Study

This study is exploratory in nature and seeks to answer -- the following questions:

1) Which characteristics or elements of buildings are most relevant in the attribution of connotative - meaning to a building as a whole?

2) What is the ralationship between the connotation of a building as a whole and the connotation given to it's components?

3) Are there any building characteristics more directly associated with some connotative dimensions than with others?

The responses to these questions, based on empirical evidence, may help outline specific research hypotheses to be tested in further, more comprehensive investigations.

CHAPTER II

REVIEW OF LITERATURE

Frame of Reference

The different areas of the study of "meaning" in architecture can be classified utilizing the terminology and concepts of semiotics: syntactics (the study of the formal relationship of signs to other signs); semantics (the study of the relation of signs to the objects to which they apply); and pragmatics (the study of the relationship between signs and interpreters).

The present study may be classified within the two former categories, since it will examine the meaning attributed to specific aspects or characteristics of buildings (signs) and their relationship to the whole building and other characteristics (other signs); and it will also study the connotations given to buildings and their characteristics (semantics).

However, it is important to emphasize that in order to have a comprehensive knowledge about meaning in architecture, all three areas must be exhaustively studied.

Semantics and Syntactics

Studies in this areas tend to be a more theoretical and philosophical in nature than the ones related to the area of pragmatics. For example, Jenks (1970), in his paper "Semiology and Architecture", proposes the utilization of traditional linguistics to study how architecture communicates meaning, He explains:

> "In every architecture (excluding artificial exceptions), there is always a form (color, texture, space), a function (purpose, use), and a technique (structure, materials, mechanical aids)...if the linguistics tries to discover what basic units communicate verbal -- meaning and finds such things as phonemes and morphemes, then it would be highly appropiate if the architectural explorer found formemes, funcemes, and technemes those fundamental -- units of architectural meaning."

The explanation he offers to the formation of meaning is that we form schemata (meaningful concepts) by "constant bombardment of outside stimuli, but also by relative pure thought (logic, chess) and language."

Similarly, Choay (1970) examines whether or not the urban environment can be considered a semiological system. With this in mind, he studied the urban scene with a method derived from general linguistics considering it a nonverbal system of meaninful elements. He points out:

> "The richness and abundance of meanings which can be embeded in build up areas --- their social power, the way they help the individual integrate to society."

In another study, Dorfles (1970), as Choay, suggested that architecture could be considered as a sign-system, one of its tasks being to communicate the architectural message:

> "The problems of architecture...are the basis for a new current of thought, which allows it to be treated in terms of information and communication theory; [and that meaning can be treated as] a process which connects objects, events, and beings, with the signs that evoke these very objects, events, and beings."

He also states that the cognitive process lies in the ability to assign meaning to the things around us, and that this is possible because the "signs" are links between our own consciousness and the phenomenological world.

However, he rejects the idea of systematizing the semiotic material in architecture as it applies to verbal language, because "even though there is an architectural code in large part institutionalized, this code cannot be reduced to discrete units equivalent to those of the spoken language." As he explains it, "no one is entitled to treat windows as 'syntagms' or bricks as 'phonemes'".

Another idea stressed by Choay (1970) is the importance of the context and the relationship between components of the architectural object when analyzing its meaning. He explains that "a syntactic (or gestaltic) aspect of architectural language...is much more important than the merely semantic aspect of the individual elements." According to him, we must determine our architecturally significant units after the analysis and -- with respect to the particular context.

In some aspects, Choay's opinion is supported by Broadbent (1970), who states that the parallelism between architecture and linguistics as semiological systems can be held only at the lev el of whole buildings. However, he concedes that sometimes it - is possible to find connotative meaning in some significant --- elements of buildings like roofs, walls, etc.

Pragmatics

In the area related to pragmatics (the study of the rela-- tion of signs to interpreters), there is a wide range and multi ple types of studies dealing with meaning in different degrees and with diverse conceptualizations of it. In order to give a - general idea of the nature and scope of work done in this areas, I will address some of the most significant studies together -- with works closely related to the present.

Some of the most determinant works in the area of environ-mental perception have been developed by Kevin Lynch. His stu-- dies, although not directly focused on meaning, have helped esta blish guidelines for the study of related issues, and indirect- ly to the study of meaning itself.

His book, The Image of the City (Lynch 1960) is focused on a visual quality of the cityscape which he calls "legibility". He stresses the importance of legibility in the formation of a -- clear image of the environment, image that, as he explains, --- "is the product of both immediate sensation and the memory of -

past experience, used to interpret information and to guide action."

He also explains that this environmental image may be divided into three components: identity, structure, and meaning. He devoted his work to the study of the first two, which combine into what he calls "imageability."

Though criticized for deliberately leaving meaning out of the scope of his studies (Crane 1961, Stea 1970), his findings related to imageability have been a stepping stone for other studies involving meaning such as the ones conducted by Harrison and Howard (1972), and Appleyard (1969).

Using similar techniques as Lynch (cognitive mapping and interview), Harrison and Howard (1972) addresed the problem of relating the role of meaning to that of imageability. They found indications that components of meaning and association, that is, the factors that were not directly related to the physical quality of the architectural object, would seem to be of about equal significance in determining how urban man views and relates to the designed environment. In their analysis they combined 28 components of imageability, classified into four types (location, appearance, meaning, and association) with 17 city elements recalled in the same study and classified according to Lynch's categories (paths, districts, nodes, and landmarks).

Also utilizing cognitive mapping and inteviews, Appleyard (1969) conducted a series of studies in Ciudad Guyana, Venezuela

His intention was to go beyond Lynch's work dealing with identification of "known urban elements" and determine why these elements are known by "discovering the attributes that capture attention and hold a place in the inhabitant's mental representation of the city".

He found evidence supporting the hypothesis that all the - elements in the urban environment (point, linear, and aereal) - are known by some combination of their form, visibility, use, - and significance. In other words, that they are recalled by the user due to: 1) the distinctiveness of their physical form -- (imageability); 2) their visibility as he travels around the -- city; 3) their role as setting for personal activities; and 4) the inferences he makes about its cultural significance (intensity of use and symbolism), the last two motives being directly related to meaning.

Following a different approach, Steintz (1969) analyzed -- the interaction between urban form and activity, and the role - of this interaction in the transmission of meaning. The proposed hypotesis of the study linked "meaningfulness of the environment as measured by knowledge of its form and activity attributes, - with its actual form and activity characteristics and their congruences." Some of his findings were:

a)-Frequency of use was the most consistently high - correlate of whether or not a place was highly -- meaningful.

b)-Congruence (form-activity) was an important factor in the meaningfulness of places.

c)-In general the forms of places were not evaluated as being highly noticeable unless they were also associated with significant activities.

d)-Imageability, as defined by Lynch, is highly de-- pendent upon meaning.

e)-Longer residence time results in greater complex- ity (more complex degree of recall) and particu-- lary in more knowledge of activities.

f)-While there were some differences, they were not about which places were known, but rather in how they were known.

Related Studies

There are a number of studies that, though focused on -- issues other than meaning, contain important implications to -- the field. For example, Stea (1970), in some studies involving image formation and cognitive mapping concluded that "histori-- cal, functional, and other meanings are often more important than the visual input in determining the salience of a parti- cular element of the cityscape." And in studies related to"home range", he identified a dimension of meaningfulness as an impor tant factor similar in importance to other physical and social dimensions.

In another study utilizing cognitive mapping to analyze -- environmental knowledge, Milgram (1976) found that although in his experiment they asked the subjects "to concentrate on geo-- graphic, visual elements, they often included purely social or historical features...as if these elements could simply not be excluded from the meaning of a particular locale." He also notes that often people would center their maps, not on the city as a whole, but on a segment of it that had special "meaning" to the subject, and that certain streets seemed to have a shared emotional significance for a considerable portion of the subjects. Thus pointing out the apparent influence that social, historical and emotional significances have in the way people perceive the cities.

In a similar form, Gibson (1950) in Perception of the Visual World suggests that meaning and spatial properties are not entirely separable from one another: Meaning is not wholly detachable from color, form, and texture."

Another example is a study by Gelwicks (1970) who analyzed factors involved in the delineation of a"home range" (and indirectly on meaning, since according to Stea, home range includes a dimension of meaningfulness). Gelwicks points out the importance of time in the formation of "significant linkages" between people and elements in the environment, and in the acquisition of a sense of identity and psychological support enhanced by the attachment to objects and spaces.

Much research has been done in a great number of areas in which evidence of a relationship with meaning has been found, or it is thought to exist. This is the case with studies on environmental characteristics like simplicity (de Jonge 1962), complexity and intensity (Wohlwill 1966), uniqueness (Ditcher 1961) smell and sound (Sowthworth 1969), Form-Activity congruence --

(Steintz 1968), some studies relate to personal characteristics of users and designers, such as ethnic background, personality, attitudes, life style, income, age, education, values, etc. (Michelson 1966, Lamana 1964). Other studies concern relocation, urbanization changes, and environment deterioration (Blenker 1967, Woolpert 1966, Pastalan 1973). A further review here would of course be neither practical nor essential for this work. There is, however, a group of studies that is necessary to review because of their relevance to this study. Studies which used the Semantic Differential (S.D.) as a method to measure a number of architectural attributes as perceived by diverse types of subjects will be reviewed here.

Studies with the Semantic Differential (S.D.)

The S.D. is a general "paper and pencil" measuring technique developed by Osgood, Suci, and Tannenbaum (1957) to measure connotative meaning. It utilizes a number of scales consisting of polar adjectives as shown below:

strong:____:____:____:____:____:____:____:weak
good:____:____:____:____:____:____:____:bad
active:____:____:____:____:____:____:____:passive
1 2 3 4 5 6 7

The scales are used to rate the meaning of concepts by coding the results using a scoring system from one to seven. The results are then factor analyzed to determine if the judgments of meaning fall into a pattern of factors or dimensions.

According to Bechtel (1974), the S.D. is the most widely used instrument in the study of subject response to architectural stimuli. In 1955, Tucker experimented with the semantic dimensions utilized by artists and non-artists to respond to modern art stimuli. Vielhauer (1965) worked on the development of a set of semantic scales as a means to describe or represent - the physical environment. Canter (1969) utilized semantic differential scales to identify the connotative dimensions used by architects and non-architects when judging architectural stimuli presented through different media. Collins (1971) proposed a set of semantic scales in an attempt to standardize the evaluation of the architectural environment. Seaton and Collins -- (1972) utilized the S.D. to assess the validity and reliability of different media for displaying stimuli to subjects judging architecture.

Hershberger has devoted most of his theoretical work to - the analysis of meaning in architecture, utilizing the S.D. as a major technique in his studies (Hershberger 1969, 1972, 1974, 1979) (Cass and Hershberger 1972, 1974)

Hershberger addressed different issues related to architectural meaning such as testing hypotheses for a proposed model of meaning; identification of dimensions of architectural meaning; definition of a set of scales to predict users response to buildings; and assessment of different media for presenting architectural stimuli.

Because of its popularity, the S.D. has gained acceatance that has been misleading (Bechlet 1974). This, in part, has -- prompted some criticism about semantic differential methodology (Heise 1969 Miron 1962) more specifically in its application to environmental studies in which "the stimulus is nonverbal and - the responses are not often based on language sampling" (Bechtel 1974). According to Bechtel, there are nine problem areas in - these kind of studies:

1-A common failure to realize that the S.D. mea-- sures connotative as opposed to denotative mea--- ning, and the sometimes unfortunate indistinctive use of both terms.

2-Ambiguity of reference in the presentation of com plex stimuli.

3-Lack of representativeness of scales as they ap-- pear in common language.

4-Representativeness of the population to be studied.

5-Representativeness of media through which concepts are shown to subjects.

6-Representativeness of the architectural environ-- ment to be studied.

7.Confusion of response modes among new and habitual modes of behavior.

8-Overemphasis on orthogonality in factors.

9-Ambiguity of derived factors.

However, there have been suggestions of how these problems might be ameliorated (Bechtel 1972 , Heise 1969, Miron 1972, -- Bayley 1970). Some of these suggestions were considered and in- tegrated in this study.

Connotative Dimensions of Meaning in Architecture

A number of underlying dimensions along which architectural stimuli seem to be judged have been identified by several researchers. Following are some examples of such dimensions.

Vielhauer (1965) identified five dimensions for interior architectural stimuli: aesthetic, physical organization, size, temperature - ventilation, and light.

In a study with architecture students, Canter (1969) found three major dimensions: character, coherence, and friendliness; and four "subsidary" ones; roughness, flexibility, fashion, and safety. In a subsequent study with non-architects judging line drawings of interior rooms, Canter identified two major dimensions: friendliness and coherence; and six "subsidary" ones: activity, formality, uniqueness, cowardliness, potency, and sanctity. He also made comparisons between the three dimensions of meaning in language found by Osgood (1962); evaluation, potency and activity, concluding that no relationship seemed to exist among them, rather, "it was thought that all the dimensions discovered might well fit under Osgood's 'evaluation' dimension."

Hershberger (1969), reported three dimensions of meaning related to the "representational" stage of meaning: Organization, potency and spaciousness, and two dimensions relating to the affective and evaluation stages: pleasantness and novelty - excitement.

In a compilative study analyzing the work of seven researchers, Hershberger (1974) included these 20 dimensions and ten -

other in a study aimed at the definition of a minimum set of - scales that could be utilized to predict user's response to -- buildings. Based on their findings, they propose a set of 10 - primary scales in 10 different dimensions "considered the absolute minium essential for coverage of the range of independent meanings attributable to designed environments." The proposed dimensions and their scales are shown in Appendix A.

In addition, they suggested the utilization of 10 "secondary" scales and provided a set of alternative scales for each of the primary and secondary scales to be used when judged more appropiate or necessary.

CHAPTER III

METHODS AND PROCEDURES

Strategy

The research design may be graphically represented as - - in figure no. 1. Basically, the experiment is designed to re-- late a number of building characteristics, and the connotative meaning of the building as a whole.

Connotative meaning was examined using semantic measu- rements of the OVERALL BUILDING in a set of seven semantic - - scales. The different BUILDING CHARACTERISTICS were measured - using the same set of semantic scales, and were thought to com prise the rating of the overall building.

