

Using data from a post-occupancy evaluation of an award-winning federal office building, aesthetic or architectural quality and the factors associated with it are considered. Various measures of quality are derived from responses to questionnaires administered to three user groups: the office workers, public visitors, and the community at large. Findings show that, on average, the public is likely to agree the building is worthy of its architectural awards. The office workers on the other hand, tend to rate the architectural quality of the building poorly. The analysis demonstrates that views on architectural quality are significantly related to the way workers assess the building as a place to work and the general ambience of their particular agency. Agency ambience is seen as having both aesthetic components and functional components such as noise levels, temperature, and people movement. It is suggested that linkages exist in the minds of occupants between the quality of the workplace including its nonaesthetic components and assessments of overall architectural quality.

MEASURING OVERALL ARCHITECTURAL QUALITY A Component of Building Evaluation

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Architects are well aware of the long tradition of critically assessing buildings and other built environments. In recent years, these assessments have taken the form of post-occupancy evaluations reflecting various perspectives (users, energy performance), methodologies (observations, questionnaires), and theoretical formulations. They have also focused on a wide range of environmental settings ranging

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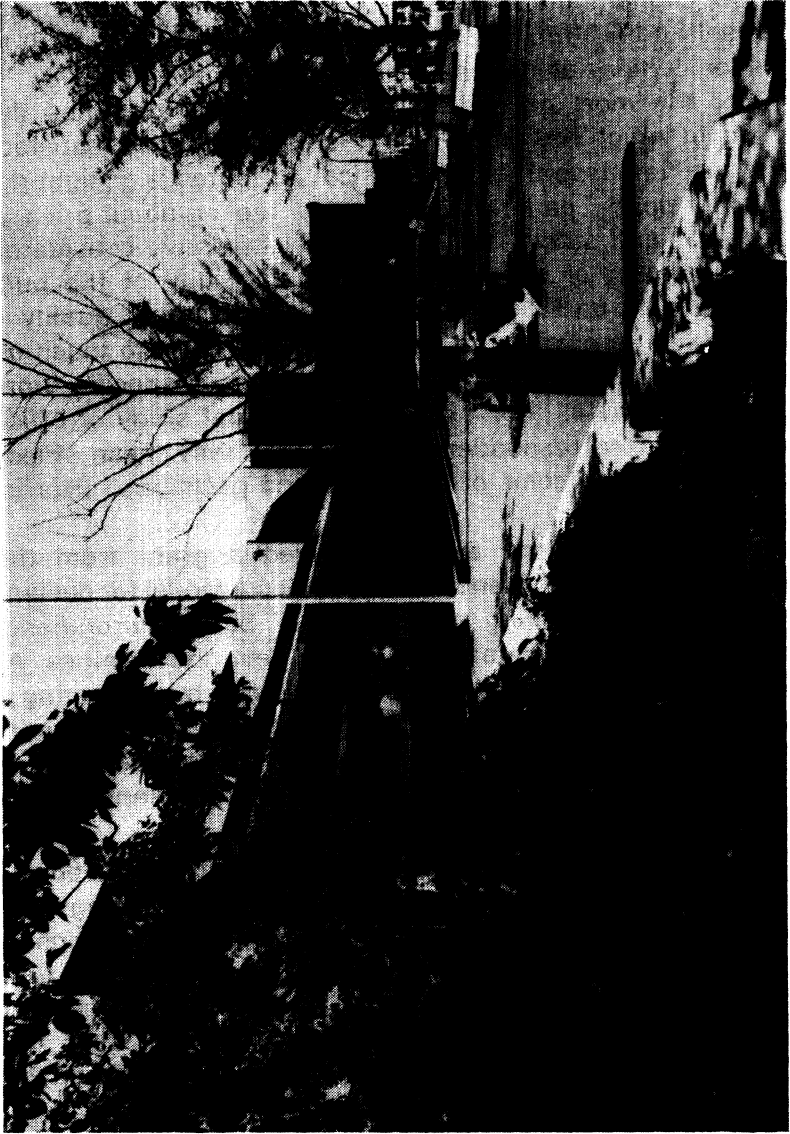
in scope from office environments (Manning, 1965; Canter, 1968; Oldham and Brass, 1979) and housing developments (Zeisel and Griffin, 1975; Cooper, 1975; Marans, 1978) to visitor centers at national parks (Zube et al., 1976).

