

THE AESTHETIC PERCEPTION OF VARIOUS GROUPS TO VISUAL
STIMULI ASSOCIATED WITH URBAN ENVIRONMENT

by 544

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B. Arch., M. S. University of Baroda, India, 1966

A MASTER'S THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF ARCHITECTURE

College of Architecture and Design

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1968

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ACKNOWLEDGEMENTS

The author wishes to express his sincere appreciation to Prof. Eugene T. McGraw, major adviser, Curriculum of Community and Regional Planning, under whose guidance this research was planned and carried out; to Dr. Leon Rappoport, Assistant Professor, Dept. of Psychology, who was most generous with his time and the providing of valuable suggestions; and to Mr. Martin Zola, Graduate student, Dept. of Psychology, whose knowledge of computer programming was invaluable.

Special acknowledgement is also due to the Chairman and Professors of various departments within the university who were kind enough to give permission to the author to use their students during class time, which made this research possible.

Last but not the least, special gratitude is expressed to the author's parents for their inspiration and confidence.

INTRODUCTION

Human needs change with time. These needs are a product of the function and the rapid scientific progress made by man. In order that cities and metropolitan areas are capable of reacting functionally to these needs, they must be planned and organized by those with powerful ideas based on a substantial understanding of urban activities. Thus the application of relevant planning and design concepts to the urban areas is essential. They should be applied in a truly comprehensive manner with the intent of defining purposes and goals as well as developing physical forms that are expressive of these objectives and goals. Only then can the urban environment satisfactorily meet the progressively changing needs of society.

Since man's first appearance on earth, he has spent much of that time as a nomad, a wanderer without settled habitation. His lack of a permanent settlement was the result of an extremely unproductive level of technology. In time man improved his technology and his system for collecting food. This situation, through a more stable food supply, made it possible for man to remain permanently settled. He started to live together in larger social groups which developed an environment that fostered better social interaction. This achievement set the stage for the emergence of cities and the start of man's control over his environment.

During the Greek era of Civilization, cities grew simultaneously along with strong agrarian activities. The building of Rome marked a turning-point in the technological advancement of man and his capacity to organize. It became possible to get and distribute the material necessities of life from distant places. While Rome may have only represented a small geographic area, on the surface of the known world, the impact of its military and political influence was mighty.

This period of history was followed by the dark ages which ended with Medieval period. Medieval towns were small in size and population; however, the close connection between industry and commerce that they fostered, together with their emphasis on technology, set a stage for the ultimate breakthrough of urbanization. This breakthrough came with a tremendous growth in productivity made possible by the use of mechanical energy.

The world's greatest urban growth has come about as a consequence of a complex series of events which occurred during the so-called Industrial Revolution and has taken place over the passed 200 years. It was during the period of Industrial Revolution that man for the first time developed the capability of utilizing sources of energy other than those of animals and his own muscle. This situation resulted in the overgrowth and expansion of the organic city beyond its political limit. The successively rapid development of

the telephone, incandescent lamp, electric trolley, subway, automobile and elevator changed the technique of city building and gave it a new physical shape.

The modern industrial city, being a product of mass production, drew manufacturing out of the home, and placed it in centralized locations. More and more workers poured into the urban areas to operate the machines and to dispose of the finished products. Urban areas attracted people not only because of certain unique attributes but mainly because they provided for the individual the possibility of securing greater economic rewards. While mechanical power was being utilized in great manufacturing and industrial centers, it was concomitantly being used in agricultural industries along with scientific knowledge. Expanding urban industries needed more people; and because of the revolution taking place in agriculture they were available because fewer workers were required on farms to supply the basic needs of the population. This situation led to the mass exodus of farmers and workers to the larger urban centers.

Thus the physical environment created in the city by these expanding industries produced nothing more than a mere haphazard arrangement of physical necessities. Gradually this unplanned and unorganized man-made environment evolved into the physical conditions that we find evident today, and that threaten man's future commitment to the city

and even his physical safety. Peterson pointed out this situation in the following passage:

Modern man is increasingly surrounded by man-made environment. This is an effect of technological explosion, and is producing good and bad consequences including artificial environment. But the intended freedom may be consuming itself in the form of unforeseen and sometimes subtle repercussions of incomplete strategy. The most obvious of the problems are seen as threats to physical safety and are being tackled, albeit piecemeal by scientists and engineers. . . . we may be failing in very serious ways to create environment that cooperated our fundamental objectives.¹

Man's control over the physical environment and the growth of the physical form has become an area of major concern in the last two to three decades. Not only physical planners, but other disciplinarians as well, along with community leaders have shown a deeper concern in attempting to understand the physical environment and to therefore better direct its growth. Kates has pointed out that the Kennedy-Johnson era has moved steadily to increase the size of the natural parklands, to limit air and water pollution, and to challenge the ugliness that mars both town and country.²

The profession (planning) most concerned with the healthy development of the man-made environment is relatively

¹Peterson, George L. Complete Visual Analysis: Highway Beautification and Environmental Quality; Paper presented in the session on Highway and Environmental Quality, 46th annual meeting of the Highway Research Board, Jan. 1967, Washington, D. C.

²Kates, R. W. Stimulus and Symbol. The view from the Bridge, Journal of Social Issues, Vol. XXII (4) 1966.

young, and the men in the field are far too occupied with practical problems to be interested in new concepts. The profession itself is a "spin off" from such fields as Architecture and Civil Engineering which have not been traditionally research orientated. The academicians in the universities have essentially taught practical courses, so much so that the theory taught in the classroom is at the same level as that applied in actual practice. They have neglected research and instead have spent much of their time in outside practices.³ Very little is known, for example, about the forms of the physical environment or even about the appropriate analytical tools for evaluating these physical forms. Not only has the profession neglected to formulate a progressive system of urban analysis but it has failed to formulate goals at two levels for the proper functioning of an urban system as suggested by Berry, namely: 1) to define urban goals in such a way that they may be meaningful to the citizens at large, and 2) to reflect the major urban concern of the nation at any point in time.⁴

The quality of the urban environment can be termed a mootpoint. It is common knowledge that anything which

³Lynch, K. and Rodwin, L. A Theory of Urban Form, Journal of the American Institute of Planners, XXII, (4) 1958.

⁴Berry, B.J.L. and Meltzer, J. Goals of Urban America. Prentice-Hall, Inc., Englewood Cliffs, N. J. p. 5.

serves a function well, survives as Darwin's theory of the survival of the fittest suggests. Cities in America and throughout the world have not only survived but have been growing at a rate never before achieved or even anticipated. Thus, it has been suggested by many that improving aesthetic on a city-wide scale, as an end in itself, may be totally uneconomical, infeasible or even absurd. Improvement and rebuilding must be done in a comprehensive manner. In other words the third dimension should be given an appropriate amount of importance. Unfortunately, for today's urban citizens the land use plan, the zoning ordinance and the community facilities plan form the major part of the comprehensive development plan while very little time, money and thought is given to how structures will actually look and harmonize with existing surroundings. This lack of three dimensional consideration and an appropriate approach to aesthetic harmony in the past has led to the development of highly unrelated urban spaces. These spaces are chaotic, uninteresting and tend to have a negative effect on man's natural behavior. The so-called control of man over his environment is a paradox best explained by the modern day professional psychiatrist. As Uhr stated "Far too often the psychologist is used to organize man. . ." ⁵ This

⁵Uhr, Leonard, Planning for Beauty, Could the Psychologist Help. American Institute of Planners, Vol. 24, Page 26, 1958.

situation shows the implicit need for better aesthetic control, which could be achieved by making the citizens more conscious and by giving enough power to direct the physical growth at the local, metropolitan and national level of government.

Unfortunately, a major percentage of our urban population is "object minded" and not "relation minded."⁶ Since the days of the Egyptian, Chinese and the Indus Valley Civilizations, artists, engineers and architects have generally concerned themselves with the design of an individual complex, in the form of being either an individual building or a small part of the urban unit. While the existing remains of ancient cities may reveal a knowledge of aesthetic unity, it may not be attributed necessarily to the builder's consciousness of visual harmony but rather due to the limited technology of the age. The use of post and beam construction not only puts Greek cities on one unified level of aesthetics, but also the architecture of other periods where technological choice was limited. The tepee villages of the American Indians is yet another example of necessitated harmonious development out of the limited scientific knowledge and technology. In short, in the past architects, planners and the common man did not

⁶Kepes, Gyorgy. Language of Vision. Introductory Essay by Hayakawa, S.K. Paul Theobald, Chicago, 1949.

necessarily consciously orient their designs to the unified aesthetic relationship of a metropolitan scale. History shows the Pharaohs as builders of pyramids and temples, the Chinese as builders of temples and palaces, the Greeks specialized in temples and the Romans in building amphitheaters, temples and forums. During the Medieval period importance was given to cathedrals, palaces and castles. The Renaissance produced a variety of buildings with similar orientation. Even today much has been written and said concerning the physical harmony of the urban environment, however, it has had little influence on the actual reconstruction of our cities. There are huge urban renewal projects underway designed with the aim of providing a more comfortable and acceptable living environment in the heart of our cities. But these projects exhibit the same "object minded" orientation. Replacing a group of buildings over an area of a few hundred acres, is a negligible undertaking compared to the renewal of a total urban area. In short, a greater emphasis needs to be placed on the totality or the enlarged picture of urban development. Cities should be renewed through a comprehensive approach that takes into consideration not just a block or a neighborhood but possibly the complete region.

Lynch points out that cities in themselves are regarded as collections of smaller environments. Most traditional design ideas such as: Neighborhood, shopping centers,

industrial districts and recreational spaces tend to reflect this thinking. In other words, it is very often thought that a beautiful urban area is simply the sum of a series of smaller areas that are beautiful in themselves. However, this may be no more true than the idea that a building is no more than a random collection of handsome rooms. He further added that every total physical form is affected not only by the quality of its parts but also by its organization and arrangement.⁷ A similar thought was expressed by Sarrinen, who pointed out the existence of a strong physical relationship of the chair to the room, the room to the house, the house to the neighborhood and the neighborhood to the total urban concept. This discussion clearly points out the need for a new approach in urban design, which develops the "whole" concept leading to its detailed "parts" and not a number of "parts" developed to constitute a "whole."

The civic consciousness of citizens and their desire to have better urban areas can be attributed to the forms of government in the free world. One of the main objectives of a democratic form of government is to give every individual equal rights, an idea never before aimed at or as yet completely achieved in the history of mankind. Since the

⁷Lynch, K., and Rodwin, L. A Theory of Urban Form. Journal of the American Institute of Planners, Vol. XXII, (4) 1958.

formation of cities, even at the time when democracy prevailed in Greece and up to the 19th Century, the head of state and/or the ruling body was considered to be superior to the common man. Being considered as a privileged individual or class, they commanded superior living conditions which were more permanent in nature and better worked out in design and aesthetics, than were the facilities available for the masses. This worked against the establishment of integrated visual harmony and unity between the living and the commercial spaces of the rich and the poor. All too often these spaces were built by forced labor and the misallocation of public monies. However, they were rich and harmonious in character, monumental and superior in design concept, when compared with today's urban construction.

The use of these spaces was not offered to the masses, who actually paid for it in cash or kind. These spaces were built for and used by but a few privileged individuals.

In contrast today's cities are built for the masses, who as taxpayers and voters have some part in shaping its future. Even with the privileges and the voting rights the common man has today, he is still living in an environment which is far from superior, and which has tremendous need for improvement. Recently, a step was taken in this direction. A study was undertaken applying the concept of "total planning" to a freeway system for the city of Chicago. The concept of "total planning" was designed to give importance to and integrate

different areas of planning including the social aspects which have been greatly neglected so far.⁸

In the past, little progress has been made towards relating various elements in the city. The accomplishments have been minor when compared with the increasing need to achieve better urban visual harmony and aesthetics as an integral part of improved urban living conditions. Today, little money if any is actually spent on the aesthetic harmony of urban elements, and most of the time this aspect of physical planning is not even considered. An automobile trip through the commercial areas of any American city shows the implicit desire and keenness of businessmen to have flashy, bright and eye catching signs, which seldom add to the aesthetics of the environment.

Today our cities are experiencing chaos. Their formlessness is a result of a contradiction of our social existence. It shows our failure to harmoniously organize and weave into our urban environment, new scientific aids, with which the human being must function if he is to maintain an equilibrium in this dynamic world. If the citizens of urbia are to survive, they must direct the present and the future towards an integrated organization of the urban elements. To work towards a livable environment today, we

⁸Looper & Whitton, Total Planning in Urban Freeway Design, American Engineer, April, 1968.

must reorient ourselves and create forms in terms of present and future living conditions. To achieve these forms, they should be based on social research conducted in the cities to bring out the desires of the citizens, who are the actual users of urban space. Instead of allowing the further uncontrolled accumulation of scientific discoveries and unplanned technological expansion; it is man's task to establish an organic interconnection of the new frontiers of knowledge. The eventual goal is a new structural order, a new form of social plans, so that on this platform, all our present knowledge and technological possessions may function unhindered as a whole. As Kepes commented:

To function in his fullest scope man must restore the unity of his experiences so that he can register sensory, emotions and intellectual dimensions of the present in an undivisible whole.⁹

Urbanites have the ability and the required facilities to develop a better urban environment, but needless to say they have not as yet, achieved the ideal public space nor the desired physical environment. This is indicative of the breakdown in communication between the policy makers and the citizens. Policy makers have failed to understand the needs and aspirations of the population, and have not been able to orientate community goals in the required direction. It would not be wrong to suggest that the above stated facts indicate the need for research by social

⁹Kepes, Gyorgy. Language of Vision. Paul Theobald, Chicago, 1949, p. 13.

scientists; studies dealing with people's attitudes such as this research paper attempts. It is high time that both policy makers and urban planners realized the importance of this aspect of social research.

CHAPTER I

STATEMENT OF THE PROBLEM

This study is an exploratory investigation in determining the impressions, understanding and psychological reactions of people when they participate as observers of the urban milieu.

PURPOSE OF THE STUDY

The purpose of this study is to expand, if possible on the rather limited body of knowledge, which presently exists today in the general area of urban aesthetics. Vigier pointed out in his study that perceptual clarity of and in the urban environment today is largely accidental. This does not deny the existence of certain empirical knowledge regarding emotional responses to certain form stimuli. However this empirical knowledge is statistically limited since it is based in its entirety on the responses of a small group of aesthetically inclined individuals: architects, urban designers, planners and artists.¹⁰

In his study Vigier mentioned that many public or symbolic spaces designed skillfully were considered "good" as a result of a conscious organization of spatial elements that were known to elicit certain specific responses such

¹⁰Vigier, Francois, G. An Experimental Approach to Urban Design, Journal of the American Institute of Planners, Vol. XXX (1), February, 1965.

as awe, admiration, fear or delight. As a result of his study he found that as of today there is little knowledge particularly in the following areas.¹¹

1. Average or general response to a given urban stimulus. In other words there is no evident data which can be used as a basis for predicting people's reactions to elements of the urban physical environment.

2. The constitutive role played by specific architectural elements. Any building structure or open space when created by a physical designer is subject to people's reactions. At present we do not have enough data that can be used as a basis to predict people's feelings and impressions of these elements.

Unfortunately the level of knowledge that contemporary urban designers possess concerning the urban physical and social environment can be compared with that of the early alchemist, and that individual's knowledge of modern day chemistry. Today if the designer is dissatisfied with the appropriateness of past solutions and eager to experiment, he is unable as yet, to predict the implications and consequences of his design decisions with any degree of accuracy.

One of the most difficult problems in the practice of urban design is to obtain an in-depth specification of goals which can be stated operationally. The operational procedure

¹¹Ibid., p. 23.

most commonly used at present is a mixture of facts, wishful thinking and guesswork. A typical urban design staff attempts to predict and anticipate the thinking of the so-called resident power structure, propose alternatives and converge to a compromise through iterative interaction. This practice has proven to be wasteful of time and effort on the part of the planning staff, and extremely costly. It has drained away tax money without getting any closer to proper establishment of community goals. This approach is deceitful, undemocratic and most of all unrelated to community needs. Peterson verified this when he stated:

In our society in the short run these (Community) goals might be obtainable empirically by induction from analysis of the actions and attitudes of the power structure. In the long run the goals should be inferred through social resolution of the popular will.¹²

Thus, the substantive purpose of this study is to develop a guideline that will hopefully obtain certain data concerning the level of people's perception and understanding of the urban physical environment. This investigation hopes to add to the existing knowledge and increase the rate at which such information can be collected for more effective utilization on a much larger scale.

¹²Peterson, op. cit., p. 10.

JUSTIFICATION OF THE PROBLEM

There is a strong relationship that exists between a human being and the environment in which he lives. This environment in which he lives is composed of a complex construction of social, political, physical and economic forces or conditions. Thus the city besides being a physical entity is also a state of mind, a body of customs and traditions and of the organized attitudes and sentiments that are transmitted by tradition. A city is not only, in other words, a mere physical entity and an artificial construction but it is a part in the vital living of the people who compose it; it is a product of nature and particularly of human nature.

The city has been studied, time and again, from the point of view of geography, architecture, planning, social interaction and ecology and more recently from the point of its total aesthetic values. In recent years architects, planners and urban designers have been involved in the development of a satisfactory technique to better understand the impressions, appreciations, and reactions of urbanites to the visual form of the city; through which part of the improvement of the existing physical environment it is hoped can be made.

The statistics of the United States Census Bureau show that from the year 1900 to 1950, the number of people residing

in metropolitan areas rose from 24 million to over eighty million. By 1975 this number is supposed to double, when 66 percent of the American population it is predicted will reside in metropolitan areas. The total U.S. urban population will account for well over 75 percent of an expected population of 240 million.¹³ Commitment of man to the city is obvious today. Every two of the three children in America grow up in an urban setting.¹⁴ Growth of urban population and the constantly growing areas call for reserach that deals with the improvement, organization and development of the physical environment. Research studies pertaining to visual appearance, some of which will be mentioned later; indicates that a method be developed by which people's opinions can be used for the evaluation of urban aesthetic.

Kevin Lynch, associate professor at the Center of Urban and Regional Studies of the Massachussets Institute of Technology, used the concept of "imageability" to determine the image held by the citizens of the city. His concept deals with the quality inherent in a physical collection of objects which give it a high probability of evoking an image response in any given observers.

¹³Kulski, Tulian Eugene. The Synoptic Design: In Search of a Meaning: Land of Urban Promise, University of Nortre Dame Press, P. 7, 1967.

¹⁴Vernon, Raymond. The Myth and Reality of our Urban Problems. Harvard University Press, Cambridge, Massachussets, 1966. p. 2.

It is the shape, color, or arrangement which facilitates the conception of a vividly identified, powerfully structured, highly useful mental images of the environment.¹⁵

These objects are thus designated as highly legible or perhaps visible, in that they are not only seen but are presented sharply and intensely to the senses.¹⁶

Lynch states that the development of an image is a two way process, involving the observer and the observed. Hence, it is possible to strengthen the image either by a symbolic device through the retaining of the perceiver or through reshaping the surroundings. Thus, the improvement of the physical environment can be achieved in two possible ways. The first approach could be an educational process by which urbanite would be made more aware of urban physical forms and their implications. However, this would necessarily mean providing citizens with the basic knowledge of aesthetic values, sufficient to that of an art critic trained in fields dealing with the aesthetics of art and architecture. This approach is highly improbable. A more realistic approach is that of a direct reshaping of people's environment. It is more feasible and can be assisted by social research dealing with people's understanding, attitudes, and analysis of urban physical forms and their effect on citizens. To obtain such

¹⁵Lynch, Kevin. The Image of the City. The M. I. T. Press, Massachussets, 1967, p. 9.

