11-2002

Preference and Perceived Danger in Field/Forest Settings

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PREFERENCE AND PERCEIVED DANGER IN FIELD/FOREST SETTINGS

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ABSTRACT: The authors investigated preference, perceived danger, and fear for a sample of 70 field/forest settings. Predictor variables included perception-based variables (visual access, penetration, movement ease), information-based variables (mystery, concealment, refuge), and variables thought to intervene between concealment and danger (entrapment, rearview concern). All variables were rated by independent groups. Danger and fear were strongly positively correlated for these settings, but preference and danger had a more modest negative correlation. Factor analysis of the strongly intercorrelated predictor variables yielded two factors, interpreted as Visibility and Locomotor Access. Both factors were positive predictors of preference and negative predictors of danger. Further analyses suggested feelings of entrapment could mediate the positive relation between concealment and danger and that after controlling for other indicators of visibility, mystery has a positive relation to preference. In general, the role of visual and locomotor access in accounting for preference or danger reactions is highlighted by these findings.

As the title implies, the purpose of the study described here was to investigate the prediction of preference and perceived danger in a sample consisting only of field/forest settings. Such an investigation should provide useful insight into the factors likely to evoke positive and negative reactions to such settings. To our knowledge, this combination of target variables and settings has not been investigated previously. The closest approximations have been

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ENVIRONMENT AND BEHAVIOR, Vol. 34 No. 6, November 2002 819-835
DOI: 10.1177/001391602237250

Schroeder and Anderson's (1984) study of scenic quality and perceived security in urban recreation sites and Shaffer and Anderson's (1983) study of attractiveness and perceived security in urban parking lots. There have been many studies of preference for field/forest settings (e.g., Herzog, 1984; Kaplan, Kaplan, & Brown, 1989; Ruddell, Gramann, Rudis, & Westphal, 1989; Woodcock, 1982). Most of the research on danger has involved urban settings (e.g., Fisher & Nasar, 1992; Nasar & Fisher, 1993; Nasar, Fisher, & Grannis, 1993; Nasar & Jones, 1997). We know of only three studies that have explicitly included both preference and danger. Herzog and Smith (1988) used small samples of 10 settings each from four different categories: canyons, field/forest, urban nature, and urban alleys. Herzog and Miller (1998) used a mixed sample of both urban alleys and field/forest settings containing pathways. Herzog and Flynn-Smith (2001) dealt exclusively with urban alleys. Because the most recent thinking from this line of studies is that results are likely to be context dependent, there was good reason to believe that a study of preference and danger in an exclusively field/forest context would yield new insights.

TARGET VARIABLES

The first and most obvious question to ask in this study concerns the relationship of the two target variables. In some studies of preference (e.g., Nasar, 1983; Woodcock, 1982), there has been a tendency to assume that danger or fear reactions are roughly the inverse of preference. Studies including both preference and danger (Herzog & Flynn-Smith, 2001; Herzog & Miller, 1998; Herzog & Smith, 1988) generally find a significant negative correlation between the two variables but not so great in magnitude as to suggest complete substitutability. Moreover, the pattern of relationships with predictors may differ from a simple inverse pattern in interesting ways. For example, the Kaplan informational predictor mystery (Kaplan & Kaplan, 1989) appears to be positively related to both preference and danger in some contexts (Herzog & Miller, 1998). Finally, in their subsample of 18 field/forest settings, Herzog and Miller (1998) found a correlation between preference and danger of only –.26, suggesting plenty of leeway for differentiating between the two constructs in that type of setting.

A related question involves another often assumed equivalence, this time between danger and fear. The two terms are often used interchangeably, but their connotations differ. Danger carries a stronger implication of cognitive appraisal, fear of emotional reaction. In many contexts, such as urban settings where crime is an issue, it is a reasonable assumption that the emotional reaction follows fairly directly from the cognitive appraisal. However, Herzog

and Miller (1998), invoking Hebb (1972), cautioned that the issue is not straightforward. In some situations, danger can be attractive, and the tolerance for danger varies greatly among people. An empirical approach would be to measure both perceived danger and fear in the same study, but if this has been tried previously, we are not aware of it. In the present study, we measured both variables.