For the most part, the evaluations have examined the ways in which the environment is used, occupant satisfaction with an assortment of physical attributes (e.g., lighting, outdoor space, parking) and peoples' feeling about privacy, security, and safety. Yet surprisingly few have considered the aesthetic or overall architectural quality of the built environment under study. If the issue of aesthetic quality is addressed as part of the evaluation, it is likely to touch on interior settings such as work stations or specific work station attributes. For example, a national study of office workers asked respondents to rate "the way these offices look" and the "color of the walls and partitions" (Harris, 1978).

In 1978, the first author received a grant from the National Bureau of Standards to develop a model for designing and implementing evaluations of built environments ranging from individual buildings to new communities. At the same time, the model was to be tested by evaluating a particular built environment. A full discussion of that model and efforts to test it with an evaluation of the federal office building in Ann Arbor, Michigan has been presented elsewhere.¹

As part of the evaluation of the Ann Arbor Federal Building, a number of issues were addressed ranging from the employees' assessments of individual work stations to relationships between the building and its surroundings. The evaluation was made from a single perspective—that of the building users. Users were defined in two ways: the federal employees who worked within the structure and the residents of the Ann Arbor area.

This article considers one aspect of that evaluation—the aesthetic or overall architectural quality of the building and the factors associated with it. Among the many issues dealt with in the Federal Building evaluation, overall architectural quality is one that attracts particular attention in that, in



general, there is little agreement as to how it is defined or commonly understood.

PAST RESEARCH

Over the years several researchers have examined the meaning of good- and poor-quality environments for various population groups. For the most part, large-scale urban and natural settings have been the focus of environmental quality studies (Craik and Zube, 1976). Typically, the studies have considered the built environment as the stage or backdrop against which perceptions of aesthetic quality of settings are measured. The architectural elements become the field rather than the central object in which subjects are expected to judge such qualities as "beauty" or "attractiveness" (Maslow and Mintz, 1956; Pyron, 1972). In studies that have attempted to measure the aesthetic quality in individual buildings, people's perceptions and judgments have been based on responses to specific visual stimuli rather than on their reactions to the actual environment. Semantic differentials have been a popular mode of data collection in this kind of research (Hershberger, 1970, 1972). The limiting aspect of this approach to determining aesthetic quality in buildings has been the inability to relate visual perceptions to a broad range of social and environmental variables (Wohlwill, 1976). Extensive research dealing with assessments of the workplace and residential settings has shown that qualitative meanings of such complex issues as "well-being" and "happiness" can be understood only in relation to a rich mixture of independent variables (Campbell et al., 1976).

In spite of our present inability to assess critically or even understand the root meaning of aesthetic quality, buildings are judged with regularity by both design professionals and laymen. The Ann Arbor Federal Building, for instance, received numerous honors soon after it opened including awards for design excellence from the Detroit chapter of the American Institute of Architects and the Michigan Society of Architects. Yet almost simultaneously, newspaper re-

ports identified problems in the building and suggested that employees were unhappy with it as a place to work. In order to determine the validity of these reports and, at the same time, explore the meaning of aesthetic quality, the evaluation considered the question of how people who worked in the building and Ann Arbor residents assess it from an architectural point of view.

METHODOLOGY

Two groups of Ann Arbor residents were queried. One group was selected by drawing a probability sample of 174 resident names from the Ann Arbor telephone directory and contacting them by telephone (community residents). From the selected names, 113 interviews were completed representing a response rate of 65%. The second group consisted of 60 visitors who were contacted as they left the building (on-site visitors). Interviewers were stationed at the four building entrances at specified periods and were instructed to interview 15 people at each location.² For the most part, questionnaires administered to both groups of Ann Arbor residents contained identical items.

Because of the relatively small number of people working in the building (270 employees), all were given questionnaires for completion. The questionnaires were distributed on a Monday morning and by the end of the week, 239 had been returned, representing a response rate of 88.5%. All questionnaires were pretested for clarity of content, length of time to administer, and question sequencing.

