Perception of Personal Safety in Urban Recreation Sites[1]

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ABSTRACT: *Photographs of 17 urban recreation sites in Chicago and Atlanta were evaluated by college students (n = 68) in Illinois, Georgia, and Michigan, for either perceived security, scenic quality, or both. For most raters, high visibility and developed park features significantly enhanced perceived security. Scenic quality, on the other hand, was enhanced for the majority of evaluators by a high degree of naturalness and vegetation. For both perceived safety and scenic quality, a small minority of raters held preferences quite different from the majority.*

KEYWORDS: *Urban parks, crime, public safety, scenic quality.*

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Urban parks can provide valuable recreation opportunities for the 70 percent of Americans who reside in cities (USDI 1978). Yet many existing sites are underused, in part because they are often seen as undesirable, threatening places where crimes frequently occur (Jacobs 1961). This article describes an effort to identify characteristics that affect the user's perception of personal safety in public recreation sites. The relation between perceived security and visual attractiveness will also be addressed, because both factors may be related to visibility in and utilization of park settings (Nasar 1982).

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The objectives of this research are (1) to determine whether judgments of personal safety in urban recreation sites show sufficient reliability to be usefully studied, (2) to use such judgments to identify park design features affecting perception of security in urban parks, and (3) to identify the relations between visibility, perceived security, and perceived attractiveness of urban parks.

Review of Literature

The relationships between crime, the setting of the crime, and the environment of the criminal's background are longstanding topics in sociological research (e.g., White 1932). Only recently have attempts been made to refine the study of crime ecology by examining more precisely the settings in which criminal acts have occurred (e.g., Ley and Cybriwsky 1974) and users' perceptions of crime risk in different settings (Nasar 1982). The difficulties of classifying the complex and dynamic urban environment, and the suspect sample validity of police reports of crimes have been major obstacles to this research (e.g., O'Donnel and Lydgate 1980). There are currently no widely accepted data on the incidence of crime in urban parks, and no sound basis for comparing the risk of crime in urban parks with risk in other public and private settings. Also, some behavior that is threatening to other users may not be classified as criminal.

The absence of good information, and the extensive press coverage given some crimes occurring in public places like parks, have established possibly undeserved reputations for parks as high risk crime areas. These reputations discourage many potential site visitors from using and enjoying available recreation resources. For instance, an American Parks and Recreation survey (Conners 1976) found that 35 percent of park managers reported park underuse due to the likelihood of criminal activity in the parks. A self-fulfilling prophecy occurs when underuse is severe, for the park may indeed become attractive to undesirable persons seeking privacy for unacceptable activities (Jacobs 1961).

Park managers have attempted to control crime through design changes, such as planting thorny shrubs to discourage pedestrian access to parts of the site, and removing shrubs to improve visibility. Such design changes are instituted to improve security, but may affect the scenic quality of parks as well.

This report presents an experiment designed to assess the influence of park features on users' perceptions of personal safety in urban recreation sites. Individuals' ratings of the degree of security they would experience in different sites were transformed into a scale of perceived security, by applying a psychophysical scaling procedure. Thurstone (1927) showed that such a scale may be used to assign stimuli to positions along perceptual dimensions whose corresponding physical dimensions are unknown. An extension of Thurstone's (1927) procedure, the Scenic Beauty Estimation method, has proven fruitful in research on assessment of the scenic quality of wildland and urban landscapes (Daniel and Boster 1976; Arthur 1977; Anderson 1981; Schroeder and Daniel 1981; Schroeder 1983; Anderson and Schroeder 1983). In the research

described here, Thurstone's scaling procedure is applied to create and evaluate a scale of perceived personal security for scenes of urban recreation sites.

Method

Color slides were taken in outdoor recreation sites in Chicago, Illinois, and Atlanta, Georgia. The photographs were rated for scenic quality and for perceived security by college students in Chicago, Illinois, East Lansing, Michigan, and Athens, Georgia. The photographs were also scored for physical features present in the scenes and for compositional aspects of the scenes. Details of these procedures are presented below.