¹⁶Ibid., p. 9.

data, Lynch suggested that the viewers should be provided with a symbolic diagram to give them a clue of the relatedness of perceptions.¹⁷

To test the idea of imageability of the urban area, he took a small group of citizens and interviewed them to obtain from them their mental image of the city and then compared these images against a systematic examination of the images perceived by trained observers in the field.

The first phase of the experiment called the office interview, consisted of a request for a sketch map of the city, detailed description of a number of trips through the city and for a list of description of the sites visited and the reactions felt by the subject. The purpose of the interview were: 1) to test the hypothesis of imageability, 2) to gain some rough approximation of people's image of the three cities: Boston, Massachusetts; Jersey City, New Jersey; and Los Angeles, California, which would be compared to the findings of the field reconnaissance and so develop suggestions for urban design (If the finding of the interview correlated with that of the field reconnaissance, then the interview could be used as a short cut method to determine the public's image of their city. In the actual testing, the correlation was found to be low), and 3) to develop a short cut

¹⁷Ibid., p. 11.

method for eliciting the public image in any given city.¹⁸

Each interview took about an hour and a half and was tape recorded. These tape recorded interviews were later transcribed. The subjects showed interest, often somewhat emotionally. In the second interview, photographs covering the entire district in a systematic way were given to the subjects at random. Photographs of other cities were also included in the collection. The participants were asked to classify the pictures and then identify as many as possible, and to state what clues they used to make the identifications. The photographs that were recognized were reassembled and the subjects were asked to lay them out on a large table as if they were placing them in their proper positions, on a large map of the city. Finally the subjects were taken out in the field to relate the earlier imaginary trip with the actual trips. They were accompanied by an interviewer, who used a portable tape recorder. Each subject led the way and was asked to give his reasons for his desire to go along a certain route, to point out what he saw along the way and to indicate where he felt confident or lost. An outside check was also made by the conductors of the experiment.¹⁹

The field analysis was simplified by the use of a systematic coverage of the area on foot by a trained observer

¹⁸Ibid., p. 141.

¹⁹Ibid., p. 142.

previously instructed concerning the concept of imageability. The observer also mapped the area to indicate the presence, and visibility and the interrelation among the various elements. At the same time he also noted the strength of the image and the weaknesses of these elements. These elements were categorized by the observer.²⁰

The first field analysis helped to develop the principal hypothesis as to the types of the elements, how they were put together and what gave each element a strong identity. The second objective was to develop a technique for making visual analysis of a city. Both of the objectives were fulfilled, but with the reservation that the method was too much concerned with single elements and hence it underemphasized the patterns in relation to a complex visual whole.²¹

The correlation between the individual interviews and the sketch map was found to be low; at the same time the correlation between the composite of sketch maps and the composite of verbal interviews was high. The tests concerning photographic recognition conformed with the verbal results quite well.

Lynch concluded his evaluation by stating that there was a lack of information concerning the element's interrelation patterns in reference to the pattern of the whole

²⁰Ibid., p. 142.

²¹Ibid., p. 143.

city. He suggested this situation could be improved by use of a more sophisticated method of investigation. He suggested that the same method could be used on a larger sample and a greater range of environment.²²

A second method has been used in the quantitative analysis of the perception of the visual appearance of residential neighborhoods by Peterson.²³ His hypothesis is that visual appearance generates a preference response according to a mathematical model, and that the description of such a model must be unique for each individual and that the probability of a similar description by any two individuals of the same model is very small. However, if the parameters and variables in the model are allowed to represent the expected values of a normally distributed population, then the model can be useful as a description of most probable preference response within a given population. It seems reasonable to conclude that the inhabitants of a census tract, a city or even a nation tend to share so much common culture, physical structure that perceptions and preference will be normally distributed in this context.²⁴

²²Ibid., p. 145.

²³Peterson, G.L. A Model of Preference; Quantitative Analysis of the Perception of the Visual Appearance of Residential Neighborhoods. Northwest University. Evanston, Illinois, June, 1966.

²⁴Ibid., p. 1.

The main purpose of the study was to determine a subjective model of preference in the context of the visual appearance of residential neighborhoods by measuring the relative desirability of different appearances and identifying and measuring the significant dimensions that contribute to the preference perception.²⁵

Twenty-three colored slides of residential neighborhoods were used to simulate the visual appearances. These photographs were selected in a pilot study from more than one hundred pictures, taken in the northern half of the metropolitan area of Chicago. Based on the recommendation of previous studies the following variables were measured:

- | | | |
|---------------|------------------|--------------------------------|
| 1. Preference | 2. Greenery | 3. Open space |
| 4. Age | 5. Expensiveness | 6. Safety |
| 7. Privacy | 8. Beauty | 9. Closeness to nature |
| | | 10. Quality of the photographs |

To measure the values and subjective quantities a rating scale method based on the "Law of Categorical Judgment," derived from Thurstone's "Law of Comparative Judgement" was used. The subjects tested were not selected by any random process.²⁶

²⁵Ibid., p. 2.

²⁶Ibid., p. 3.

From the results of the study, Peterson concluded that for the subjects, objects and variables included in the study, the results showed support of the original hypothesis that the desirability of the visual appearance of residential neighborhoods is a multi-dimensional phenomenon that can be simplified to a model of preference. The results showed the preference in three dimensions 1) appearance of general physical quality, 2) harmony with nature, and 3) noise. Although the observation appeared to be meaningless, they helped in refining the hypothesis. Nothing was proved or was demonstrated by the fact that the numbers obtained from the experiment fitted the model, for several other meaningful models might fit equally well. The question of preference of one scene over another was not determined. At this stage the author felt that the possibilities offered intriguing avenues for further investigation.²⁷ Peterson suggested:

If the findings can be replicated by externally valid experiments and if the model of preference can be psychologically related into standard physical measurements of things which can be conveniently manipulated, then considerable progress can be made. . . . Another question that should be investigated is whether or not visual appearances can be classified by a conceptually meaningful method of numerical taxonomy.²⁸

A third study, reviewed by the author, was done by

²⁷Ibid., p. 10.

²⁸Ibid., p. 11.

Vigier.²⁹ He conducted an exploratory experiment in 1962 at the Harvard Center for Cognitive Studies to test whether methodologies developed before to isolate specific factors contributory to "primitive" form perception could be adapted to an urban setting. The hypothesis that he tested was whether the responses to an urban situation would occur in a manner similar to those aroused by other complex situations, as to pattern of attention shifting among specific aspects of the stimulus as well as among perception proper and action-oriented behavior.

The experiment consisted of a tachistoscopic presentation of wide-angle photographs of Boston streets and squares. The photographs were flashed for a very short time (a range of exposure from 50 to 200 milliseconds was used) which forces the subjects to decompose his search pattern. After each exposure the subject reported what he had seen. This made it possible to follow and plot the search pattern three dimensionally, as well as to identify elements found dominant. The ten subjects used in the experiment had design and non-design backgrounds.

The responses of the subjects were analyzed from three aspects:³⁰

²⁹Vigier, F. An Experimental Approach to Urban Design op. cit.

³⁰Ibid., p. 24.

1. Density of responses which is the number of items mentioned after each exposure. The density profiles, obtained by plotting density of information against time, indicated the readily perceptible items and thus their richness. Also when it is analyzed from the point of view of the subjects rather than the stimulus, it reflects the individual or group differences in perceptive skill under similar stimulus conditions.

2. Saturation which refers to the point at which most subjects declared that further exposure to the material would not contribute significantly to their comprehension of the stimulus. The index used to determine the complexity and/or its intrinsic interest was the measurement in millisecond. The stimulus was considered more complex and/or interesting when saturation occurred later.

3. Ambiguity was defined on the basis of the emergence of a major constitutive element (or elements). When the constitutive elements were used by 80 percent or more of the subjects, the stimulus was unambiguous; but where there was a choice of elements, the stimulus was considered ambiguous.

The results showed some behavioral differences between subjects with and without design background; streets and squares yielded different recognition patterns, and some ambiguities started to emerge. There was no marked difference between the two groups of subjects with regards

to the identification of the major constituents of the stimulus; but if accuracy of perception of an urban environment would be related to a broader perception pattern, the non-designers did better than the designers. However, the subjects with design background were able to recognize and to form tentative images with fewer cues.

All subjects used recognition strategies that corresponded closely to the spatial qualities of the stimulus when faced with a street. Attention was distributed left and right, both for primary and secondary search patterns and centered in the middle distance. On the other hand, for squares, the primary attention occurred both in the foreground and middle distance, while secondary attention was more evenly distributed between foreground, middle distance and background.³¹

Vigier summarized that the experimental technique used can yield new insights into the perceptual characteristics of urban space. The striking differences obtained between streets and squares and between ambiguous and unambiguous materials supported it. Although the sample of stimuli (70) used was more valid than the sample of subjects (10), neither was large enough to estimate reliability statistically. The

³¹Ibid., p. 26.

consistency of results obtained, however, suggested the need for further exploration.³²

The experiment also confirmed that primitive techniques could be adapted to a complex "real life" situation. The perceptible differences between streets and squares itself, can be measured in terms of the density of response they generate, saturation and general recognition patterns.³³

He concluded that first there is a need for further research to arrive at a better understanding of the direction pursued for urban design and clarification and definition of the elements that exist in the cities as defined by Lynch and Miller. Second, the need to develop more reliable research techniques that would incorporate a more accurate simulation of an urban situation, including movements as well as such environmental clues as noise, odors and temperature differential. Third, is the need to correlate results with demographic and socio-economic characteristics of the subjects tested, which may be relevant to perceptive ability.³⁴

He further emphasized the importance of knowing more the characteristics of the people--the clients, for more effective urban design. Such questions as: How well do

³²Ibid., p. 28.

³³Ibid., p. 29.

³⁴Ibid., p. 29.

people adapt to a complex urban situation requiring quick decisions? Can their behavior be predicted? To what extent can they be taught a symbolic language?, and etc., have to be answered. He also stated that increased attention should be given to the visual aspects of our cities to parallel the importance now being given to computer simulation of urban and regional planning problem. Lastly he commented:³⁵

Although more sophisticated methods will undoubtedly be perfected in time, it seems that the application of standard psychological experiment procedure to urban design are not only warranted but rich in contributive possibilities.

Lynch compared the opinions of the ordinary citizens to the opinions presented by trained observers. He assumed in his study that the reactions offered by trained and untrained persons towards urban forms are different. Vigier used subjects both with and without design background to test their perspective ability. Similarly in this study, the author used students from different disciplines to determine their perspective evaluation of the urban environment. He compared the reactions of students of Architecture and the reactive evaluation of students majoring in Home Economics, Commerce and Social Sciences. Another comparison was made among the opinions of students majoring in fields other than that of Architecture. The results of these

³⁵Ibid., p. 30.

comparisons could give clues of people's perception and may indicate that a small group of people with a homogenous background could be used to generalize the opinions of a larger sample. In the studies done by Peterson, Lynch and Vigier, the subjects as well as the slides used were from the same city. The subjects of the author's study were students of K.S.U., a majority of whom are not permanent residents of Manhattan.

Peterson's study included the use of a mathematical model. He suggested that numerals should be used in the analysis of urban environment, replacing the conventional use of linguistic adjectives. The use of numbers has some obvious advantages as numbers tend to give a clear-cut conception of opinions and are universally understood. Numbers present more meaningful answers that are easier to use in the analysis of people's evaluation, especially if a large sample is used. Numerals were used in this study, which not only simplified the subjects' evaluation of the slides but also the analysis of their reactions.

Vigier as well as Peterson used slides to stimulate people's reactions. Similarly the slides were used in the author's study. Being exploratory research none of the studies mentioned above had a parameter that was statistically valid. Lynch used three cities for his study. Peterson analysed neighborhoods and Vigier used streets and squares of Boston for the analysis. This author also used a specific

approach using photographic slides of the constituent elements of urban areas. The research methodology discussed above should be further improved to achieve a better and more reliable feedback of people's reactions to the physical environment. This is similar to, and equally as important as the continuous feedback obtained by automobile manufacturers from the sales of cars in comprehending the desire of customers. Surveys have been conducted in fields such as sociology, building construction, transportation, engineering, architecture and planning, however, all these surveys did nothing more beyond collecting simple data pertaining to sociological statistics. Uhr commented:

Although they (planners) must worry constantly as to how their finished product will look, have attempted to find out almost nothing beyond the simplest facts about the world for which they plan. The surveys that have been conducted have given interesting sociological information: how much will they pay, how many children in the family, how long will they stick it out in the same house, do they want a TV nook or a mahjong porch. But, does the fact that Upper-Uppers want bigger houses and will spend more for same than Lower-Lowers surprise or interest? The real questions, that are of primary importance in determining what we should do for a group of people; What do they really want? Are rarely posed.³⁶

The need today is to go deeper into the subject of finding the perspective of people's attitudes and detailed investigation of their desire.

³⁶Uhr, Leonard. Planning for Beauty: Could the Psychologist Help? American Institute of Planners Journal Vol. 24, 1958, p. 25.

A creative urban designer, architect or planner is one who can actually conceive of buildings, parks, streets and neighborhoods in such a manner as to create urban areas that not only bring satisfaction, but also give joy to the observer. This he can do only if he has an insight into what people want and need, their personality and aspirations. The expressed purpose of the three studies mentioned previously and of this study is to discern what people perceive about urban complexes. The information, therefore, obtained from these studies would hopefully serve as a guideline to architects, planners and urban designers seeking solutions to problems that are primarily conceived and planned by them today in purely economic terms. As Schocken said, "The answers can only be found in the public attitude of planning."³⁷

The present rate of growth, development, and rebuilding endorses the reports that urban America is going to be rebuilt in the next two or three decades and that this will be done through new developments, urban renewal of existing cities and totally new concepts in urban living. These principal methods of urban development aim at improving the social, economic, psychological and spiritual aspects of American urban area, the reconstruction of the urban physical forms. However, the social and economic problems of urban

³⁷Schocken, Thomas D. Must our Cities Remain Ugly, American Institute of Planners, XXII, pp. 218-226.

planning have become of such major importance during the past few decades that they have overshadowed the involvement of man into the field of urban design. Urgent action of one kind or another by various government agencies, is required today to control redevelopment and building activity in central urban areas, also sufficiently effective architectural and urban design codes must be developed. As the situation stands today there are almost no controls which prevent the spread of obsolescence and architectural disorder in the urban forms of American cities.

The relatedness of urban forms and aesthetic controls is mandatory if a better urban environment for tomorrow is to be built--one that will satisfy human needs, both physically and spiritually, and provide a happier way of life for the citizens of America's continuously growing urban places.

CHAPTER II

METHOD OF PROCEDURE

The purpose of this study was to obtain certain data concerning the aesthetic perception level of various groups to visual stimuli associated with the urban environment. The questionnaire and slide technique was used to assess the impressions of various people and to determine their feelings or reactions to the urban scenes presented in the slides.

DEVELOPMENT OF THE QUESTIONNAIRE AND THE SELECTION OF THE SLIDES

Preparation of Questionnaire

In the process of framing the questionnaire, the following factors were given considerable attention:

1. Data being measured (aesthetic perception).
2. Types of answers expected.
3. Length of the questionnaire.
4. Length of time to answer the questionnaire.
5. Types and numbers of slides to be selected.
6. Adequacy and suitability of questions asked for each slide.
7. Ease in responding without biasing the answers.
8. Methods of statistical analysis to be used.

The questions were so worded that they were not leading nor indicative of the author's point of view, but rather the subjects' spontaneous reaction to the urban scenes shown in the slides.

The questionnaire developed consisted of two parts: Part A, personal data, which sought information regarding sex, age, level of education, place of birth, travel experience, occupation, size of family, type of housing, and place of permanent residence; and Part B, which consisted of two or three questions for each slide. These questions were specifically structured for each slide to get the general reaction and feelings of the respondents based on the answers given and to find out how well the questions asked brought out those feelings to the slides presented.

Collection and selection of slides

Selected slides of certain urban areas in the United States (Kansas City, Kansas; Chicago, Illinois; and New York, New York) and Europe were used. A major part of the slides came from the Faculty of Architecture, Kansas State University. These slides were then supplemented by some of the author's showing certain areas in Boulder and Denver, Colorado, and Oklahoma City, Oklahoma. The total number was well over 300. These slides were then categorized under the following headings by the author.

1. Relation to culture
2. Aesthetics and function
3. Dynamics of circulation
4. Humanization of high densities

5. Degree of mixture of urban-rural elements
6. Geographic location of the city
7. Influence of the social, economic and psychological factors on aesthetic values.

These headings did not adequately break up the constituent elements of the urban area into sufficient detail, so it became necessary to further subclassify the photographs according to the following headings listed by Spreiregan.³⁸

These elements were:

1. Topography
2. Shapes
3. Patterns and Texture
4. Routes
5. Districts
6. Landmarks and Nodes
7. Open spaces
8. Vistas
9. Magnet generation
10. Special activity
11. Experience
12. Strong and weak orientation
13. Sign area
14. Points of conflict
15. Community structure

³⁸Spreiregan, Paul. Urban Design: The Architecture of Town and Cities. Published by the American Institute of Architects.

16. Area of preservation

17. Residential

The slides were again classified by the author and were reviewed several times with the intention of keeping about five slides representing each category mentioned by Spreiregan. The categories which had less than two slides were dropped. This reduced the categories to the following ten which are listed below:

1. Topography	2
2. Shapes	3
3. Pattern, texture and Grain	4
4. Routes	3
5. Districts	4
6. Open space	4
7. Experience	3
8. Sign area	3
9. Points of conflict	5
10. Residential	<u>4</u>

35 slides

At this point in the selection of slides for classification, Dr. Rappoport suggested that a group of senior students in Architecture be asked to help in reclassification of the slides into various categories. As the first classification of the 35 slides into the 10 categories mentioned above, was done by the author and some bias might have been involved. It was thought that having several students

do the classification, it would be more valid. So 115 additional slides out of the original 300 slides were added to the 35 slides selected by the author. This brought the total number of slides to 150. The 150 slides (from which the final set was chosen) were shown to a group of ten senior students of Architecture. Each slide was numbered. A sheet of paper with 14 categories which are listed below (3 categories being added to the above mentioned list of ten) was used in the classification of these slides, and which was given to each student.

- | | |
|--------------------------------|------------------------------------|
| 1. Topography | 9. Experiences |
| 2. Shapes | 10. Strong and weak
Orientation |
| 3. Pattern Textures and Grains | 11. Sign Area |
| 4. Routes | 12. Points of Conflict |
| 5. Districts | 13. Residential Areas |
| 6. Landmarks and Nodes | 14. Others |
| 7. Open spaces | |
| 8. Special Activity Centers | |

The students were required to view the slides and to determine under which category each slide should be classified. They did this by writing down the number of the slide under a given category.