Semantic Scales

The proposed semantic scales were selected from the set - defined by Hershberger (1974) in his compilative study. Due to practical limitations, only the 10 scales identified by Hershber ger (1974) as "absolute minimum" were pondered for the study, with three further considerations: First, since the scales do not only judge the building as a whole, but individual fea tures also, scales that obviously do not apply to the majority of features were excluded (i.e. space, temperature, light, ti- diness). Second, in the case of the general-evaluative, activ- ity, and organization dimensions, the alternative scales were u s e d instead of the primary scales since they are judged - to apply more properly to both, the overall building and to --

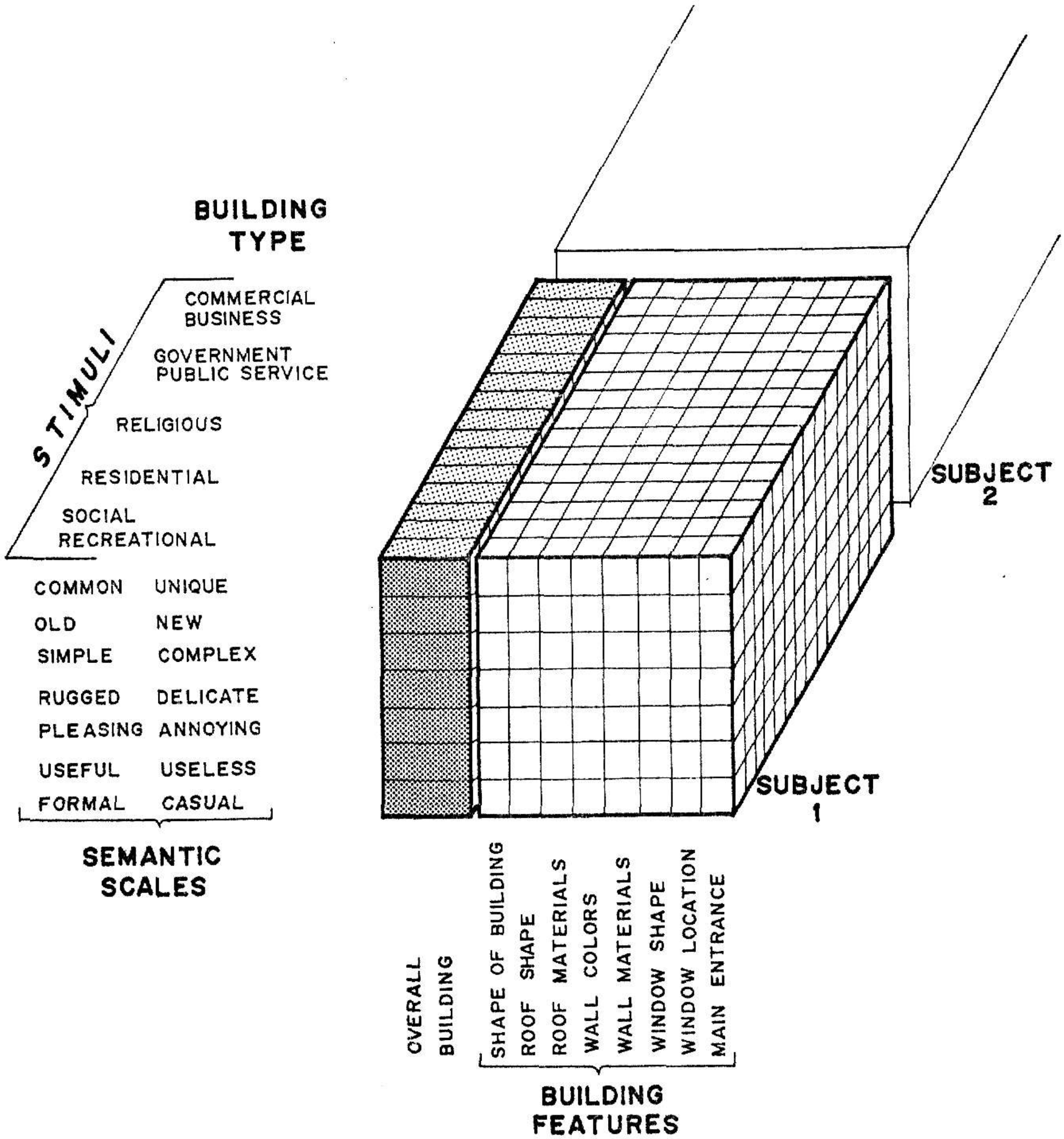


Figure 1. Research Design Graphic Representation. In one dimension we see the dependent (overall building) and independent (building features) variables which were rated on the seven semantic scales shown in a second dimension. A third dimension represents the stimuli shown to each subject.

its features. Finally, as mentioned before, the Canadian Building Inventory (CIB) (Sykes 1970) includes "apparent age" as a - salient characteristic to be considered. Hershberger (1972) -- also identified a "time" dimension in his study and suggests - an old-new scale as a secondary option to be included if necessary (Hershberger 1974). Therefore, it was suggested that an - additional old-new scale be included in the set for this study.

Accordingly, the final set of scales utilized was:

COMMON------UNIQUE

OLD------------NEW

SIMPLE-----COMPLEX

RUGGED----DELICATE

PLEASING--ANNOYING

USEFUL-----USELESS

FORMAL------CASUAL

Building Characteristics

For the purpose of selecting the building characteristcs to be analyzed in the study a number of features common to all buildings and most frequently used as meaningful cues by users were examined. The identification of such a group of variables could be a subject for a whole study by itself; however, lacking substancial information in this respect, the effort was - made to define a set of variables which were: Usually present in all types of buildings; clear and easy to identify by -- "laymen"; easily communicable in "laymen" terminology; and collectively comprehensive enough to represent a substancial portion of all possible building aspects.

A basic set was obtained by analyzing the 70 building - characteristics listed in the (CIB). The CIB was developed as part of a five year program designed to scan the basic archi-- tectural and structural characteristics of some 100,000 buildings throughout Canada, ranging from 17th century reliques to modern highrises. In addition to its comprehensiveness, the inventory was designed to be administered by non-designers, and therefore uses mostly common language in its classifica- - tions.

The 70 listed characteristics were clustered into ten general categories with as many as three subdivisions each. They were: use/type, apparent age, context, form/shape, size, walls (material, color, design and details), roof (shape and materials), windows (shape, type, amount, location), main door (location, shape, materials), and miscellaneous.

1) Use/Type: Five types of buildings were included in the study: commercial/business, government/public - service, religious, residential, and social/recre-- ational (see appendix B). The typology is based on a present-use-activity criteria and is the product of a close examination of classifications by The Life Safety Code (NFPA 1978), The Canadian Inventory of Building (Sykes 1970), and The Southern Standard Building Code (1973).

A total of 19 different categories were identified in - this examination and were grouped into six major types (the --

five types mentioned before plus an industrial/agricultural -- type wich was not included in the study).

2) Age and Size: These characteristics are of a connotative nature, therefore their inclusion as semantic - scales was considered and as mentioned before, an -- old-new scale was included in the set of semantic -- scales.

3) Context: The relevance of this variable is fully acknowledged. However, it was dismissed from the study after carefully weighting the possible benefits of - including it against the complications and disadvantages that its inclusion generated. These were mainly in relation to the problem of ambiguity of refe-- rence when rating slides that exhibited not only the building in question but surrounding buildings also.

4) The rest of the characteristics were redefined to -- fill the criteria mentioned above. Consequently, the final set of building characteristics to be included in the study were:

Type of building
Shape of building
Roof shape
Roof materials
Wall colors
Wall materials
Window shape
Window location
Main Entrance

Instrument Development

Based mostly on the Semantic Differential Technique -- (S.D.) (Osgood, Suci, and Tannenbaum 1957), a questionnaire -- was designed to measure connotative judments of the overall -- building and the nine building features selected for the study.

The problems that according to Bechtell are related to the application of the S.D. to environmental studies (see page 19) were ameliorated to some extent by:

1) A careful selection of the variables used in the study analyze each of the two types of meaning, the building's physical characteristics (which are more closely related to the denotative stage of -- architectural meaning) and the semantic scales directly related with the connotative stage;
2) excluding the context and extraneous elements from the stimuli as much as possible, and by instructing respondents to concentrate on the single characteristic being evaluated at the time, frequently reminding them to do so;
3) the careful selection of scales from previous studies which appear to be the "best" predictors;
4) looking for respondents in diverse groups, resulting in a largely representative sample in terms of age, sex, occupation, and education;
5) presenting stimuli through slides, which with some -

limitations, has proven to be a reliable medium of visual presentation of architectural objects next to presenting the object itself (Seaton & Collings 1972; Hershberger & Cass 1973; Danford and Willems 1975);

6) trying to present the greatest variety of buildings possible in terms of type, use, style, age, materials, colors, shape, size, etc. within the practical limitations of the experiment;
7) presenting stimuli that were commonplace to most respondents and at the same time controlling familiarity and frequency of use;
8) comparing and weighing results from factor analysis in the light of results from other techniques (i.e. multiple regression and ANOVA) to check for possible non-orthogonal (i.e. related or correlated) ocurrences of factors;
9) a careful selection of factor names using "layman" terminology as much as possible.

Appendix B shows part of the questionnaire used in the study. It includes the two major sections that formed the complete questionnaire. The first section is designed to: 1) code each questionnaire; 2) compile general information about respondents; 3) state the confidentiality of the information gathered and explain the purpose of the study; and 4) give general instructions to use the semantic scales.

The second section displays nine sets of semantic scales and a number of questions related to preference, familiarity, and frequency of use. Each set of scales contains the same seven scales, and was utilized to rate each building characteristic, plus the overall building. The order and direction of the scales in every set was randomly defined to avoid order-of-presentation bias in subject responses.

This second section was repeated six times in the questionnaire, once for each slide, plus one used for a trial run.

Population

One hundred and sixty respondents were recruited among -- the residents of Wamego, Kansas -population 3200- with -- the assistance of the Wamego Chamber of Commerce. The recruitment was performed by approaching a number of organizations -- asking for an opportunity to perform the experiment before or after one of their regular meetings (see table 1).

A pledge of 750 dollars (five dollars for each respondent) was made to the city of Wamego, to be administered by the Chamber of Commerce. The donation was to be utilized in a number - of social programs and distributed to some community organizations. The different organizations approached were informed of the donation in order to encourage their cooperation.

Although the selection of subjects was not done by random, an effort was made to approach those organizations in which diverse types of people were represented in terms of age, sex, - occupation, and race. A largely diverse sample was obtained, - and by performing the experiment in most cases during regular meetings, the participation of some subjects who would not - -

Table 1

LIST OF ORGANIZATIONS AND GROUPS PARTICIPATING IN THE EXPERIMENT

Frequency Distributions

ORGANIZATION	FREQUENCY	PERCENT
Lions Club	28	17.50
Wamego High Boosters Club	9	5.62
Wamego JC's	13	8.12
Valley Vista Nursing Home	13	8.12
American Baptist Women	14	8.75
First National Bank	12	7.50
Kaw Valley Bank	13	8.12
Wamego Phone Company	7	4.37
PRW Power Company	5	3.12
Wamego Methodist Church	15	9.37
Wamego High School (Teachers)	5	3.12
Wamego Presbyterian Church	4	2.50
Junior Federation	8	5.00
Wamego Historical Society	4	2.50
Manhattan Baptist Church	10	6.25
Total	160	100.00

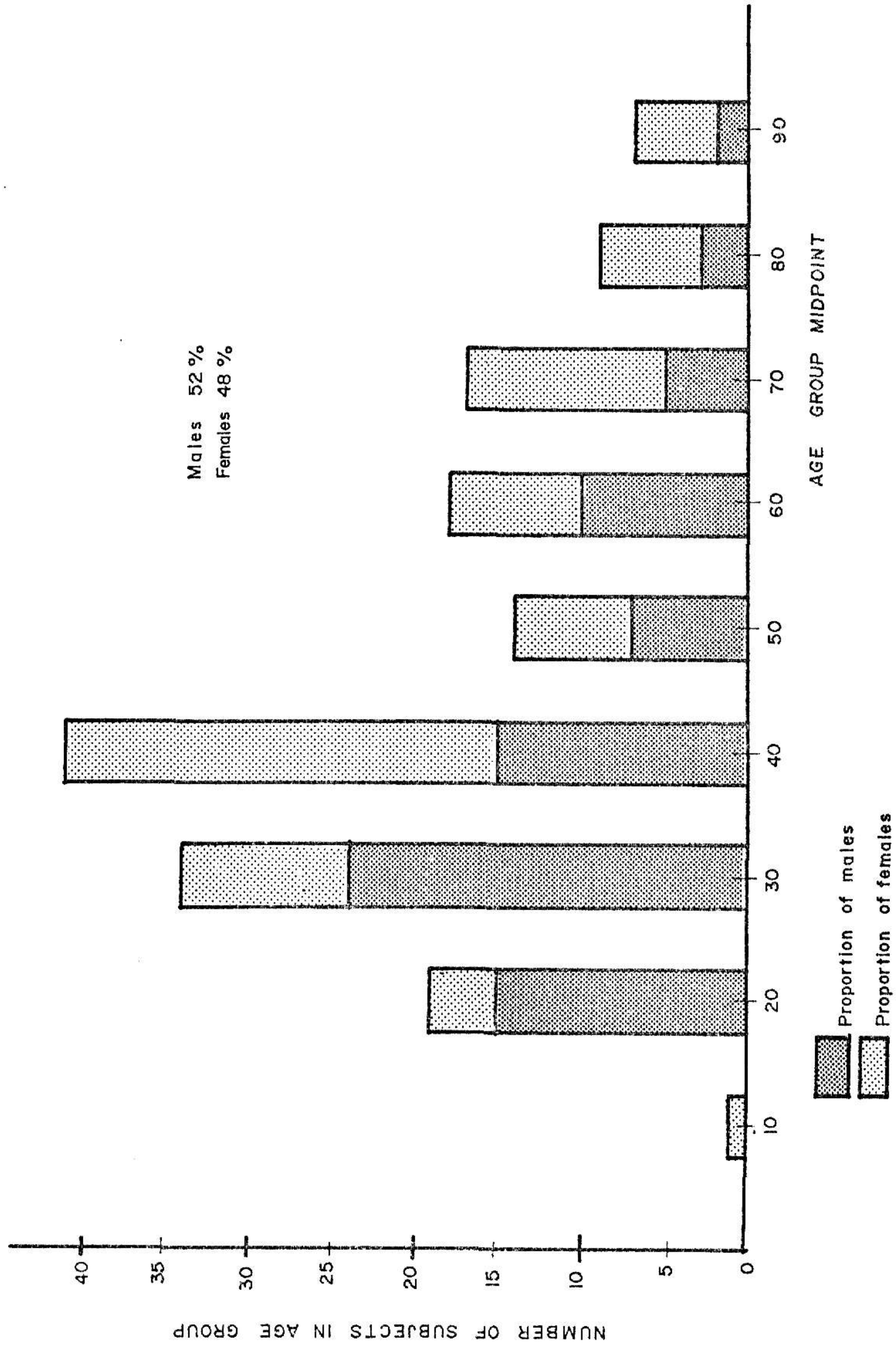


Figure 2. Age/Sex Frequency Distribution of Respondents

Table 2

OCCUPATION AND WORK AREAS OF RESPONDENTS

Frequency Distribution

OCCUPATION	FREQUENCY	PERCENT
Professionals	19	11.87
Technicians	2	1.25
Health Workers	3	1.87
Teachers	15	9.37
Managers & Administrators	14	8.75
Secretaries & Typists	5	3.12
Self Employed: Retail & Trade	6	3.75
Salesworkers	9	5.62
Retail Trade	2	1.25
Clerical	26	16.25
Craftsmen	1	0.62
Foremen	3	1.87
Construction	6	3.75
Operatives (except transport)	2	1.25
Farm	6	3.75
Food Service	1	0.62
Housework	23	14.37
Military	1	0.62
Students	9	5.62
Retired	6	3.75
Not Specified	1	0.62
Total	160	100.00

Table 3

YEARS OF EDUCATION OF RESPONDENTS

Frequency Distribution

YEARS OF EDUCATION	FREQUENCY	PERCENT
0	1	0.62
6	3	1.87
8	4	2.50
9	4	2.50
10	6	3.75
11	7	4.37
12	44	27.50
13	11	6.87
14	12	7.50
15	3	1.87
16	29	18.12
17	6	3.75
18	9	5.62
19	11	6.87
20	4	2.50
22	1	0.62
25	1	0.62
Not Specified	4	2.50
Total	160	100.00
$\bar{X}$	13.92	
S	3.50	

have participated in a purely voluntary basis was achieved.So me characteristics of the sample of respondents are summarized in figure 2, and in tables 1, 2 and 3.