In addition to the three questionnaires, a second major data collection involved the recording of environmental information using working drawings, furniture plans, and field measures of light, temperature, and noise conditions. Data covering each work station were recorded on forms that had been prenumbered to correspond to the questionnaires administered to the building occupants. This procedure enabled the researchers to analyze employee responses in relation to the environmental conditions they were experiencing.

Finally, observations of employers and the public as they used the building and its spaces provided a third major source of information. The findings reported below cover only the data on aesthetic quality gleaned from the analysis of the questionnaires.

ARCHITECTURAL QUALITY FROM THE COMMUNITY PERSPECTIVE

For Ann Arbor residents, the meaning of architectural quality was determined in several ways. First, residents were asked what they liked and disliked about the building. Then they were asked to indicate the degree to which they thought the building's exterior and its interior were attractive.

When asked whether there was anything about the building they particularly liked, more than half (55%) of the community residents and two-thirds (67%) of the on-site visitors responded affirmatively. In contrast, 38% of the first group and one-third of the second said there was something they disliked about the building. Building attributes viewed favorably by community residents were the plaza with its landscaping and stairs (33% of all mentions), the overall design and attractiveness of the building (20%), and its windows and skylights (19%). On-site visitors were most likely to mention the overall design (18%) and the spaciousness of the interior as the attributes liked best. Among the community residents who said there was something they disliked about the building, its overall design was mentioned more than a third (37%) of the time, while 14% of the mentions dealt with specific exterior features such as its bland color scheme or its barren walls. On-site visitors were most likely to be unhappy about the parking situation at the building. Despite these mixed responses, it is important to note that within both groups people were most likely to say there was something about the building they liked.

Mixed responses were also reflected in the attractiveness ratings of both groups to the interior and exterior of the building. Table 1 shows that two-thirds of the community