After the testing, the data collected was studied for final selection of the slides. All slides that were classified under the same category by five or more students were chosen. The rest of the slides that were either vague or

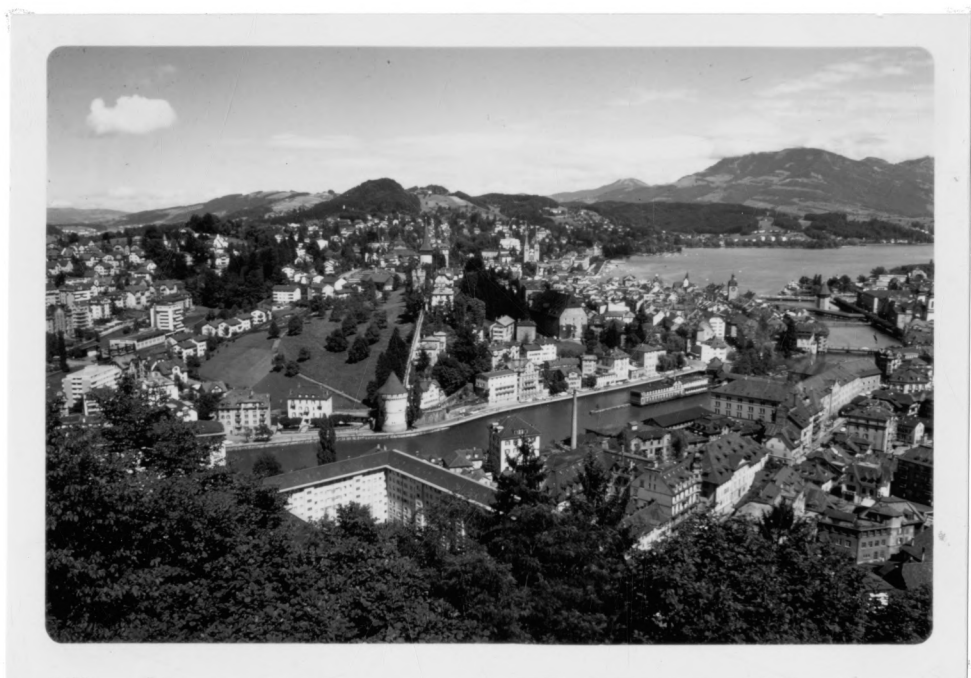
that little agreement could be reached as to their classification were rejected. This reduced the number of slides to 24 (approximately 4 slides per category) and the categories to six. The categories left were:

1. Topography
2. Shapes
3. Districts
4. Open space
5. Sign area
6. Residential

Photographic copies of the slides are in the following pages.



SLIDE NO. 1



SLIDE NO. 2



SLIDE NO. 3



SLIDE NO. 4



SLIDE NO. 5



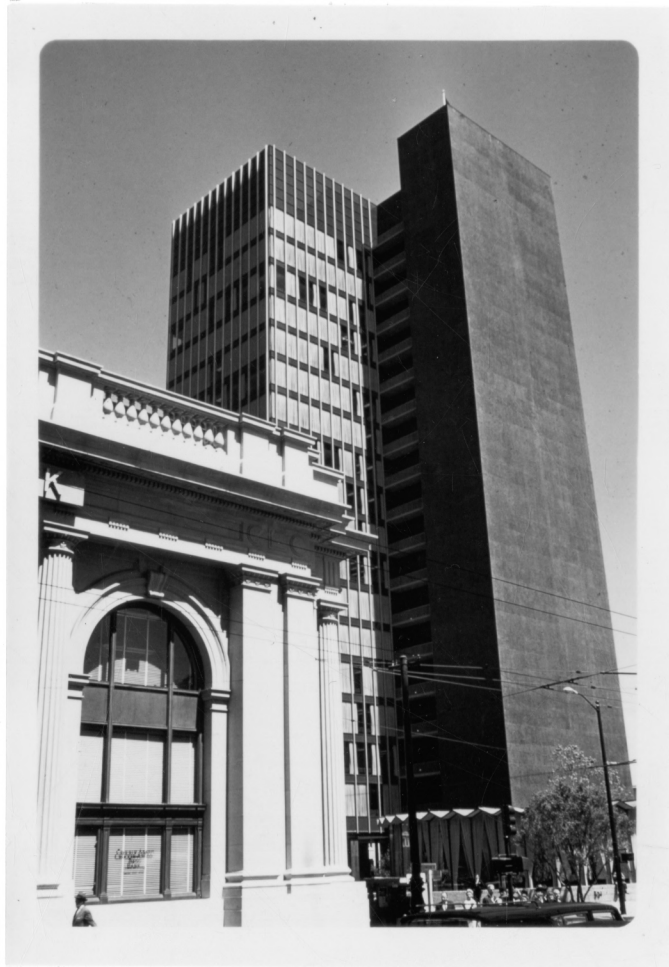
SLIDE NO. 6



SLIDE NO. -7



SLIDE NO. 8



SLIDE NO. 9



SLIDE NO. 10



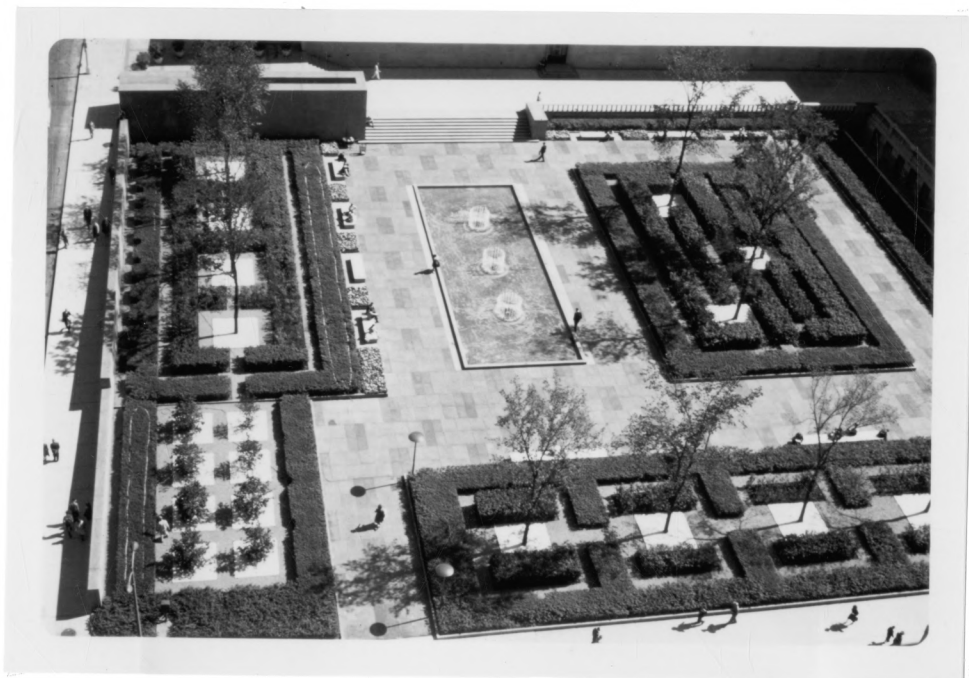
SLIDE NO. 11



SLIDE NO. 12



SLIDE NO. 13



SLIDE NO. 14



SLIDE NO. 15



SLIDE NO. 16



SLIDE NO. 17



SLIDE NO. 18



SLIDE NO. 19



SLIDE NO. 20



SLIDE NO. 23



SLIDE NO. 24



SLIDE NO. 21



SLIDE NO. 22

Pilot Study to Test the Questionnaire and Slides

A test was conducted with nine Architecture undergraduate and graduate students and five additional students from other areas of study. The main object of the pre-testing was to discover what deficiencies, if any, the questionnaire had and to determine how well the questions asked correlated with the slides presented. The questionnaire was tested with students because they would form the majority of the respondents, and would thus tend to typify the responses expected of those in the larger sample based on the level of education, experience and age.

The testing lasted for an hour and a half and at this stage the author was faced with two problems: 1) the length of time to answer the questionnaire and 2) the amount of statistical data which would require interpretation and analysis derived from the testing. To reduce the time to answer the second section of the questionnaire (Part B) and for easy interpretation and analysis of responses, Dr. Rappoport of the Department of Psychology suggested the use of a seven scale semantic technique (Appendix A). Using this method the subjects would be simply asked to indicate their attitudes towards each slide presented by rating it through the use of a set of eight descriptive scales given below:

like	___	___	___	___	___	___	dislike
unfriendly	___	___	___	___	___	___	friendly
open	___	___	___	___	___	___	close
disorganized	___	___	___	___	___	___	organized
pleasing	___	___	___	___	___	___	disturbing
complex	___	___	___	___	___	___	simple
harmonious	___	___	___	___	___	___	chaotic
unlivable	___	___	___	___	___	___	livable

To counteract response set and halo effect the favorable extreme was placed sometimes on the right and sometimes on the left. The eight descriptive scales were applied to all slides. A question or two was asked for each slide so as to direct the subjects as to what to evaluate in the slides presented (Appendix B). This semantic technique has four advantages:

1. It is easy to understand and to answer.
2. Answers are pure response to the slides.
3. Answers are easy to qualify.
4. Answers are purely objective.

Following the suggestion of Dr. Rappoport, the second part of the questionnaire was changed and the final set (Appendix B) using the semantic differential technique was adapted in the final testing. Part A of the questionnaire was also revised for coding, for tabulation on computer "IBM 360 model 50". Each of the questions in Part A and B of

the questionnaire was given a number for key punching on the I B M cards (key punching machine 029), and analysis of the data. Although there were 23 questions in Part A of the questionnaire, only question number 5 pertaining to the educational background of the subject was used in the analysis of data.

THE RESPONDENTS

Originally, the sample of respondents was to be divided into three parts. First part was to be students from K.S.U. and part two was to include the businessmen and residents of Manhattan and part three, the military personnel at Fort Riley. It was considered important to include the businessmen, civic leaders and residents of Manhattan because of the role they play in the development of the city. Businessmen choose locations for their business, civic leaders strongly influence the decision making process and the residents as voters and taxpayers play a unique role in the building of projects such as schools, city halls, libraries, hospitals, highways and other public projects that change the face of a city. Personal meetings were arranged with the Presidents of the Service Clubs, City Beautification Committee, and the Lions Club. Many other organizations were contacted by telephone. The over-all response by the people contacted was very poor. The general reasons for refusal were:

1. Members and elected officers were pre-occupied with other so-called community projects. They claimed that the research presented was not related to Manhattan.

2. They did not see the practical application of the research at the present time.

3. The time factor was also contributory to the resistance met. It was Christmas season and most of the citizens were busy with projects that had been planned before the holiday season.

Part three consisted of military personnel at Fort Riley. The possibility of having military personnel as subjects was considered interesting since urban areas are usually their vacation centers. They are looked at by them from a different perspective in the light of their own standards of aesthetics. The Adjutant General at Fort Riley was contacted for the use of the military personnel. Fifty six officers and soldiers were tested but the results were not used in the actual analysis because of the lack of funds. Ultimately the students from K.S.U. formed all of the respondents. They offered a healthy and much needed variety for the testing since they came from different types of urban and rural areas, both inside and outside the state of Kansas. They also came from various fields of study which represent different disciplines and most of all they were readily available. It was also hoped that since they would be the future participaters in the community affairs of tomorrow

that the testing would impress upon them the importance of proper physical development in urban areas as a contribution to harmonious urban life.

Actual Testing

The heads of various departments on the campus of K.S.U. along with individual faculty members were approached for the use of their students in the testing. About 400 students from the following departments participated in the experiment:

1. Home Economics
 - A. Institutional Management
 - B. Home Ec. Education
 - C. Textile and Interior Design
2. Art
3. Geography
4. Political Science
5. Department of Modern Languages
6. Statistics
7. Psychology
8. Architecture
9. Engineering
 - A. Civil Engineering
 - B. Industrial Engineering

Testing was held in the classrooms where the classes actually met. It ran for approximately 45 minutes to an

hour. During the testing each student was given a questionnaire. A brief explanation of the project and the procedure to be followed in filling out the questionnaire was given before the slides were shown. The students were told to ask questions about the procedure to resolve any doubts they may have had about the testing. Before showing the slides, the students were asked to fill out the first part (Part A) of the questionnaire which sought information about age, sex, level of education, travel experience, permanent residence, etc. This data was collected to determine whether these variables would have any effect on the results to be obtained. After finishing with the first section of the questionnaire the slides were shown. They were presented with the use of a Kodak Carousel projector and a beaded folding screen.

Although 410 questionnaires from the students and 56 from the military personnel were completed, 136 were used for the final analysis. Unfortunately, the rest of the data collected had to be dropped because of the lack of funds.

In selecting the groups for the final analysis, the academic discipline of the students was the criterion. The aim was to have a reasonable statistical sample, limiting the total number of questionnaires to about 150. The disciplines considered were: Home Economics, Commerce, Social Sciences and Architecture. It was anticipated that the students with these educational backgrounds would form an

interesting parameter for the statistical analysis and correlation. There were 16 students with an architectural background as compared to 40 from other disciplines. Though they represented a rather small sample they were, however, an important sample since architects from time immemorial have influenced the physical development of the urban environment, which is the basis of this study.

Treatment of Data

In the preparation of the questionnaire, all the 218 questions asked in Part A and B were numbered. The first 23 numbers pertained to personal data and the rest of the numbers were the responses to the questions asked pertaining to the slides. Variation as to intensity of agreement were anticipated with each response to receive a weighting of from "seven" for extreme favorable agreement to "one" for extreme unfavorable agreement and "four" indicating indifference of agreement.

Three I B M cards were prepared for each respondent. Every respondent had an identification number which appeared in column number 74, 75, 76 of each card. Column number 77 referred to the 1st, 2nd, and 3rd card for each respondent. A part of the 1st card reproduced the personal data and the rest of the cards had responses to the slides.

Statistical analysis included the factor analysis across the slides and means of responses of eight scales

for each slide which were computed and plotted on graph paper. These means for the four groups were analyzed for significant difference in response by the Analysis of Variance.

RESULTS

Rating of slides

The mean ratings for each slide for each of the four groups across the eight scales were plotted. Twenty-four graphs presented from page 66 to page 77, contain information regarding the mean ratings. A typical graph represents the mean evaluation ratings for the different groups of students across the eight scales. This was done to determine the similarities and differences in response of the four groups with different educational background. It could be assumed perhaps that some of the differences in rating of the groups may be due to chance and others may reflect statistically, significantly different results. An Analysis of Variance was used to determine the statistical significance of the apparent differences between group ratings. The significance in differences between groups, scales and interaction was established using an analysis of variance design discussed in (Winer 1962).³⁹ The results obtained have been summarized in Table 1.

The Table shows that the substantial difference which can be seen in the plotted graphs, among the groups and the scales are significant at $p < .01$ for all the slides except three (slides 2, 8, and 24). For most slides interaction between scales and groups was not significant.

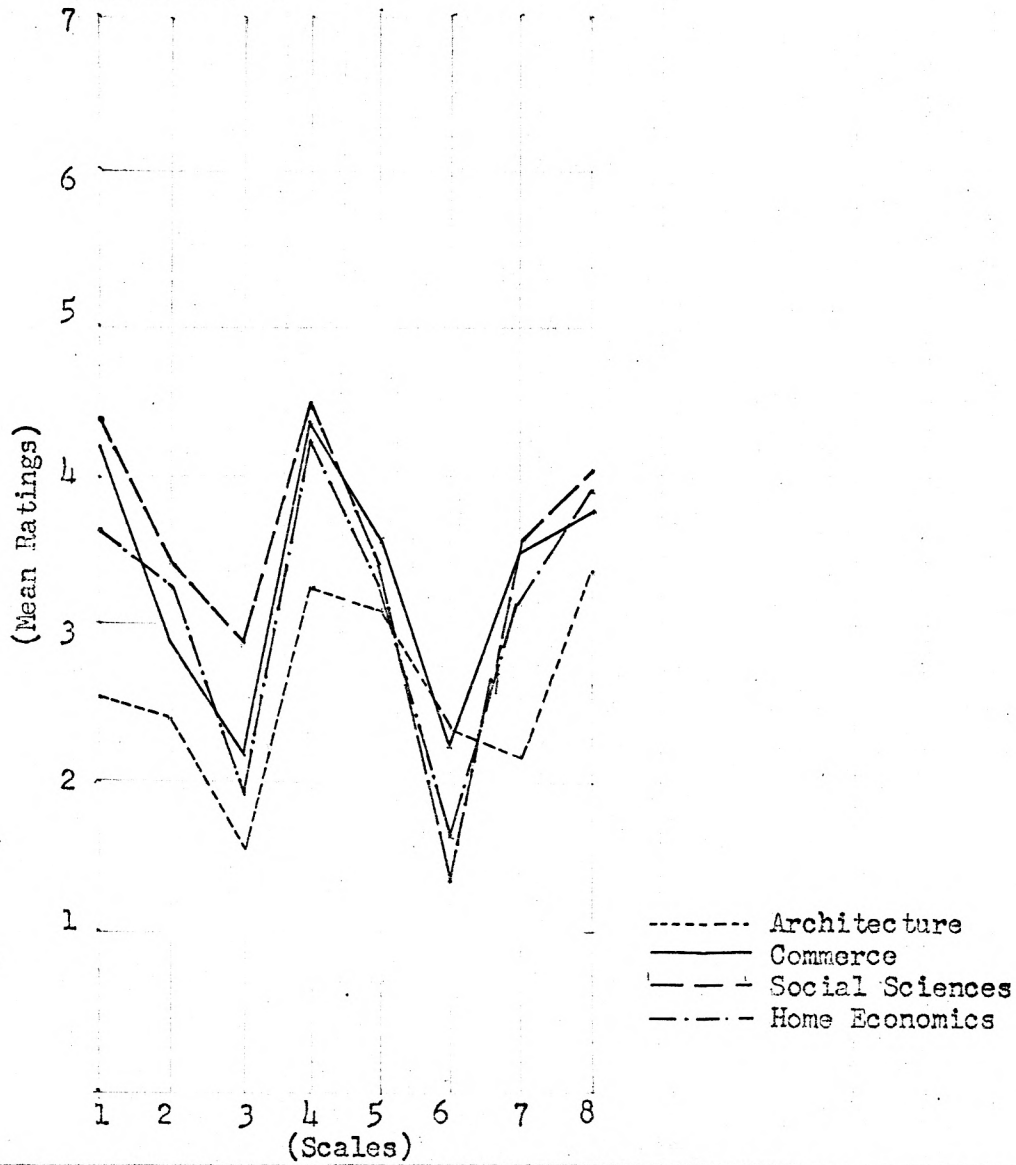
³⁹Winer, B. J. Statistical Principles in Experimental Design, McGraw-Hill, New York. 1962, p. 646.