Stimuli

The stimuli for the experiment were selected among a number of slides of buildings taken at different locations in -- Kansas other than -and relatively far from- Wamego.

Three different slides were provided to represent each -- of the five types of buildings under study, making a total of 15 slides for the experiment. Nevertheless, only five slides - (one of each type) were presented and rated at each session. - The five slides to be presented at each session were selected through the following process: 1) each of the three slides - - from the five categories was randomly assigned to one of three sets of slides; 2) as a result, there were three sets of five slides, one from each category; 3) each one of the three sets was used only once with groups of respondents of equal or similar size; 4) once all three sets were used, a new group of three sets was arranged, and the process was repeated for three new groups of respondents.

As a result of this process, all types of buildings were equally represented in every session and rated approximately - the same number of times as the rest of the slides.

The selection of the 15 slides for the study was based on the following criteria:

1) Location: relatively far from Wamego to increase the - probabilities that buildings were equally unfamiliar and unused

by all respondents;

2) <u>Variety</u>: diverse characteristics between buildings of the same type were seeked, such as age, style, materials, color, shape, etc.;

3) <u>Photographic homogeneity</u>: selecting slides of good quality, sharpness and exposure, and an optimum representation of each building without favoring or disfavoring one building versus the others;

4) <u>Legibility</u>: buildings easily and consistently identified by "laymen" as belonging to one of the five building categories of the research.

The first three criteria were verified either at the time of taking the pictures and/or when examining the slides after being processed. The last criteria, legibility, was verified with a pretest of some slides. In this pretest, 30 subjects were asked to indicate to which of the five types of buildings listed (the types under study) each building in the slides belonged to. A group of 25 slides was tested (five of each type) selecting the three slides from each type most frequently classified correctly, and were significant at the .05 level.

<u>Experiment Procedure</u>

Before the actual experiments took place, the instrument was pretested in a session with ten respondents from Manhattan, Kansas following a similar process to the one practiced during the actual experimental sessions. This will be described below. Only slight modifications resulted from the pretest; some remarks were clarified in the introductory statements; some in-- structions were slightly modified; and a few oral indications to be made during the trial run were found necessary.

The experiment was performed in 15 different sessions - - with 15 groups of respondents. The locale was provided in all cases by the organization to which the respondents belonged, - and in most cases it was a meeting room, although in a few in- stances the room provided was an office.

Before every session, an effort was made to set in ad- - vance the screen, projector and slides; however, when this was not possible, the preparations were made while the subjects -- were reading the instructions.

A brief oral introduction was made each time thanking the respondents and the organization for their cooperation, and -- explaining very briefly the purpose and expectations of the re search.

Thereafter, the questionnaires and some pencils were dis- tributed,and subjects were asked to start reading the first -- section and answer the demographic data questions.

Once everybody seemed to be ready, the slide to be rated in the trial run was displayed and the respondents were in- - structed to start aswering the questionnaire (rating the build ing) on the scales of the corresponding pages. All questions - and doubts manifested at this stage were clarified as much as possible; indications were made relative to the layout of the instrument, as well as what to look for in the slide at a par- ticular moment.

Once all subjects had gone through the trial run and all questions were clarified, the first slide of the actual experiment was displayed. Respondents were asked to go through the questionnaire in the same way they did in the trial run. A new slide was displayed once everybody was through with the previous slide, and the process was repeated until all five slides were rated.

At the end, the questionnaires were collected and the group was thanked for its cooperation.

During the rating of the slides, only questions for which response would not bias the results of the experiment were answered, otherwise they were answered after the experiment was completed or once the participants were done with the slide in question.

It took subjects an average of 45 minutes to complete the questionnaire, of which ten to fifteen minutes were spent reading the introduction, answering the demographic data questions, and reading the instructions. The fastest group (bank employees) completed the questionnaire in 35 minutes, and the slowest (elderly from a nursing home) in 90 minutes.

There were some differences in the mood of the different respondent groups. While some groups were joyful and relaxed others appeared serious and stern; however, no effect in responses was evident as a result of those differences. For example, neither the ocurrence of missing data, nor the time required to complete the questionnaires seem to be correlated to the differences in group mood, rather, they seem to be more related to the age of respondents than to group attitude (higher age seems to be related to higher ocurrance of missing data and longer time needed to respond).

In almost every group some subjects approached me after - the experiment was over to tell me that it had been an interesting experience which they enjoyed.

Analysis

The raw data from the questionnaires were coded with the help of an automated computer coding program available at the Department of Architecture at Kansas State University.

All statistical tests performed for the study adopted --- the Statistical Analysis System's programs from the SAS library al Kansas State University Computing Center, (SAS 1979). -- The original set of data was processed to create several SAS - data sets to be used later with a number of SAS programs.

Stepwise Regression

A variation of the stepwise multiple regression technique was utilized to examine the relationship between the overall - building (dependent variable), and building characteristics with independent variables. The variation of stepwise used was the "Maximum R-square Improvement Technique" (MAXR). Unlike - - stepwise and the multiple regression backwards and forward -- techniques, stepwise MAXR does not settle on a single model; - instead, it looks for the 'best' one variable model, the 'best' two variable model. The MAXR technique was also used to -- analyze the same variables for the five types of buildings in order to examine if the relationship between the dependent and the independent variables differed among types of buildings. MAXR was similarly utilized to study the same relationship in each single slide separately, checking if the building descriptions obtained actually matched the characteristics of the specific building to which the test referred, and to some extent, verifying the validity of the two tests previously mentioned.

Factor Analysis

Factor Analysis was applied in order to: 1) check the independence of factors represented by the semantic scales included in the study; and 2) to compare factors identified for the overall building with factors recognized for the building characteristics under study.

The FACTOR program from the SAS library was employed in the analysis.

Other Programs

The SAS MEANS program was used to compute means and distributions for each slide, and the results were utilized together with the MAXR results in the analysis of single slides.

The SAS FREQ program was utilized to cross-classify the demographic data with data related to preference, familiarity, and frequency of use.

The SAS CHART procedure was used to produce a number of histograms related to slide preference, sex, and age/sex distribution of respondents.

CHAPTER IV

FINDINGS

Significance of Building Characteristics

Stepwise (MAXR) multiple regression analysis was used to determine which building characteristics accounted for the variance in the overall rating of the buildings. The results of the analysis are sumarized in table 4. The table presents the largest models of independent variables in each scale, in which all variables are significant at the $p \leq .01$ level. Most models are comprised of five variables, except the ones in the scales useful - useless (3 variables), and formal - casual (six variables). The portion of variance explained by each model (R-square) ranged from .3335 (useful - useless) to .7637 (old - new) averaging approximately .50 for all scales. In other words, it appears that half of the variance of judgments of the overall building can be explained by ratings of specific building characteristics.

It is possible to examine the relevance of these building characteristics by looking at the frequency of their appearance in the models included in the table. For example, main entrance is included in every model in the seven scales, and since weights -- indicate that it is the most significant variable in four scales, it seems to be the most relevant characteristic in predicting -- overall ratings.

Following the same rationale, other significant variables may be examined, such as building shape, roof shape. In conclu-

TABLE 4

STEPWISE MULTIPLE REGRESSION FOR ALL THE BUILDINGS RATED

F Values and Weights of Significant Variables ($p \leq .01$) in Improved Models

Maximum R-square Improvement Technique
Dependent Variable Overall Building

INDEPENDENT VARIABLES		SCALES: COMMON UNIQUE	OLD NEW	SIMPLE COMPLEX	RUGGED DELICATE	PLEASING ANNOYING	USEFUL USELESS	FORMAL CASUAL
MAIN ENTRANCE	F value	65.83*	52.54	24.16	79.17*	28.29	81.94*	30.95*
	weight	0.26341	0.21629	0.16459	0.29857	0.19083	0.30105	0.19771
WALL COLORS	F value	14.94	44.18		12.40	67.06*	53.34	10.67
	weight	0.13745	0.20679		0.08457	0.26753	0.22463	0.12215
WINDOW SHAPE	F value	8.10		33.00		8.18		16.79
	weight	0.10361		0.19480		0.09453		0.14065
WALL MATERIALS	F value				44.28			
	weight				0.22838			
ROOF SHAPE	F value	38.21	29.95	28.65	35.11	34.57		22.36
	weight	0.20868	0.10389	0.13919	0.18460	0.20164		0.17783
ROOF MATERIALS	F value			10.60				9.15
	weight			0.11388				0.10999
WINDOW LOCATION	F value		16.54		31.12			
	weight		0.12353		0.18068			
SHAPE OF BUILDING	F value	47.23	86.85*	51.79*		45.13	71.29	29.67
	weight	0.25103	0.33842	0.27793		0.23424	0.26601	0.20167
R-SQUARE OF MODEL		0.42356	0.76376	0.41647	0.47060	0.62140	0.33354	0.49946

*Most significant variable in each model.
Note: weights are not standardized and refer to variables in the same model.

Note: Only variables significant at $p \leq .01$ are shown in all STEPWISE tables.

TABLE 4

STEPWISE MULTIPLE REGRESSION FOR ALL THE BUILDINGS RATED

F Values and Weights of Significant Variables ($p \leq .01$) in Improved Models

Maximum R-square Improvement Technique
Dependent Variable Overall Building

INDEPENDENT VARIABLES		COMMON UNIQUE	OLD NEW	SIMPLE COMPLEX	RUGGED DELICATE	PLEASING ANNOYING	USEFUL USELESS	FORMAL CASUAL
MAIN ENTRANCE	F value	[illegible]	52.34	24.16	[illegible]	28.29	[illegible]	[illegible]
	weight	[illegible]	0.21629	0.16459	[illegible]	0.19083	[illegible]	[illegible]
WALL COLORS	F value	14.94	44.18		12.40	[illegible]	53.34	10.67
	weight	0.13745	0.20679		0.08457	[illegible]	0.22463	0.12215
WINDOW SHAPE	F value	8.10		33.00		8.18		16.79
	weight	0.10361		0.19480		0.09453		0.14065
WALL MATERIALS	F value				14.20			
	weight				0.22838			
ROOF SHAPE	F value	38.21	29.95	28.65	35.11	34.57		22.36
	weight	0.20868	0.10389	0.13919	0.18460	0.20164		0.17783
ROOF MATERIALS	F value			10.60				9.15
	weight			0.11388				0.10999
WINDOW LOCATION	F value		16.54		31.12			
	weight		0.12353		0.18068			
SHAPE OF BUILDING	F value	47.71	[illegible]	[illegible]		45.13	73.29	29.67
	weight	0.26103	[illegible]	[illegible]		0.23424	0.26601	0.20147
R-SQUARE OF MODEL		0.42356	0.76376	0.41647	0.47060	0.62140	0.33354	0.49946

*Most significant variable in each model.
Note: weights are not standardized and refer to variables in the same model.

(dark shading) Most Significant Variable. (light shading) 2nd. Variable in significance.

Note: Only variables significant at $p \leq .01$ are shown in all STEPWISE tables.

sion, it appears that for buildings in general, main entrance and shape of building are the most relevant characteristics, followed by roof shape and wall colors.

Further examinations were made to inquire if the same portion of the variance in the dependent variable was explained -- when controlling for building type, and to see if the same building characteristics were significant for the various types of buildings examined.

Stepwise multiple regression analysis was conducted for - each type of building in the study, the results are summarized in tables 5 through 9; which include the largest models for -- each scale in which all independent variables were significant at the $p \leq .01$ level.

The portion of variance accounted for by the independent - variables was not very different when all models were conside-- red. For business and commercial, and government and public service types, the portion of variance explained was also aproximately 50 percent, with slight variations on the relative contribution of the various scales. For religious, residential, and - recreational types, the portion of variance accounted for was - somewhat lower, from 42 to 45 percent. In these three types, a greater variation in the portion of variance explained by each scale was observed, ranging from as high as 85 percent to as -- low as 21 percent (see tables 7 through 9).

More contrasting differences were found in the identification of the most significant characteristics for the various --

TABLE 5

STEPWISE MULTIPLE REGRESSION BY TYPE: BUSINESS AND COMMERCIAL

F Values and Weights of Significant Variables ($p \leq .01$) in Impaired Models

Maximum R-square Improvement Technique
Dependent Variable Overall Building

		SCALES						
INDEPENDENT VARIABLES		COMMON UNIQUE	OLD NEW	SIMPLE COMPLEX	RUGGED DELICATE	PLEASING ANNOYING	USEFUL USELESS	FORMAL CASUAL
MAIN ENTRANCE	F value	25.71		14.52				13.69
	weight	0.37256		0.29243				0.31519
WALL COLORS	F value					30.45*		9.23
	weight					0.37489		0.23613
WINDOW SHAPE	F value				17.63	8.59	11.76	
	weight				0.24186	0.20389	0.17691	
WALL MATERIALS	F value				15.85			
	weight				0.27071			
ROOF SHAPE	F value		13.05		15.88			
	weight		0.37109		0.25035			
ROOF MATERIALS	F value							
	weight							
WINDOW LOCATION	F value							
	weight							
SHAPE OF BUILDING	F value	46.84*	21.73*	47.72*	17.92*	18.76	41.99*	25.62*
	weight	0.47340	0.47973	0.55673	0.31190	0.33438	0.36556	0.39033
R-SQUARE OF MODEL		0.49710	0.66100	0.40167	0.63632	0.63029	0.40039	0.56644

*Most significant variable in each model.
Note: weights are not standardized and refer to variables in the same model.