Park Selection

Ten sites in the Chicago area and seven in Atlanta were selected for this study. The ten Chicago sites included a small downtown city park, several neighborhood parks, a large lakefront park, and several forested paths and picnic areas. All ten sites are located within the city of Chicago, and are surrounded by densely populated neighborhoods. The sites ranged from heavily wooded, largely undeveloped natural sites to open areas devoted to field sports. The sites included a wide variety of facilities, such as picnic tables, paths, field houses, fences, and ponds. In some cases features outside the site, such as streets, buildings, and cars could be seen by users. The Atlanta sites included a similar mix of new and old parks with various levels of forest cover, all within Atlanta city limits.

The sites represent some of the different kinds of urban recreation opportunities common in American cities and include areas differing in visibility, vegetation density, extent of facilities and level of development, size and age, and visual access to residential and other urban areas surrounding the site.

Photosampling Procedure

The photographers sampled large parks by walking along a path through the park or in a straight line across the park if there was no existing path to follow. All photos were taken in full daylight between 9:00 a.m. and 4:00 p.m., in the summer months. At equal intervals along the path, the photographer took two photographs at 180 degree angles, using random numbers to determine the direction of the first photo. Ten such points were defined for each site. For smaller sites, photographs were taken toward the center of the park from points equally spaced around its perimeter. We took additional pictures of special features that we suspected would influence perceptions of the security of a particular setting, such as telephones, gates and fences, lights, stairwells, graffiti, and litter. In most cases the photographs were taken on weekdays when there were relatively few people in the sites.

Security and Scenic Quality Evaluations

Twenty of the slides were selected, taking a few from each of the Chicago sites, to serve as baseline slides. These slides represented the range of conditions existing in the entire set of slides. The baseline slides were shown to all groups of evaluators to allow comparison and combination of data from the different groups. From the remaining slides of Chicago and Atlanta sites, two sets of 80 slides each were selected at random, one for presentation to midwestern groups and the other to the Georgia group. With the addition of the 20 baseline slides, all groups viewed 100 slides. One set of slides was shown to a group of 26 geography students at Northeastern Illinois University in Chicago. The raters were told that the scenes were of urban parks and recreation areas. They were instructed to rate the scenes according to how safe they would feel being in the places pictured. The scale ranged from zero (very unsafe) to nine (very safe).

The same set of slides was also shown to a group of 19 recreation students at Michigan State University. These raters were also told that the scenes represented urban parks and recreation areas. They were instructed to rate the scenic quality of the parks, from zero (very unattractive) to nine (very attractive).

The second set of 100 slides was shown to a group of 23 psychology students at the University of Georgia. These students rated the 100 slides for security, as described above, and they rated the first 50 slides a second time, for scenic quality. After completing the rating tasks, all the raters were asked to list specific features of the scenes that caused them to give either high or low ratings of perceived safety or scenic quality.

Physical Feature Ratings

The investigators, both of whom were experienced in evaluating landscape characteristics for analyses such as the one which follows, rated 29 physical features of the scenes. The physical features were based partly on earlier studies of urban scenic quality and park safety perception, and partly on intuition of the researchers. The features were rated from the photographs of the parks, but in principle most of them could also have been measured directly in the parks themselves. Most of the physical features can be altered at least to some extent by park designers or managers. The rated features are listed in Table 1, along with the interpretation of the scales on which the slides were rated.

The interjudge correlations for the physical features ranged from a low of .62 for maintenance problems to a high of .93 for woody vegetation, cars, and benches. The average interjudge correlation over all the features was .82. This indicated sufficient reliability to average the two judges' ratings for each feature. The judges also categorized each scene on the basis of the type of park depicted: a natural undeveloped site, a sports-oriented facility, a picnic site, a playground, or a general purpose urban park. The judges agreed on 93 percent of the assignments of scenes to categories.

TABLE 1

Physical Features of Park Slides

Feature	Scale
Woody vegetation Grass Water Athletic fields Park structures Nonpark structures Parking lots	Percent of photo image covered by feature, from 0 (0-10%) to 9 (90-100%)
Average view distance Lowest view distance	Distance seen into site, from 0 (lowest) to 8 (farthest)
Tree density	From 0 (low) to 5 (high)
Tree distribution	From 0 (even) to 5 (clumped)
Maintenance problems People Streets Windows Picnic facilities Playground equipment Shrubs Features outside of park Park facilities Cars Benches Fences Lights Stairs Graffiti Litter Paths Topographic variation	Prominence of feature in scene, from 0 (low) to 5 (high)

Results

Perception ratings

The level of agreement among the groups rating perceived security and scenic beauty was evaluated from the interrater correlation matrix. Table 2 shows the average interrater correlation for each rater group, that is, the average correlation between all possible pairs of raters within a group.

