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Mystery and Preference in Within-Forest Settings

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Recent studies have found negative correlations between mystery and preference for forest settings. Our reanalysis of earlier data suggested that those findings may have stemmed from a failure to examine setting categories within the forest domain. In the current study of 70 within-forest settings, factor analysis of preference ratings revealed two setting categories corresponding to high- and low-visual-access settings. In the high-access category, preference was positively correlated with mystery but uncorrelated with visual access. In the low-access category, preference was uncorrelated with mystery but positively correlated with visual access. We also examined an expanded definition of mystery that made explicit the distinction between mystery and surprise. The expanded definition produced results identical to the standard definition in the high-access category, but in the low-access category, expanded mystery was positively correlated with preference. We conclude that when properly understood, mystery tends to be positively related to preference.

Keywords: *preference; mystery; visual access; danger*

Mystery refers to the promise that more can be seen if one entered more deeply into a setting. Curving pathways, partial concealment, and shadows are the kinds of features that enhance mystery (Gimblett, Itami, & Fitzgibbons, 1985; Hammitt, 1980; Ruddell, Gramann, Rudis, & Westphal, 1989). An important point about the definition of mystery is that the promise of further information has to be visible from one's current position (R. Kaplan & Kaplan, 1989; S. Kaplan & Kaplan, 1982). Thus, mystery is different from surprise where new information that one could not have anticipated is suddenly revealed. With mystery, the new information is continuous with what is already available.

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Mystery is one of the predictors of environmental preference in the Kaplans' preference matrix (R. Kaplan & Kaplan, 1989; S. Kaplan & Kaplan, 1982). The preference matrix is composed of two binary dimensions. One deals with the basic human needs of understanding and exploration (known in earlier writings as making sense and involvement). The other deals with whether one is processing the two-dimensional picture plane, where the information is immediately available, or the larger three-dimensional world, which requires greater inference on the part of the perceiver. Together, these two dimensions define four cells, each of which contains a conceptually distinct predictor of environmental preference. *Coherence* refers to features of the picture plane that aid in organizing or understanding the scene. *Legibility* refers to features of the larger environment that foster understanding by aiding way finding and the building of a useful cognitive map. *Complexity* refers to how much is going on in the two-dimensional scene, how intricate or visually rich it is. *Mystery* refers to any feature that encourages one to enter more deeply into the larger environment with the promise that one could gain interesting new information. Coherence and legibility satisfy the basic need for understanding, whereas complexity and mystery provide opportunities for exploration. In general, the Kaplans propose that all four predictors will be positively related to preference.

Research evidence on the utility of the preference-matrix predictors has been accumulating for more than 30 years. Results have been generally supportive of modest positive relations between the predictors and preference (Gifford, 2002; Kaplan, Kaplan, & Ryan, 1998) but with sufficient variability that not everyone is impressed (Stamps, 2004). Those willing to make distinctions (Gifford, 2002; R. Kaplan & Kaplan, 1989; Kaplan et al., 1998) have generally suggested that the positive evidence is more solid for coherence and mystery than for the other two predictors. Legibility has been the least researched of the predictors, but recent studies have been supportive (e.g., Herzog & Kropscott, 2004; Herzog & Leverich, 2003).

The point of departure for the present study was a recent trend toward negative correlations between mystery and preference (Herzog & Kirk, 2005; Herzog & Kropscott, 2004; Herzog & Kutzli, 2002). Although only one of the correlations was statistically significant ($r = -.39$ in Herzog & Kropscott, 2004), the run of negative correlations might be seen as tarnishing the reputation of mystery. This possibility seems to have been sufficiently worrisome that both Herzog and Kropscott (2004) and Herzog and Kirk (2005) devoted substantial portions of their discussions to explaining why the negative correlations may have been atypical. The gist of their explanations is that either or both of the following propositions may be

true: (a) for within-forest settings with very low visual access, mystery and preference may indeed have an atypical negative correlation, and (b) for samples of within-forest settings containing exemplars with very low visual access, the standard definition of mystery may malfunction, producing invalid results. In the latter case, the suggestion is that mystery defaults to visual access. Given that the two variables are negatively correlated in such samples ($r = –.92$ in Herzog & Kropscott) and that visual access is positively correlated with preference, a negative correlation between mystery and preference becomes very likely. However, this should not happen if mystery is properly understood. When mystery defaults to visual access at very low levels of access, mystery and surprise are confused. At very low levels of visual access, surprise is possible, but mystery is not. This line of thought suggests that an improved definition of mystery may be called for in such situations.