TABLE 5

STEPWISE MULTIPLE REGRESSION BY TYPE: BUSINESS AND COMMERCIAL

F Values and Weights of Significant Variables ($p \leq .01$) in Impaired Models

Maximum R-square Improvement Technique
Dependent Variable Overall Building

INDEPENDENT VARIABLES		SCALES						
		COMMON UNIQUE	OLD NEW	SIMPLE COMPLEX	RUGGED DELICATE	PLEASING ANNOYING	USEFUL USELESS	FORMAL CASUAL
MAIN ENTRANCE	F value	25.71		14.52				13.69
	weight	0.37256		0.29243				0.31519
WALL COLORS	F value					[illegible]		9.23
	weight					[illegible]		0.23613
WINDOW SHAPE	F value				17.63	8.59	11.76	
	weight				0.24186	0.20389	0.17691	
WALL MATERIALS	F value				15.85			
	weight				0.27071			
ROOF SHAPE	F value		13.05		15.88			
	weight		0.37109		0.25035			
ROOF MATERIALS	F value							
	weight							
WINDOW LOCATION	F value							
	weight							
SHAPE OF BUILDING	F value	[illegible]	[illegible]	[illegible]	[illegible]	18.76	[illegible]	[illegible]
	weight	[illegible]	[illegible]	[illegible]	[illegible]	0.33438	[illegible]	[illegible]
R-SQUARE OF MODEL		0.49710	0.66100	0.40167	0.63632	0.63029	0.40039	0.56644

*Most significant variable in each model.
Note: weights are not standardized and refer to variables in the same model.

(shaded box) Most Significant Variable.

TABLE 6

STEPWISE MULTIPLE REGRESSION BY TYPE: GOVERNMENT AND PUBLIC SERVICE

F Values and Weights of Significant Variables ($p \leq .01$) in Improved Models

Maximum R-square Improvement Technique
Dependent Variable Overall Building

		SCALES						
INDEPENDENT VARIABLES		COMMON UNIQUE	OLD NEW	SIMPLE COMPLEX	RUGGED DELICATE	PLEASING ANNOYING	USEFUL USELESS	FORMAL CASUAL
MAIN ENTRANCE	F value weight	37.36* 0.40040	36.41* 0.37208	36.35* 0.38549	49.52* 0.48851	38.39* 0.40895	30.62* 0.29247	24.98* 0.31686
WALL COLORS	F value weight						24.28 0.27547	
WINDOW SHAPE	F value weight	9.01 0.26810						15.01 0.26321
WALL MATERIALS	F value weight				11.95 0.27113	16.14 0.29635		
ROOF SHAPE	F value weight	13.95 0.28065		11.51 0.26147				
ROOF MATERIALS	F value weight							16.15 0.29140
WINDOW LOCATION	F value weight		19.87 0.33219					
SHAPE OF BUILDING	F value weight		14.18 0.28259	13.46 0.30312		15.68 0.27177	16.04 0.25943	
R-SQUARE OF MODEL		0.46047	0.46047	0.55794	0.44577	0.46585	0.43906	0.55128

*Most significant variable in each model.
Note: weights are not standardized and refer to variables in the same model.

TABLE 6

STEPWISE MULTIPLE REGRESSION BY TYPE: GOVERNMENT AND PUBLIC SERVICE

F Values and Weights of Significant Variables ($p \leq .01$) in Improved Models

Maximum R-square Improvement Technique
Dependent Variable Overall Building

		SCALES						
INDEPENDENT VARIABLES		COMMON UNIQUE	OLD NEW	SIMPLE COMPLEX	RUGGED DELICATE	PLEASING ANNOYING	USEFUL USELESS	FORMAL CASUAL
MAIN ENTRANCE	F value weight	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
WALL COLORS	F value weight						24.28 0.27547	
WINDOW SHAPE	F value weight	9.01 0.26810						15.01 0.26321
WALL MATERIALS	F value weight				11.95 0.27113	16.14 0.29635		
ROOF SHAPE	F value weight	13.95 0.28065		11.51 0.26147				
ROOF MATERIALS	F value weight							16.15 0.29140
WINDOW LOCATION	F value weight		19.87 0.33219					
SHAPE OF BUILDING	F value weight		14.18 0.28259	13.46 0.30312		15.68 0.27177	16.04 0.25943	
R-SQUARE OF MODEL		0.46047	0.46047	0.55794	0.44577	0.46585	0.43906	0.55128

**Most significant variable in each model.*
Note: weights are not standardized and refer to variables in the same model.

▩ Most Significant Variable.

TABLE 7

STEPWISE MULTIPLE REGRESSION BY TYPE: RELIGIOUS

F Values and Weights of Significant Variables ($p \leq .01$) in Improved Models

Maximum R-square Improvement Technique
Dependent Variable Overall Building

INDEPENDENT VARIABLES		COMMON UNIQUE	OLD NEW	SIMPLE COMPLEX	RUGGED DELICATE	PLEASING ANNOYING	USEFUL USELESS	FORMAL CASUAL
		SCALES						
MAIN ENTRANCE	F value	27.45*	7.12		11.94	13.15		
	weight	0.36193	0.17832		0.27860	0.22339		
WALL COLORS	F value						19.13	
	weight						0.30536	
WINDOW SHAPE	F value		17.87	13.57				
	weight		0.22522	0.24524				
WALL MATERIALS	F value				18.93		9.50	
	weight				0.34082		0.25334	
ROOF SHAPE	F value		8.93	21.30*	20.64*	93.58*		
	weight		0.17546	0.31641	0.33077	0.62404		
ROOF MATERIALS	F value							
	weight							
WINDOW LOCATION	F value							
	weight							
SHAPE OF BUILDING	F value	15.21	54.63*				23.55*	60.69*
	weight	0.34520	0.44828				0.33438	0.57101
R-SQUARE OF MODEL		0.26407	0.85727	0.21045	0.41458	0.57768	0.39381	0.29648

*Most significant variable in each model.
Note: weights are not standardized and refer to variables in the same model.

TABLE 7

STEPWISE MULTIPLE REGRESSION BY TYPE: RELIGIOUS

F Values and Weights of Significant Variables ($p \leq .01$) in Improved Models

Maximum R-square Improvement Technique
Dependent Variable Overall Building

INDEPENDENT VARIABLES		SCALES: COMMON UNIQUE	OLD NEW	SIMPLE COMPLEX	RUGGED DELICATE	PLEASING ANNOYING	USEFUL USELESS	FORMAL CASUAL
MAIN ENTRANCE	F value weight	[illegible]	7.12 0.17832		11.94 0.27860	13.15 0.22339		
WALL COLORS	F value weight						19.13 0.30536	
WINDOW SHAPE	F value weight		17.87 0.22522	13.57 0.24524				
WALL MATERIALS	F value weight				18.93 0.34082		9.50 0.25334	
ROOF SHAPE	F value weight		8.93 0.17546	[illegible]	[illegible]	[illegible]		
ROOF MATERIALS	F value weight							
WINDOW LOCATION	F value weight							
SHAPE OF BUILDING	F value weight	15.21 0.34520	[illegible]				[illegible]	[illegible]
R-SQUARE OF MODEL		0.26407	0.85727	0.21045	0.41458	0.57768	0.39381	0.29648

*Most significant variable in each model.
Note: weights are not standardized and refer to variables in the same model.

Most Significant Variable.

TABLE 8
STEPWISE MULTIPLE REGRESSION BY TYPE: RESIDENTIAL

F Values and Weights of Significant Variables ($p \leq .01$) in Improved Models

Maximum R-square Improvement Technique
Dependent Variable Overall Building

INDEPENDENT VARIABLES		SCALES: COMMON UNIQUE	OLD NEW	SIMPLE COMPLEX	RUGGED DELICATE	PLEASING ANNOYING	USEFUL USELESS	FORMAL CASUAL
MAIN ENTRANCE	F value		20.70		39.22*	29.29*	36.51*	11.59
	weight		0.30637		0.41731	0.34328	0.47419	0.26302
WALL COLORS	F value		32.27*			8.23	15.31	
	weight		0.34257			0.23171	0.33117	
WINDOW SHAPE	F value			13.53				
	weight			0.40538				
WALL MATERIALS	F value	13.57	23.13	10.14		10.63		
	weight	0.29882	0.31174	0.23214		0.26841		
ROOF SHAPE	F value					12.59		
	weight					0.22883		
ROOF MATERIALS	F value	36.23*	7.20	17.24*				20.87*
	weight	0.38304	0.15882	0.28312				0.35878
WINDOW LOCATION	F value							
	weight							
SHAPE OF BUILDING	F value				12.58			
	weight				0.29182			
R-SQUARE OF MODEL		0.29871	0.84680	0.32322	0.41670	0.69076	0.28014	0.33275

* Most significant variable in each model.
Note: weights are not standardized and refer to variables in the same model.

TABLE 8

STEPWISE MULTIPLE REGRESSION BY TYPE: RESIDENTIAL

F Values and Weights of Significant Variables ($p \leq .01$) in Improved Models

Maximum R-square Improvement Technique
Dependent Variable Overall Building

INDEPENDENT VARIABLES		SCALES: COMMON UNIQUE	OLD NEW	SIMPLE COMPLEX	RUGGED DELICATE	PLEASING ANNOYING	USEFUL USELESS	FORMAL CASUAL
MAIN ENTRANCE	F value weight		20.70 0.30637		[redacted]	[redacted]	[redacted]	11.59 0.26302
WALL COLORS	F value weight		[redacted]			8.23 0.23171	15.31 0.33117	
WINDOW SHAPE	F value weight			13.53 0.40538				
WALL MATERIALS	F value weight	13.57 0.29882	23.13 0.31174	10.14 0.23214		10.63 0.26841		
ROOF SHAPE	F value weight					12.59 0.22883		
ROOF MATERIALS	F value weight	[redacted]	7.20 0.15882	[redacted]				[redacted]
WINDOW LOCATION	F value weight							
SHAPE OF BUILDING	F value weight				12.58 0.29182			
R-SQUARE OF MODEL		0.29871	0.84680	0.32322	0.41670	0.69076	0.28014	0.33275

* Most significant variable in each model.
Note: weights are not standardized and refer to variables in the same model.

Most Significant Variable.

TABLE 9

STEPWISE MULTIPLE REGRESSION BY TYPE: RECREATIONAL AND SOCIAL

F Values and Weight of Significant Variables ($p \leq .01$) in Improved Models

Maximum R-square Improvement Technique
Dependent Variable Overall Building

		SCALES						
INDEPENDENT VARIABLES		COMMON UNIQUE	OLD NEW	SIMPLE COMPLEX	RUGGED DELICATE	PLEASING ANNOYING	USEFUL USELESS	FORMAL CASUAL
MAIN ENTRANCE	F value			8.18			15.06	
	weight			0.24576			0.28014	
WALL COLORS	F value	19.95*	20.15		7.02	9.91	18.02	14.39
	weight	0.26096	0.27377		0.17323	0.26891	0.21931	0.30791
WINDOW SHAPE	F value		9.57					8.14
	weight		0.18792					0.21996
WALL MATERIALS	F value							
	weight							
ROOF SHAPE	F value	11.00	14.09					21.58*
	weight	0.19638	0.23049					0.34086
ROOF MATERIALS	F value			9.61*				
	weight			0.24534				
WINDOW LOCATION	F value	10.38						
	weight	0.18621						
SHAPE OF BUILDING	F value		39.24*	7.98	33.62*	41.76*	25.63*	
	weight		0.39011	0.24191	0.44084	0.51104	0.26710	
R-SQUARE OF MODEL		0.29578	0.79329	0.27893	0.36901	0.51431	0.40207	0.43098

* Most significant variable in each model.
Note: weights are not standardized and refer to variables in the same model.

TABLE 9

STEPWISE MULTIPLE REGRESSION BY TYPE: RECREATIONAL AND SOCIAL

F Values and Weight of Significant Variables ($p \leq .01$) in Improved Models

Maximum R-square Improvement Technique
Dependent Variable Overall Building

INDEPENDENT VARIABLES		COMMON UNIQUE	OLD NEW	SIMPLE COMPLEX	RUGGED DELICATE	PLEASING ANNOYING	USEFUL USELESS	FORMAL CASUAL
		SCALES						
MAIN ENTRANCE	F value weight			8.18 0.24576			15.06 0.28014	
WALL COLORS	F value weight	[redacted]	20.15 0.27377		7.02 0.17323	9.91 0.26891	18.02 0.21931	14.39 0.30791
WINDOW SHAPE	F value weight		9.57 0.18792					8.14 0.21996
WALL MATERIALS	F value weight							
ROOF SHAPE	F value weight	11.00 0.19638	14.09 0.23049					[redacted]
ROOF MATERIALS	F value weight			[redacted]				
WINDOW LOCATION	F value weight	10.38 0.18621						
SHAPE OF BUILDING	F value weight		[redacted]	7.98 0.24191	[redacted]	[redacted]	[redacted]	
R-SQUARE OF MODEL		0.29578	0.79329	0.27893	0.36901	0.51431	0.40207	0.43098

* Most significant variable in each model.
Note: weights are not standardized and refer to variables in the same model.

Most Significant Variable.

types of buildings. With the assistance of the overlays provided with tables 5 through 9, it can be noticed that the frequency of variables appearing in the models differs greatly from table to table (i.e., from type to type). While in table 5 for business and commercial, building shape appears more frequently in models (most significant in all but one scale); it ranks in a second standing in the table for government and public service (table 6), in which main entrance is clearly the most salient characteristic (most significant characteristic in all seven models). For religious buildings, roof shape and building shape seem equally relevant (most significant in three scales), for residential buildings, main entrance and roof materials appear more frequently as significant elements (most significant in three models, and present in other two), and finally, recreational and social, in which building shape (most relevant in four scales and present in another), and wall colors (most significant in one scale and second most significant in five others) are apparently the most relevant features. It is clear that different building features, account for various proportions of the variance in judgments of different types of buildings.

Building Description from Connotative Judgments

A similar process was performed to determine whether specific descriptions of particular buildings could be obtained from data gathered with semantic techniques, and to evaluate how close such descriptions matched the buildings to which they refered.

Results of these analyses are presented in a series of figures (3 through 17) which display: 1) a photograph of the building rated; 2) a composite description of the building created with information from the stepwise analysis, complemented with mean scores, and variance; 3) a stepwise summary table. These tables include only variables of models that accounted for a considerable portion of the variation (i.e. R-square values higher than .40 in some cases and .50 in others). This way, a more precise and concise description of each building was achieved. Here again, the variables included belong to the largest models in which all variables were significant at the $p \leq .01$ level.