PREDICTORS

The most interesting and useful insights about preference and danger are likely to be found in their relations with predictor variables. We begin at what has been called the informational level (e.g., Kaplan et al., 1989) and then look outward at more perceptual variables and inward at intervening variables. There can be no doubt that of the preference predictors in the Kaplan informational model, the strongest and most consistent predictor for natural settings has been mystery, that is, the promise of further information if one moves more deeply into a setting (for earlier research, see Kaplan & Kaplan, 1989; references to more recent research can be found in Kaplan, Kaplan, & Ryan, 1998). Given the recent implication of mystery as a positive predictor of both preference and danger (Herzog & Flynn-Smith, 2001; Herzog & Miller, 1998), it seemed essential to include it in the present study.

Still at the informational level, we thought it desirable to examine one of the two main predictors of Appleton's (1975, 1984) prospect-refuge theory. Prospect refers to vantage points from which one can see unhindered into the distance, and refuge refers to potential hiding places in a setting. Refuge has been strongly implicated by Nasar and his colleagues (e.g., Fisher & Nasar, 1992; Nasar et al., 1993; Nasar & Fisher, 1993; Nasar & Jones, 1997) as a positive predictor of danger/fear reactions in urban settings. Whether it would work the same way in more natural settings is uncertain. Where prospect and refuge have been tried as predictors of preference in natural or seminatural settings, they have not been very effective (e.g., Herzog, 1989; Woodcock, 1982). Nonetheless, one exception to this trend inspired us to take a careful look at refuge.

Woodcock (1982) distinguished between primary and secondary prospect and refuge. Primary refuge refers to the view from within a hiding place, and secondary refuge refers to the view of a hiding place from a vantage point outside it. A similar distinction applies to prospect. To his surprise, Woodcock found that primary refuge was a negative predictor of preference and that this was especially true for the biome of hardwood forests. We felt that it was high time for a follow-up to Woodcock's intriguing finding in an exclusively field/forest setting. Thus, we included both primary refuge (which we called

concealment) and secondary refuge (which we called refuge) as predictors in our study.

Woodcock's attempt to explain his counterintuitive negative correlation between primary refuge and preference motivated us to look for further predictors, both outward toward more perceptual variables and inward toward deeper intervening variables. Essentially, Woodcock (1982) emphasized the obstructions that typically accompany a view from within a hiding place. In his words, "such obstructions to vision and easy movement may make a forest a more forbidding place" (p. 242). And later, "the close foliage hiding the observer may also serve to hide any hazard that may be nearby" (p. 243). It was the negative reactions to the obstructive stimulus configuration that struck Woodcock as noteworthy. Thus, even though he was trying to account for preference, his explanation would seem to apply even better to danger/fear reactions. When Woodcock did his study, researchers had not yet thought to measure such reactions directly. It is worth noting that Lazarus and Symonds (1992) have documented negative reactions from birds toward obstructive cover in their neighborhood.

Inspired by Woodcock's line of thought, we first looked outward toward the obstructive stimulus configuration. This led us to include three predictors: visual access, penetration, and movement ease. The first two refer to visibility and the last to locomotor access. The distinction between visual access and penetration has to do with just what one can see. For visual access, the emphasis was on being able to see all parts of a setting without having one's view blocked. For penetration, the emphasis was on being able to see deeply or a long way into a setting before having one's view obscured. It seemed likely that the two visual predictors would behave very similarly, but we included both just to see if the difference in emphasis mattered. Penetration seems similar to the visual penetration variable of Ruddell et al. (1989). Meanwhile, movement ease dealt with how easy it would be to move within or through a setting. Ground cover obstruction is clearly the major issue here. It seemed quite possible that the ability to move might be just as relevant in a dangerous situation as the ability to see clearly. Measuring movement ease allowed us to find out.