Table 1 RESULTS OF SIGNIFICANCE TESTS CARRIED OUT ON DATA FOR EACH SLIDE

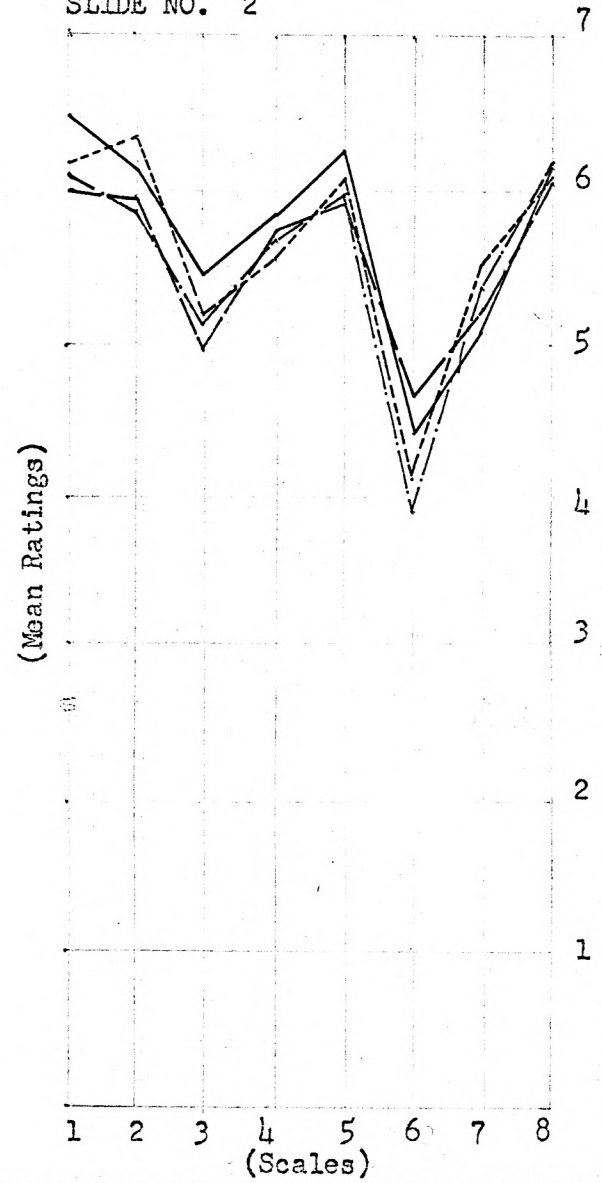
SLIDES	F GROUPS	p	F-SCALES	p	F-INTERACTION	p
1	9.43	<.01	39.52	<.01	1.61	<.05
2	1.72	<.25	36.92	<.01	1.00	N.S.
3	19.33	<.01	22.61	<.01	1.00	N.S.
4	13.65	<.01	27.02	<.01	1.00	N.S.
5	6.45	<.01	9.75	<.01	1.00	N.S.
6	26.23	<.01	14.27	<.01	1.64	<.05
7	22.35	<.01	17.53	<.01	2.32	<.01
8	2.20	<.05	10.59	<.01	1.00	N.S.
9	5.81	<.01	4.88	<.01	1.00	N.S.
10	26.91	<.01	3.93	<.01	1.00	N.S.
11	7.70	<.01	3.44	<.01	1.00	N.S.
12	17.23	<.01	6.09	<.01	1.00	N.S.
13	14.81	<.01	14.80	<.01	1.00	N.S.
14	11.65	<.01	18.23	<.01	1.94	<.01
15	24.51	<.01	8.75	<.01	1.00	N.S.
16	5.79	<.01	14.47	<.01	1.20	<.25
17	42.13	<.01	13.54	<.01	1.64	<.05
18	20.21	<.01	58.36	<.01	1.60	<.01
19	4.81	<.01	35.30	<.01	1.00	N.S.
20	25.09	<.01	5.60	<.01	1.00	N.S.
21	15.32	<.01	19.91	<.01	1.00	N.S.
22	8.91	<.01	13.84	<.01	1.00	N.S.
23	33.02	<.01	6.31	<.01	2.31	<.01
24	2.81	<.1	11.6	<.01	1.00	N.S.

The following graphs (1-24) show mean ratings on the 8 judgement scales, given by each group for each slide.

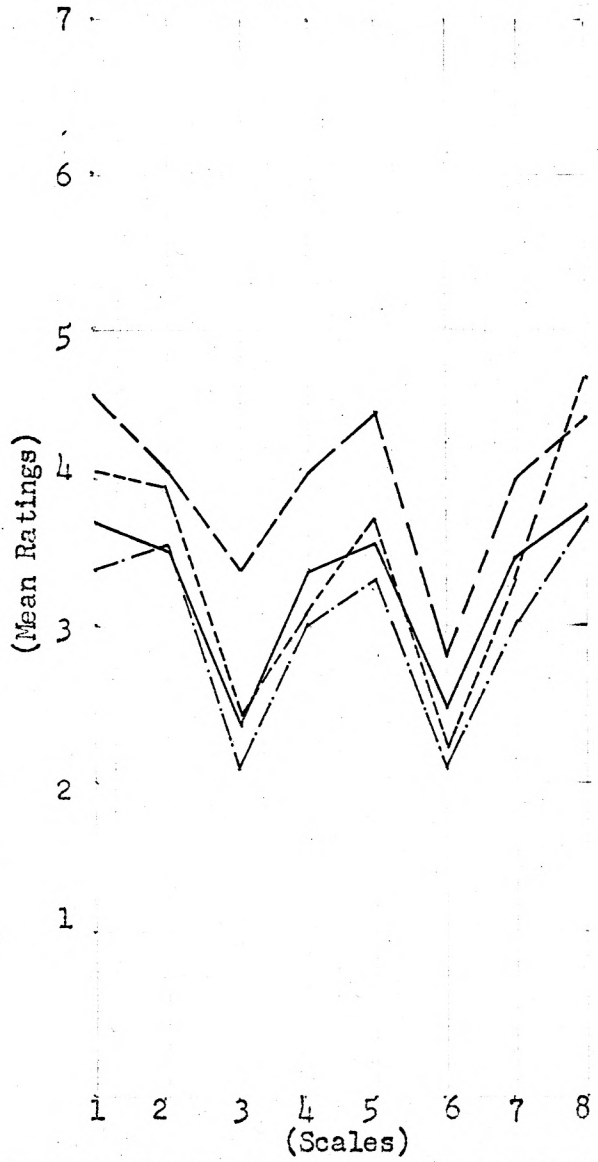
SLIDE NO. 1



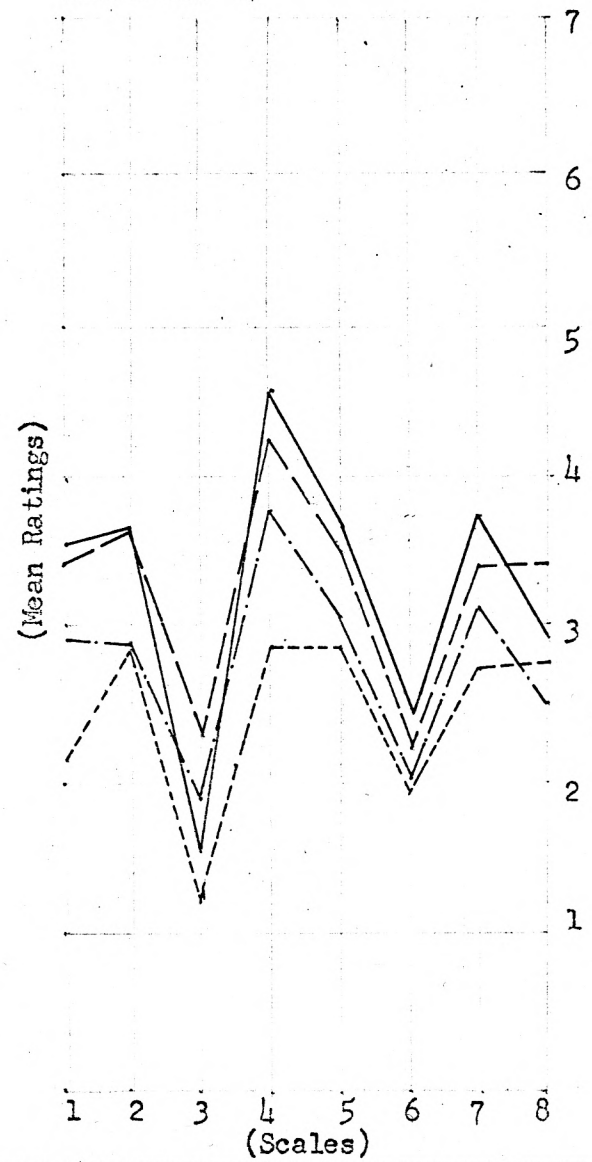
SLIDE NO. 2



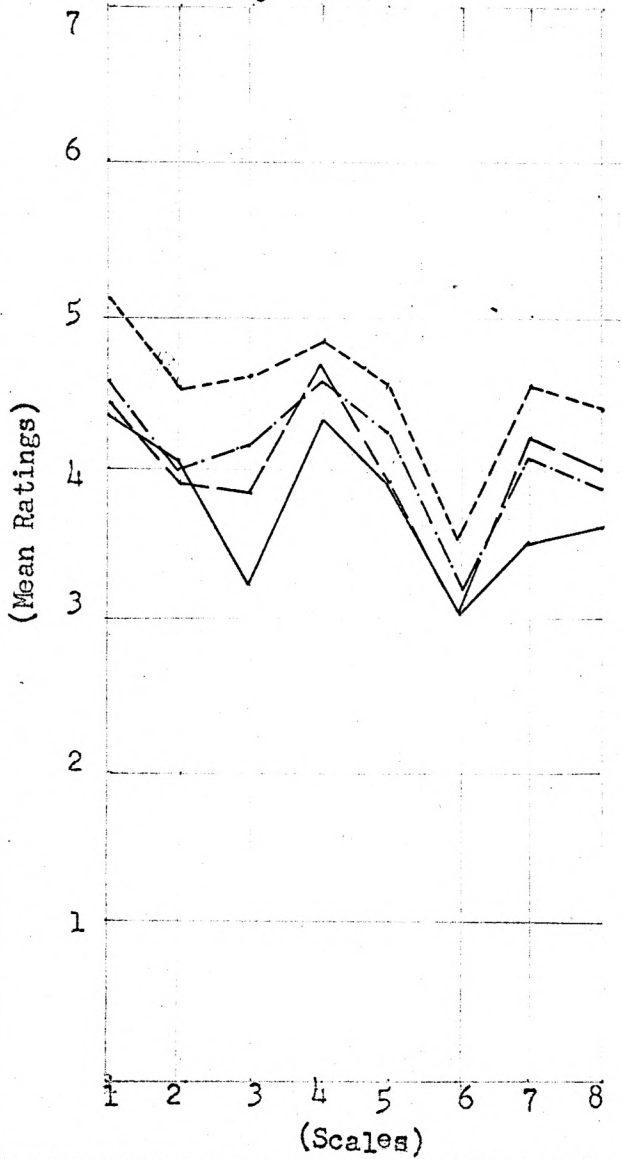
SLIDE NO. 3



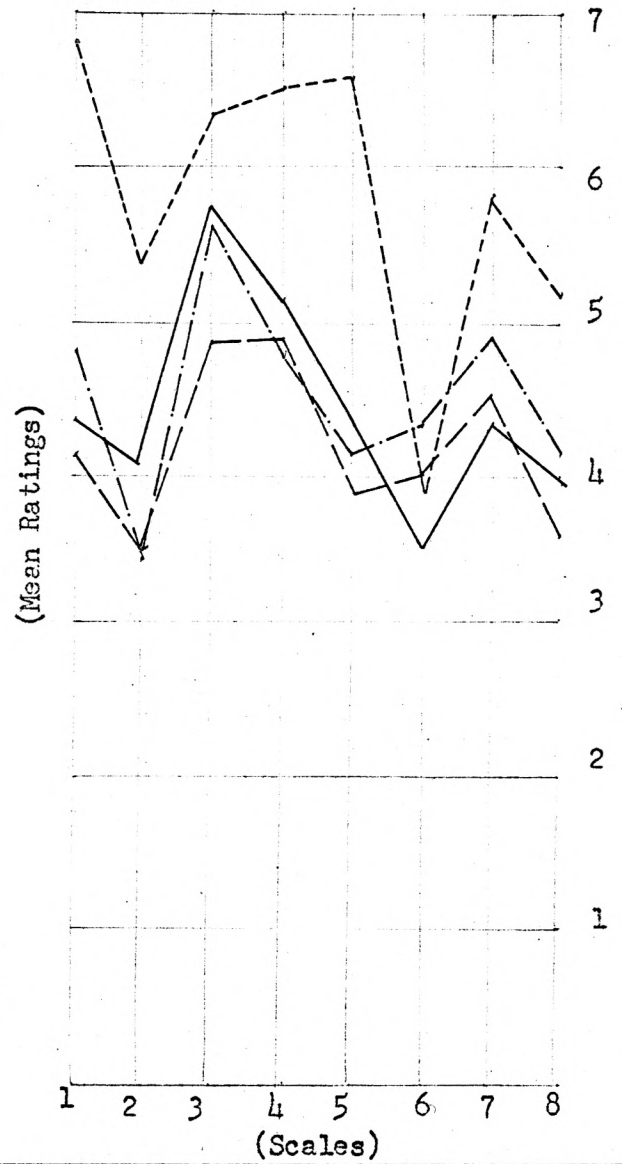
SLIDE NO. 4



SLIDE NO. 5

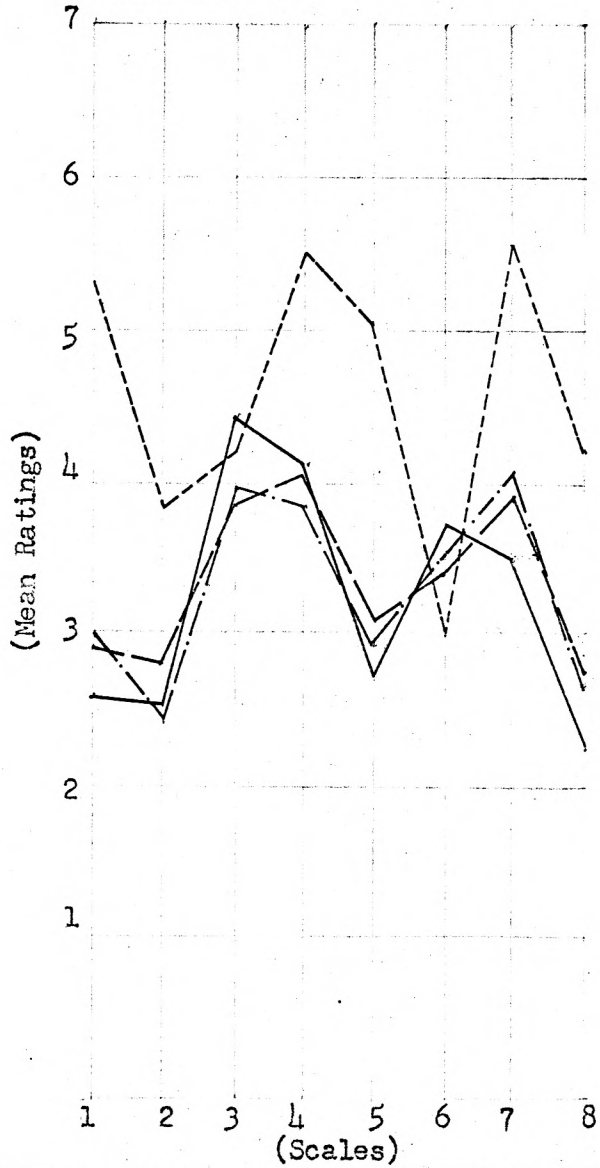


SLIDE NO. 6

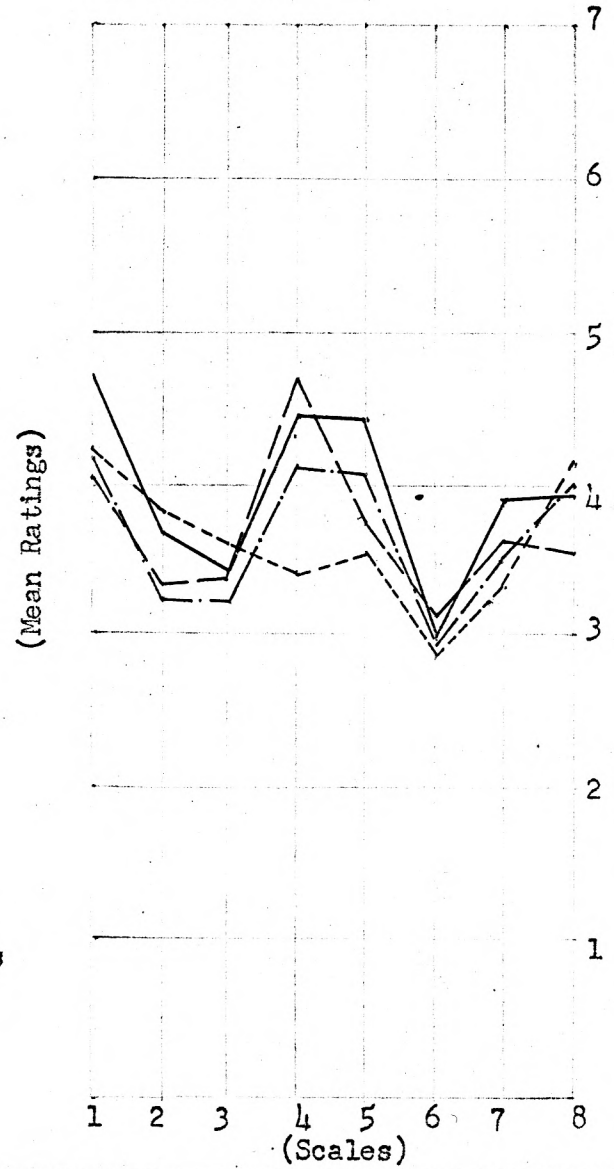


----- Architecture
———— Commerce
- · - · - Social Sciences
- - - - Home Economics