The composite description has two sections: judgment of the overall building, and judgments of specific features. The overall building judgments are defined by the scales in which more agreement (i.e. variance lower than two), in ratings was found.

The appropiate qualifier was selected from the scale by looking at the mean score (i.e., in the common-unique scale, scores lower than four were defined as common, higher than four as unique). In addition, a grading was introduced with the use of adverbs placed before each qualifier. These adverbs were defined following the scale on page 65.

FIGURE 3

SLIDE no. 11

Men's Store,

Marion K.S.

COMPOSITE DESCRIPTION

Overall Building:

Useful, old, rugged, and simple.

Characteristics:

Shape of building: somewhat casual, neither pleasing, nor annoying.

Main entrance: simple and somewhat casual.

Wall colors: somewhat annoying and simple

STEPWISE MULTIPLE REGRESSION FOR MEN'S STORE

Weight and Mean Score of Significant Variables ($p \leq .01$)

Maximum R-square Improvement Technique
Dependent Variable Overall Building

INDEPENDENT VARIABLES		SCALES COMMON UNIQUE	OLD NEW	SOMPLE COMPLEX	RUGGED DELICATE	PLEASING ANNOYING	USEFUL USELESS	FORMAL CASUAL
MAIN ENTRANCE	weight mean score			0.5634 1.76				0.4125 4.97
WALL COLORS	weight mean score			0.6438 2.06		0.3630 4.52		
SHAPE OF BUILDING	weight mean score					0.4425 4.12		0.3936 4.80
R-SQUARE OF MODEL				.5330		.6079		.6085
OVERALL BUILDING	variance mean score	2.00 2.14	(1.13) 1.92	(1.63) 2.04	(1.39) 2.22	2.87 4.16	(0.68) 1.92	2.89 4.74

Note: Models with R-square < .50 are not shown. Variables that were not significant in any model are not included.
( ) Scales with variance < 2.00 in overall building judgments.

FIGURE 4

SLIDE No. 12

Restaurant
Manhattan K.S.
COMPOSITE DESCRIPTION

Overaal building: new and useful.

Characteristics:

Window shape: new, somewhat simple but pleasing.
Shape of building: slightly pleasing, but common.
Wall colors: new, somewhat pleasing.
Roof materials: somewhat rugged and simple.
Window location: neither rugged nor delicate.
Main entrance: new.
Wall materials: somewhat common.

STEPWISE MULTIPLE REGRESSION FOR RESTAURANT

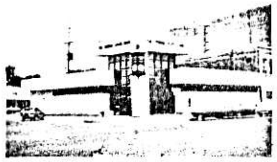
Weight and Mean Score of Significant Variables ($p \leq .01$)

Maximum R-square Improvement Technique
Dependent Variable Overall Building

INDEPENDENT VARIABLES		SCALES: COMMON UNIQUE	OLD NEW	SIMPLE COMPLEX	RUGGED DELICATE	PLEASING ANNOYING	USEFUL USELESS	FORMAL CASUAL
MAIN ENTRANCE	weight		0.2914					
	mean score		5.96					
WALL COLORS	weight		0.3308			0.3199		
	mean score		6.01			3.40		
WINDOW SHAPE	weight		0.2142	0.4266		0.4145		
	mean score		5.79	2.79		2.73		
WALL MATERIALS	weight	0.5155						
	mean score	2.60						
ROOF MATERIALS	weight			0.6317	0.5180			
	mean score			2.96	3.28			
WINDOW LOCATION	weight				0.3120			
	mean score				3.94			
SHAPE OF BUILDING	weight	0.4247				0.3472		
	mean score	3.28				3.03		
R-SQUARE OF MODEL		.5351	.5499	.5625	.6167	.7197		
OVERALL BUILDING	variance	5.29	(1.40)	4.77	3.04	4.36	(1.79)	3.75
	mean score	3.86	6.41	3.37	3.18	3.15	1.83	5.32

Note: Models with R-square < .50 are not shown. Variables that were not significant in any model are not included.
( ) Scales with variance < 2.00 in overall building judgments.

FIGURE 5



SLIDE No. 13

Bank
Marysville K.S.

COMPOSITE DESCRIPTION

Overall building: no agreement in judgements.

Characteristics:

Shape of building: slightly rugged and useful.

Main entrance: neither pleasing nor annoying.

Top shape: neither rugged nor delicate.

STEPWISE MULTIPLE REGRESSION FOR BANK

Weight and Mean Score of Significant Variables ($p \leq .01$)

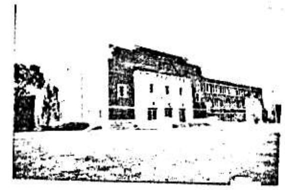
Maximum R-square Improvement Technique
Dependent Variable Overall Building

		SCALES						
INDEPENDENT VARIABLES		COMMON UNIQUE	OLD NEW	SIMPLE COMPLEX	RUGGED DELICATE	PLEASING ANNOYING	USEFUL USELESS	FORMAL CASUAL
MAIN ENTRANCE	weight mean score					0.7886 2.54		
ROOF SHAPE	weight mean score				0.3392 3.56			
SHAPE OF BUILDING	weight mean score				0.6174 3.50			0.5739 3.14
R-SQUARE OF MODEL					.5728	.5403	.5879	
OVERALL BUILDING*	variance mean score	3.04 5.19	2.70 5.82	3.31 4.45	2.97 3.74	3.84 3.63	2.40 2.82	2.85 3.17

Note: Models with R-square < .50 are not shown. Variables that are not significant in any model are not included.

* All scales have variance < 2.00.

FIGURE 6



SLIDE No. 21

High School

El Dorado K.S.

COMPOSITE DESCRIPTION

Overall building: old and rugged.

Characteristics:

Window Shape: neither pleasing nor annoying.

Roof shape: slightly pleasing.

Shape of building: old.

STEPWISE MULTIPLE REGRESSION FOR HIGH SCHOOL

Weight and Mean Score of Significant Variables ($p \leq .01$)

Maximum R-square Improvement Technique
Dependent Variable Overall Building

INDEPENDENT VARIABLES		SCALES: COMMON UNIQUE	OLD NEW	SIMPLE COMPLEX	RUGGED DELICATE	PLEASING ANNOYING	SUEFUL USELESS	FORMAL CASUAL
WINDOW SHAPE	weight					0.6682		
	mean score					3.60		
ROOF SHAPE	weight					0.4475		
	mean score					3.08		
SHAPE OF BUILDING	weight		0.5909					
	mean score		2.41					
R-SQUARE OF MODEL			.6116			.8644		
OVERALL BUILDING	variance	3.87	(1.41)	3.68	(1.53)	4.11	2.42	3.16
	mean score	2.89	2.08	3.38	3.36	3.17	2.28	3.48

Note: Models with R-square < .50 are not shown. Variables that are not significant in any model are not included.
( ) Scales with variance < 2.00 in overall building judgments.

FIGURE 7

SLIDE No. 22

Post Office

Concordia K.S.

COMPOSITE DESCRIPTION

Overall Building: Useful, old, unique, complex, and pleasing.

Characteristics:

Wall colors: useful.

Main entrance: somewhat useful and rugged.

STEPWISE MULTIPLE REGRESSION FOR POST OFFICE (CONCORDIA)

Weight and Mean Score of Significant Variables (p≤.01)

Maximum R-square Improvement Technique
Dependent Variable Overall Building

		SCALES						
INDEPENDENT VARIABLES		COMMON UNIQUE	OLD NEW	SIMPLE COMPLEX	RUGGED DELICATE	PLEASING ANNOYING	USEFUL USELESS	FORMAL CASUAL
MAIN ENTRANCE	weight				0.6204		0.1905	
	mean score				3.41		2.82	
WALL COLORS	weight						0.5799	
	mean score						2.34	
R-SQUARE OF MODEL					.4479		.5843	
OVERALL BUILDING	variance	(1.58)	(1.24)	(1.89)	3.30	(1.94)	(1.22)	2.04
	mean score	5.58	2.04	5.20	3.17	2.54	2.13	2.67

Note: Models with R-square <.40 are not shown. Variables that were not significant in any model are not included.
( ) Scales with variance <2.00 in overall building judgments.

FIGURE 8

SLIDE No. 23

Post Office

Marion K.S.

COMPOSITE DESCRIPTION

Overall building: useful.

Characteristic:

Main entrance: somewhat pleasing and casual.

Shape of building: neither formal nor casual.

Wall materials: neither old nor new.

Window location: slightly old.

STEPWISE MULTIPLE REGRESSION FOR POST OFFICE (MARION)

Weight and Mean Score of Significant Variables ($p \leq .01$)

Maximum R-square Improvement Technique
Dependent Variable Overall Building

INDEPENDENT VARIABLES		SCALES						
		COMMON UNIQUE	OLD NEW	SIMPLE COMPLEX	RUGGED DELICATE	PLEASING ANNOYING	USEFUL USELESS	FORMAL CASUAL
MAIN ENTRANCE	weight					0.7062		0.5003
	mean score					3.18		4.59
WALL MATERIALS	weight		0.5098					
	mean score		3.81					
WINDOW LOCATION	weight		0.5394					
	mean score		3.42					
SHAPE OF BUILDING	weight							0.3354
	mean score							4.39
R-SQUARE OF MODEL			.5089			.6367		.5726
OVERALL BUILDING	variance	2.30	4.57	2.59	2.03	3.20	(0.86)	4.90
	mean score	2.11	3.98	2.16	2.37	2.90	1.62	4.12

Note: Models with R-square < .50 are not shown. Variables that were not significant in any model are not included.

( ) Scales with variance < 2.00 in overall building judgments.

FIGURE 9

SLIDE No. 31

Church

Herrington K.S.

COMPOSITE DESCRIPTION

Overall building: old.

Characteristics:

Wall materials: old.

Main entrance: useful and somewhat rugged.

Window shape: somewhat useful.

Roof shape: slightly rugged.

STEPWISE *MULTIPLE REGRESSION FOR CHURCH* (HERRINGTON)

Weight and Mean Score of Significant Variables ($p \leq .01$)

Maximum R-square Improvement Technique
Dependent Variable Overall Building

INDEPENDENT VARIABLES		SCALES						
		COMMON UNIQUE	OLD NEW	SIMPLE COMPLEX	RUGGED DELICATE	PLEASING ANNOYING	USEFUL USELESS	FORMAL CASUAL
MAIN ENTRANCE	weight				0.3408		0.4214	
	mean score				3.29		2.29	
WINDOW SHAPE	weight						0.3823	
	mean score						2.77	
WALL MATERIALS	weight		0.7399					
	mean score		2.08					
ROOF SHAPE	weight				0.4386			
	mean score				2.95			
R-SQUARE OF BUILDING			.5607		.4446		.4866	
OVERALL BUILDING	variance	3.92	(1.66)	2.25	2.42	2.07	2.46	2.82
	mean score	3.53	2.20	5.48	2.77	2.63	2.30	2.59

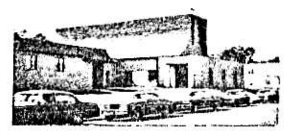
Note: Models with R-square < .40 are not shown. Variables that were not significant in any model are not included.
( ) Scales with variance <2.00 in overall building judgments.

FIGURE 10

SLIDE No. 32

Church

El Dorado K.S.



COMPOSITE DESCRIPTION

Overall building: very new, unique.

Characteristics:

Roof Shape: somewhat pleasing.

Main entrance: new.

STEPWISE MULTIPLE REGRESSION FOR CHURCH (EL DORADO)

Weight and Mean Score of Significant Variables (p≤.01)

Maximum R-square Improvement Technique
Dependent Variable Overall Building

		SCALES						
INDEPENDENT VARIABLES		COMMON UNIQUE	OLD NEW	SIMPLE COMPLEX	RUGGED DELICATE	PLEASING ANNOYING	USEFUL USELESS	FORMAL CASUAL
MAIN ENTRANCE	weight		0.4726					
	mean score		6.19					
ROOF SHAPE	weight					0.8535		
	mean score					2.97		
R-SQUARE OF MODEL			.6356			.7128		
OVERALL BUILDING	variance	(1.25)	(0.47)	3.73	3.22	3.75	2.98	2.62
	mean score	6.29	6.51	4.53	4.31	2.93	2.61	3.62

Note: Models with R-square < .50 are not shown. Variables that were not significant in any model are not included.

( ) Scales with variance < 2.00 in overall building judgments.

FIGURE 11

SLIDE No. 33

Church

Clay Center K.S.

COMPOSITE DESCRIPTION

Overall building: pleasing.

Characteristics:

Main entrance: pleasing and new.

Roof shape: pleasing.

Window location: new.

STEPWISE MULTIPLE REGRESSION FOR CHURCH (CLAY CENTER)

Weight and Mean Score of Significant Variables ($p \leq .01$)

Maximum R-square Improvement Technique
Dependent Variable Overall Building

		SCALES						
INDEPENDENT VARIABLES		COMMON UNIQUE	OLD NEW	SIMPLE COMPLEX	RUGGED DELICATE	PLEASING ANNOYING	USEFUL USELESS	FORMAL CASUAL
MAIN ENTRANCE	weight		0.2336			0.4364		
	mean score		5.58			2.36		
ROOF SHAPE	weight					0.3651		
	mean score					1.98		
WINDOW LOCATION	weight		0.2676					
	mean score		6.05					
R-SQUARE OF MODEL			.4407			.5420		
OVERALL BUILDING	variance	2.29	2.17	4.22	3.88	(1.77)	2.08	5.11
	mean score	6.17	6.39	4.96	2.69	1.89	1.91	3.39

Note: Models with R-square < .40 are not shown. Variables that were not significant in any model are not included.

( ) Scales with variance < 2.00 in overall building judgments.

FIGURE 12

SLIDE No. 41

House

Randolph K.S.

COMPOSITE DESCRIPTION

Overall building: rugged.

Characteristics:

Main entrance: old and slightly pleasing.

Roof shape: somewhat pleasing.

Roof materials: somewhat casual.

STEPWISE MULTIPLE REGRESSION FOR HOUSE (RANDOLPH)

Weight and Mean Score of Significant Variables (p≤.01)

Maximum R-square Improvement Technique
Dependent Variable Overall Building

		SCALES						
INDEPENDENT VARIABLES		COMMON UNIQUE	OLD NEW	SIMPLE COMPLEX	RUGGED DELICATE	PLEASING ANNOYING	USEFUL USELESS	FORMAL CASUAL
MAIN ENTRANCE	weight		1.1299			0.6828		
	mean score		2.07			3.29		
ROOF SHAPE	weight					0.3033		
	mean score					2.78		
ROOF MATERIALS	weight							0.6494
	mean score							4.94
R-SQUARE OF MODEL			.9607			.7963		.5852
OVERALL BUILDING	variance	4.31	5.30	2.40	(1.62)	3.67	5.01	2.41
	mean score	3.25	2.21	2.15	1.76	3.03	3.47	5.46

Note: Models with R-square < .50 are not shown. Variables that were not significant in any model are not included.