Looking inward from concealment toward a deeper intervening level of explanation, it seemed to us that Woodcock's suggestion that obstructive cover might serve to hide potential hazards might lead to either or both of two reactions to a view from concealment. One is the feeling of entrapment, of being unable to escape if the need arose. The studies of Nasar and colleagues on fear of crime (Fisher & Nasar, 1992; Nasar et al., 1993; Nasar & Fisher, 1993; Nasar & Jones, 1997) have used a predictor variable variously called either "entrapment" or "escape" and shown modest relations with such fear

(they have also used a predictor called "concealment" but with a definition very different from ours). The other potential reaction to a view from concealment is concern or worry about what might be behind one. Woodcock (1982) noted that in a real concealment setting, one can turn around and check. Perhaps, but the rearward view is likely to be as obstructed, or even more obstructed, than the frontward view from within a hiding place, thereby limiting the usefulness of such a check. Moreover, one knows that in a field/forest setting, the walls of one's hiding place are far from impregnable. Thus, a hiding place could plausibly inspire concern about what is lurking unseen nearby. On this line of thought, we included both entrapment and rearview concern in our set of predictors. We suspected that either or both of them might mediate between concealment (primary refuge) and danger/fear reactions.

In summary, we measured three target variables for a large sample of field/forest settings with the intent of exploring the relations between them: preference, danger, and fear. There were eight predictor variables, grouped at three levels of "depth" within the processing system. At the most peripheral level are the predictors that are most directly tied to the stimulus configuration: visual access, penetration, and movement ease. At a slightly deeper informational level are mystery, concealment (primary refuge), and refuge (secondary refuge). At an even deeper intervening level between concealment and the target variables are the two potential mediators, entrapment and rearview concern. Figure 1 presents a highly idealized version of what we expected to find based on existing theory and research. The diagram is helpful if not taken too seriously, and to aid that frame of mind, we have included a few question marks where we felt uncertain. It is also quite possible that relations might show up that are not predicted. For example, we would not have been greatly surprised if a direct connection between movement ease and danger occurred. Thus, the figure is meant to be inspirational, not something well enough developed to qualify for causal modeling. Therefore, our analytic approach was to examine the correlations among the variables. We then proceeded to regression analysis with preference and danger as dependent variables. As will be seen, our freedom to include predictors in these analyses was limited by the strong correlations among the predictor variables. We addressed this problem by reducing the number of predictors based on the output of a factor analysis of the correlations among the predictors. Where we felt strongly about possible mediation, as in the path from concealment to danger via entrapment and rearview concern, we did a separate analysis involving just those variables.

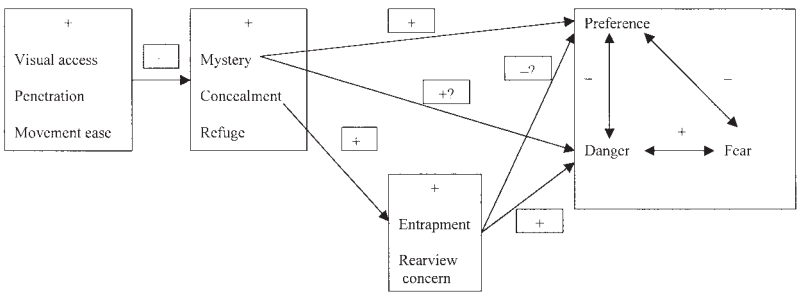

Figure 1: Idealized Version of Expected Relations Between Variables
NOTE: A single plus sign inside a box means that all variables inside that box are positively correlated with each other.

METHOD

PARTICIPANTS

The sample consisted of 438 undergraduate students (132 men, 306 women) at a university in the Midwestern United States. Participation fulfilled a course requirement for introductory psychology. Twenty-eight sessions consisting of from 7 to 23 participants were run.