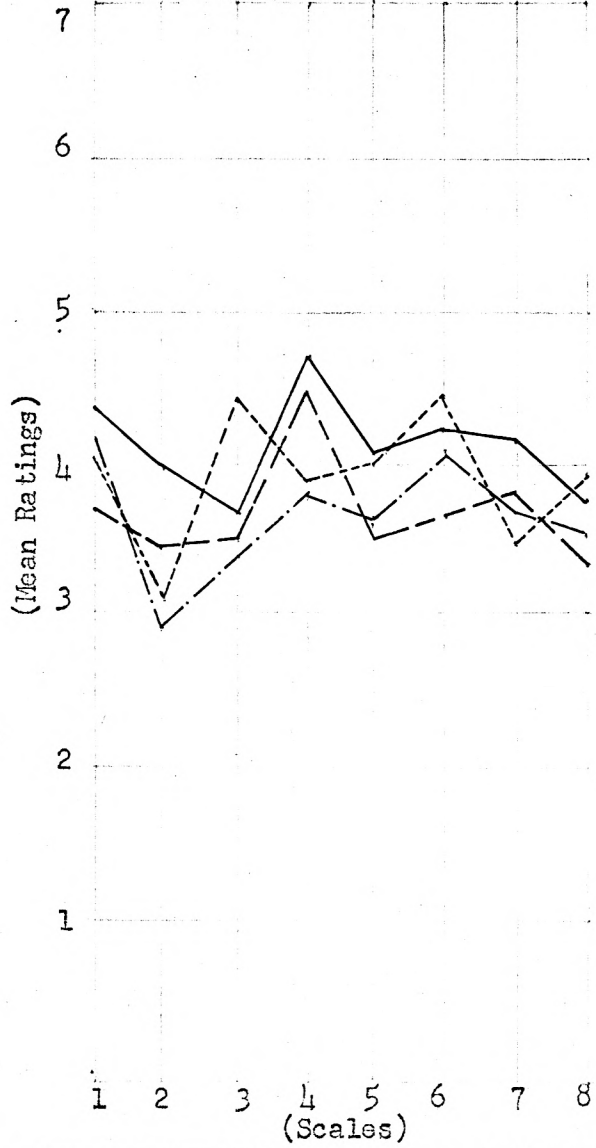
SLIDE NO. 7



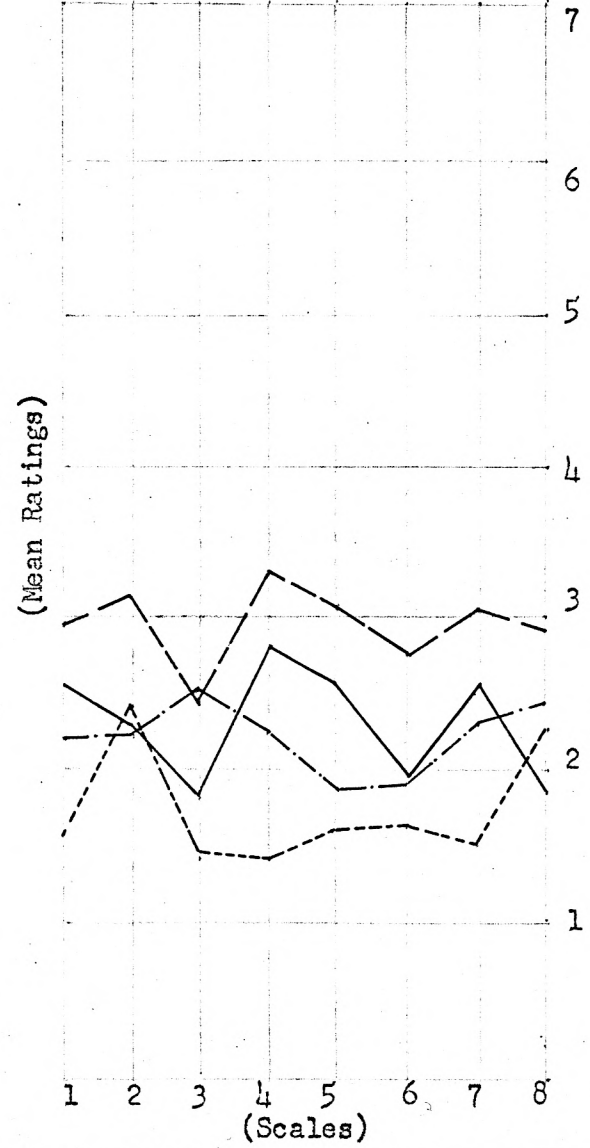
SLIDE NO. 8



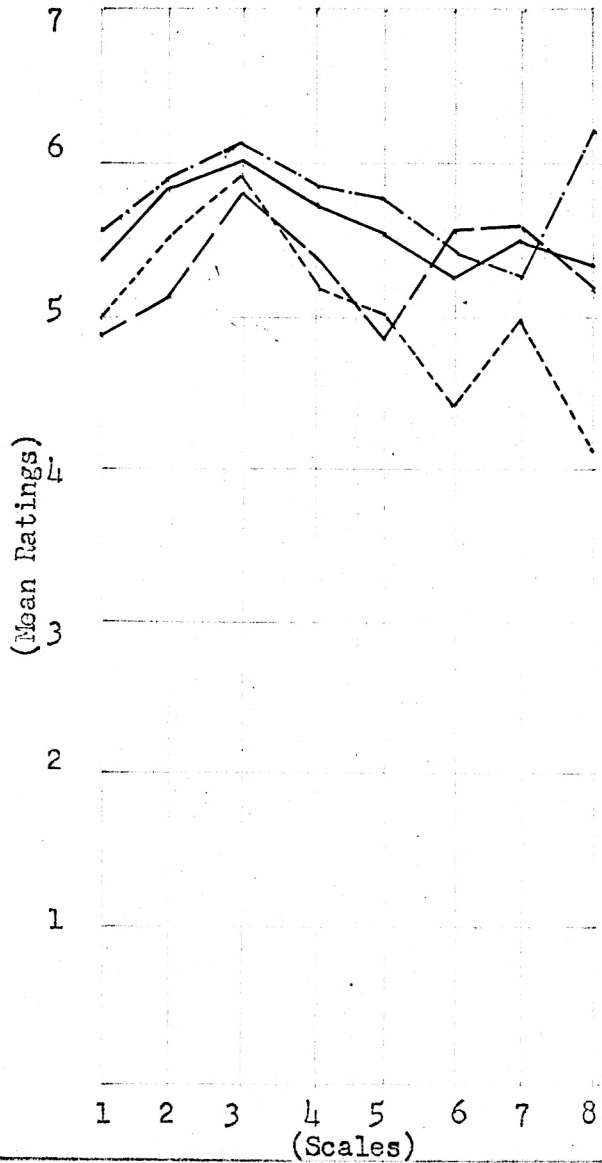
SLIDE NO. 9



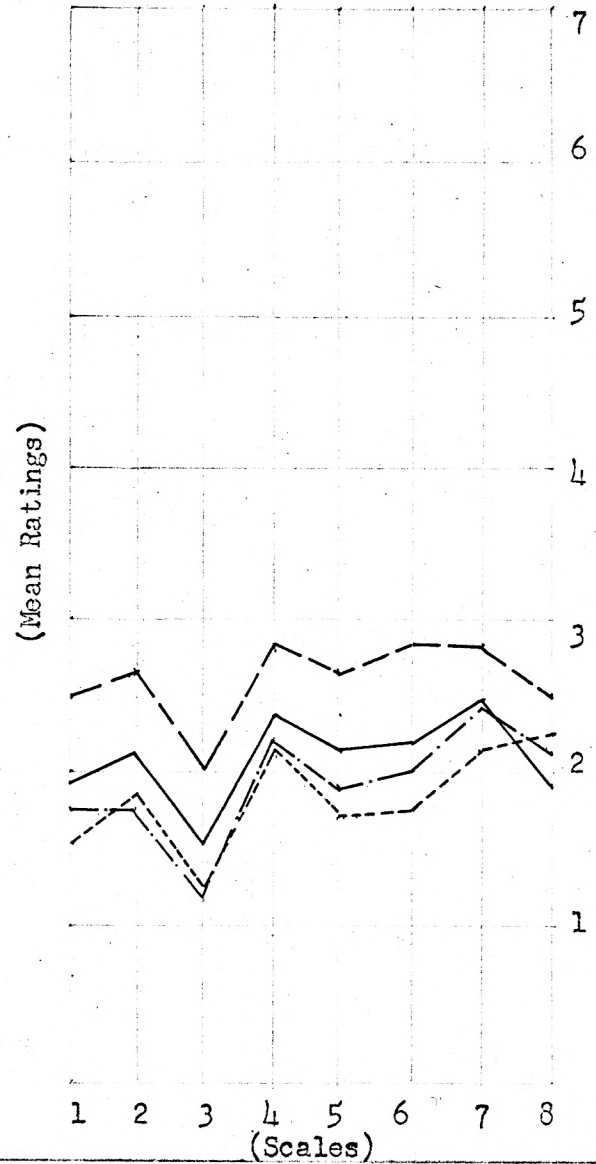
SLIDE NO. 10



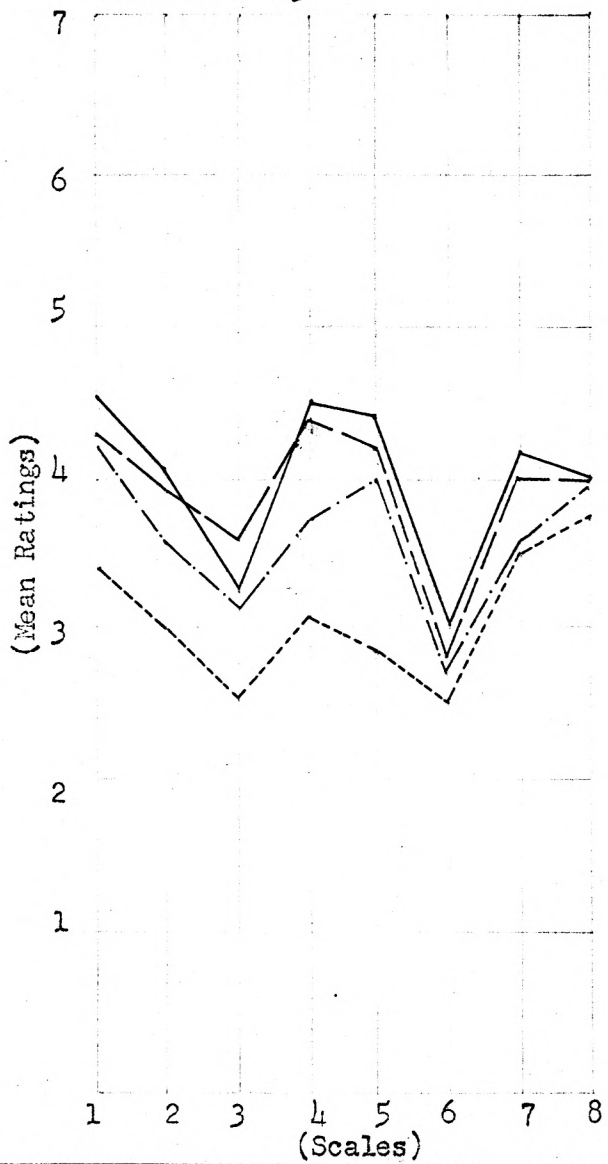
SLIDE NO. 11



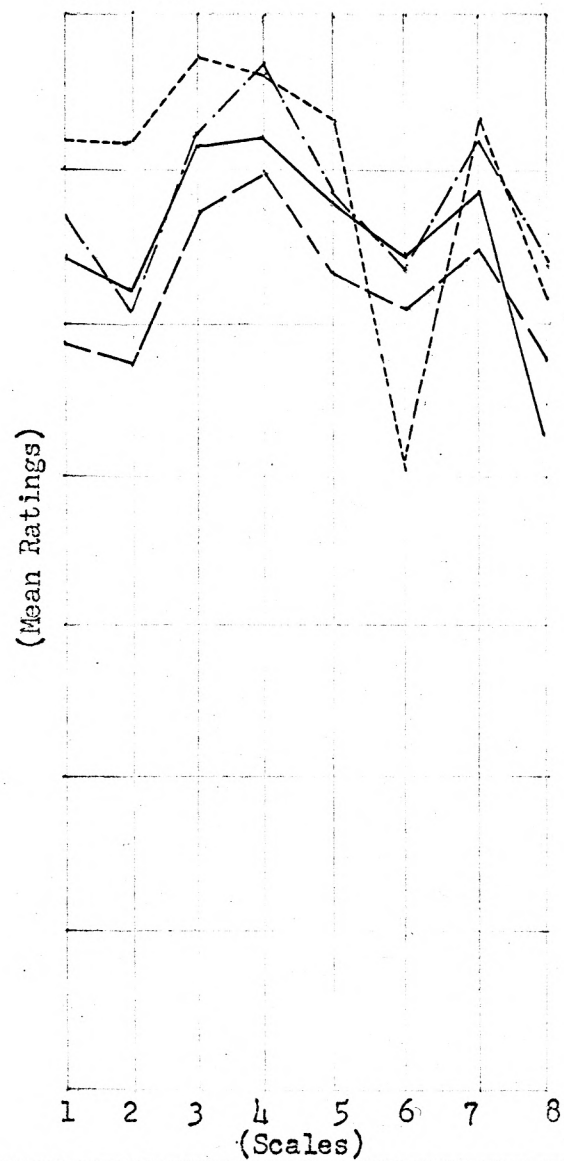
SLIDE NO. 12



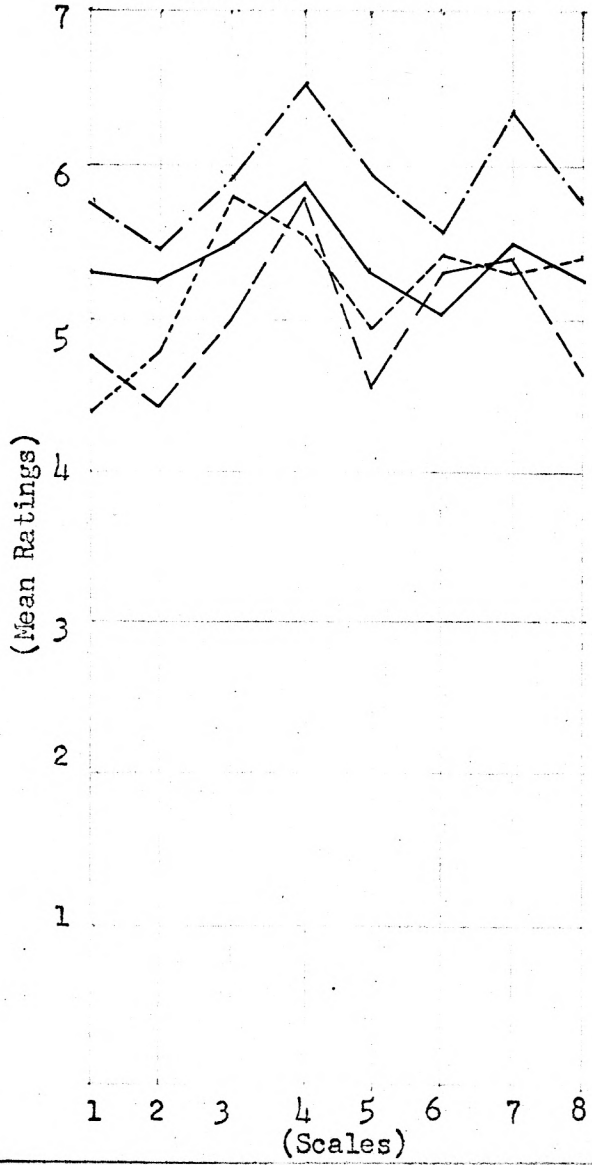
SLIDE NO. 13



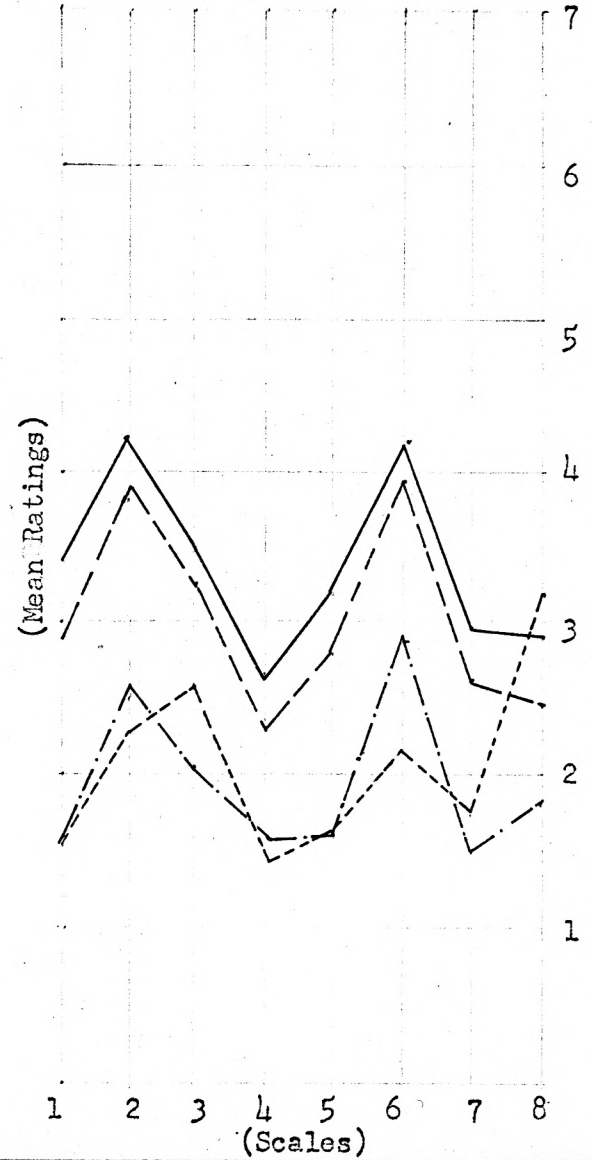
SLIDE NO. 14



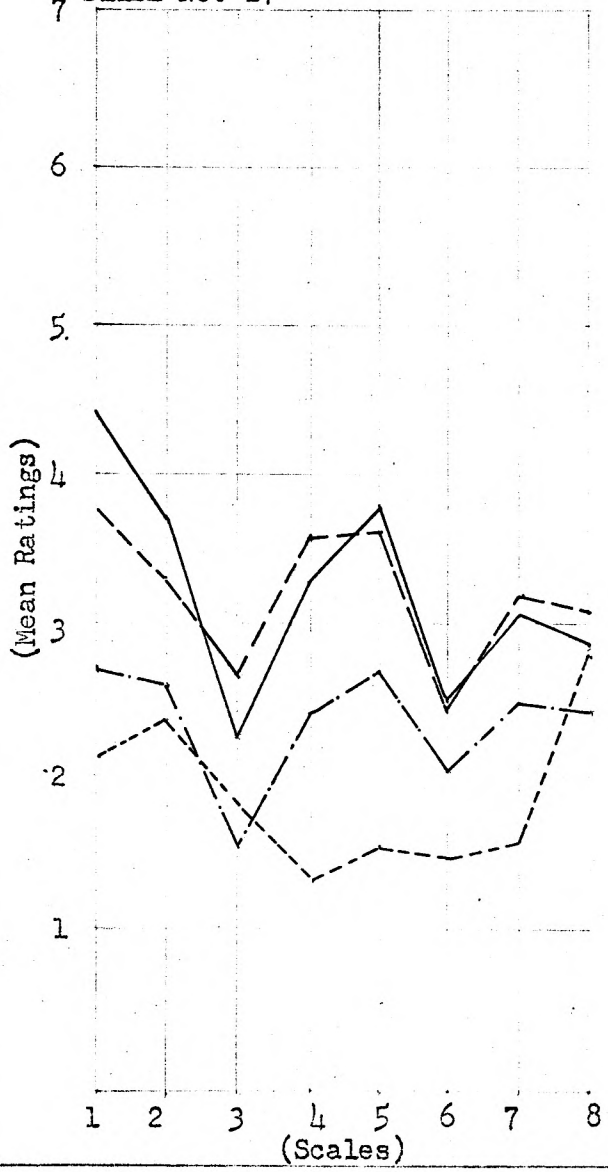
SLIDE NO. 15



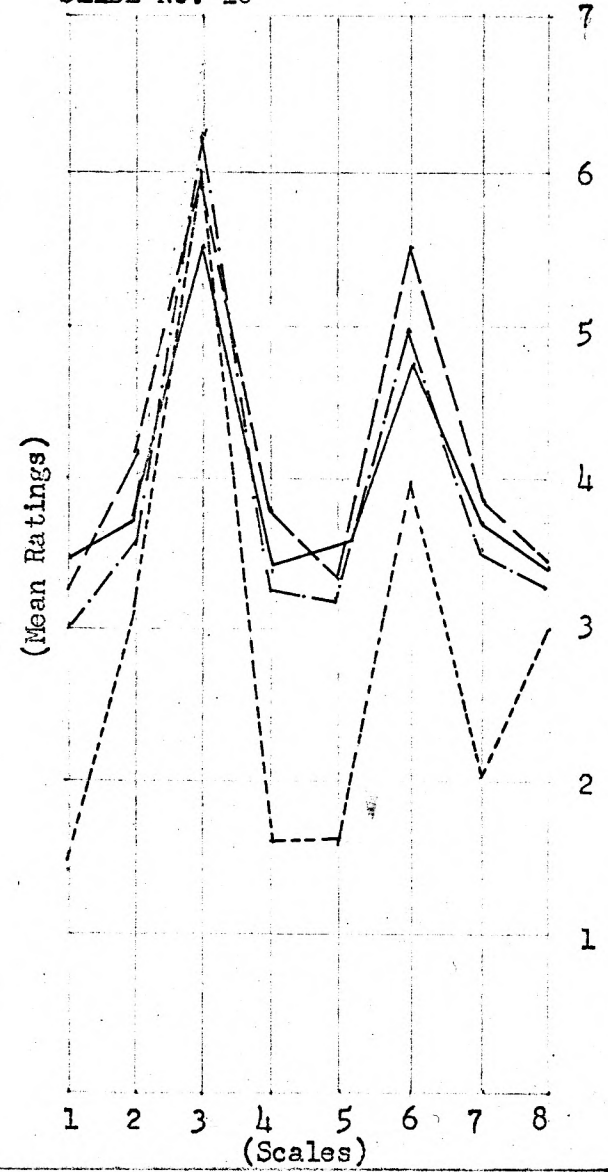
SLIDE NO. 16



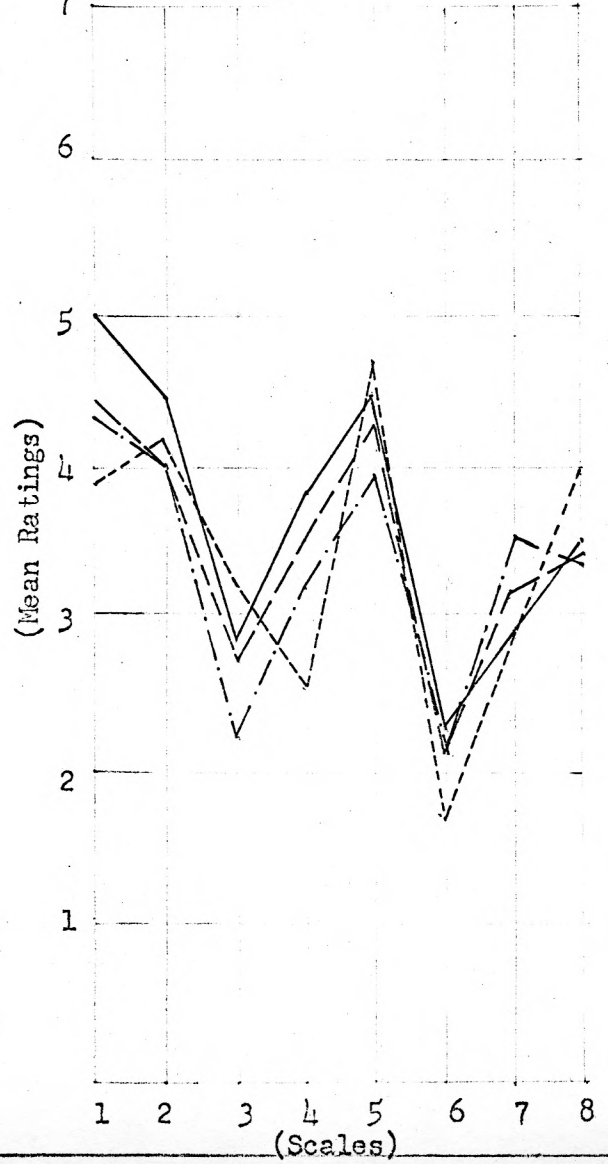
SLIDE NO. 17



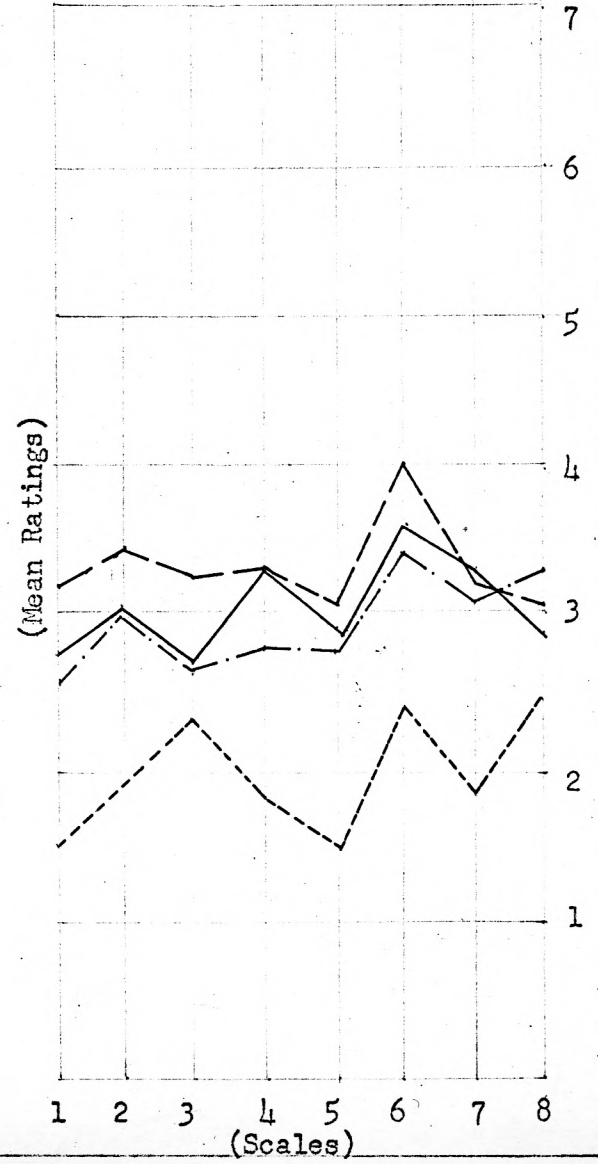
SLIDE NO. 18

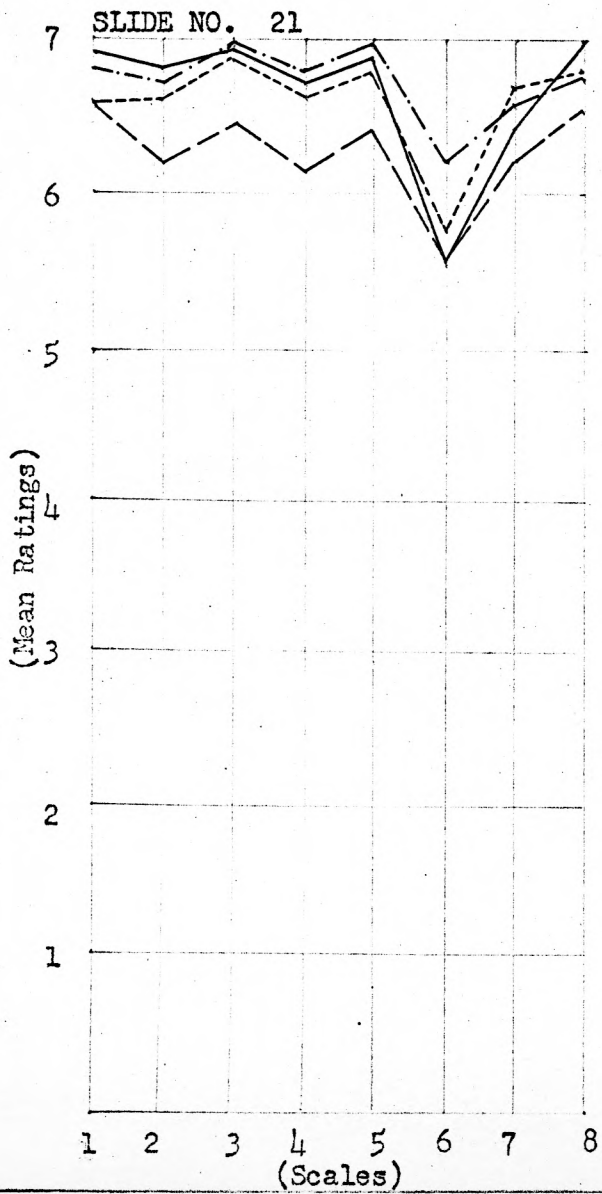


SLIDE NO. 19

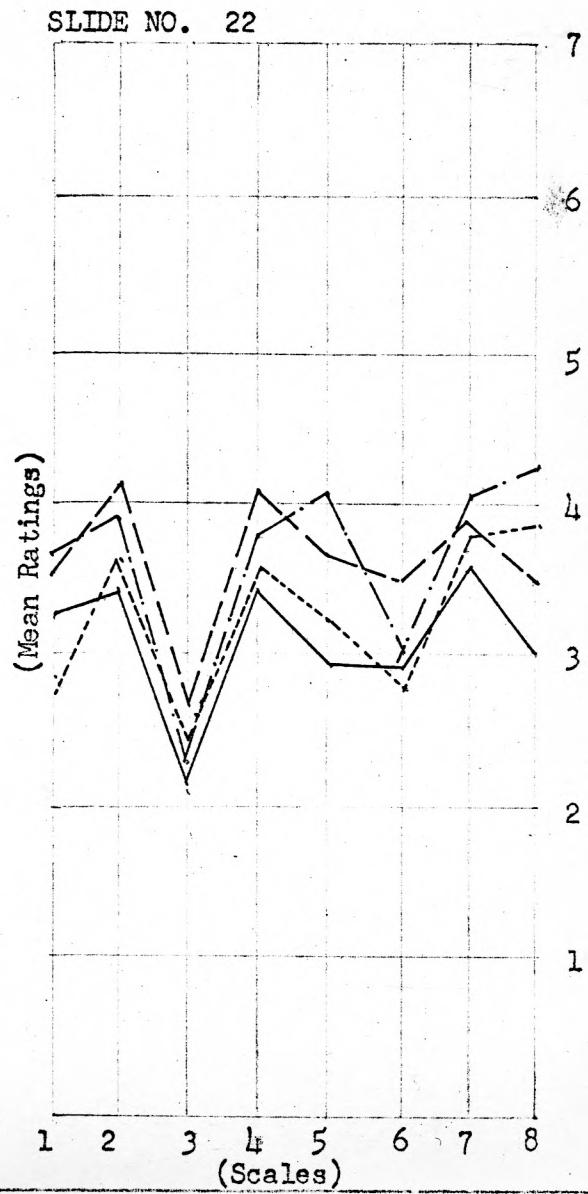


SLIDE NO. 20

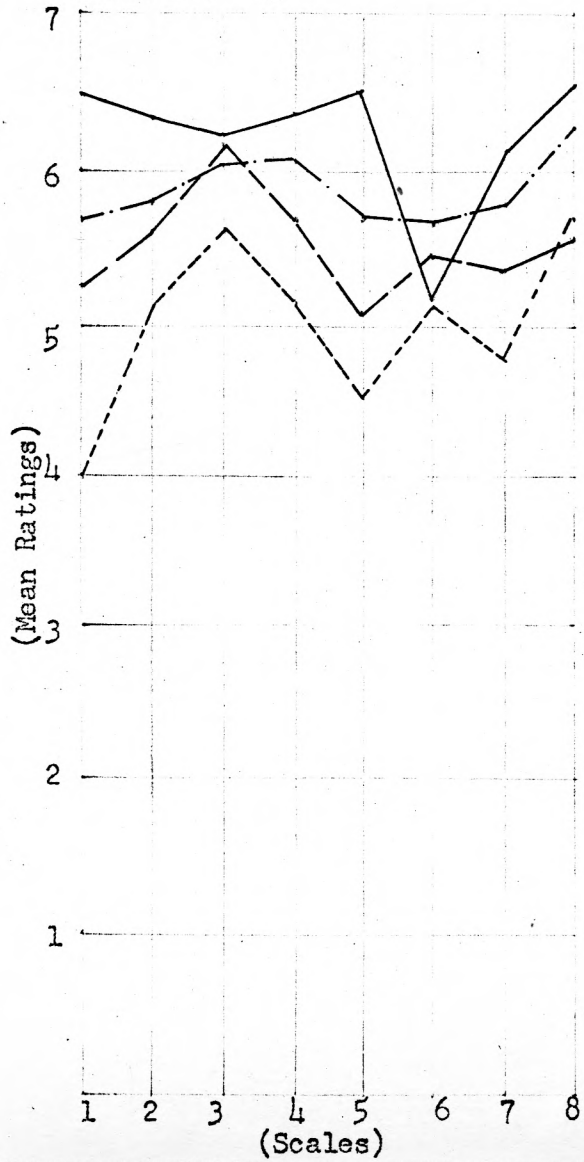




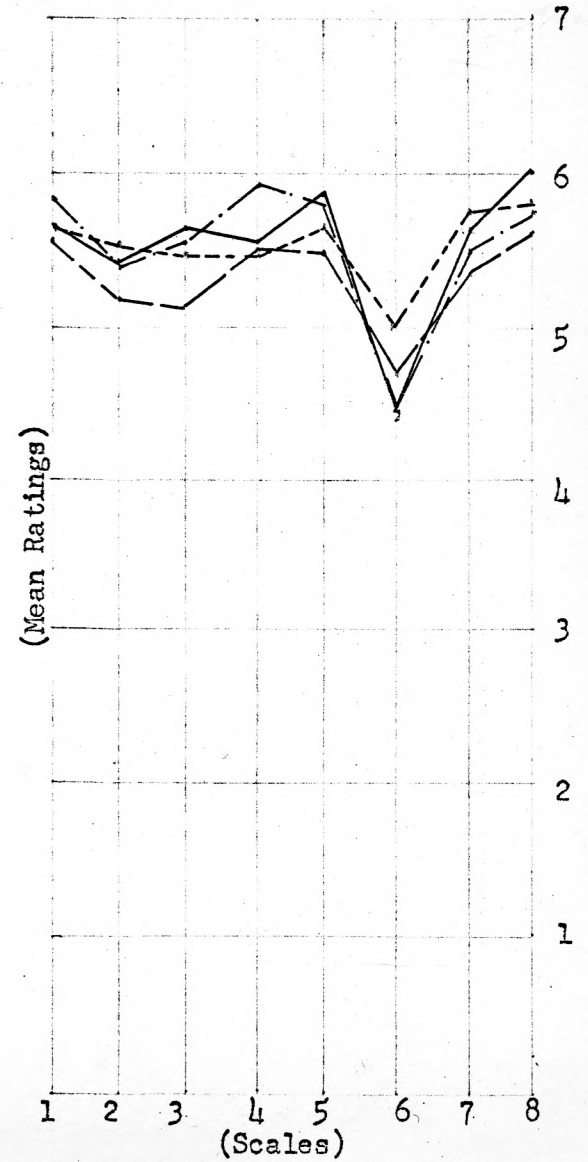
- Architecture
- Commerce
- - - - Social Sciences
- · - · Home Economics



SLIDE NO. 23



SLIDE NO. 24



Group Comparison

Observations pertaining to specific similarities and differences between the groups are enumerated below in order of their importance.

1. Response given by students of Architecture was more towards the poles, in comparison with the mean ratings of all other groups. A majority of the slides were rated differently by students of Architecture. However slides 2, 8, 9, 14, 22, and 24 showed a similar response among all the four groups.

2. Comparison of all other groups to the Architecture student group, showed that the mean rating pattern of students of Home Economics followed closest to that of the students of Architecture.

3. In comparison with the other groups the students of Social Sciences rated a majority of the slides nearer the middle rating (4). Their response tended closer to the point of uncertainty and further away from the extreme rating.

4. The mean response of the students of Social Sciences and Commerce followed the same general pattern for the following thirteen slides: 3, 4, 5, 7, 9, 12, 13, 14, 16, 17, 19, and 20. All the six categories used for the selection of the 24 slides for this experiment are covered by these thirteen slides.

5. Slides of open spaces received high ratings from all four groups, where as slides of business districts,

busy commercial areas, and advertisement signs received a low rating from all students. However, slide 19, a night scene of the Time Square, New York, was rated as pleasing in appearance by all groups, but it was not liked as much by students of Architecture.

6. All students gave high ratings to slides showing suburban residential areas, however, residential areas near the Central Business District were rated low.

7. Except for slides 6 and 7 which were rated higher by students of Architecture, scenes of urban shapes or forms of individual or group of buildings received a mixed response from all groups.