Although the correlations between individual raters are somewhat low, the agreement among groups on the average rating of the common baseline

TABLE 2

Average Interrater Correlations for Three Groups of Observers Rating Perceived Security and Scenic Beauty

Raters	Perceived Security	Scenic Beauty
	r (no. of slides viewed in common)	
Chicago	.335 (100)	–
Michigan	–	.513 (100)
Georgia	.316 (100)	.382 (50)

slides is much higher. Intergroup agreement was determined by averaging the ratings for all raters within a group and then correlating across the common slides between groups. The intergroup correlation between the Chicago group and the Georgia group for perceived security ratings (20 slides) is .76 ($p < .0005$) and the correlation between the Michigan group and the Georgia group for scenic beauty ratings (10 slides) is .81 ($p < .005$).

To explore in greater detail the agreement among raters, we factor analyzed the interrater correlation matrices for all four rating tasks following the procedure described by Schroeder (1983). This procedure indicates the extent to which observers' ratings are determined by a common perception of the scenes. If all the observers in a group share similar perceptions of the scenes, then a single factor will account for most of the variance in ratings. If subgroups of the raters hold differing perceptions, then more than one factor will emerge.[2] For each rater group a single factor accounted for a large proportion of the variance in ratings (Table 3), indicating that the raters' perceptions of the scenes are fairly consistent. It appears that consistency is somewhat higher for scenic beauty than for security ratings. Following a quartimax rotation, which attempts to rotate factors so that each variable loads high on one and only one factor, we found that a majority of the raters in each task had their highest loading on the first factor.

In addition to the large first factor, a much smaller second factor emerges for each task. These smaller factors reflect a consistent "minority view" within each group, with three to four people in each group loading highest on the second factor.

To get an idea of how the majority and minority views differed, we calculated factor scores on the first two factors for the perceived safety and for the scenic beauty ratings of each slide. Then we looked at slides having high and low scores on each factor. For the security ratings, the first factor appeared to

[2]Instead of the usual factor analytic procedure (in which, for example, items on a test are factored on the basis of how subjects respond to them), our procedure involved factoring the subjects on the basis of how they responded to the slides. The factor analysis subroutine of SPSS (Nie, Hull, Jenkins, Steinbrenner, and Bent 1975) was used for these analyses.

TABLE 3

Results of Factor Analyses of Interrater Correlation Matrices

Raters (Feature Rated)	Percent of variance accounted for by:		Number of raters loading highest on:	
	Factor 1	Factor 2	Factor 1	Factor 2
Chicago (Security)	39.9	10.2	17	4
Michigan (Scenic Quality)	53.4	10.6	14	4
Georgia (Security)	38.3	15.1	16	3
Georgia (Scenic Quality)	45.0	11.4	19	3

associate high perceived security with proximity to city streets adjoining the parks and with open, mowed areas (Figs. 1a and 1b). Low security was associated with undeveloped densely forested sites, and urban sites where graffiti or other signs of abuse were visible (Figs. 1c and 1d). The second, smaller factor associated high security with densely forested areas, along with well maintained urban parks. Low security on the second factor was produced by urban scenes in which graffiti or vacant-appearing buildings were present.

With respect to the scenic beauty ratings, the major factor associated high scenic quality ratings with undeveloped, dense forests, well maintained city parks with abundant trees, and water (Figs. 1a and 1c). Low scenic quality ratings were given to athletic fields and urban scenes with many buildings, especially if graffiti was present (Figs. 1b and 1d). The smaller second factor favored well maintained urban parks and associated low scenic quality with unmaintained natural areas, expecially if litter was present.