STIMULI

The settings consisted of 70 color slides of field/forest environments. An attempt was made to sample broadly with respect to the predictor variables. Thus, openness, smoothness of ground texture, and cues to mystery (shadow, foliage, pathway curvature) varied widely. The great majority of these settings represent field and forest environments in the Midwestern United States. Some sample scenes representing different levels of openness and ground texture are presented in Figures 2 to 4. No settings contained people. All were photographed in summer or early fall. All slides were oriented horizontally.

PROCEDURE

All participants in each session rated each of the 70 settings on only 1 of the 11 measured variables. All ratings used a 5-point scale ranging from A

Figure 2: Settings High in Openness

Figure 3: Settings Low in Openness

Figure 4: Settings With Smooth Ground Texture

(*very high* [highest possible rating]) to E (*not at all* [lowest possible rating]). The letters A through E were later converted to the numbers 5 through 1, respectively, for analysis. There were 3 target variables. Preference was defined as, "How much do you like the setting? This is your own personal degree of liking for the setting, and you don't have to worry about whether you're right or wrong or whether you agree with anybody else." Danger was, "How dangerous is this setting? How likely is it that you could be harmed in this setting?" Fear was, "How much does this setting make you feel anxious or fearful? How much does it seem like a frightening or scary place?" The 8 predictor variables fall into three subsets. At the information level, mystery was defined as, "How much does the setting promise more to be seen if you could walk deeper into it? Does the setting seem to invite you to enter more deeply into it and thereby learn more?" Concealment (primary refuge) was, "How much does it seem that you are hidden or concealed from view in this setting?" Refuge (secondary refuge) was, "How easy would it be for you to find a hiding place in this setting, a place where you can see what is going on without being seen?" At the perceptual level, visual access was defined as, "How easy is it to see into this setting? How well can you see all parts of this setting without having your view blocked or interfered with?" Penetration was, "How easy is it to see deeply into this setting? How well can you see a

long way into this setting before having your view blocked or obscured?" Movement ease was, "How easy would it be to move within or through this setting?" Finally, there were two predictors we thought of as potential mediators of the relation between concealment and danger. Entrapment was defined as, "How much does it seem like you could be trapped and be unable to escape in this setting?" Rearview concern was, "How much does it seem like you should be worried about what might be behind you in this setting?"

Sessions proceeded as follows. After explaining the task and obtaining informed consent, four practice slides were presented to help participants get used to the task and their instructions for responding. Then participants rated 74 slides, presented in two sets of 37 slides each, with a 2-minute rest between sets. The first and last slide within each set were fillers, intended to absorb any beginning- or end-of-set effects. The remaining 70 slides yielded the data for analysis. These slides were presented in one of two orders. The first order was used for the first 14 sessions and the second order for the last 14 sessions. Within each block of sessions using a given slide order, there were 4 sessions devoted to preference and 1 session devoted to each of the other 10 rated variables. The extra sessions for preference afforded us the option of factor analyzing the preference ratings (which we did, but the results are not presented in this article). Aside from the constraints on the ordering of sessions just noted, the ordering of sessions was haphazard. One of the slide presentation orders was generated randomly, and the second presentation order was derived by interchanging the halves of the first order. Viewing time was 15 seconds per slide in all sessions. Final sample sizes were 140 for preference; 33 for refuge; 31 for penetration and entrapment; 30 for movement ease; 29 for danger, mystery, concealment, visual access, and rearview concern; and 28 for fear.

RESULTS

Unless noted otherwise, all analyses were based on setting as the units of analysis and setting scores as raw scores. A setting score is the mean score for each setting based on all participants who completed one of the rating tasks. Thus, for each rated variable, every setting had a setting score. Internal consistency reliability coefficients (Cronbach's alpha), based on settings as cases and participants as items, ranged from .91 for fear to .98 for four of the rated variables.