8. The mean ratings of the four groups plotted for the first three slides (slides of three different cities, sitting on different topography, with different urban characters) were found to be similar, although slide 2 was rated higher across the eight scales.

9. None of the twenty-four slides had the same level of rating across the eight scales.

Factor Analysis Results

The data was analyzed separately for each of the four groups. This analysis of the data was carried out by a technique known as factor analysis. Rummel describes this

technique in the following passage:⁴⁰

Factor analysis is a means by which the regularity and order in phenomenon can be discerned. . . .What factor analysis, does is, it takes thousand and potentially millions of measurements and quantitative observations and resolves them into distinct pattern of occurrence. It makes explicit and more precise the building of factlinkage going on continuously in the human mind. . . .Factor Analysis can be applied in order to explore a content area, structure a domain, map unknown concepts, classify or even reduce data, illuminate casual nexuses (interconnection link or tie), screen or transform data, define relationship, test hypothesis, formulate theories, control variables, or make inferences.

Factor Analysis has been used on this study as a technique to determine how the slides are grouped together by the different student groups. That is, this technique is used here to explore or map reactions to the eight different scales. The results of this analysis are given in Tables 2 and 3. Three highest loaded slides were selected for each of the four factors. These loadings measure which variables are involved in what factor pattern and to what degree. The highest loaded slides for a factor have more in common with each other.

Results of Factor Analysis for the Different Groups

Students of Architecture

Factor 1: Various types of cities.

⁴⁰Rummel, R.J. Understanding Factor Anlaysis. The Journal of Conflict Resolution, Vol XI (4), December, 1967, pp. 444-480.

Factor II: Shapes and forms of individual buildings.

Factor III: Suburban housing, openness. and new construction.

Factor IV: Colored and illuminated signs.

Students of Home Economics

Factor I: C.B.D.

Factor II: Shapes and forms of individual buildings.

Factor III: Signs for outdoor advertizements.

Factor IV: Recently constructed residential structures both high rise apartments and single family housing.

Students of Commerce

Factor I: C.B.D.

Factor II: Suburban shopping centers and suburban housing.

Factor III: Formal, rigid and controlled urban open spaces.

Factor IV: Building clusters with different aesthetics and character.

Students of Social Sciences

Factor I: C.B.D.

Factor II: Suburban shopping centers and suburban housing.