Thus, the majority of observers seem to perceive greater safety in developed urban parks and feel least safe in densely forested areas, while a minority of observers hold roughly the opposite view, feeling safest in the densely wooded areas. For scenic beauty the relations are reversed: the majority favors natural-appearing forested areas and a minority gives high ratings to urban parks and low ratings to undeveloped forests. In all cases the presence of litter, graffiti, and other visible signs of abuse served to further decrease ratings of disliked sites.

Perceived Security and Scenic Quality Indexes

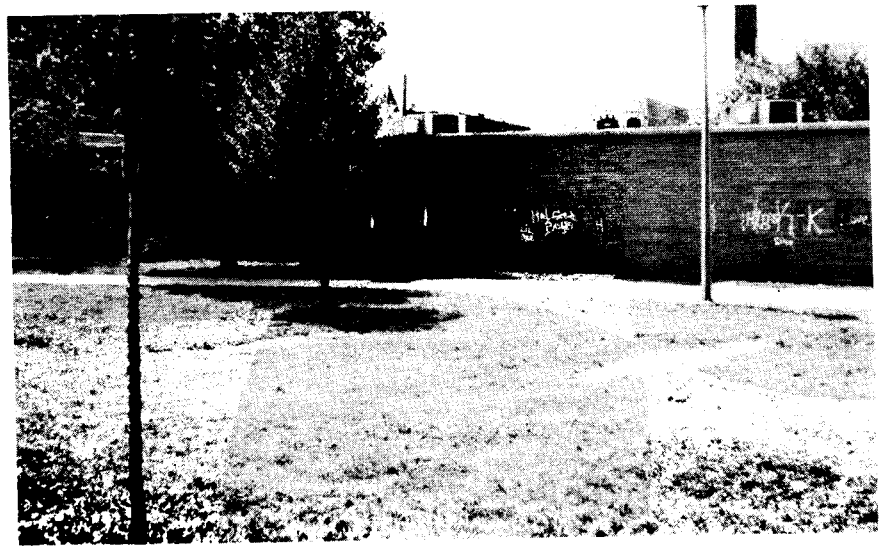
Although the analysis offered evidence of a minority viewpoint for both security and scenic quality perceptions, too few people held the minority view (only three or four per group) to support a more detailed analysis. For this reason, the ratings for all individuals were combined into a single aggregate index of perceived security or scenic beauty using Daniel and Boster's (1976) SBE computer program. The index values calculated from security ratings will be referred to PSE's (perceived security estimates), and the values calculated from scenic beauty ratings will be called SBE's (scenic beauty estimates).

FIGURE 1a
Scene with high security (PSE = 52) and high scenic quality (SBE = 105).

FIGURE 1b
Scene with high security (PSE = 60) and low scenic quality (SBE = −75).

FIGURE 1c
Scene with low security (PSE = −75) and high scenic quality (SBE = 65).

FIGURE 1d
Scene with low security (PSE = −26) and low scenic quality (SBE = −117).



Correlations of SBE's and PSE's for the baseline slides between the Georgia group and the Illinois and Michigan groups were high enough (i.e., .76 for security and .81 for senic beauty) to justify combining the ratings of all slides by the three groups into two common scales, one of perceived security and one of scenic beauty. The baseline slides provided a common origin for placing the different groups' PSE's and SBE's on the same scale of measurement. In this way a single data set was created which included PSE's for all 180 slides rated for security and SBE's for all 140 slides rated for scenic quality. This data set is the basis for all further analyses. While the PSE and SBE scale values reflect the perceptions of the majority of the raters, the reader should remember that a few of the raters in each group held divergent perceptions.

The correlation between PSE's and SBE's over the 140 slides that were rated for both security and scenic quality is low (0.13) and nonsignificant. This low correlation probably indicates that observers used the visual features of the photographed sites differently for evaluating safety and scenic beauty. The following analyses explore in more detail the relations of visual features to perceived security and scenic quality.