Table 1 contains correlations among the 11 rated variables of this study based on all 70 settings. Several points can be made. First, preference and

TABLE 1
Correlations Among Rated Variables (*N* = 70 Settings)

Variable	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*
1. Preference	—	−.56**	−.54**	−.17	−.41**	−.32*	.45**	.48**	.52**	−.49**	−.42**
2. Danger		—	.78**	.74**	.76**	.66**	−.77**	−.77**	−.91**	.89**	.76**
3. Fear			—	.74**	.83**	.49**	−.81**	−.82**	−.64**	.87**	.85**
4. Mystery				—	.82**	.60**	−.85**	−.83**	−.63**	.79**	.78**
5. Concealment					—	.51**	−.95**	−.81**	−.62**	.83**	.95**
6. Refuge						—	−.51**	−.58**	−.80**	.63**	.41**
7. Visual access							—	.89**	.61**	−.82**	−.90**
8. Penetration								—	.68**	−.84**	−.74**
9. Movement ease									—	−.80**	−.57**
10. Entrapment										—	.80**
11. Rearview concern											—

*$p < .01$. **$p < .001$.

danger are not simply inverse variables. Even with a generous allowance for measurement error, the two variables had only 31% of their variance in common. All of the predictors had opposite-sign correlations with these two target variables, but the correlations were uniformly greater for danger than for preference. In a similar vein, danger and fear, although strongly positively correlated, had only 61% of their variance in common. Nonetheless, the pattern of correlations with the predictors for these two target variables was very similar. Thus, in subsequent analyses, we concentrated on preference and danger as target variables. Second, the matrix of correlations among the predictor variables is loaded with large correlations (17 of 28 exceed .70). This suggests possible problems with multicollinearity in subsequent regression analyses. Third, concealment and refuge have a relatively modest correlation with each other, suggesting that the two senses of refuge, primary and secondary, are relatively independent of each other. Fourth, among the perceptual predictors, visual access and penetration are highly correlated, but movement ease has more modest correlations with both of them. Thus, visual and locomotor affordances are likely tapping into relatively distinct sets of issues. Fifth, the mediating variables, entrapment and rearview concern, are fairly redundant. Sixth, of the 24 firm directional predictions in Figure 1 (10 within the boxes, 14 between the boxes), we were correct on 23 of them. Only the correlation between mystery and preference failed to confirm our prior prediction. Because that prediction has strong support from previous research, we present some further results relevant to it below.

Our original intent was to run regression analyses with preference and danger as dependent variables and the eight rated predictors as independent variables. The strong intercorrelations among the rated predictors gave us pause. Collinearity diagnostics for such a regression analysis indicated that only two of the rated predictors met the multicollinearity criteria proposed by Tabachnick and Fidell (1996): "Criteria for multicollinearity are a conditioning index > 30 and at least two variance proportions > .50 for a given root number" (p. 87). Those two were concealment and rearview concern. Nonetheless, we decided to be cautious and performed a factor analysis on the correlations among the rated predictors (principal axis factoring, varimax rotation).[1] Two factors were extracted that, after rotation, accounted for 54% and 31% of the variance in the data, respectively. Communalities ranged from .72 to .96. The factor loadings are presented in Table 2. The second factor is dominated by movement ease and refuge, and the first factor is dominated by the other six predictors. Thus, we interpret the first factor as primarily concerned with visibility (visual access and penetration as positive indicators, the other four high loaders as negative indicators) and the second factor as primarily concerned with locomotor access (movement ease a

TABLE 2
Factor Loadings From the Factor Analysis of the Eight Predictor Variables

	Factor	
Variable	*1*	*2*
Mystery	–.74	–.48
Concealment	–.92	–.33
Refuge	–.25	–.81
Visual access	.92	.34
Penetration	.74	.50
Movement ease	.36	.86
Entrapment	–.70	–.60
Rearview concern	–.90	–.25

NOTE: Factors 1 and 2 were interpreted as Visibility and Locomotor Access, respectively.