Factor III: Sign boards for outdoor advertisements.

Factor IV: Purely geometrical urban forms.

Table 3 COMPARISON OF FACTOR STRUCTURES
($> .5$ OR THE HIGHER TO DIFFERENT SAMPLES
THREE LOADINGS)

	FACTOR III																								
	SLIDES																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
COMMERCE				.33											.63	.77									
ARCHITECTURE															.43			.70						.70	
SOCIAL SCIENCES																.62		.64		.60					
HOME ECONOMICS																.70		.58		.41					
ALL SUBJECTS											.54							.72		.65				.54	
	FACTOR IV																								
COMMERCE	.47				.62			.69	.58	.60															
ARCHITECTURE									.46							-.39			-.40						
SOCIAL SCIENCES		.60																							
HOME ECONOMICS							-.55																		
ALL SUBJECTS		.66							-.47												.47			.38	
																					.65			.49	

Comparison of Factors Obtained for Different GroupsFactor I (16 percent variance)

1. Students of Architecture: Slides showing cities sitting on different topography.
2. Students of Home Economics:
3. Students of Social Sciences: Slides of central business district.
4. Students of Commerce:

Factor II (10-12 percent variance)

1. Students of Architecture: Shapes and forms of buildings
2. Students of Home Economics: with an unusual character.
3. Students of Commerce: Suburban shopping centers
4. Students of Social Sciences: and suburban housing.

Factor III (8-9 percent variance)

1. Students of Architecture: Suburban housing, openness, and new construction.
2. Students of Social Sciences: Sign boards for outdoor
3. Students of Home Economics: advertisements.
4. Students of Commerce: Formal rigid and well planned urban spaces.

Factor IV (7 percent variance)

1. Students of Architecture: Colored and illuminated signs.

2. Students of Home Economics: Recently constructed residential structures both high rise and single family housing.
3. Students of Commerce: Building clusters with different aesthetic values and character.
4. Students of Social Sciences: Pure geometric forms.

DISCUSSION AND CONCLUSIONS

It is axiomatic that students with different educational backgrounds will probably differ somewhat in their reactions towards various constituent elements of the city, and that their response patterns may be directly correlated with their educational specialization. The results of the analysis of variance and factor analysis undertaken in this study demonstrated that students with an architectural background differ significantly for most slides in their response pattern from the other three groups of students. The students of architecture showed intense reaction to the slides shown by rating them either extremely to the left or to the right of the scales. Their reaction did not show any indifference to the urban stimulus presented. Their response was either intense like for what they thought was good or outright dissatisfaction with elements they did not like. Their reaction demonstrate their desire for improved urban forms based on more appropriate design concepts which will hopefully create harmony among various urban elements. This reaction could be attributed to the orientation of their (architectural) curriculum, which deals with the visual aspects of physical forms. In contrast, the orientation of the students of Home Economics, Commerce and Social Science is such that they seem to appreciate a city's activity pattern and value its livability more than its form. The

central business area and other important focal points seem to mean more to them than the forms, shapes and aesthetic harmony between urban elements. In short, the student of architecture look at the urban scenes from a viewpoint far different from that of the other students in the sample.

The ratings of the students of Home Economics was an unexpected result. They followed closely in rating pattern with the student of architecture. This similarity may be attributed mainly to their broad curriculum which includes a number of subjects in such fields as Interior Design, Fine Arts, Sculpture and Architecture. A basic concern of the home economists is related to that of the architect--improvement of man's living conditions. A further (investigation) study involving interviews and testing of a statistically valid sample of students of Home Economics and Architecture would be recommendable to determine whether the similarity in response pattern between the two groups has any significant value.

The students of commerce and the social sciences showed similarity in their response pattern for rating slides. Their reactions were more toward the middle and less to the extreme left or right of the scales which showed indifference to or lack of understanding of what was asked of them. Although the slides of urban areas shown were representative of present urban physical forms, the response of these two groups demonstrated their lack of concern for and a certain

indifference to these urban forms. This indicates that a different set of values was used in judging the slides than those employed by the students of architecture.

The second analysis of data by Factor Analysis also indicated a marked difference in the hierarchy of values among the four groups towards the different elements of the physical environment. The architecture students seemingly gave more importance to the physical forms of cities and of individual buildings, while the other three groups considered the activities patterns of the city, such as, the C.B.D. as more important. This should be an indication to designers, planners and architects of the important differences in peoples' understandings and attitudes toward their urban surroundings.

The use of outdoor advertising signs and neon lights was one of the factors for all four student groups. This demonstrated that this element should be given more attention not only by the businessmen who use them as a media to make their business location conspicuous but also by the designers who are concerned with their aesthetic values. Therefore, more design consideration should be given to the appropriateness of these advertising devices. It may be suggested that the competitive comparison among adjacent signs should be discouraged to reduce the present existing chaos, also that city governments should consider stronger legal ordinances regulating their size, shapes, colors and brightness.

All subjects gave high ratings to slides showing suburban areas and low ratings to residential areas in or near the central business district. For example high density residential areas such as slides 9, 12, 22, which show row housing with on-street parking facilities near the central business district, they were all rated low. Whereas, slides 21, 23 and 24, showing single-family housing in suburban neighborhood with plenty of open space, were rated high. This clearly indicated the American peoples desire to live where more open space is available which allows them a feeling of independent living away from congested areas in the vicinity of the C.B.D.

The results of this study demonstrated that the use of the scale with numbers to signify the intensity of the people's reactions to the urban stimuli could be used in place of the linguistic adjectives. Based on the result of this study and the recommendation made by Peterson (1966), a recommendation for its use to measure people's attitudes, ideas and impressions of the urban environment seems warranted.

A validation of the experimental situation as a substitute for the real situation is necessary to predict from experimentation the ability of people to understand and react to the urban environment. This study has been done under the assumption that the simulated experimental condition adequately approximates the same result as would be

derived from a real life situation. It has been pointed out that anything that contributes to psychological stress such as quality of slides, emotional state of the individual, physical condition of the room affect the subject's judgement. But these variables can not be controlled and would be the same for all subjects.

RECOMMENDATIONS FOR FURTHER STUDY

A statistically random sample of the citizens and businessmen of any community be listed and then compared with the results of a community relatively larger in population, and size.

Factor Analysis across the scales to determine whether lesser number of adjectives in the scales could be used successfully to get people's reactions to urban stimuli without losing any information.

Randomly shown slides of the different categories to subjects and not in sequence according to categories as was done in this study. Compare the results.

Demographic and socio-economic data should also be analyzed and correlated with results obtained to find out whether these factors have any significant influence on the way people judge the physical environment.

That this method be applied to an urban renewal project in or around a C.B.D. to pre-test acceptability of design proposals so that good and desired elements may be incorporated

in the design proposals. After the preliminary proposals are drawn up another testing should be carried out to test the validity of the future design of the area, based on the attitude survey of the perspective users of this urban space.

This method may be used for design projects of any size; from single dwelling unit to a complete neighborhood. The project in question should be broken down into a sufficient number of appropriate categories to bring out the essential data required for analysis by the designer so that it may serve as a guideline. An intelligent designer can thus articulate the desires of his client or clients in greater detail, because this technique will help to establish better communication between designer and citizen through the use of actual pictures instead of vagueness of language in which the common man is handicapped in expressing his feelings.

An understanding of psychology, and thus of man, plays a major part in the analysis of the data and in deriving validly supportable conclusions.

BIBLIOGRAPHY

BIBLIOGRAPHY

A BOOKS

1. Berry and Meltzer, edited by Goals for Urban America, Prentice-Hall, Inc., N.J. 1967.
2. Blumenfeld, Hans, The Modern Metropolis, The M.I.T. Press, 1967.
3. Gest & Fava, Urban Sociology, Thomas Y. Cromell Company, New York, 1965.
4. Grven, Victor, The Heart of Our Cities, Simon and Schuster, New York, 1967.
5. Hayakawa, S.K., Introductory Essay in Language of Vision by Kepes, Gyorgy, Paul Theobald, Chicago, 1949.
6. Kepes Gyorgy, Language of Vision, Paul Theobald, Chicago, 1949.
7. Kulaski, Tulian Eugene, Land of Urban Promise, University of Notre Dame Press, 1967.
8. Lynch, Kevin, The Image of the City, The M.I.T. Press, 1967.
9. Lynch, Kevin and John R. Myer, The View From the Road, M.I.T., 1963.
10. Meyerson, Martin, Face of the Metropolis, Random House, New York.
11. Mumford, Lewis, The Condition of Man, Harcourt, Brace and Company, New York, 1944.
12. Mumford, Lewis, The Highway and the City, The New American Library, New York, 1964.
13. Owen, Wilfred, The Metropolitan Transportation Problem, Doubleday & Company, Inc., 1966.
14. Spreiregan, Paul, Urban Design: The Architecture of Town and Cities, Published by the American Institute of Architects, 1965.
15. Vernon, Raymond, The Myth and Reality of our Urban Problems, Harvard University Press, Cambridge, Massachusetts, 1966.

16. Willbern, York, The Withering Away of the City, Indiana University Press, 1966.
17. Winer, B.J., Statistical Principles in Experimental Design, McGraw-Hill, New York, 1962.

B JOURNALS

1. Kates and Wohwin, Mans Response to Physical Environment, Journal of Social Issues, Vol. XXII (4) 1966.
2. Looper & Whitton, Total Planning in Urban Freeway Design, American Engineer, April, 1968.
3. Lynch, K. and Rodwin, L., A Theory of Urban Form, Journal of American Institute of Planners, Vol. XXIV (4) 1958.
4. Rummel, R. J., Understanding Factor Analysis, The Journal of Conflict Resolution, Vol. XI (4) December, 1967.
5. Schoeken, Thomas D., Must our Cities Remain Ugly, Journal of the American Institute of Planners, Vol. XXII, pp. 218-226.
6. Uhr, Leonard, Planning for Beauty, Could the Psychologist Help? American Institute of Planners Journal, Vol. 24, 1958.
7. Vigier, Francois, C., An Experimental Approach to Urban Design, Journal of the American Institute of Planners, Vol. XXX (1) February, 1965.

C UNPUBLISHED PAPERS

1. Peterson, George L., Complete Visual Analysis: Highway Beautification and Environmental Quality; Paper presented in the session on Highway and Environmental Quality, 46th annual meeting of the Highway Research Board, Jan. 1967, Washington, D.C.
2. Peterson, G. L., A Model of Preference; Quantative Analysis of the perception of the Visual appearance of Residential Neighborhoods, Northern University, Evanston Illinois, June, 1966.

APPENDIX A
SEMANTIC DIFFERENTIAL SCALES

SEMANTIC-DIFFERENTIAL SCALES¹

A very useful type of scale is one which employs direct rating of concepts with scales anchored on the extremes by bipolar adjectives. The following is an example of the use of these scales:

like	----	----	----	----	----	----	----	dislike
	1	2	3	4	5	6	7	
open	----	----	----	----	----	----	----	close
	1	2	3	4	5	6	7	
livable	----	----	----	----	----	----	----	unlivable
	1	2	3	4	5	6	7	

A collection of scales as those above is referred to as a semantic differential. Although it will be convenient here to speak of THE semantic differential, the term is used in a generic sense to refer to any collection of rating scales anchored by bipolar adjectives. Rather than the semantic differential being a particular instrument (or test, as some have called it), it is a very flexible approach to obtaining measures of attitudes and other sentiments. The flexibility of the approach is one of the appealing features. The object that is rated is referred to as a CONCEPT, and anything that can be named can be rated, Winston Churchill, peach ice cream, labor unions, birth controls, my best friend, and automobiles. Not only are bipolar adjectives easily adapted to a multitude of concepts, but it is easy to apply a list of scales to a

¹Nunnally, Jum C. Psychometric theory, McGraw Hill Book Company, 1967, pp. 540-544.

number of different concepts in the same rating form. For example, if one is interested in examining attitudes towards a number of different political figures, institutions, and forms of policies, these can all be investigated in the same instrument. Subjects have no difficulty in rating 20 concepts on 20 scales in an hour's time or less. Semantic differential is very flexible in another sense.

An impressive array of studies has been performed on semantic differential by C.E. Osgood and his colleagues (Osgood, 1962; Osgood, Suci, and Tannenbaum, 1957). The semantic differential was mainly developed in relation to a mediational theory of learning (Osgood, 1962).

LOGIC OF SEMANTIC DIFFERENTIAL: It is the nature of spoken and written language, that the characteristics of ideas and real things are communicated and defined largely by adjectives. Therefore, it is reasonable to assume that adjectives, themselves, can be used to measure various facets of meaning. Logically carrying this line of reasoning a step further, it has been found that to obtain anchors for the ends of the rating scales, it is useful to work with pairs of bipolar adjectives. Most adjectives have logical opposites, such as is evidenced in the pairs sweet-sour, dark-light, and tall-short. Where an opposing adjectives is not obviously available, one can easily be generated with "in" or "un", e.g., sufficient-insufficient and satisfactory-unsatisfactory. All that remains, then, is to 1) generate a wide sample of

such pairs of adjectives, 2) use them as anchors on rating scales, as illustrated previously, and 3) search for common factors among the scales. If strong factors are found and the factors appear in ratings of many different kinds of concepts, the factors can be used as general measures of different factors of meaning.

FACTORS IN SEMANTIC DIFFERENTIAL SCALES: Numerous factor-analytic studies of semantic-differential scales lead to a conclusion that there are three major factors of meaning involved. These three factors with similar content have occurred in many analysis under varied conditions. The most frequent found factor is evaluation, which is defined by the following pairs of adjectives;

good-bad	pleasant-unpleasant	honest-dishonest
fair-unfair	wise-foolish	positive-negative

The evaluative factor is by far the strongest factor in semantic differential scales.

The second strongest factor that frequently appears in factor analysis of semantic differential scales is POTENCY. The pairs of adjectives that are usually associated with that factor are as follows:

strong-weak	thick-thin	masculine-feminine
hard-soft	rugged-delicate	severe-lenient
heavy-light	large-small	

The third strongest factor that frequently appears is ACTIVITY. Pairs of adjectives which are related to that factor are as follows:

active-passive	excitable-calm	quick-slow
tense-relaxed	sharp-dull	busy-lazy
impetuous-quiet	hot-cold	

INTERACTION OF SCALES AND CONCEPTS: One caution in employing semantic-differential scales is that the meaning of scales sometimes depends on the concept being rated. For example whereas "rugged" is positively evaluative when applied to men, it is not positively evaluative when applied to women. Thus, the interaction of scales with concepts places a limit on the extent to which individual scales can be interpreted the same when applied to different concepts and it also places a limit on the extent to which factors in semantic differential scales can be employed as general yard-stick (e.g. to measure evaluation) regardless of the concept in a particular study.

Second, it is wise to perform factor analysis for any type of concept which is to be investigated extensively. For example, if one intended to make extensive use of semantic differential scales with many different types of geometrical designs, it would be wise to investigate the factor structure of such scales with that particular type of concept rather than depend entirely on the factor structure found with other types of concepts.

Third, instead of relying blindly on the scales that usually define factors in semantic-differential scales, it is wise to think carefully about possible interactions of scales and concepts in particular studies. For example, whereas the scale beautiful-ugly usually measures evaluation, anyone would be foolish to employ it for that purpose in rating of famous statesmen e.g. Churchill, Napoleon, and Lincoln.

WHAT THE SEMANTIC DIFFERENTIAL MEASURES: Previously it was said that the initial purpose of the semantic differential was to measure the meaning of concepts. Now the potency and activity factors provide auxiliary information about evaluation beyond that provided by the scales specifically intended to measure evaluation and they provide suggestions about conceptual classes of objects. During the last 10 years the semantic differential has become an important "workhorse" in psychology for the investigation of attitudes and other types of sentiments.

APPENDIX B
QUESTIONNAIRE

QUESTIONNAIRE
PART A

1. Amount of education completed. (please check one).

- 1 elementary school
 2 some high school
 3 high school
 4 some college
 5 college
 6 some graduate studies
 7 master's degree
 8 Ph. D., L.L.B. or equivalent

2. Sex

- 1 male
 2 female

3. How many brothers and sisters did you grow up with ? _____

4. Age (please check one).

- | | |
|-------------------------------------|--|
| 1 <input type="checkbox"/> under 18 | 6 <input type="checkbox"/> 42-47 |
| 2 <input type="checkbox"/> 18-23 | 7 <input type="checkbox"/> 48-53 |
| 3 <input type="checkbox"/> 24-29 | 8 <input type="checkbox"/> 54-59 |
| 4 <input type="checkbox"/> 30-35 | 9 <input type="checkbox"/> 60 and over |
| 5 <input type="checkbox"/> 36-41 | |

5. Occupation

- 1 professional (name the profession) _____
 2 student (major) _____
 3 intended career _____

Which of the following places have you lived in ?

- | | How long | | Type of housing |
|---|-----------------------------|-----------------------------|---|
| | 6 | 7 | (write number only
corresponding to
list given below) |
| <input type="checkbox"/> a big city
(population greater
than 500,000). | 6 <input type="checkbox"/> | 7 <input type="checkbox"/> | 1. single family |
| <input type="checkbox"/> a medium or small city
(population less than
500,000). | 8 <input type="checkbox"/> | 9 <input type="checkbox"/> | 2. row housing |
| <input type="checkbox"/> a suburb of a big city | 10 <input type="checkbox"/> | 11 <input type="checkbox"/> | 3. house with two
or more apartments |
| <input type="checkbox"/> a suburb of a medium
or small city | 12 <input type="checkbox"/> | 13 <input type="checkbox"/> | 4. apartment dwell
less than four
stories. |
| <input type="checkbox"/> in the country | 14 <input type="checkbox"/> | 15 <input type="checkbox"/> | 5. apartment dwell
five or more
stories. |

16. What do you consider to be your home town ? _____

17. Approximate population _____

18. How long have you lived there ? _____

TRAVEL EXPERIENCE: In which of the states listed below have you done some sight seeing? Place a check mark in front of the states in which you have gone out of your way to stop and see some of the sights. It does not matter how little you may have seen or how short your visit was; rather, the important thing is that you actually took time to see something. Of course, not to be included are those states which you have only driven through or flown over without visiting.

<input type="checkbox"/> Colorado	<input type="checkbox"/> Missouri	<input type="checkbox"/> Nebraska
<input type="checkbox"/> South Carolina	<input type="checkbox"/> Maine	<input type="checkbox"/> California
<input type="checkbox"/> Pennsylvania	<input type="checkbox"/> Minnesota	<input type="checkbox"/> Arizona
<input type="checkbox"/> Mississippi	<input type="checkbox"/> Indiana	<input type="checkbox"/> Kansas
<input type="checkbox"/> Virginia	<input type="checkbox"/> North Dakota	<input type="checkbox"/> New York
<input type="checkbox"/> Illinois	<input type="checkbox"/> Louisiana	<input type="checkbox"/> Rhode Island
<input type="checkbox"/> Oklahoma	<input type="checkbox"/> North Carolina	

Indicate the NUMBER of countries where you have done some sight seeing in the continents listed below:

<input type="checkbox"/> Canadian Provinces	<input type="checkbox"/> South American Countries
<input type="checkbox"/> Central American Countries	<input type="checkbox"/> European Countries
<input type="checkbox"/> 20	<input type="checkbox"/> 21
<input type="checkbox"/> African Countries	<input type="checkbox"/> Australia and New Zealand
<input type="checkbox"/> Asian Countries	<input type="checkbox"/> 23
<input type="checkbox"/> 22	

PART B

DIRECTIONS: In each questions there are eight descriptive scales which you are to use for judging each slide. Each scale is bounded by a pair of opposite adjectives. In each scale as you go from one end to the other, there are seven steps of gradual shift in meaning from one adjective to the opposite. You are to place a check mark above one of the seven blanks that corresponds to your point of view. The middle blank indicates an attitude half way between opposites.