Simple Correlations between Visual Features and Perceptions

The simple correlation of each physical feature rating with PSE's and SBE's (Table 4) reflects how that feature is related to perceived security and scenic quality for the set of slides. The visible amounts of woody vegetation and shrubs are negatively associated with perceived security. Woody vegetation has a strong positive relation to scenic quality, although the negative correlation of tree density with SBE may mean that trees too closely spaced are unattractive. The amount of grass visible has a strong positive association to perceived security. It appears that open areas with few trees are perceived as the safest, but that the lack of trees may be an esthetic liability. This interpretation is confirmed by the positive correlation of view distance with PSE. The farther one can see in the scene, the higher the rated security. Scenic beauty has a small but significant negative correlation with view distance. In general, manmade features such as cars, fences, lights, and nearby buildings are negatively correlated with scenic beauty. This is consistent with other studies showing preferences for natural over urban environments (Kaplan, Kaplan, and Wendt 1972; Brush and Palmer 1979; Anderson and Schroeder 1983). Some manmade features, however, seem to enhance perceived safety (e.g., facilities, cars, and features outside of the park). Graffiti visible in the slides is negatively associated with both security and scenic quality perceptions.

The pattern of simple correlations is consistent with the factor scores for slides discussed above. The majority of the raters associated high security with developed parks, long view distances, and access to nearby streets and buildings. High scenic quality, on the other hand, depends on the presence of natural features such as trees and water and is generally lowered by manmade features and structures.

TABLE 4

Correlations of Visual Feature Ratings with Perceived Security and Scenic Beauty

Feature	Correlation with Perceived Security	Correlation with Scenic Quality
Woody vegetation	−.29**	.54**
Grass	.52**	−.09
Water	.10	.27**
Athletic field	−.01	−.20**
Park structures	.06	−.24**
Nonpark structures	.13*	−.47**
Parking lots	.02	−.20**
Average view distance	.54**	−.23*
Lowest view distance	.37**	−.26**
Tree density	−.14*	−.28**
Tree distribution	−.03	−.06
Maintenance problems	−.08	−.25**
People	.24**	.04
Streets	.14*	−.18*
Windows	.06	−.53**
Picnic facilities	.02	.09
Playground equipment	.02	−.13
Shrubs	−.45**	.13
Features outside of park	.19**	−.42**
Park facilities	.20**	−.19**
Cars	.25**	−.27**
Benches	.22**	.15*
Fences	.08	−.29**
Lights	.06	−.22**
Stairs	.08	.06
Graffiti	−.25**	−.32**
Litter	−.18**	−.07
Paths	−.10	.12
Topographic variation	.11	.01

*$p < .05$
**$p < .01$

Modelling Perceptions from Visual Features

Clearly, perceptions of safety and scenic quality are related to many of the visual features we measured, but the relationship is strikingly different for these two perceived attributes. Many of the simple correlations are significant and several are moderately high, but the correlations alone do not indicate the overall extent to which perceptual judgment can be predicted by a combination of visual features, nor the independent contribution of each feature, adjusting for the correlations among visual features. To explore this potential

predictive relationship, regression analyses were performed using visual features as predictors and perceived security and scenic quality of the slides as the dependent variables. We used stepwise analysis to select variables, including in each step the feature adding the most to the variance accounted for by the model.[3]

The regression of PSE on physical features (Table 5) accounts for 55 percent of the variance in perceived security, using nine features. Average view distance is the strongest predictor, accounting for 30 percent of the variance on the first step. The other features are consistent with the previous analyses. Shrubs, graffiti, and litter have negative coefficients, and manmade features have positive coefficients. Grass and water also are good predictors of high perceived safety, perhaps because they are usually associated with more open park areas.

TABLE 5

Regression of Perceived Security (PSE) on Visual Features

Step	Feature	R^2 (cumulative)	Standardized Regression Coefficient
1	Average view distance into scene	.296	.358**
2	Prominence of graffiti	.359	-.243**
3	Amount of photo image in grass	.419	.376**
4	Prominence of benches	.461	.112
5	Prominence of shrubs	.490	-.115
6	Amount of photo image in water	.510	.139*
7	Prominence of streets outside of Park	.527	.021
8	Prominence of litter	.540	-.131*
9	Number of people in scene	.554	.042

*$p<.05$
**$p<.01$
Note: N = 180; for final model adjusted R^2 = .533.

The regression of SBE on visual features (Table 6) accounts for 65 percent of the variance in scenic quality judgments using 11 variables. Woody vegetation and water are the main positive influences on scenic quality, while manmade features, litter, graffiti, and maintenance problems detract from scenic quality.