TABLE 3
Regression of Preference and Danger on Visibility and Locomotor Access (*N* = 70 Settings)

	Preference			*Danger*		
Predictor	B	*Partial* r	p	B	*Partial* r	p
Visibility	.17	.34	.004	–.30	–.83	< .001
Locomotor Access	.20	.37	.002	–.39	–.88	< .001

NOTE: *B* is the raw score regression weight. For preference, adjusted R^2 =.21, $p < .001$; for danger, adjusted R^2 = .85, $p < .001$.

positive indicator, refuge a negative indicator). We obtained factor scores using the regression approach for each of the two factors. The correlation between the factor scores for visibility and locomotor access was only .06, clearly indicating no multicollinearity problem with these two variables in a regression analysis. Both variables had moderate positive correlations with preference (.34 and .36 for visibility and locomotor access, respectively, $p <$ .01 in both cases) and substantial negative correlations with danger (–.60 and –.74 for visibility and locomotor access, respectively, $p < .001$ in both cases).

We then proceeded to regression analyses with preference and danger as dependent variables and the two factors, Visibility and Locomotor Access, as independent variables. The results of those analyses are presented in Table 3. Both predictors had modest positive partial relations with preference and much stronger negative partial relations with danger. As was the case with the original predictors, the new composite predictors did a much better job in accounting for danger than for preference.

AUXILIARY ANALYSES

The strong correlations among our predictor variables discouraged us from investigating how they all worked together in regression analyses. However, given the account in the introduction of how concealment (primary refuge) might relate to danger via the mediational influence of entrapment or rearview concern, we thought it worthwhile to do the more limited analyses implied by that account. In addition, we present some further results bearing on the relation between mystery and preference.

Regarding the first issue, it is apparent from Table 1 that concealment and rearview concern cannot be used as predictors in the same analysis because they correlate .95 with each other. However, concealment and entrapment, with a correlation of .83, might be viable. Thus, we ran a regression analysis with danger as the dependent variable and concealment and entrapment as the independent variables. Collinearity diagnostics indicated no problems. Entrapment was a significant positive predictor (partial $r = .72$, $p < .001$), but concealment was not (partial $r = .09$, $p = .48$). This pattern of results suggests that entrapment could mediate the relation between concealment and danger.

Given the strong track record from previous research for a positive relation between mystery and preference, we felt compelled to investigate whether such a relation was being masked in the current study. That is, it seemed likely to us that within-forest settings like those in Figure 2 might be anchoring a strong negative relation between mystery and visibility, thereby masking a positive relation between mystery and preference that might be evident if visibility were controlled. To check, we computed partial correlations between mystery and each of the two target variables, preference and danger, with each of the other seven rated predictors partialed out. The results are presented in Table 4. It is evident that controlling for other rated predictors, especially those associated with visibility, tends to turn the relation between mystery and preference positive. The same kind of control weakens the positive relation between mystery and danger but does not change its direction.

DISCUSSION

Before discussing the implications of this study, its limitations should be stressed. First, our population was college students, and there is reason to suppose that the reactions of college students to environmental settings do not necessarily generalize to other age groups (Balling & Falk, 1982; Herzog, Herbert, Kaplan, & Crooks, 2000; Zube, Pitt, & Evans, 1983). Second, we

TABLE 4
Partial Correlations Between Mystery and Each Target Variable, With Each of the Seven Remaining Predictor Variables Partialed Out

	Preference		*Danger*	
Predictor Partialed	*Partial* r	p	*Partial* r	p
Concealment	.30	.011	.33	.006
Refuge	.03	.835	.57	< .001
Visual access	.44	< .001	.27	.023
Penetration	.47	< .001	.29	.016
Movement ease	.23	.060	.52	< .001
Entrapment	.40	.001	.14	.268
Rearview concern	.26	.030	.38	.001

used color slides to present the settings. Although concerns about the generality of results from this medium of presentation have been raised (e.g., Heft & Nasar, 2000; Hetherington, Daniel, & Brown, 1993; Scott & Canter, 1997), the validity of the medium for aggregate results and static visual attributes of environments is strongly supported (e.g., Hershberger & Cass, 1973; Hull & Stewart, 1992; Sommer, Summit, & Clements, 1993; Stamps, 1990; Trent, Neumann, & Kvashny, 1987; Zube, Simcox, & Law, 1987). Third, strong correlations among our original predictor variables prevented us from exploring how all of those variables worked together in regression analyses. More focused studies with fewer predictor variables would seem to be necessary to assess the role of specific predictor variables.