SLIDE NO. 1 How do you feel about this slide?

- | | | |
|------------------|-------|------------|
| 24. like | _____ | dislike |
| 25. unfriendly | _____ | friendly |
| 26. open | _____ | close |
| 27. disorganized | _____ | organized |
| 28. pleasing | _____ | disturbing |
| 29. complex | _____ | simple |
| 30. harmonious | _____ | chaotic |
| 31. unlivable | _____ | livable |

SLIDE NO. 2 How do you feel about this slide?

- | | | |
|------------------|-------|------------|
| 32. like | _____ | dislike |
| 33. unfriendly | _____ | friendly |
| 34. open | _____ | close |
| 35. disorganized | _____ | organized |
| 36. pleasing | _____ | disturbing |
| 37. complex | _____ | simple |
| 38. harmonious | _____ | chaotic |
| 39. unlivable | _____ | livable |

40. Where would you like to live? (check one)

___ on the hilltop

___ near the water

___ Not particular

Give your opinion about the body of water passing through the city (check)

1 ___ like very much

2 ___ like

3 ___ indifferent

4 ___ dislike

5 ___ strong dislike

41 ___

SLIDE NO. 3 How do you feel about the building shown in this slide? ¹⁰⁵

42. like	_____	dislike
43. unfriendly	_____	friendly
44. open	_____	close
45. disorganized	_____	organized
46. pleasing	_____	disturbing
47. complex	_____	simple
48. harmonious	_____	chaotic
49. unlivable	_____	livable

SLIDE NO. 4 How do you feel about the buildings shown in this slide?

50. like	_____	dislike
51. unfriendly	_____	friendly
52. open	_____	close
53. disorganized	_____	organized
54. pleasing	_____	disturbing
55. complex	_____	simple
56. harmonious	_____	chaotic
57. unlivable	_____	livable

SLIDE NO. 5 How do you feel about the building shown in the slide?

58.	like	-----	dislike
59.	unfriendly	-----	friendly
60.	open	-----	close
61.	disorganized	-----	organized
62.	pleasing	-----	disturbing
63.	complex	-----	simple
64.	harmonious	-----	chaotic
65.	unlivable	-----	livable

SLIDE NO. 6 How do you feel about the building shown in this slide?

66.	like	-----	dislike
67.	unfriendly	-----	friendly
68.	open	-----	close
69.	disorganized	-----	organized
70.	pleasing	-----	disturbing
71.	complex	-----	simple
72.	harmonious	-----	chaotic
73.	unlivable	-----	livable

SLIDE NO. 9 How do you feel about this slide?

90.	like	-----	dislike
91.	unfriendly	-----	friendly
92.	open	-----	close
93.	disorganized	-----	organized
94.	pleasing	-----	disturbing
95.	complex	-----	simple
96.	harmonious	-----	chaotic
97.	unlivable	-----	livable

SLIDE NO. 10 How do you feel about this slide?

98.	like	-----	dislike
99.	unfriendly	-----	friendly
100.	open	-----	close
101.	disorganized	-----	organized
102.	pleasing	-----	disturbing
103.	complex	-----	simple
104.	harmonious	-----	chaotic
105.	unlivable	-----	livable

SLIDE NO. 11 How do you feel about this slide?

- | | | | |
|------|--------------|-------|------------|
| 106. | like | _____ | dislike |
| 107. | unfriendly | _____ | friendly |
| 108. | open | _____ | close |
| 109. | disorganized | _____ | organized |
| 110. | pleasing | _____ | disturbing |
| 111. | complex | _____ | simple |
| 112. | harmonious | _____ | chaotic |
| 113. | unlivable | _____ | livable |

SLIDE NO. 12. How do you feel about this slide?

- | | | | |
|------|--------------|-------|------------|
| 114. | like | _____ | dislike |
| 115. | unfriendly | _____ | friendly |
| 116. | open | _____ | close |
| 117. | disorganized | _____ | organized |
| 118. | pleasing | _____ | disturbing |
| 119. | complex | _____ | simple |
| 120. | harmonious | _____ | chaotic |
| 121. | unlivable | _____ | livable |
122. Do the colors have any effect in your judgement of the slide? (check)
1. ___ very much 2. ___ much 3. ___ a little
 4. ___ very little 5. ___ not at all.

SLIDE NO. 13. How do you feel about this slide?

123 . like	.....	dislike
124. unfriendly	.....	friendly
125. open	.....	close
126. disorganized	.....	organized
127. pleasing	.....	disturbing
128 . complex	.....	simple
129 . harmonious	.....	chaotic
130 . unlivable	.....	livable

SLIDE NO. 14. How do you feel about this slide?

131. like	.....	dislike
132. unfriendly	.....	friendly
133. open	.....	close
134. disorganized	.....	organized
135. pleasing	.....	disturbing
136. complex	.....	simple
137. harmonious	.....	chaotic
138. unlivable	.....	livable

SLIDE NO. 15. How do you feel about this slide?

139.	like	_____	dislike
140.	unfriendly	_____	friendly
141.	open	_____	close
142.	disorganized	_____	organized
143.	pleasing	_____	disturbing
144.	complex	_____	simple
145.	harmonious	_____	chaotic
146.	unlivable	_____	livable

SLIDE NO. 16. How do you feel about this slide?

147.	like	_____	dislike
148.	unfriendly	_____	friendly
149.	open	_____	close
150.	disorganized	_____	organized
151.	pleasing	_____	disturbing
152.	complex	_____	simple
153.	harmonious	_____	chaotic
154.	unlivable	_____	livable

SLIDE NO. 17. How do you feel about this slide ?

155. like	-----	dislike
156. unfriendly	-----	friendly
157. open	-----	close
158. disorganized	-----	organized
159. pleasing	-----	disturbing
160. complex	-----	simple
161. harmonious	-----	chaotic
162. unlivable	-----	livable

SLIDE NO. 18. How do you feel about this slide?

163. like	-----	dislike
164. unfriendly	-----	friendly
165. open	-----	close
166. disorganized	-----	organized
167. pleasing	-----	disturbing
168. complex	-----	simple
169. harmonious	-----	chaotic
170. unlivable	-----	livable

SLIDE NO. 19. How do you feel about this slide?

171. like	-----	dislike
172. unfriendly	-----	friendly
173. open	-----	close
174. disorganized	-----	organized
175. pleasing	-----	disturbing
176. complex	-----	simple
177. harmonious	-----	chaotic
178. unlivable	-----	livable

SLIDE NO. 20. How do you feel about this slide?

179. like	-----	dislike
180. unfriendly	-----	friendly
181. open	-----	close
182. disorganized	-----	organized
183. pleasing	-----	disturbing
184. complex	-----	simple
185. harmonious	-----	chaotic
186. unlivable	-----	livable

SLIDE NO. 21. How do you feel about this slide?

187.	like	-----	dislike
188.	unfriendly	-----	friendly
189.	open	-----	close
190.	disorganized	-----	organized
191.	pleasing	-----	disturbing
192.	complex	-----	simple
193.	harmonious	-----	chaotic
194.	unlivable	-----	livable

SLIDE NO. 22. How do you feel about this slide?

195.	like	-----	dislike
196.	unfriendly	-----	friendly
197.	open	-----	close
198.	disorganized	-----	organized
199.	pleasing	-----	disturbing
200.	complex	-----	simple
201.	harmonious	-----	chaotic
202.	unlivable	-----	livable

SLIDE NO. 23. How do you feel about this slide?

203.	like	_____	dislike
204.	unfriendly	_____	friendly
205.	open	_____	close
206.	disorganized	_____	organized
207.	pleasing	_____	disturbing
208.	complex	_____	simple
209.	harmonious	_____	chaotic
210.	unlivable	_____	livable

SLIDE NO. 24. How do you feel about this slide?

211.	like	_____	dislike
212.	unfriendly	_____	friendly
213.	open	_____	close
214.	disorganized	_____	organized
215.	pleasing	_____	disturbing
216.	complex	_____	simple
217.	harmonious	_____	chaotic
218.	unlivable	_____	livable

APPENDIX C
TABLE SHOWING ROTATED FACTOR LOADINGS
FOR ALL SLIDES

Table 1

ROTATED FACTOR LOADINGS FOR
ALL STUDENTS

Slide No	PERCENTAGE OF VARIANCE			
	FACTOR I 16.2%	FACTOR II 11%	FACTOR III 8%	FACTOR IV 7%
1	0.303	-0.277	0.013	0.093
2	0.197	-0.0063	-0.088	0.669
3	0.238	-0.041	-0.124	0.268
4	0.585	0.0209	-0.1686	0.019
5	0.235	0.243	-0.009	0.0429
6	-0.069	0.7399	-0.0724	0.1546
7	-0.127	0.7040	0.029	-0.144
8	0.620	0.050	0.019	0.0120
9	0.5838	0.3753	-6.0407	-0.2417
10	0.516	0.079	0.0862	-0.149
11	-0.01205	0.300	0.544	0.185
12	0.311	-0.047	0.0688	-0.184
13	0.62311	-0.041	0.05	0.153
14	0.046	0.5503	0.1772	0.1209
15	0.0588	0.4797	0.2126	0.1200
16	0.2127	-0.1138	0.3872	-0.0538
17	0.6766	-0.2085	0.1168	0.1646
18	-0.0974	0.087	0.7276	-0.1501
19	0.5694	-0.1682	0.0299	0.3487
20	0.0891	-0.0973	0.6553	-0.2066
21	-0.0763	0.1203	0.0642	0.6585
22	0.1095	0.0705	0.0242	0.034
23	0.09225	0.0097	0.5465	0.3962
24	0.1168	0.3011	-0.0234	0.490

Table 2

 ROTATED FACTOR LOADINGS FOR
 STUDENTS OF HOME ECONOMICS

Slide No	PERCENTAGE OF VARIANCE			
	FACTOR I 15%	FACTOR II 10%	FACTOR III 8%	FACTOR IV 7%
1	0.6029	-0.1273	-0.2039	-0.0115
2	0.3850	-0.0857	-0.3109	0.2894
3	0.4633	-0.0696	-0.1799	-0.0346
4	0.4845	-0.1382	-0.091	-0.3221
5	0.2641	0.1738	-0.3754	-0.1439
6	-0.2072	0.6408	-0.0739	-0.2570
7	-0.1581	0.6325	-0.0249	-0.3682
8	0.58918	0.0760	-0.1118	-0.0877
9	0.0681	0.2202	-0.0841	-0.4710
10	0.5414	0.1546	0.2634	-0.2962
11	0.0489	0.4511	0.0971	0.2998
12	0.5311	0.1389	0.1746	-0.2562
13	0.577	-0.0406	0.0497	-0.1181
14	0.0152	0.5279	-0.2641	0.0164
15	-0.1996	0.3339	-0.3328	-0.1553
16	0.1516	0.0551	0.7082	-0.0687
17	0.6365	-0.0044	0.1868	0.1558
18	-0.1702	0.4483	0.5891	0.1955
19	0.6051	-0.0530	0.0244	0.3015
20	0.2904	0.3211	0.4159	0.1834
21	0.0773	0.2782	-0.42509	0.4724
22	0.5532	0.1150	0.0452	-0.0476
23	0.1594	0.456	0.151	0.387
24	0.215	0.418	-0.404	0.155

Table 3

 ROTATED FACTOR LOADINGS FOR
 STUDENTS OF SOCIAL SCIENCE

Slide No	PERCENTAGE OF VARIANCE			
	FACTOR I 18%	FACTOR II 13%	FACTOR III 9%	FACTOR IV 7%
1	0.451	-0.140	-0.272	-0.090
2	0.2196	0.1492	-0.1504	0.6029
3	0.5525	-0.2425	-0.1387	0.2202
4	0.60795	-0.0788	-0.1553	-0.1048
5	0.4864	0.3550	-0.1929	-0.2674
6	0.1765	0.5088	-0.2104	-0.2125
7	0.1650	0.4011	0.0230	-0.5565
8	0.6508	0.1421	0.0331	-0.1538
9	0.443	0.3329	0.1640	-0.1716
10	0.5514	-0.0236	0.3282	-0.1005
11	-0.07258	0.6345	0.2923	0.1914
12	0.5508	-0.3006	0.2958	-0.1828
13	0.7414	0.0268	-0.1249	0.1205
14	0.0937	0.6901	-0.0537	0.0160
15	0.1479	0.6828	0.0844	-0.0519
16	0.1624	-0.0602	0.6249	0.3316
17	0.7335	-0.1603	0.0301	0.2695
18	-0.15188	0.3663	0.6436	0.1166
19	0.6431	-0.1144	-0.0039	0.4816
20	0.2907	0.0712	0.6048	-0.056
21	-0.02027	0.3849	-0.4368	0.27044
22	0.4828	-0.2041	0.1566	-0.2905
23	-0.1264	0.5715	0.1239	0.3036
24	0.2933	0.3437	-0.4894	0.0956

Table 4

 ROTATED FACTOR LOADINGS FOR
 STUDENTS OF ARCHITECTURE

Slide No	PERCENTAGE OF VARIANCE			
	FACTOR I 16%	FACTOR II 12%	FACTOR III 8%	FACTOR IV 7%
1	0.3664	-0.2052	-0.3742	-0.066
2	0.6207	-0.0928	-0.2776	-0.3587
3	0.6521	0.0351	-0.090	-0.1371
4	0.5753	0.2060	0.0290	0.3419
5	0.4777	0.0595	-0.0283	0.2233
6	0.1697	0.7127	0.0156	-0.2511
7	0.1027	0.6840	0.0078	-0.2378
8	0.4794	0.0521	-0.1148	0.3519
9	0.1726	0.0047	0.1195	0.4669
10	0.5722	-0.3545	0.08238	0.1216
11	0.2116	0.0965	0.2629	-0.3175
12	0.3317	-0.01401	-0.0238	0.3624
13	0.4632	0.0623	0.1471	0.2666
14	0.19169	0.7724	0.1351	-0.2810
15	0.2342	0.2477	0.4367	0.1439
16	0.3281	-0.4420	0.3254	-0.3911
17	0.4236	-0.4777	-0.2593	-0.1223
18	-0.0068	-0.4000	0.7000	-0.1613
19	0.4310	-0.0530	-0.3468	-0.4062
20	0.25026	-0.4899	0.3098	-0.2802
21	0.5437	0.3417	0.1371	-0.0335
22	0.2407	-0.1559	-0.2686	0.0312
23	0.2759	0.0132	0.7010	0.0409
24	0.5318	0.0775	0.03054	0.1509

Table 5
 ROTATED FACTOR LOADINGS FOR
 STUDENTS OF COMMERCE

Slide No	PERCENTAGE OF VARIANCE			
	FACTOR I 16%	FACTOR II 10%	FACTOR III 9%	FACTOR IV 8%
1	0.2800	-0.1752	-0.1652	0.4714
2	0.4223	-0.2755	0.2550	-0.0742
3	0.232	-0.1789	-0.1911	0.0411
4	0.2778	0.05659	0.33193	0.4026
5	0.0828	-0.0913	0.2415	0.6223
6	0.0349	-0.1814	0.0392	-0.0303
7	-0.1719	0.2473	0.1922	0.0495
8	0.3284	-0.0238	0.07820	0.6949
9	0.0526	0.1769	0.2095	0.5806
10	-0.0164	0.0734	-0.1055	0.6004
11	-0.1045	-0.36630	0.29854	0.08184
12	0.01505	0.2214	0.1152	0.1465
13	0.4523	-0.1107	0.1158	0.2276
14	-0.0832	-0.0236	0.63481	0.0841
15	0.0075	-0.1766	0.7714	0.1458
16	0.03503	0.02612	0.0027	-0.2597
17	0.77462	0.0087	-0.03719	0.2094
18	0.137	0.1114	0.2040	-0.2439
19	0.7941	-0.0729	-0.0536	0.1178
20	0.0621	0.2008	-0.0888	0.0278
21	0.0749	-0.76146	0.0855	-0.0388
22	0.13709	0.0126	-0.0598	-0.06413
23	0.08243	-0.8243	0.1266	-0.04368
24	-0.03433	-0.5392	-0.0854	0.4334

THE AESTHETIC PERCEPTION OF VARIOUS GROUPS TO VISUAL
STIMULI ASSOCIATED WITH URBAN ENVIRONMENT

by

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B. Arch., M. S. University of Baroda, India, 1966

AN ABSTRACT OF A MASTER'S THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF ARCHITECTURE

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KANSAS STATE UNIVERSITY
Manhattan, Kansas

1968

The present historical trend in the development of highly unrelated urban forms and spaces has emphasized the need for basic research that will help ascertain the attitudes of American urban citizens, who, after all, are the actual users of these spaces and who are either advantaged or disadvantaged materially and spiritually by its development. This study is an exploratory investigation concerning levels of aesthetic perception of various groups to visual stimuli associated with the urban environment. A questionnaire and slide technique was used to assess the impressions of various student groups and to quantitatively measure their reactions to the urban scenes presented in the series of slides.

A questionnaire using a seven scale semantic technique with a set of eight descriptive scales was developed to determine the general reactions and feelings of the respondents to the 24 slides of various types of urban areas in both the United States and Europe. These slides were grouped into the following categories: Topography, Shapes, Districts, Open Spaces, Sign Areas, and Residential Areas were selected.

A total of 410 students were interviewed of which a subtotal of 136 students, 40 each from Home Economics, Commerce, Social Sciences and 16 from Architecture were used in the final analysis. Ratings of the slides by the four groups were factor analyzed, to determine how the slides would be categorized by the different student groups. An analysis of variance was used to determine the statistical

significance of the apparent differences between group ratings, and the significance in difference between groups scales and interaction.

Results of rating of slides showed a significant difference ($p < .01$) among the groups for all the slides, except slides 2, 3, and 24. The response given by the students of Architecture were more towards the poles. The Home Economics students followed closest to that of the students of Architecture in response pattern, and the students of Social Sciences and Commerce were more to the middle rating.

For most slides there is no significant relationship between the scales and the groups. None of the 24 slides had the same level of rating across the eight scales. Slides of urban shapes or the form of an individual building or group of buildings received a mixed response from all groups, while slides of open spaces were rated high by all four groups. Business districts, busy commercial areas and advertisement signs received low ratings from all students. All students gave high ratings to slides showing suburban residential areas, while residential areas near the CBD or inner city were rated low.

The results of the Factor Analysis across the slides indicated a strong difference in the hierarchy of values among the four groups, (most likely based on education and training) in their perception of the different elements constituting the fabric of the urban physical environment. Architecture

students tended to place more importance on the physical forms of urban elements while the other three groups seemed to be more activity orientated in their appreciations.