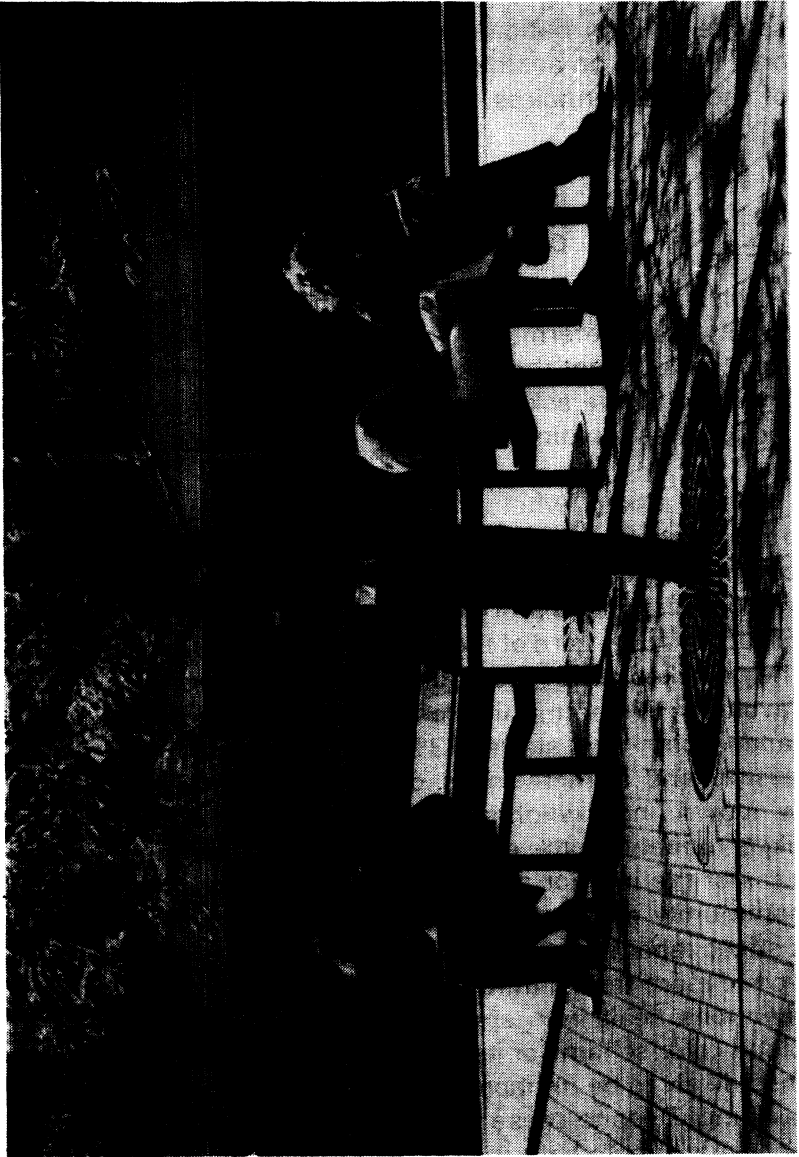


TABLE 1
Ratings of Federal Building Attractiveness by Community Residents
and On-Site Visitors (percentage distribution)

<u>Rating of:</u>	<u>Community Residents</u>	<u>On-Site Visitors</u>
<u>Interior Appearance</u> ¹		
Very attractive	16	25
Fairly attractive	48	55
Not very attractive	28	18
Not at all attractive	<u>8</u>	<u>2</u>
Total	100	100
Number of respondents	77	60
Mean rating ³	2.7	3.0
<u>Exterior Appearance</u> ²		
Very attractive	31	36
Fairly attractive	44	43
Not very attractive	19	17
Not at all attractive	<u>6</u>	<u>4</u>
Total	100	100
Number of respondents	98	58
Mean rating	3.0	3.1

1. The question was: "What do you think of the appearance of the inside of the building? Would you say it's very attractive, fairly attractive, not very attractive, or not at all attractive?"

2. The question was: "And what do you think about the overall appearance of the outside of the building? Is it very attractive, fairly attractive, not very attractive, or not at all attractive?"

3. Mean ratings are based on scores of 4 for very attractive, 3 for fairly attractive, 2 for not very attractive and 1 for not at all attractive.

residents who had been to the building said its interior was very or fairly attractive; four out of five on-site visitors gave this response. With respect to the exterior of the building, three-quarters of both groups said it was attractive. It is interesting to speculate whether or not these data would have influenced the decisions of members of the architecture profession who cited the building for its quality architecture.

In order to see if any particular segment of the public was more or less likely to rate the building favorably, average

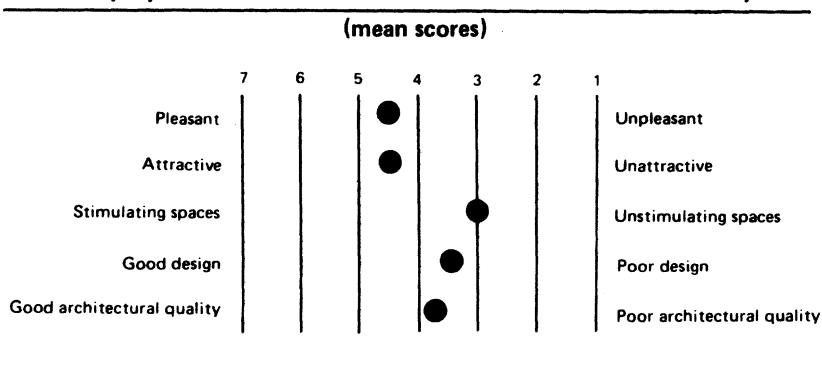
ratings were calculated for different subgroups of the telephone respondents. Although none of the differences in the mean ratings were statistically significant, there was a tendency for long-term residents of Ann Arbor and those who worked outside the central city to give the highest marks to the building. At the same time, familiarity with the building in terms of the number of visits to downtown Ann Arbor tended to be associated with low ratings.

ARCHITECTURAL QUALITY FROM OCCUPANTS' PERSPECTIVE

All of the federal employees who occupied the building were also asked to evaluate it and several building attributes from the point of view of architectural quality. Architectural quality was tapped through employee ratings, using semantic differential scales of the building's design, its attractiveness, the extent to which the spaces were stimulating, and a single item called architectural quality. Because these four dimensions, along with ratings of pleasantness of the environment, were shown to be highly intercorrelated (mean $r = .47$; coefficient of reliability = .65), an index of architectural quality was created to try to capture the multidimensional nature of the concept. Table 2 shows the mean ratings of the five dimensions for the 239 respondents or 90% of the employees who answered the questions.