Given these limitations, what can be concluded? First, it seems likely that the target variables, although related, are not equivalent constructs. Preference and danger had only about 30% of their variance in common. The relation between preference and fear was comparable. Thus, the implicit inference in many studies that fear is simply the inverse of preference may lead to serious errors of conceptualization. As for danger and fear, rough substitutability seems reasonable in many situations, including the present study, because the two variables are substantially correlated (although in this study, more than a third of their variance was unshared) and have very similar patterns of relations with predictors. Still, as pointed out in the introduction, one must be alert for situations in which danger might not lead to fear.

Second, perhaps the most compelling result of the present study is the role that access, visual or locomotor, plays in accounting for preference or danger reactions. For both target variables, existing literature and theory, reviewed earlier, support the plausibility of such a role. What appears to be new in this study is the suggestion that such variables may be even stronger predictors of

danger than of preference. This, too, makes sense. In a setting where preference is the only concern, access may be viewed as a luxury, but where danger is an issue, it looms as a vital necessity. It is also noteworthy that the two types of access appear to have some ability to predict independently. Visual access is pleasing and reassuring apart from any inference about movement possibilities, and vice versa. As noted below, this implies that either construct may provide an opportunity for planners.

Third, we replicated Woodcock's (1982) finding of a negative relation between concealment (primary refuge) and preference. Furthermore, as implied by his explanation, the relation is even stronger between concealment and danger. Moreover, our auxiliary regression analysis suggests that this relation could be mediated by feelings of entrapment. All of this makes good sense. The reaction to a stimulus configuration that affords concealment should depend on the context. In a nonthreatening context, concealment could be comforting, even pleasant. Where danger is an issue, concealment can readily lead to thoughts about entrapment, thereby heightening the sense of danger.

Fourth, the simple correlation between mystery and preference (–.17) was puzzling inasmuch as it failed to support about 30 years of accumulated evidence attesting to a positive relation in many natural domains. Our auxiliary analysis of partial correlations suggested that when indicators of visual access are controlled statistically, the relation between mystery and preference turns positive. No such tendency occurred for mystery and danger, where both simple and partial correlations were positive. The positive relation between mystery and both target variables, after controlling for other indicators, agrees with the paradoxical role for mystery suggested by Herzog and Miller (1998). They suggested that in certain contexts, mystery can enhance either preference or danger/fear reactions, whichever is evoked by other cues in the setting. In the current study, the emergence of a positive relation between mystery and preference after controlling for visual access may reflect a masking effect of access. As suggested earlier, the low-access within-forest settings tended to be rated high in mystery and low in preference, working against any positive relation between mystery and preference. With the influence of access removed, the normally positive relation between mystery and preference emerged. This account is necessarily tentative, but if it has any merit, it implies that some strange things can happen to mystery when very low-access settings are involved.

Although further research is needed to find out if movement considerations are as potent in predicting the perception of danger in urban settings as in field/forest settings, it seems likely that there are practical applications of the results involving locomotor access. The rule of thumb would be that

where danger is likely to be an issue, design should provide ample opportunity for locomotor access as well as visual access. Opportunities for entering and leaving the setting should be clearly visible, conveniently located, and sufficient in number. This seems like commonsense advice, but it is worthwhile having research results that clearly support it. As regards the use and arrangement of natural elements, this would imply smooth, well-maintained ground surfaces; limbed-up trees; and the careful placement of shrubs and other vegetation so as not to impede visibility or movement. Recent commentators have noted that such arrangements should be possible while still retaining the inference of further information that is central to the experience of mystery (e.g., Herzog & Miller, 1998; Kuo, Bacaicoa, & Sullivan, 1998). Thus, planners should be able to achieve mystery without fear.

NOTE

1. This approach was suggested by a reviewer of an earlier draft of the article.

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