The importance of view distance and vegetation in the analyses reported above suggests that there is a marked difference in the way people perceive densely forested sites as opposed to developed parks. This is reflected in the average PSE and SBE for each type of site (Table 7). One-way analysis of variance indicated that there are significant differences between site types for both perceived safety and scenic quality. Undeveloped sites received extremely low perceived security judgments (these sites were for the most part heavily forested) and also the highest scenic ratings. Athletic fields were perceived as the safest but least scenic type of site. Picnic areas are moderately high in both perceived safety and security, presumably because they are not as wild as undeveloped forests and not as highly developed as urban parks and playfields.

[3]The regressions were calculated using SPSS (Nie et al. 1975) with the reported model determined using only variables contributing at least .01 to the cumulative R^2.

TABLE 6

Regression of Scenic Quality (SBE) on Visual Features

Step	Feature	R^2 (cumulative)	Standardized Regression Coefficient
1	Amount of photo image in woody vegetation	.296	.310**
2	Prominence of windows off-site	.422	-.154
3	Amount of photo image in parking lot	.467	-.239**
4	Prominence of graffiti	.509	-.164*
5	Amount of photo image in water	.547	.156**
6	Prominence of litter in scene	.570	-.160**
7	Prominence of maintenance problems	.593	-.168**
8	Prominence of streets	.611	-.094
9	Prominence of shrubs	.629	-.116
10	Prominence of off-site features	.641	-.242
11	Prominence of fences	.651	-.127

*$p<.05$
**$p<.01$
Note: N = 140; for final model adjusted R^2 = .624.

TABLE 7

Average Perceived Security Estimate (PSE) and Scenic Beauty Estimate (SBE) by Site Type

Type of recreation site	PSE	(n)	SBE	(n)
Undeveloped, natural site	-89.4	(13)[a]	28.6	(10)[b]
Athletic field	19.0	(21)	-42.9	(14)[c]
Playground	3.5	(8)	-42.5	(6)
Picnic area	12.5	(13)	16.6	(10)
Developed; no special use	9.9	(125)	-1.8	(100)

Note: For PSE: $F(174,5) = 18.87$, $p<.01$
For SBE: $F(135,4) = 4.47$, $p<.01$
[a]Significantly ($p<.05$) different from other four conditions by Tukey Honestly Significant Differences (HSD) test (Nie et al. 1975 p. 428).
[b]Significantly different from athletic field and playground scenes by Tukey HSD.
[c]Significantly different from picnic area by Tukey HSD.

Discussion

Several findings emerge with respect to the slides and observers used in this study. Judgments of perceived security and scenic quality are generally consistent across and within the observer groups from Illinois, Michigan, and Georgia. The existence of a small minority of observers holding divergent views on both scenic quality and perceived security is intriguing, but must be investigated with larger samples. For now, it is appropriate to focus on the average perceptions held by all the raters.

In general, high security is associated with open areas with long view distances and with signs of development and nearby populated areas. On the other hand, high scenic quality depends on the presence of natural vegetation, in either forests or park-like settings, and is lowered by manmade features. Overall the correlation between security and scenic quality is low, meaning that some settings are high on both dimensions, others are low on both, and still others are high on one and low on the other.

Specific, measurable features of the scenes influence judgments of security and scenic quality, but in different ways. Some features seem to enhance perceived safety while detracting from scenic quality (e.g., nearby buildings). Others enhance scenic quality while detracting from perceived safety (e.g., forest vegetation). Features reflecting maintenance problems and abuse (graffiti, litter) tend to lower judgments of both security and aesthetics. Although the effects vary for the two dimensions, the regression analyses show that much of the variance in each dimension can be accounted for with a reasonable number of features.

These results are consistent with earlier studies of the aesthetics of natural and urban landscapes and show that the research methods used to study landscape aesthetics may be successfully applied to additional dimensions as well. Implications of these results may be discussed with respect to both management and research.

Management Implications

There is considerable consensus among groups of observers on what constitutes a safe or scenic recreation site. This means that managers may be able to please a large part of their constituency with appropriate landscape designs. Nevertheless, there are likely to be individuals who do not share the majority's preferences. Recreation site design should include enough diversity to satisfy those users with divergent preferences.