( ) Scales with variance < 2.00 in overall building judgments.

FIGURE 13

SLIDE No. 42

House

Manhattan K.S.

COMPOSITE DESCRIPTION

Overall building: new, useful, pleasing.

Characteristics:

Wall materials: pleasing.

Shape of building: pleasing.

STEPWISE MULTIPLE REGRESSION FOR HOUSE (MANHATTAN)

Weight and Mean Score of Significant Variables ($p \leq .01$)

Maximum R-square Improvement Technique
Dependent Variable Overall Building

		SCALES						
INDEPENDENT VARIABLES		COMMON UNIQUE	OLD NEW	SIMPLE COMPLEX	RUGGED DELICATE	PLEASING ANNOYING	USEFUL USELESS	FORMAL CASUAL
WALL MATERIALS	weight mean score					0.4928 1.87		
SHAPE OF BUILDING	weight mean score					0.3582 2.22		
R-SQUARE OF MODEL						.6799		
OVERALL BUILDING	variance mean score	3.67 3.22	(0.68) 6.35	3.52 3.01	2.83 3.46	(1.60) 1.70	(1.26) 1.59	3.29 4.74

Note: Models with R-square <.40 are not shown. Variables that were not significant in any model are not included.

( ) Scales with variance <2.00 in overall building judgments.

FIGURE 14

SLIDE No. 43

House

Manhattan K.S.

COMPOSITE DESCRIPTION

Overall building: old, useful, slightly rugged.

Characteristics:

Main entrance: somewhat pleasing and rugged.

Roof materials: pleasing.

STEPWISE MULTIPLE REGRESSION FOR HOUSE (MANHATTAN)

Weight and Mean Score of Significant Variables ($p \leq .01$)

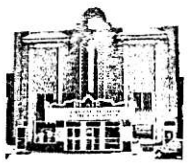
Maximum R-square Improvement Technique
Dependent Variable Overall Building

		SCALES						
INDEPENDENT VARIABLES		COMMON UNIQUE	OLD NEW	SIMPLE COMPLEX	RUGGED DELICATE	PLEASING ANNOYING	USEFUL USELESS	FORMAL CASUAL
MAIN ENTRANCE	weight				0.4946	0.5865		
	mean score				3.23	2.76		
ROOF MATERIALS	weight					0.4762		
	mean score					2.42		
R-SQUARE OF MODEL					.4143	.6810		
OVERALL BUILDING	variance	2.37	(0.59)	2.54	(1.70)	2.40	(1.28)	2.71
	mean score	4.72	1.87	4.12	2.68	2.89	2.25	3.38

Note: Models with R-square < .40 are not shown. Variables that were not significant in any model are not included.

( ) Scales with variance < 2.00 in overall building judgments.

FIGURE 15



SLIDE No. 51

Theatre

Belville K.S.

COMPOSITE DESCRIPTION

Overall building: somewhat useful, unique, old.

Characteristics:

Shape of building: Somewhat pleasing and - rugged.

Top materials: slightly pleasing.

Main entrance: slightly rugged.

STEPWISE MULTIPLE REGRESSION FOR THEATRE

Weight and Mean Score of Significant Variables ($p \leq .01$)

Maximum R-square Improvement Technique
Dependent Variable Overall Building

INDEPENDENT VARIABLES		SCALES						
		COMMON NEW	OLD NEW	SIMPLE COMPLEX	RUGGED DELICATE	PLEASING ANNOYING	USEFUL USELESS	FORMAL CASUAL
MAIN ENTRANCE	weight				0.4995			
	mean score				3.38			
WALL MATERIALS	weight							0.3190
	mean score							3.89
ROOF SHAPE	weight							0.5294
	mean score							2.75
ROOF MATERIALS	weight					0.4444		
	mean score					2.55		
SHAPE OF BUILDING	weight				0.4166	0.5465		
	mean score				3.30	3.00		
R-SQUARE OF MODEL					.5648	.699		.5242
OVERALL BUILDING	variance	(1.72)	(1.79)	2.18	2.63	3.83	(1.45)	2.08
	mean score	5.67	2.20	4.97	3.30	2.95	2.59	3.04

Note: Models with R-square <.50 are not shown. Variables that were not significant in any model are not included.

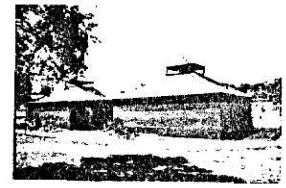
( ) Scales with variance <2.00 in overall building judgments.

FIGURE 16

SLIDE No. 52

Bath House

Clay Center K.S.



COMPOSITE DESCRIPTION

Overall building: useful, new, somewhat rugged.

Characteristics:

Window shape: new.

Main entrance: new and useful.

Shape of building: somewhat useful.

STEPWISE MULTIPLE REGRESSION FOR BATH HOUSE (CLAY CENTER)

Weight and Mean Score of Significant Variables ($p \leq .01$)

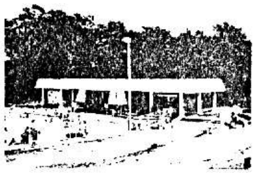
Maximum R-square Improvement Technique
Dependent Variable Overall Building

INDEPENDENT VARIABLES		SCALES						
		COMMON UNIQUE	OLD NEW	SIMPLE COMPLEX	RUGGED DELICATE	PLEASING ANNOYING	USEFUL USELESS	FORMAL CASUAL
MAIN ENTRANCE	weight mean score		0.3030 6.25				0.3440 2.22	
WINDOW SHAPE	weight mean score		0.3923 6.26					
SHAPE OF BUILDING	weight mean score						0.3982 2.51	
R-SQUARE OF MODEL			.6722				.5495	
OVERALL BUILDING	variance mean score	2.61 5.47	(1.33) 6.31	4.09 5.37	(1.41) 2.68	2.57 2.94	(1.25) 2.29	2.97 4.74

Note: Models with R-square <.50 are not shown. Variables that were not significant in any model are not included.

( ) Scales with variance <2.00 in overall building judgments.

FIGURE 17



SLIDE No. 53

BATH HOUSE

CHANUTE K.S.

COMPOSITE DESCRIPTION

Overall building: useful, new, pleasing.

Characteristics:

Main entrance and window location: somewhat rugged.

Wall colors and roof shape: neither common nor unique.

STEPWISE MULTIPLE REGRESSION FOR BATH HOUSE (CHANUTE)

Weight and Mean Score of Significant Variables ($p \leq .01$)

Maximum R-square Improvement Technique
Dependent Variable Overall Building

INDEPENDENT VARIABLES		SCALES COMMON UNIQUE	OLD NEW	SIMPLE COMPLEX	RUGGED DELICATE	PLEASING ANNOYING	USEFUL USELESS	FORMAL CASUAL
MAIN ENTRANCE	weight mean score				0.4534 3.42			
WALL COLORS	weight mean score	0.4346 3.77						
ROOF SHAPE	weight mean score	0.3583 2.96						
WINDOW LOCATION	weight mean score				0.4151 3.30			
R-SQUARE OF MODEL		.5134			.5606			
OVERALL BUILDING	variance mean score	4.71 4.94	(1.62) 6.50	5.40 3.84	3.59 3.62	(1.76) 1.86	(0.75) 1.53	2.30 5.60

Note: Models with R-square $<.50$ are not shown. Variables that were not significant in any model are not included.

( ) Scales with variance <2.00 in overall building judgments less than 1.50 - very, quite

1.51 - 2.50 - no adverb

2.51 - 3.50 - somewhat, slightly

3.51 - 4.50 - neither nor

4.51 - 5.50 - somewhat, slightly

5.51 - 6.50 - no adverb

6.51 and above - very, quite

Judgments of significant features were defined following the same procedure described above. The variables from models with higher R-square values are mentioned first, continuing in descending order.

Generally, the description obtained matched the building being judged, with a few exceptions in which the adjective applied to the variable did not correspond well. Such was the case in slide 53, and slide 12. Only in one building (slide 13) no substancial agreement was registered in overall building -- judgments, otherwise, enough adjectives and variables could be included in the description to examine their accurancy and appropiateness.

Connotative Dimensions and Orthogonality of Scales

In order to examine the orthogonality if the semantic scales in the instrument, a series of factor analysis were performed for the overall building and for each of the building characteristics. Results are summarized in tables 10 through 19, and compared in table 20.

The evidence suggests that the scales utilized are not independent (i.e., orthogonal). Three stable and orthogonal dimen sions were identified for the overall building: aesthetic, evaluative, and fashion. These same scales were identified with -- slight variations for all but two building characteristics. Two different factors (organization and novelty) were identified -- in the analysis for the other two characteristics.

The first dimension was clearly an aesthetic factor, displaying high and generally exclusive loadings on the common - unique, simple - complex, and formal - casual scales. All of - them refer to artistic and formal qualities of buildings ---- suggesting that in general, buidings and characteristics that - were judged common and simple are rated as casual, and when considered unique and complex are viewed as formal. The same scales resulted highly loaded for building shape and window location, but loadings on the common - unique scale were not restricted to this factor, and loaded high on another factor (novelty). This suggests that an organization factor may be more appropiate for these building characteristics. Another slight difference in this factor occurs for window shape, for which in addition of the former scales (common, simple, and formal) the -- rugged - delicate scale also presented a high loading. This scale, as the others, relates also to an artistic quality (i.e., - texture), it can therefore be asummed that we are dealing basically with the same aesthetic factor.

The second factor, evaluation, is present in all building characteristics in the study plus the overall building, this -- factor is made up by the pleasing - annoying, and useful - useless scales, which appear to be associated by their appreciative or estimative character. A slight variation in this factor occurs in the case of wall colors, which present an inverse --- high loading in the old-new scale, indicating that colors rated old are judged annoying and useless, and viceversa. This fact - apparently reinforces the evaluative character of the factor.

Finally, a third factor, fashion, was identified for overall building and most building characteristics, except window location and building shape. The fashion factor was defined by high loadings on the old - new and rugged - delicate scales, which - refer to style qualities such as age and the making or form of the building characteristics. Only two slight variations are - apparent, for wall colors, ald - new, loads high on another scale, suggesting perhaps and emphasis on the remaining exclusive scale, rugged - delicate and, therefore, in the textural quality of the colors, rather than on age. Another variation is present for window shape which presented a high loading on rugged-delicate in another factor (organization).

In the case of window location and building shape, the --- third factor, novelty, was defined by the common - unique, old-new, and rugged - delicate scales, referring clearly to the peculiarity or newness of the variables.

In short, scales did not represent independent dimensions as expected and as suggested by Hershberger (1974). Aesthetic, evaluative, and fashion factors were identified for the overall building and all building characteristics except window location and building shape, which appear to be judged along organization, and novelty factors.

Table 10

FACTOR ANALYSIS FOR OVERALL BUILDING
QUARTIMAX FACTOR LOADINGS

SCALES	FACTOR 1 AESTHETIC	FACTOR 2 EVALUATIVE	FACTOR 3 FASHION	FINAL COMMONALITY ESTIMATES
COMM	(0.690)	- 0.177	0.333	0.618
OLD	- 0.054	- 0.232	(0.808)	0.709
SIMPLE	(0.815)	0.041	0.143	0.687
RUGGED	0.214	0.155	(0.719)	0.587
PLEASING	- 0.149	(0.828	- 0.086	0.716
USEFUL	0.160	(0.804)	0.014	0.672
FORMAL	(-0.736	- 0.104	0.228	0.605
EIGEN-VALUE	1.948	1.559	1.084	
PORTION	0.278	0.223	0.656	
CUM PORTION	0.278	0.501	0.656	
CONTRIBUTION TO COMMON VARIANCE BY ROTATED FACTORS	1.779	1.453	1.361	4.682

(   ) Scales loading higher than .60

N = 741

Table 11

FACTOR ANALYSIS FOR MAIN ENTRANCE
QUARTIMAX FACTOR LOADINGS

SCALES	FACTOR 1 AESTHETIC	FACTOR 2 EVALUATIVE	FACTOR 3 FASHION	FINAL COMMONALITY ESTIMATES
COMMON	(0.791)	- 0.087	0.223	0.683
OLD	- 0.075	- 0.282	(0.785)	0.701
SIMPLE	(0.825	0.148	0.112	0.715
RUGGED	0.200	0.177	(0.739	0.617
PLEASING	- 0.148	(0.824)	- 0.023	0.701
USEFUL	0.214	(0.793)	- 0.037	0.676
FORMAL	(- 0.741)	0.009	0.196	0.588
EIGEN- VALUES	2.046	1.522	1.113	
PORTION	0.292	0.217	0.159	
CUM PORTION	0.292	0.510	0.669	
CONTRIBUTION TO COMMON VARIANCE BY ROTATED FACTORS	1.969	1.448	1.264	4.681

( ) Scales loading higher than .60

N = 740

Table 12

FACTOR ANALYSIS FOR WALL COLORS

QUARTIMAX FACTOR LOADINGS

SCALES	FACTOR 1 AESTHETIC	FACTOR 2 EVALUATIVE	FACTOR 3 FASHION	FINAL COMMONALITY
COMMON	(0.765)	- 0.113	0.195	0.636
OLD [a]	0.227	- 0.434	0.565	0.558
SIMPLE	(0.833)	0.054	0.065	0.701
RUGGED	0.040	0.194	0.748	0.598
PLEASING	0.101	(0.804)	- 0.071	0.662
USEFUL	0.154	(0.818)	0.186	0.728
FORMAL	(- 0.603)	- 0.055	0.348	0.487
EIGEN-VALUES	1.781	1.536	1.054	
PORTION	0.254	0.219	0.151	
CUM PORTION	0.254	0.474	0.624	
CONTRIBUTION TO COMMON VARIANCE BY ROTATED FACTORS	1.729	1.561	1.080	4.371

( ) Scales loading higher than .60

a) Scales loading higher than .40 in more than one factor

N = 746

Table 13

FACTOR ANALYSIS FOR WINDOW SHAPE
QUARTIMAX FACTOR LOADINGS

SCALES	FACTOR 1 AESTHETIC	FACTOR 2 EVALUATIVE	FACTOR 3 FASHION	FINAL COMMONALITY ESTIMATES
COMMON	(0.752)	- 0.045	0.314	0.666
OLD	0.044	- 0.074	(0.904)	0.826
SIMPLE	(0.814)	0.003	0.108	0.674
RUGGED a)	0.409	0.107	0.571	0.505
PLEASING	- 0.140	(0.841)	- 0.198	0.765
USEFUL	0.242	(0.735)	0.208	0.718
FORMAL	(- 0.782)	- 0.070	0.164	0.644
EIGEN-VALUES	2.392	1.365	1.039	
PORTION	0.342	0.195	0.148	
CUM PORTION	0.342	0.537	0.685	
CONTRIBUTION TO COMMON CARIANCE BY ROTATED FACTORS	2.087	1.346	1.364	4.797