These two post hoc explanations for the negative correlations between mystery and preference suggest two procedural strategies for future research. One is to look at within-forest settings with very low visual access as a distinct setting category and compare it to within-forest settings with greater visual access. The other is to examine alternative definitions of mystery, particularly those that make explicit the distinction between mystery and surprise. In this study, we have implemented both strategies. It is worth noting that all the studies yielding negative correlations between mystery and preference had three common features: (a) inclusion of within-forest settings with very low visual access, (b) no attempt to look seriously at those settings as a separate category, and (c) positive partial correlations (not always significant) between mystery and preference after controlling for visual access. These common features suggest that looking at very-low-access within-forest settings as a separate category may be fruitful.

It is not necessary to generate a new data set to examine low-access within-forest settings as a separate category. In a footnote, Herzog and Kropscott (2004) reported that they factor analyzed their preference ratings and obtained two setting categories corresponding to high- and low-access within-forest settings. They noted that the correlation between setting category and rated visual access was .89 and, on that basis, decided not to pursue further analysis of setting categories. That decision may have been unfortunate. Even when setting categories derived by factor analysis are largely redundant with a rated predictor, it is still possible to gain valuable insights by examining relations between variables within the setting categories.

We revisited the Herzog-Kropscott factor analysis (principal-axis factoring, varimax rotation) of their preference ratings to see what would happen

when the high- and low-access categories ($N = 32$ and 19 settings, respectively) were examined separately. We looked at mean differences between the two categories, as well as relations among the rated variables within the categories. Figure 1 contains a pair of examples from each of the two setting categories, and Table 1 contains setting scores (means for each setting based on all participants who provided ratings for a given variable) for all settings in Figure 1. Figure 1 suggests that the low-access settings may also have substantially lower light levels than the high-access settings. Table 1 suggests that the categories differ on a number of other variables besides visual access. Specifically, the low-access category appears also to be lower in preference, coherence, legibility, and movement ease and higher in danger and mystery. Comparison of category means (means for all settings in each category) confirms these impressions, with the two categories differing on all rated variables except complexity and landmarks at $p < .001$. Thus, at least part of the reason for the overall negative correlation ($r = –.39$) between mystery and preference can be attributed to the fact that the low-access setting category was both higher in mystery and lower in preference than the high-access setting category. This pattern is consistent with the notion that mystery may have defaulted inappropriately to visual access in the low-access category.

The correlations among rated variables within the two setting categories are in Table 2. Here we see that within the low-access category visual access is positively correlated with preference, whereas mystery is uncorrelated. The opposite occurs within the high-access category: Mystery has a modest positive correlation with preference ($r = .33$; $p = .06$), whereas visual access is uncorrelated. This pattern suggests that it is not true that low-access within-forest settings represent a category in which mystery and preference have an atypical negative correlation; rather, the two variables are uncorrelated within that category. Meanwhile, in the high-access category, the more typical positive correlation occurs. In general, these results are fairly good news for the traditional view of mystery as a positive predictor of preference.

We had two goals in this study. First, we wanted to check whether the pattern of findings described above could be replicated with a new sample of within-forest settings chosen specifically to represent the two categories of high- and low-visual access. Second, we wanted to compare results of the standard definition of mystery with those of an expanded definition that explicitly draws a distinction between mystery and surprise. We also introduced a second new predictor variable called *light,* defined as how high the lighting level in the setting appears to be. The purpose was to check our impression that the low-access category also has lower light levels than the high-access category.

Table 1
Setting Scores for the Settings in Figure 1

Figure 1 Setting	Rating Variables								
	Preference	Danger	Coherence	Complexity	Legibility	Mystery	Landmarks	Visual Access	Movement Ease
Upper left	3.43	1.79	3.47	3.00	3.59	2.54	1.71	3.76	3.90
Upper right	3.46	1.86	4.13	2.93	3.86	2.75	1.68	3.48	3.97
Lower left	2.42	3.07	1.73	2.14	2.38	3.96	1.43	1.17	2.62
Lower right	2.30	3.11	2.30	2.59	1.97	4.07	1.11	1.31	1.83

Figure 1
Examples of Settings in the High-Visual-Access (top row) and Low-Visual-Access (bottom row) Setting Categories of Herzog and Kropscott (2004)

Note: Setting scores for these settings are in Table 1.