The focus of landscape management has traditionally been on aesthetics, but other perceived attributes must also be considered. A scenic site may remain unused if it is perceived as unsafe or threatening.

Perceptions of both safety and aesthetics depend on specific manageable features of the recreation sites, including vegetation and manmade features. Our results seem to support the common belief that removing vegetation to increase visibility will produce an environment that feels safer, although such changes in vegetation may also decrease the scenic quality of the site. If one

believes, as did Frederick Law Olmstead (quoted in Nash 1973, p. 155), that natural parks and preserves are necessary as a means to resist "vital exhaustion," "nervous irritation," and "constitutional depression," then excessive zeal to enhance feelings of personal safety might lead to the elimination of the primary benefits of urban parks.

Although perceived security and attractiveness may sometimes be difficult to achieve simultaneously, this is not necessarily always the case. In our study, picnic areas near forested settings were rated reasonably high on both dimensions. They seem to represent a combination of the natural vegetation which is essential for scenic beauty with the developed appearance that enhances feelings of safety.

A compromise between perceived safety and scenic quality might also be achieved by reducing shrubs and raising tree canopies to improve visibility at ground level, while preserving a feeling of naturalness. The correlations in Table 1 suggest that this strategy would work by simultaneously increasing the view distance required for perceived safety while maintaining the woody vegetation that enhances scenic quality. Figure 1a offers an example of this kind of environment.

Finally, managers should realize that perceptions of safety and aesthetics are influenced by nearby features that are not part of the recreation site itself. Although managers may have little or no control over these nearby features (streets, buildings, etc.), they should take them into account when designing the recreation site.

Research Implications

The major focus of landscape perception research has been the aesthetic quality of the landscape. Our results show that the same research methods can be applied to other perceived attributes of recreational landscapes, and that important new understandings of users' perceptions can thereby be acquired. Judgments of perceived safety are almost as reliable as those of perceived scenic quality. Our results also offer support for the validity of the perceived safety scale. The correlation of perceived safety with scenic quality is low, indicating that the perceived safety ratings are tapping a dimension of landscape perception different from visual esthetics. At the same time, the perceived safety scale shows clear correlations to physical features of the park environment, and these correlations are consistent with our intuition about how the physical environment might influence feelings of safety. A single study cannot conclusively demonstrate the validity of a subjective scale, but these results certainly demonstrate the potential fruitfulness of further research on perceived safety.

By investigating security and other dimensions of landscape perception, researchers can move toward a more complete understanding of how site features affect the users' experience of the site. This in turn should allow more accurate predictions of users' choices of which sites to visit and how to use them..

The high degree of consensus among raters should not lead us to ignore the fact that some individuals within groups may hold perceptions that deviate

substantially from the group average. High intergroup correlations do not imply that there is absolute unanimity among the raters within each group. The within-group differences observed in this study are consistent with those reported by Schroeder (1983) and seem to indicate that individuals vary in their degree of preference for natural versus developed recreation sites.

Future Research

This study did not address several factors that may also influence perceived safety, such as what activity the person is engaged in, whether the person is alone or in a group, day versus night use, and the reputation of the area. These additional factors could be the basis for future studies of perceived safety.

Further limitations of the present study involve the limited information available to the raters in the photographs. Although the raters based their judgments on features visible in the photographs, a person actually standing in the site would be able to see more, would have additional information (noises, smells, etc.), and would know more about the general setting of the site. Further, the present study used a limited observer population consisting of university students. This population represents one type of potential park user, but future studies should try to obtain more diverse samples of observers. Age, in particular, is probably an important user characteristic for park planning purposes, but was quite restricted in our sample.

Finally, it should be noted that our study addressed perceptions of safety rather than the actual incidence of crime in the parks we studied. Obviously, the park managers must be concerned with the actual safety of the park environment. Our study has shown, however, that regardless of the actual risk of crime in a recreation site, users' feelings of safety are affected by specific landscape features. These feelings of safety almost certainly influence the potential users' decision of whether to visit a particular site. Therefore, research on the perceived safety of recreation environments can help managers provide enjoyable recreation sites for urbanites to use.

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