( ) Scales loading higher than .60

a) Scales loading higher than .40 in more than one factor

N = 738

Table 14
FACTOR ANALYSIS FOR WALL MATERIALS
QUARTIMAX FACTOR LOADINGS

SCALES	FACTOR 1 AESTHETIC	FACTOR 2 EVALUATIVE	FACTOR 3 FASHION	FINAL COMMONALITY ESTIMATES
COMMON	(0.714)	0.042	0.324	0.616
OLD	0.032	0.208	(0.835)	0.741
SIMPLE	(0.786)	0.059	0.206	0.664
RUGGED	0.267	0.306	(0.662)	0.603
PLEASING	- 0.107	(0.841)	- 0.109	0.731
USEFUL	0.250	(0.789)	0.109	0.697
FORMAL	(- 0.725)	0.010	0.277	0.602
EIGEN-VALUES	2.165	1.412	1.076	
PORTION	0.309	0.202	0.154	
CUM PORTION	0.309	0.511	0.665	
CONTRIBUTION TO COMMON VARIANCE BY ROTATED FACTORS	1.799	1.471	1.382	4.653

(   ) Scales loading higher than .60

N = 739

Table 15

FACTOR ANALYSIS FOR ROOF SHAPE

QUARTIMAX FACTOR LOADING

SCALES	FACTOR 1 AESTHETIC	FACTOR 2 EVALUATIVE	FACTOR 3 FASHION	FINAL COMMONALITY ESTIMATES
COMMON	(0.835)	- 0.033	0.196	0.737
OLD	- 0.074	0.233	(0.833)	0.755
SIMPLE	(0.881)	- 0.005	0.043	0.778
RUGGED	0.207	0.325	(0.617)	0.530
PLEASING	- 0.176	(0.815)	- 0.050	0.697
USEFUL	0.293	(0.745)	0.032	0.641
FORMAL	(- 0.782)	- 0.107	0.155	0.648
EIGEN-VALUES	2.230	1.362	1.103	
PORTION	0.331	0.195	0.158	
CUM PORTION	0.331	0.526	0.684	
CONTRIBUTION TO COMMON VARIANCE BY ROTATED FACTORS	2.251	1.392	1.143	4.786

( ) Scales loading higher than .60

N = 741

Table 16

FACTOR ANALYSIS FOR ROOF MATERIALS
QUARTIMAX FACTOR LOADINGS

SCALES	FACTOR 1 AESTHETIC	FACTOR 2 EVALUATIVE	FACTOR 3 FASHION	FINAL COMMONALITY ESTIMATES
COMMON	(0.835)	- 0.010	0.079	0.703
OLD	- 0.207	- 0.290	(0.793)	0.756
SIMPLE	(0.844)	0.076	0.066	0.724
RUGGED	0.208	0.382	(0.676)	0.646
PLEASING	0.150	(0.844)	- 0.069	0.740
USEFUL	0.340	(0.734)	0.052	0.656
FORMAL	(-0.693)	- 0.026	0.170	0.510
EIGEN-VALUES	2.263	1.342	1.133	
PORTION	0.323	0.192	0.162	
CUM PORTION	0.323	0.515	0.677	
CONTRIBUTION TO COMMON VARIANCE BY ROTATED FACTORS	2.116	1.489	1.133	4.739

(   ) Scales loading higher than .60

N = 733

Table 17

FACTOR ANALYSIS FOR WINDOW LOCATION
QUARTIMAX FACTOR LOADINGS

SCALES	FACTOR 1 ORGANIZATION	FACTOR 2 EVALUATIVE	FACTOR 3 NOVELTY	FINAL COMMONALITY ESTIMATES
COMMON [b]	(0.685)	0.002	0.513	0.733
OLD	- 0.015	- 0.042	(0.865)	0.750
SIMPLE	(0.777)	0.083	0.308	0.706
RUGGED	0.161	0.076	0.543	0.327
PLEASING	- 0.077	(0.886)	- 0.136	0.810
USEFUL	0.222	(0.794)	0.270	0.753
FORMAL	(-0.835)	- 0.018	0.162	0.723
EIGEN-VALUES	2.367	1.374	1.060	
PORTION	0.338	0.196	0.151	
CUM PORTION	0.338	0.535	0.686	
CONTRIBUTION TO COMMON VARIANCE BY ROTATED FACTORS	1.852	1.430	1.520	4.802

(   ) Scales loading higher than .60

b Scales loading higher than .50 in more than one factor

N = 733

Table 18

FACTOR ANALYSIS FOR SHAPE OF BUILDING
QUARTIMAX FACTOR LOADINGS

SCALES	FACTOR 1 ORGANIZATION	FACTOR 2 EVALUATIVE	FACTOR 3 NOVELTY	FINAL COMMONALITY ESTIMATES
COMMON[b]	(0.678)	- 0.086	0.598	0.715
OLD	0.029	- 0.115	(0.867)	0.765
SIMPLE	(0.808)	0.080	0.300	0.750
RUGGED	0.158	0.286	0.551	0.410
PLEAGIN	- 0.104	(0.855	- 0.094	0.750
USEFUL	0.295	(0.715)	0.202	0.638
FORMAL	(-0.800)	- 0.094	0.218	0.696
EIGEN-VALUES	2.362	1.319	1.043	
PORTION	0.337	0.188	0.149	
CUM PORTION	0.337	0.536	0.675	
CONTRIBUTION TO COMMON VARIANCE BY ROTATED FACTORS	1.875	1.359	1.490	4.724

(   ) Scales loading higher than .60

b Scales loading higher than .50 in more than one factor

N = 738

TABLE 19

COMPARATIVE TABLE OF FACTORS

Quartimax Exclusive Loadings Over .60 by Factors
for All Variables: All Buildings

VARIABLES	FACTOR I	FACTOR II	FACTOR III	CUMULATIVE PORTION ACCOUNTED FOR BY FACTORS
OVERALL BUILDING	AESTHETIC Simple .81 Formal -.73 Common .68	EVALUATIVE Pleasing .82 Useful .80	FASHION Old .80 Rugged .71	.65
MAIN ENTRANCE	AESTHETIC Simple .82 Common .79 Formal -.74	EVALUATIVE Pleasing .82 Useful .79	FASHION Old .78 Rugged .73	.66
WALL COLORS	AESTHETIC Simple .83 Common .76 Formal -.60	EVALUATIVE Useful .81 Pleasing .80	FASHION Rugged .74 Old .56[a]	.62
WINDOW SHAPE	AESTHETIC Simple .81 Formal -.78 Common .75	EVALUATIVE Pleasing .84 Useful .78	FASHION Old .90 Rugged .57[a]	.68
WALL MATERIALS	AESTHETIC Simple .78 Formal -.72 Common .71	EVALUATIVE Pleasing .84 Useful .78	FASHION Old .83 Rugged .66	.66
ROOF SHAPE	AESTHETIC Simple .88 Common .83 Formal -.78	EVALUATIVE Pleasing .81 Useful .74	FASHION Old .83 Rugged .61	.68
ROOF MATERIALS	AESTHETIC Simple .84 Common .83 Formal -.69	EVALUATIVE Pleasing .84 Useful .73	FASHION Old .79 Rugged .67	.67
WINDOW LOCATION	ORGANIZATION Formal -.83 Simple .77	EVALUATIVE Pleasing .88 Useful .79	NOVELTY Old .86 Rugged .54[b] Common .51[a]	.68
SHAPE OF BUILDING	ORGANIZATION Simple .80 Formal -.79	EVALUATIVE Pleasing .85 Useful .71	NOVELTY Old .86 Common .56[a] Rugged .55[b]	.67

a) Scales loading higher than .5 in the factor indicated. and loading over .4 in another factor also.
b) Scales loading higher than .5 .

CHAPTER V

DISCUSSION AND CONCLUSIONS

Communication of Meaning

Although the complex and highly diverse character of meaning in architecture is not to be ignored, it appears from the results in this study that architectural meaning could be manipulated to a great extent by controlling a small number of building characteristics. This is suggested by the acceptable portion of variance in connotative judgments of buildings that is accounted for by a handful of building features. However, the limited generalizability of the findings should be noted since results are base on a restricted sample of buildings typical of the geographical area in which they are located. Nonetheless, results are encouraging because it seems possible to define a more detailed and generalizable set of meaningfully significant building characteristics through the process used in this research.

For designers, the avaiability of such a set represents a source of useful information on how to communicate with users through the characteristics of the buildings they design, and on which aspects to amphasize in order to generate specific responses from those who view the building.

Knowledge about a well-defined set of meaningful aspects could provide useful and interesting cues applicable to the study and manipulation of phenomena related to meaning such as legibility, image formation, environmental learning, etc.

Influence of Type

The findigs suggest that type has a strong bearing upon -- meaning. Differences in characteristics identified as signifi-- cant for each type imply several things.

For designers, the most obvious implication is that diffe- rent building characteristics should be emphasized and treated according to the type of building being designed in order to ef fectively communicate meaning to users. For example, in reli--- gious buildings, meaning could be more effectively and clearly communicated through roof shape and the general shape of the -- building, in government buildings, the main entrance may be the most salient feature, and so forth.

The present findings provide only a rudimentary basis to - make such decisions, however, information of this sort derived from a greater variety of types, buildings, and characteristics could be extremely useful in the design process.

Congruence Between Type and Building Characteristics

The strong association of type-building characteristics sug gested by the results of this study seems consistent with find- ings reported by Steintz (1968) relative to congruence between form and activity. Such findings indicated, among other facts, that buildings were judged more meaningful when they presented a congruent form - activity relationship. In the present study, the particular way in which some building features are associa- ted with a specific type of building, suggests that users may - match up building form with anticipated activity based on past experience.

Architecture and semiology

Findings in this study seem to be related also to issues - in the area of semiotics. For example, indications that certain building characteristics are consistently associated by users - with certain types of buildings, could be a sign that architectural environment may be conceptualized as semiological or sign-system, as suggested by Choay (1970) and Dorfles (1970). In -- further studies, it would be interesting to examine if some consistent patterns and units similar to the ones found in language exist in the communication of meaning. Moreover, it may be possible to single out, measure, and relate some basic units used to comunicate the "architectural message" Jenks (1970), which - suggests at least some parallelism between linguistics and architecture.

Pattern Language

Results derived from the analysis by type may also imply - that some kind of pattern language, as conceptualized by Alexander (1979), is in effect used by people to interpret and "bring to life buildings". Alexander (1979) explains that "the patterns are always interlocked with certain geometric patterns in the - space", just as certain building characteristics (geometric -- patterns) in this study seem to be 'interlocked' to certain -- type and meaning in the analysis.

A research similar to the present one may be a way to identify some elements and relationships of such language, with res pect to information obtained from the ones which, according to Alexander, create the patterns and the language: the users.

Description of Buildings With Semantic Scales

Another finding of this research is reflected in the fact that descriptions of specific buildings were obtained utilizing data gathered with the semantic differential technique. The descriptions,altough far from comprehensive or detailed, are fairly accurate and generally matched the buildings from which the -- semantic ratings were obtained.

The findings seem significant not only because of the po-- tential usefulness of the methodology followed in this study, - but also because it suggests the possibility of using the -- S.D. in a way and for purposes for which it was previously -- judged unfit.

Orthogonality of Factors

The semantic scales selected for the measurements were assumed to represent independent (i.e. orthogonal) dimensions by which buildings were judged. The assumption was based on ---- research by Hershberger (1974). The concern in including inde-- pendent scales originantes from the need to cover the greatest range of connotative meaning in buildings with the fewest --- number of scales.

The orthogonality of factors (i.e. scales) was examined by factor-analyzing judgements for the overall building and -- each building characteristic. As indicated in the results, the scales did not appear to be independent, and clustered in -

five different factors.

Similarities in Factors

As pointed out in the results section, factors identified for the overall building and building characteristics were generally very similar, only two characteristics presented considerable difference in loadings to be considered for judgment along different factors.

The great similarity of factors found was expected for several reasons: one reason and apparently the most important, relates to the selection of the scales. As may be recalled, the selection included only scales that could apply to all the variables to be measured. Consequently, scales that could have defined different factors for one or several variables, but did not apply to all of them, were not included. As can be seen, such scales were likely to be the ones that could be the most helpful in differentiating factors between variables.

Another possible reason for the similarities could be that the variables in the study are of a similar origin and nature, therefore it is feasible that they are judged basically along the same connotative dimensions.

Areas for Further Research

Significant Features

Further empirical studies are necesary to define a comprehensive, reliable and generalizable set of significant building features which could account for a greater portion of variance in judgements of the connotative aspects of buildings. It may be possible to obtain a basic set through research similar to that performed by Stea (1970), Milgram (1976), and Appleyard (1969), but concentrating on architectural features of specific buildings rather than urban elements. Subsequently, the significance of characteristics identified in such studies may be established with an approach similar to the one proposed in this one.

Building Type Inventory and Other Variables

Research is also necessary to select an inventory of building types. Such inventory, as well as the set of features mentioned above, should preferably reflect the taxonomy and vocabulary of respondents and users. It seems also important to examine if both the inventory of building types and the set of features should be defined and adjusted according to the geographical area and particular context in which the buildings rated are embedded.

An effort should be made in further studies to incorporate variables different than type but also of a global nature, such as style, context, structure, etc., which might have a significant effect on meaning, and could facilitate the definition of various aspects of architectural meaning, probably making them more descriptive and accurate.

Semantic Scales

As noted before, it is important to define a comprehensive and representative set of semantic scales to be used in studies like the present where a large number of variables must be measured in all scales. If such a set is to be useful for this kind of study it should embrace as many aspects of connotative meaning and, at the same time, be as concise as possible to allow measurements of all variables in a reasonable amount of time.

Conclusions

Methodology

The results of this study exemplified a way by which the S. D. can be utilized more effectively to analyze meaning in architectural stimuli. It was demonstrated that some of the weaknesses involved in its application to environmental problems can be ameliorated. It was also suggested that the S.D. can also be useful and of value in the analysis of some specific aspects of architectural meaning, given an adequate research design and manipulation of the variables.

Connotative Meaning Explained by Building Characteristics

Findings suggest that connotative meaning of buildings (i.e, semantic judgments of the overall building) can be explained, to a great extent, by a small number of building characteristics. It appears that among the most significant building features, in terms of meaning, are the main entrance and the shape of the building followed by the roof shape and the wall colors.