Employees clearly had mixed feelings about the quality of the building's architecture.³ While there was a tendency for workers to view the building as moderately pleasant and attractive, they were less than favorably inclined toward the quality of its architectural design including its interior spaces. The varied sentiments were also revealed in the comments volunteered by people completing the questionnaires. One person wrote, "I think that the architecture of this building is exciting and different and I'm proud to work in it." Another person thought the building was "worth its

TABLE 2
 Employees' Evaluations of Dimensions of Architectural Quality



weight in gold." Other persons, however, were not so kind in their added remarks: "If this building won an award for design excellence, I would hate to work in other federal buildings," and "I resent the fact that the designers received an award without the benefit of employee input."

Feelings about architectural quality were significantly related to the way federal employees rated the building as a place to work. When evaluations of six building attributes were considered simultaneously in predicting these ratings, 47% of the variability was accounted for with the workers' assessments of architectural quality as the most important predictor ($\eta^2 = .65$).⁴

Undoubtedly there are other factors besides architectural quality contributing to people's assessments of a building as a workplace. In fact, we found that relative to their views on architectural quality, people's feelings about their agencies and their immediate work environments were more strongly associated with their overall ratings of the building as a workplace. This would suggest that there are both functional and aesthetic dimensions to the response of people who are asked to provide a general rating of the building in which they work. Our purpose here is not to examine the exact nature of each of these dimensions; that would require a different set of measures than those available as part of this study. Suffice it to say that the analysis demon-

strates that views on architectural quality are important in understanding the way buildings are judged by the people who purposefully occupy them.

While we were interested in knowing what the occupants thought about the Federal Building from an architectural perspective, we also wanted to know how those thoughts differed among various groups of occupants. Bivariate analyses indicate that feelings about architectural quality differed for individuals depending on the agency they worked in, the type of job they had, and to a lesser extent, the amount of time they spent in the building. The military recruiters, the postal workers, and the professional and clerical staff of the small agencies (FBI, Department of Labor, Soil Conservation Service), and short-term occupants tended to rate architectural quality highly; the professional and clerical staffs from the Heritage, Conservation and Recreation Service, and long-term occupants gave the lowest marks to architectural quality. When the three employee characteristics were considered simultaneously, nearly a quarter of the variation in the evaluation scores on architectural quality was explained (see Table 3).

As a way of determining whether evaluations of selected building attributes were related to architectural quality, employees' feelings about the building signs and building maintenance were considered in a multivariate analysis.⁵ As shown in the second part of Table 3, this procedure increased the proportion of the explained variance to 35.7%. After taking into account who the employees were, their ratings of the building's upkeep was second only to their agency affiliation as a factor in explaining their feelings about architectural quality.⁶

In order to further understand why the employees' agencies were so important to their views about architectural quality of the building, we decided to investigate that quality vis-à-vis the individuals' feelings about their agencies. As we noted before, the individuals' ratings of the general ambience of their agencies seemed most appropriate in our exploration of factors influencing architectural quality. When ambience was considered along with other predic-

TABLE 3
Evaluation of Architectural Quality, Predicted by Ratings of Building Attributes and Agency Ambience (multiple classification analysis—238 employees)

<u>Predictor</u>	Beta Coefficient ¹		
	<u>Eta Coefficient</u>	<u>Employee Characteristics</u>	<u>Employee Characteristics, Building Attribute and Agency Ambience Ratings</u>
<u>Employee Characteristics</u>			
Agency	.45	.36(1)	.34(1)
Time in building	.26	.27(2)	.17(5)
Job classification	.36	.20(3)	.26(3)
<u>Attribute Ratings</u>			
Signs	.29		.21(4)
Upkeep	.42		.22(4)
<u>Agency Ambience Rating</u>	.54		.35(1)
Percent of variance explained (adjusted multiple R ²)		24.1	35.7
			44.7

1. Numbers in parentheses indicate ranking of importance.

tors, the proportion of variance accounted for in the multivariate analysis increased to 45%. As the Beta coefficients in Table 3 indicate, agency ambience is the most important predictor. These data suggest that the way the workers view their surroundings can significantly color their feelings about the building as a whole, including the quality of its architecture.