Based on the findings reported above and our theoretical intuitions, and on the further assumption that we would obtain the two within-forest setting categories based on visual access, we offer the following hypotheses:

1. Over all settings, there will be (a) a negative correlation between mystery and preference, (b) a negative correlation between mystery and visual access, and (c) a positive correlation between visual access and preference.
2. The low-access setting category will be lower in mean preference, visual access, and light than the high-access category. It will also be higher in mean danger and mystery (standard definition) than the high-access category.
3. Within the high-access category, mystery (standard definition) will be positively correlated with preference, but visual access will be uncorrelated.
4. Within the low-access category, mystery (standard definition) will be uncorrelated with preference, but visual access will be positively correlated.
5. Mystery (expanded definition) will not differ on the average between the two setting categories.
6. Mystery (expanded definition) will be positively correlated with preference within both setting categories and possibly over all settings as well.

Table 2
Correlations Among Rating Variables for the High-Visual-Access (Above Diagonal, $N = 32$) and Low-Visual-Access (Below Diagonal, $N = 19$) Setting Categories of Herzog and Kropscott (2004)

		1	2	3	4	5	6	7	8	9
1	Preference	—	.05	.43*	.02	.02	.33	.13	–.08	.03
2	Danger	–.38	—	–.36*	.69***	–.54**	.73***	.42*	–.64***	–.81***
3	Coherence	.54*	–.59**	—	–.68***	.38*	–.17	–.21	.34	.41*
4	Complexity	.34	.12	.19	—	–.37*	.44*	.53**	–.42*	–.61***
5	Legibility	.64**	–.53*	.63**	.28	—	–.57**	.25	.64***	.78***
6	Mystery	–.03	.21	–.33	–.28	–.29	—	.24	–.86***	–.73***
7	Landmarks	.49*	–.10	.45	.62**	.73***	–.27	—	–.21	–.10
8	Visual access	.58*	–.77***	.69**	.26	.60**	–.41	.29	—	.79***
9	Movement ease	.44	–.73***	.47*	–.31	.59**	.09	.17	.50*	—

*$p < .05$. **$p < .01$. ***$p < .001$.

Method

Participants

The sample of raters consisted of 537 undergraduate students (166 men, 371 women) at a university in the Midwestern United States. Participation fulfilled a course requirement for introductory psychology. A total of 24 sessions were run, with the number of participants per session ranging from 5 to 33.

Stimuli

The settings consisted of 70 color slides of within-forest environments containing no visible pathways. In addition, we made a conscious attempt to sample only the two within-forest settings of Herzog and Kropscott (2004): high and low visual access. It was, therefore, a purposive sample of settings. Figure 2 provides examples of the two setting categories. No settings contained people. All were photographed in spring, summer, or early fall. All slides were oriented horizontally.

Procedure

All participants in each session rated each of the 70 settings on only one of the nine measured variables. All ratings used a 7-point scale ranging from

A (very high [highest possible rating]) to G (none at all [lowest possible rating]). The letters A through G were later converted to numbers 7 through 1, respectively, for analysis. For seven of the nine rating variables, we used standard definitions borrowed from previous research (Herzog & Kropscott, 2004). These definitions are provided in Table 3. Two new variables assessed in this study were light and an expanded version of mystery. *Light* was defined as the following: "How good is the light in this setting? Is the light level high enough that you can see everything clearly, or does the setting seem to be dominated by low light or deep shadow?" High ratings were to be assigned to good light levels. For mystery expanded, we provided the following short essay to explore the concept at length prior to the ratings:

> Settings high in mystery are very likely to give the impression that one could acquire new information if one were to travel deeper into the setting. They provide partial information concerning what might lie ahead. Mystery involves the inference that one could learn more through locomotion and exploration. The setting draws one in, encourages one to enter and to venture forth, thus providing an opportunity for learning something that is not fully apparent from the current vantage point. There are several ways in which settings can suggest that there is more information available, that there is more to see, and that one can find out more as one keeps going. Such hints about what is coming might be in the form of a gradual bend in a pathway, vegetation, or foliage that partially obscures what lies ahead, or even a modest change in the form of the landscape that suggests one is about to enter a different kind of terrain.
>
> A key feature of mystery is that the new information revealed by going deeper into the setting is continuous with what is already available. This is quite different from "surprise" where new information that one could not have anticipated is suddenly revealed. If vegetation is so dense that you can see nothing through it, then whatever you encounter on the other side will be a surprise, but there is no mystery. On the other hand, if the vegetation is less dense, so that you can get a partial view through it, then you can probably think of several hypotheses about what lies ahead, and you should not be surprised by what you encounter ahead. This is mystery, and its essence is partial revelation from the current vantage point about what lies ahead. Clearly, mystery and surprise are different. And what if there is no partial screening of what lies ahead so that everything is visible as far as you can see? Then there is neither mystery nor surprise.
>
> In summary, if the current vantage point suggests that you could find out more if you keep going and that there is more to see ahead, then the setting has mystery. The more hints the landscape provides of what is coming, the more mystery it has.

Figure 2
Examples of Settings in the High-Visual-Access (top row) and Low-Visual-Access (bottom row) Setting Categories of This Study

Note: Setting scores for these settings are in Table 5.

Sessions proceeded as follows. After explaining the task and obtaining informed consent, the first 10 slides were shown briefly (5 s per slide) without being rated to familiarize participants with the range of settings to be encountered. Then participants rated 74 slides, presented in two sets of 37 slides each, with a 2-min rest between sets. Viewing time was 15 s per slide in all sessions. The first and last slides 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 12 sessions, the second order for the last 12 sessions. Within each block of sessions using a given slide order, there were three sessions devoted to preference, two to danger, and one session devoted to each of the other seven rated variables. The extra sessions for preference and danger provided greater statistical precision for the two target variables, as well as enabling the factor analysis of the preference ratings. Aside from the constraints on the ordering of sessions just

Table 3
Standard Definitions of Rating Variables Used in This Study

Preference—How much do you like the setting? This is your own personal degree of liking for the setting as a setting, NOT as a picture. You don't have to worry about whether you're right or wrong or whether you agree with anybody else.
Danger—How dangerous is this setting? How likely is it that you could be harmed in this setting?
Coherence—How well does the scene "hang together"? How easy is it to organize and structure the scene?
Complexity—How much is going on in the scene? How much is there to look at?
Legibility—How easy would it be to find your way around in the setting? How easy would it be to figure out where you are at any given moment or to find your way back to any given point in the setting?
Mystery—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?
Visual Access—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?

noted, the ordering of sessions was randomized. One of the slide presentation orders was generated randomly, and the second presentation order was derived by interchanging the halves of the first order. Final sample sizes were 153 for preference, 100 for danger, 53 for legibility, 45 for visual access, 41 for mystery, 40 for mystery expanded and light, 33 for complexity, and 32 for coherence.

Results

Except for the factor analysis, all analyses were based on settings as the units of analysis and setting scores as raw scores. As noted earlier, 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, were at least .90 for all rated variables except complexity ($\alpha = .73$) and mystery expanded ($\alpha = .64$).

Table 4 presents the correlations among the rated variables based on all 70 settings. Only one part of Hypothesis 1 was supported—the negative correlation between mystery (standard definition) and visual access. However, neither of these predictors correlated with preference. The tentative part of Hypothesis 6—that mystery expanded would be positively correlated

with preference over all settings—was supported. Note that mystery and mystery expanded were uncorrelated, suggesting that our revised definition of mystery was distinct from the standard definition. Note also that mystery expanded was uncorrelated with visual access, indicating no tendency for the revised definition of mystery to default to visual access. Two other points are worth noting. First, the correlations between the predictor variables and danger were generally greater in magnitude than those between the predictor variables and preference. This supports the danger-saliency hypothesis (danger is a more salient target variable than preference) discussed at length by Herzog and Kirk (2005). Second, in contrast to several previous studies (see Herzog & Kirk, 2005, for a review), preference and danger were uncorrelated.