Effect of Type on Meaning

Evidence seems to indicate that judgments about meaning are based, to some extent, on the recognition of certain forms being consistently associated with certain functions or types of buildings, and that features used to judge meaning differ clearly among types.

Connotative Factors

Factor analysis indicated that, even though the scales --

used in the study did not represent independent dimensions as originaly assumed, their application proved to be useful in reaching the objectives of the study.

Great similarities were found in the factors along which - the overall building and building characteristics are judged. - The question remains, however, about whether the similarities - were due to selection of scales, or to the fact that the dimensions used to judge the variables in this study are actually similar.

Five different factors were identified: aesthetic, evaluative, and fashion factors were identified for the overall buiding and all building characteristics, except window location -- and building shape which appear to be judged along organization, evaluation, and novelty factors.

Further Research

Future research was suggested in relation to the definition of a comprehensive and generalizable set of most significant features used to judge buildings connotatively. The need of selecting a more representative variety of building --- categories, incorporating other intervening variables like style, context, and structure for further research was also emphasized. The convenience of considering the taxonomy and vocabulary defined by respondents (i. e. users) when working in the areas noted above was indicated.

APPENDIX A

SEMANTIC SCALES

APPENDIX A

HERSHBERGER'S CONNOTATIVE DIMENSIONS OF ARCHITECTURAL MEANING AND SCALES SUGGESTED FOR THEIR MEASUREMENT.

Semantic Scales To Measure The Meaning of Designed Environments: Hershberger-Cass Base Set (Cass & Hershberger 1974)

Factors	Primary Scales	Alternate Scales
1. General Evaluative	good-bad	pleasing-annoying
	useful-useles	friendly-hostile
2. Utility Evaluative	unique-common	interesting-boring
3. Aesthetic Evaluative	active-pasive	complex-simple
	cozy-roomy	private-public
4. Activity	rugged-delicate	rough-smooth
5. Space	clean-dirty	tidy-messy
6. Potency	ordered-chaotic	formal-casual
7. Tidiness	warm-cool	hot-cold
8. Organization	light-dark	bright-dull
9. Temperature		
10. Lightining		

Secondary Scales	Alternate-Secondary Scales
old-new	traditional-contemporary
expensive-inexpensive	frugal-generous
large-small	huge tiny
exciting-calming	beatiful-ugly
clear-ambiguous	unified-diversified
colorful-colorless	vibrant-subsued
safe-dangerous	protected-exposed
quiet-noisy	distracting-facilitating
stuffy-drafty	musty-fresh
rigid-flexible	permanent-temporary

Note: The scales used in this study appear underlined.

APPENDIX B

THE INSTRUMENT

SUBJECT ID DATE ____________________

GROUP ID PLACE ID

STATEMENT OF CONFIDENTIALITY

The information provided in this questionnaire will remain anonymous. It will be treated with absolute confidentiality and will be used exclusively for the purposes of this study.

PURPOSE OF THE STUDY

The purpose of the present study is to analyze how people judge buildings. You will be shown slides of five different buildings, and will be asked to judge them using a series of word descriptions or scales. Some examples of these scales and the instructions for their use are provided in the following pages.

PERSONAL INFORMATION

001 Sex: ☐ Male ☐ Female

002 How old are you?_________years.

003 Are you currently: ☐ Single

☐ Married

☐ Divorced

☐ Separated

☐ Widowed

004 Occupation ______________________________ (If retired, give occupation for most of your life).

005 How many years of school have you completed?________years.

006 Where were you born?______________________________________

City State Population

007 Where do you live?____

City State Population

008 For how long have you lived in that locality?_______years.
(If more than <u>five</u> years, skip questions 9 and 10)

009 Where did you live before?__________________________________

City State Population

010 For how long?_______years.

INSTRUCTIONS

The word descriptions or scales that you will use to judge the buildings consist of a pair of words with seven spaces in between as shown below:

PLEASING ____:____:____:____:____:____:____ ANNOYING

If you feel that the building being judged is very closely related to one end of the scale, you should place a chek-mark as follows:

PLEASING __X__:____:____:____:____:____:____ ANNOYING

or

PLEASING ____:____:____:____:____:____:__X__ ANNOYING

If you feel that the building or characteristic of the building being judged is closely (but not extremely) related to one or the other end of the scale, you should place your check-mark as follows:

PLEASING ____:__X__:____:____:____:____:____ ANNOYING

or or

PLEASING ____:____:____:____:____:__X__:____ ANNOYING

If the building or characteristic seems only slightly related to one side as opposed to the other side (but is not realy neutral), then you should check as follows:

PLEASING ____:____:__X__:____:____:____:____ ANNOYING

or

PLEASING ____:____:____:____:__X__:____:____ ANNOYING

The direction toward which you check, of course, depends upon which of the two ends the scale seems most appropriate for the building or characteristic you are judging.

There might be a few instances in which the building or characteristic being judged seems equally related to both ends of the scale. In this situation you may place the check-mark in the middle space. However, please do not use the middle space unless you realy feel there isn't the slightest difference between checking toward one end or the other.

IMPORTANT: ++Place your check-marks in the middle of spaces, not in the boundaries.

THIS NOT THIS

____:__X__:____:____:____X____:____

++Be sure you check every scale for every building, do not omit any.

++Never place more than one check-mark on a single scale.

GENERAL RECOMMENDATIONS

Work at a fairly high speed through the test. Do not worry or puzzle over individual judgements, it is your first impressions, the immediate "feelings" about each building or characteristic that we want. On the other hand, please do not be careless, because we want your true impressions.

Do not look for "right" or "wrong" answers, we are interested in your personal opinion which may very well differ from others'.

When asked to give your overall impression of the building, try not to focus you attention on any specific characteristic.

Conversely, when asked to rate a particular characteristic (shape, entrance, windows, etc.) try to concentrate on that single aspect when making your judgements.

Please rate the buildings and their characteristic following the order suggested by the scales, going from the top to the bottom of each page.

We will take a trial run on a slide of a familiar building to familiarize you with the different scales, the sequence, and the amount of time allowed for judging each building. If you have any question, please feel free to ask.

Please turn to the first page of scales (page 4) and familiarize with the various scales, thank you.

S L I D E 5

OVERALL BUILDING

You'll be rating the overall building using the following word descriptions or scales. Please base your judgements on your overall impression of the building. Do not focus your attention on specific aspects or details.

501 COMPLEX ____:____:____:____:____:____:____ SIMPLE

502 RUGGED ____:____:____:____:____:____:____ DELICATE

503 FORMAL ____:____:____:____:____:____:____ CASUAL

504 NEW ____:____:____:____:____:____:____ OLD

505 COMMON ____:____:____:____:____:____:____ UNIQUE

506 USEFUL ____:____:____:____:____:____:____ USELESS

507 ANNOYING ____:____:____:____:____:____:____ PLEASING

511 To what extent do you like or dislike this building? (Please check a space as you did in the scales above)

Like it very much ____:____:____:____:____:____:____ Dislike it very much

....

512 What type of building do you think this is?

- ☐ Commercial and business
- ☐ Government and public service
- ☐ Religious
- ☐ Residential
- ☐ Recreational and social

....

513 Do you know where this building is located?

- ☐ NO; (Go to next question)
- ☐ YES. Could you mention the city? ____________

....

514 Have you ever been in this building?

- ☐ NO; (Please turn page)
- ☐ YES...

515 Once or twice a year or less ----------- ☐

Three times a year to once a month ----- ☐

More than once a month ----------------- ☐

RATING OF CHARACTERISTICS

In the following eight boxes you'll be rating specific characteristics of the building on slide five. The characteristic you are supposed to rate appears at the top of each box, and the scales below are the ones you should use to rate that characteristic

Please keep in mind that in each box you should concentrate on the single aspect you are judging, and forget about other features and details of the building.

MAIN ENTRANCE

521 SIMPLE _____:_____:_____:_____:_____:_____:_____ COMPLEX

522 RUGGED _____:_____:_____:_____:_____:_____:_____ DELICATE

523 FORMAL _____:_____:_____:_____:_____:_____:_____ CASUAL

524 USELESS _____:_____:_____:_____:_____:_____:_____ USEFUL

525 PLEASING _____:_____:_____:_____:_____:_____:_____ ANNOYING

526 COMMON _____:_____:_____:_____:_____:_____:_____ UNIQUE

527 OLD _____:_____:_____:_____:_____:_____:_____ NEW

OUTSIDE WALL COLORS

531 NEW _____:_____:_____:_____:_____:_____:_____ OLD

532 FORMAL _____:_____:_____:_____:_____:_____:_____ CASUAL

533 ANNOYING _____:_____:_____:_____:_____:_____:_____ PLEASING

534 SIMPLE _____:_____:_____:_____:_____:_____:_____ COMPLEX

535 COMMON _____:_____:_____:_____:_____:_____:_____ UNIQUE

536 USEFUL _____:_____:_____:_____:_____:_____:_____ USELESS

537 RUGGED _____:_____:_____:_____:_____:_____:_____ DELICATE

WINDOW SHAPE

541	COMPLEX	____ :	____ :	____ :	____ :	____ :	____ : ____	SIMPLE
542	NEW	____ :	____ :	____ :	____ :	____ :	____ : ____	OLD
543	DELICATE	____ :	____ :	____ :	____ :	____ :	____ : ____	RUGGED
544	ANNOYING	____ :	____ :	____ :	____ :	____ :	____ : ____	PLEASING
545	USEFUL	____ :	____ :	____ :	____ :	____ :	____ : ____	USELESS
546	FORMAL	____ :	____ :	____ :	____ :	____ :	____ : ____	CASUAL
547	COMMON	____ :	____ :	____ :	____ :	____ :	____ : ____	UNIQUE

OUTSIDE WALL MATERIALS

551	DELICATE	____ :	____ :	____ :	____ :	____ :	____ : ____	RUGGED
552	SIMPLE	____ :	____ :	____ :	____ :	____ :	____ : ____	COMPLEX
553	USEFUL	____ :	____ :	____ :	____ :	____ :	____ : ____	USELESS
554	CASUAL	____ :	____ :	____ :	____ :	____ :	____ : ____	FORMAL
555	COMMON	____ :	____ :	____ :	____ :	____ :	____ : ____	UNIQUE
556	ANNOYING	____ :	____ :	____ :	____ :	____ :	____ : ____	PLEASING
557	NEW	____ :	____ :	____ :	____ :	____ :	____ : ____	OLD

ROOF (OR UPPERMOST EDGE) SHAPE

561	PLEASING	____ :	____ :	____ :	____ :	____ :	____ : ____	ANNOYING
562	COMPLEX	____ :	____ :	____ :	____ :	____ :	____ : ____	SIMPLE
563	RUGGED	____ :	____ :	____ :	____ :	____ :	____ : ____	DELICATE
564	UNIQUE	____ :	____ :	____ :	____ :	____ :	____ : ____	COMMON
565	USEFUL	____ :	____ :	____ :	____ :	____ :	____ : ____	USELESS
566	CASUAL	____ :	____ :	____ :	____ :	____ :	____ : ____	FORMAL
567	OLD	____ :	____ :	____ :	____ :	____ :	____ : ____	NEW

ROOF (OR UPPERMOST EDGE) MATERIALS

571	USEFUL	____:____:____:____:____:____:____	USELESS
572	PLEASING	____:____:____:____:____:____:____	ANNOYING
573	COMMON	____:____:____:____:____:____:____	UNIQUE
574	CASUAL	____:____:____:____:____:____:____	FORMAL
575	OLD	____:____:____:____:____:____:____	NEW
576	COMPLEX	____:____:____:____:____:____:____	SIMPLE
577	RUGGED	____:____:____:____:____:____:____	DELICATE

WINDOW LOCATION

581	COMPLEX	____:____:____:____:____:____:____	SIMPLE
582	CASUAL	____:____:____:____:____:____:____	FORMAL
583	OLD	____:____:____:____:____:____:____	NEW
584	UNIQUE	____:____:____:____:____:____:____	COMMON
585	ANNOYING	____:____:____:____:____:____:____	PLEASING
586	DELICATE	____:____:____:____:____:____:____	RUGGED
587	USEFUL	____:____:____:____:____:____:____	USELESS

SHAPE OF BUILDING

591	PLEASING	____:____:____:____:____:____:____	ANNOYING
592	COMMON	____:____:____:____:____:____:____	UNIQUE
593	USELESS	____:____:____:____:____:____:____	USEFUL
594	NEW	____:____:____:____:____:____:____	OLD
595	RUGGED	____:____:____:____:____:____:____	DELICATE
596	FORMAL	____:____:____:____:____:____:____	CASUAL
597	COMPLEX	____:____:____:____:____:____:____	SIMPLE

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THE ARCHITECTURAL CONNOTATIVE MEANING OF
BUILDINGS AND ITS RELATION TO
BUILDING CHARACTERISTICS

by

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AN ABSTRACT OF A MASTER'S THESIS

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ABSTRACT

This thesis examines the relationship between connotative meaning in architecture and a number of characteristics of architectural stimuli.

Previous research in related areas of environmental behavior has substantiated the importance of meaning for users and designers. However, research has been directed independently to either connotative or denotative aspects of buildings. Few efforts have been made towards the study of meaning in a way that relates the two aspects mentioned. Furthermore, no empirical studies have addressed such relationships as perceived by users of buildings.

In this study, eight building characteristics are measured and related to connotative judgements of buildings as a whole, utilizing a number of semantic scales. The connotative aspect was defined by semantic measurements of the overall building.

Fifteen slides of buildings from several towns in Kansas were rated by 160 subjects from Wamego K.S. -population 3,500. A questionnaire-like instrument, based mostly on the Semantic Differential Technique, was designed to rate the buildings. Interviewing variables such as type, context, familiarity, and frequency of use were controlled by the selection of stimuli and subjects.

Stepwise multiple regression analysis was used to study the relationship between the dependent variable (overall building) and the independent variables (building characteristics). The same method was employed in a similar analysis controlling

the variable building type, to examine if the ralationship varied among types of buildings. Multiple regression was also used to investigate if building characteristics could be identified with semantic techniques in specific buildings.

Factor analysis was used to check orthogonality of the semantic scales utilized in the study, and to investigate if differences occured between the dimensions upon which building characteristics and the overall building were judged.

Findings suggest that about 50 percent of the variance in judgements of the overall building could be explained by a relative small number of building characteristics. Results also -- indicate that the building characteristics accounting for most of the variance differ among types of buildings, and that spe-- cific building characteristics can be examined with semantic -- scales.

Three dimensions were identified in the factor analysis for the overall building, and six building characteristics. Two additional dimensions were identified for the other two characteristics analyzed.

Conclusions were drawn, and implications and areas for -- further research proppposed from these findings.