EVALUATION OF AGENCY AMBIENCE

Federal employees were asked a series of questions about the space available to their agencies—that is the offices and other work spaces assigned to the particular organization in which they work. Responses to one question dealing with the appearance of the agency were combined with another evaluative question covering the degree to which employees thought their physical surroundings were pleasant; the combined evaluative index reflected people's feelings about the general ambience of their agencies ($r = .62$; coefficient of reliability = $.75$). A significant number of federal employees were not very happy about the physical surroundings beyond their immediate work stations. Nearly two-thirds (62%) of the building's occupants rated the appearance of the agency negatively, whereas four in ten thought their physical surroundings were unpleasant.

Although our combined measure of agency ambience contains a strong aesthetic component, it embodies other dimensions of the physical environment in which people perform their day-to-day functions. Noise levels, temperature, humidity, and the movements taking place around workers are part and parcel of that setting. To test this proposition, actual conditions within each agency were examined relative to the workers' evaluations of the surrounding ambient conditions. Four conditions were found to be related to people's feelings about the overall ambience of their agencies: noise from the other agencies, noise from their own agency, movement from other people and equipment, and the quality of the building's air.⁷ When people's perceptions of these four ambient conditions were considered simultaneously in predicting the overall agency ambi-

ence, 30% of the variance in responses was explained (see Table 4). Air quality was the most important ambient condition, followed by noise from other agencies. People most bothered by the quality of the air around them and the noise from elsewhere in the building were most likely to rate the ambience of their agency poorly.

People's ratings of their immediate work settings also contributed to their feelings about the ambience of the agency within which they worked. As shown in the last part of Table 4, work station satisfaction added one-third to the explained variance over and above the employee characteristics and their views about specific ambient conditions. It has been shown elsewhere that people's feelings about the immediate workplace reflect, in part, their attitudes toward the aesthetic quality of that work place (Marans and Spreckelmeyer, 1982). But these feelings also reflect other conditions including the amount and type of work space and the workers' assessments of the view from the work station.

CONCLUSION

Our analyses lead us to conclude that linkages exist in the minds of building occupants between the quality of the immediate workplace, including its nonaesthetic attributes, and their assessments of the architectural quality of the building they occupy. Moreover, these linkages are mediated by workers' feelings about the intermediate level of this environment—in this instance, the ambience of the agency within which they work. We have also shown that, at each level, quality has both functional and aesthetic components, and, for this particular office building, these components have been considered by the public as well as by the building occupants.

Our findings suggest that, while most members of the public would agree that the building is worthy of its architectural awards, a significant minority would not concur with the views of the professional judges, nor would the building's occupants, whose ratings of architectural quality were less than favorable. If, in the future, informed judgments about the quality of architecture are to be made, the senti-

TABLE 4
 Evaluation of Agency Ambience, Predicted by Employee Characteristics, their Perceptions of Ambient Condition,
 and Work Station Satisfaction (multiple classification analysis—202 respondents)

Predictors	Beta Coefficient (ranking of importance)			
	Eta Coefficient	Employee Characteristics Only	Employee Characteristics Perceptions Only	Employee Characteristics Perceptions and Work Station Satisfaction
<u>Employee Characteristics</u>				
Agency	.43	.46(1)	.27(2)	.27(2)
Job classification	.24	.15(2)	.15(4)	.07(7)
<u>Perceptions of Ambient Conditions</u>				
Air quality	.39		.38(1)	.24(3)
Noise from other agencies	.37		.24(2)	.16(4)
Movements	.35		.15(3)	.11(5)
Noise from own agencies	.20		.14(4)	.10(6)
<u>Work Station Satisfaction</u>	.56 ¹		.09(6)	.43(1)
Percent of variance explained (adjusted multiple R ²)		16.0	30.4	34.6
				46.6

ments of both user groups need to be considered. At the same time, designers who seek recognition from their colleagues must pay particular attention to the functional components of the workplace and the requirements of the people who occupy them.