The next step was to factor analyze the preference ratings (principal-axis factoring, varimax rotation). We extracted five factors to make sure that we allowed for more than two setting categories, but only the first two factors had pure loaders (settings with rotated factor loadings of at least $|.40|$ on one factor only). In fact, the first two factors accommodated all 70 settings as pure loaders—46 on the first factor and 24 on the second—and they accounted for 61% of the variance in the preference ratings. Two examples from each of the two setting categories are provided in Figure 2, and the setting scores for those examples are in Table 5. It is clear that we can think of the two categories as high- and low-visual-access categories. As in Herzog and Kropscott (2004), the low-access category seems also to be lower in coherence and legibility but higher in danger and mystery (standard definition) than the high-access category. Unlike in Herzog and Kropscott, there appears to be no difference in preference. As for the new variables, the low-access category seems to be lower in light, but the two categories do not appear to differ in mystery expanded.

All of these impressions are confirmed by comparisons of the category means provided in Table 6. The two categories differed at $p < .001$ in the directions noted above on all rated variables except preference, complexity, and mystery expanded. Thus, all parts of Hypothesis 2, except the prediction for preference, were supported, and Hypothesis 5 was also supported.

Table 7 contains correlations among the rated variables separately for each setting category. Within the high-access category, mystery (standard definition) was positively correlated with preference, but visual access was not. Within the low-access category, visual access was positively correlated with preference but mystery was not. Mystery expanded was positively correlated with preference within both setting categories (with alpha set at .05 for testing specific hypotheses). Thus, Hypotheses 3, 4, and 6 were fully

Table 4
Correlations Among Rating Variables for All Settings ($N = 70$)

		1	2	3	4	5	6	7	8	9
1	Preference	—								
2	Danger	–.14	—							
3	Coherence	.32**	–.91***	—						
4	Complexity	.38**	.13	–.03	—					
5	Legibility	.16	–.96***	.93***	–.08	—				
6	Mystery	.08	.94***	–.85***	.17	–.92***	—			
7	Mystery expanded	.38**	.10	.04	.47***	.02	.18	—		
8	Visual access	.12	–.96***	.92***	–.05	.96***	–.94***	–.04	—	
9	Light	.09	–.88***	.81***	.08	.84***	–.87***	–.08	.86***	—

*$p < .05$. **$p < .01$. ***$p < .001$.

supported. Several more points are worth noting. First, mystery and mystery expanded were positively correlated within the high-access category but uncorrelated within the low-access category. There seems to be substantial redundancy between the two definitions when rating high-access forest settings, but the two definitions diverge when rating low-access settings. Second, correlations between the predictors and danger were generally greater in magnitude within both categories than correlations between the predictors and preference, but the difference was less pronounced within the low-access category. Third, preference and danger were negatively correlated within the low-access category but uncorrelated within the high-access category. Finally, there is no ambiguity about how visual access relates to danger. It was a strong negative predictor within both setting categories.

Discussion

When the results of the present study are combined with those of Herzog and Kropscott (2004, plus our reanalysis of their data), we arrive at several conclusions about within-forest settings. All of the conclusions depend on the insights gained by dividing the domain of within-forest settings into two categories corresponding to high- and low-visual-access settings. We note that compared to the high-access category, the low-access category also differs in a number of other respects besides visual access. It is lower in coherence,

Table 5
Setting Scores for the Settings in Figure 2

Figure 2 Setting	Rating Variables								
	Preference	Danger	Coherence	Complexity	Legibility	Mystery	Mystery Expanded	Visual Access	Light
Upper left	4.25	2.49	5.25	4.30	5.11	3.49	4.18	5.62	5.23
Upper right	4.51	2.62	5.28	4.61	4.74	4.22	4.58	5.13	4.95
Lower left	4.36	4.05	2.91	4.33	2.19	5.66	3.73	2.87	2.68
Lower right	4.01	4.47	2.25	4.82	1.91	5.95	4.25	2.80	2.50

Table 6
Means and Standard Deviations for Each Rating Variable in Each Setting Category

Setting Category	Rating Variables								
	Preference	Danger	Coherence	Complexity	Legibility	Mystery	Mystery Expanded	Visual Access	Light
High visual access									
Mean	4.39	2.74	4.95	4.52	5.00	4.10	4.42	5.29	4.92
SD	0.32	0.29	0.52	0.38	0.47	0.44	0.34	0.38	0.56
Low visual access									
Mean	4.34	4.09	2.90	4.51	2.44	5.79	4.40	2.85	2.71
SD	0.42	0.28	0.60	0.50	0.42	0.28	0.57	0.52	0.70

Note: $N = 46$ and 24 settings for the high- and low-visual-access setting categories, respectively.