NOTES

1. See Marans and Spreckelmeyer (1981) for a complete report on the study. The conceptual model for evaluating work environments is also described in Marans and Spreckelmeyer (1982).

2. A detailed discussion of the procedures used in selecting the two samples is presented in Marans and Spreckelmeyer (1981: ch. 2).

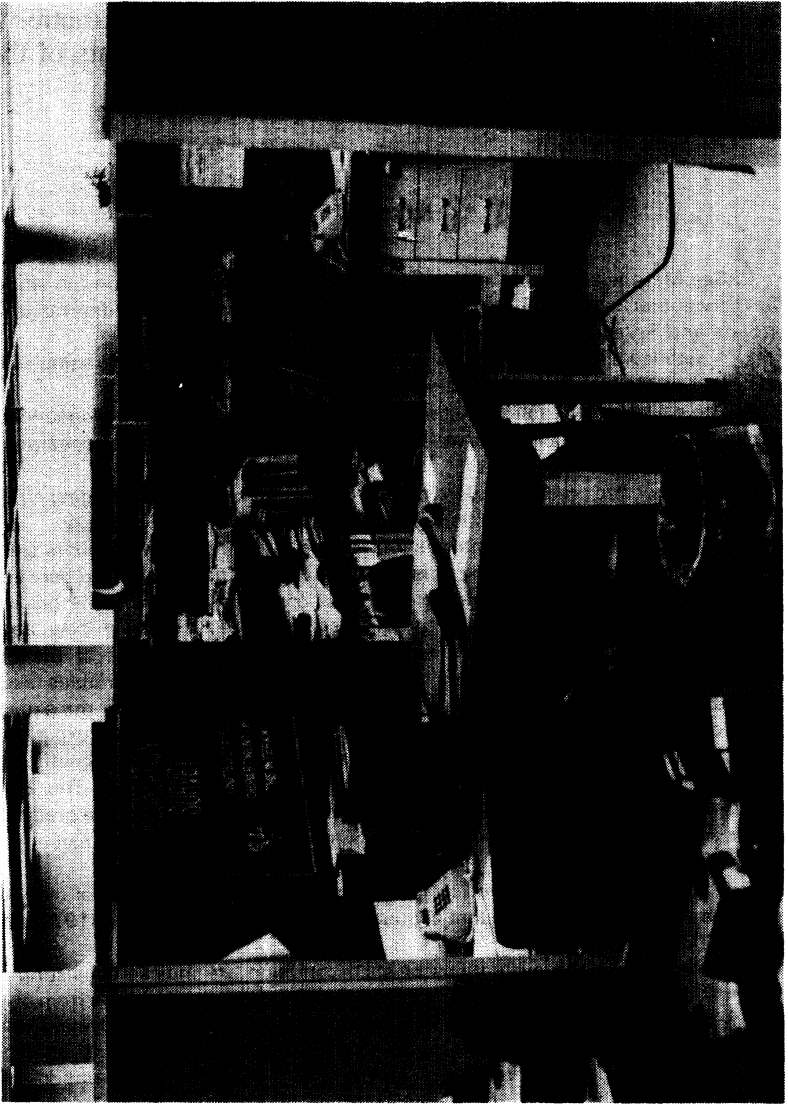
3. The employees' reactions to the building's interiors were more pronounced. In response to a single question, two-thirds of the employees rated the appearance of their agencies as fair or poor.

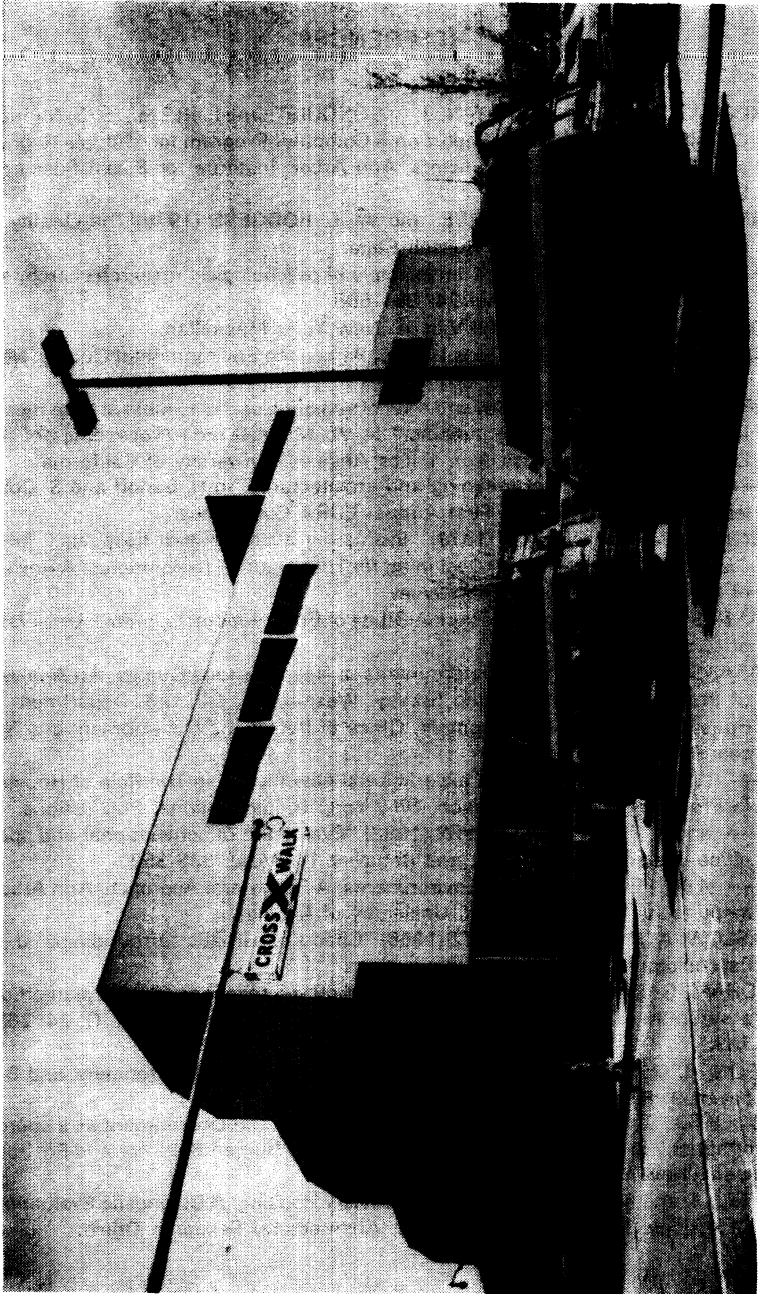
4. The other five predictors were ratings of the signs, the ease of finding one's way, the convenience of the toilets, maintenance, and building security.

5. Multiple Classification Analysis (MCA) was the principal multivariate technique used throughout the study. It is used to examine the relationship between each of a set of independent variables and a dependent variable while holding constant the effects of all other predictors. The statistics show how each independent variable relates to the dependent variable by means of the Eta coefficient. The analysis also shows how strongly the independent variables taken together related to the dependent variable by means of the multiple R, the square of which expresses the relationships as the percentage of variance explained. Finally, the analysis supplies, for each predictor variable, a Beta coefficient indicating its relative importance in the total variance explained. The Beta coefficient squared is an estimate of the independent contribution of the predictor with respect to the multiple R². For a complete discussion of the technique, see Andrews et al. (1973).

6. These findings correspond to findings showing the importance of maintenance as a determinant of residential quality. See, for example, Cooper (1976) and Marans (1979).

7. Measures for the evaluations of each condition are indices consisting of combinations of responses to specific questions. For example, the noise from own agency measure is based on combined responses to three questions dealing with the extent to which workers are bothered by telephones, equipment, and the talking that takes place around them. The mean correlation of the items in this index is .47. For the other indices, the mean correlations are: noise from other agencies ($r = .71$); movement of people and equipment ($r = .43$); air quality ($r = .65$).





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