Table 7
Correlations Among Rating Variables for the High-Visual-Access (Above Diagonal, $N = 46$) and Low-Visual-Access (Below Diagonal, $N = 24$) Setting Categories

		1	2	3	4	5	6	7	8	9
1	Preference	—	.01	.41**	.45**	.21	.48**	.36*	–.19	–.02
2	Danger	–.59**	—	–.58***	.72***	–.74***	.74***	.68***	–.74***	–.51***
3	Coherence	.73***	–.62**	—	–.35*	.65***	–.33*	–.17	.40**	.28
4	Complexity	.30	–.24	.28	—	–.51***	.80***	.61***	–.69***	–.26
5	Legibility	.44*	–.72***	.58**	.19	—	–.54***	–.33*	.69***	.13
6	Mystery	–.05	.55**	–.24	–.45*	–.48*	—	.68***	–.75***	–.36*
7	Mystery expanded	.41*	–.13	.26	.34	.43*	.23	—	–.53***	–.47**
8	Visual access	.61**	–.72***	.80***	.40	.67***	–.49*	.14	—	.18
9	Light	.18	–.32	.15	.67***	.17	–.61**	.07	.32	—

*$p < .05$. **$p < .01$. ***$p < .001$.

legibility, movement ease, and light level, and it is higher in perceived danger and mystery. The differences in access, light, danger, and mystery are in accord with Hypothesis 2. The low-access category may or may not be lower in preference (Hypothesis 2). At this time we cannot specify when the two categories will differ in preference.

Our first major conclusion is that when the within-forest categories do differ in preference, the category differences in mean preference and mystery are largely responsible for a negative correlation between mystery and preference in the broader domain of within-forest settings (Hypothesis 1). When the two categories do not differ in preference, there is no negative correlation in the broader domain. In either case, there is reason to believe that for the low-access category, ratings of mystery using the standard definition are generally based on visual access, that is, mystery is roughly equated with low visual access (Hypothesis 1). Thus, when visual access is controlled statistically, the mystery-preference correlation typically turns positive (Herzog & Kirk, 2005; Herzog & Kropscott, 2004; Herzog & Kutzli, 2002). Earlier reports of negative correlations between mystery and preference for setting samples that included the low-access within-forest category may thus be artifacts of mean category differences.

When we look within the two setting categories, we find no encouragement for the notion that the low-access within-forest settings represent a category in which mystery and preference have an atypical negative correlation.

On the contrary, there is either no correlation or a positive correlation, depending on the definition of mystery used (Hypotheses 4 and 6). In the high-access category, the typical positive correlation between mystery and preference occurs (Hypotheses 5 and 6). As noted in the introduction, this pattern of results generally supports the traditional view of mystery as a positive predictor of preference. Meanwhile, visual access seems to be unrelated to preference in the high-access category but positively related to preference in the low-access category (Hypotheses 4 and 5). It seems that when visual access is severely limited, any improvement in access is desirable.

The final major issue to be considered involves the two definitions of mystery: Which is more valid and therefore preferred? In the high-access category, both definitions produce the expected positive correlation with preference, and the two versions of mystery are strongly and positively correlated with each other (Table 7). They appear to be getting at the same construct, and thus one might favor the standard definition on the grounds of convenience (it is shorter). In the low-access category, mystery standard is uncorrelated with preference but negatively correlated with visual access. In contrast, mystery expanded is positively correlated with preference and uncorrelated with visual access. If one favors positive correlations between mystery and preference on theoretical grounds, then one might be inclined toward the expanded definition of mystery in the low-access category. Is there any other evidence to bolster that inclination?

Comparison of mean ratings across categories (Table 6) is instructive. Mystery standard is higher in the low-access category, but mystery expanded does not change. Now look at the settings in the bottom row of Figure 2. If you think that a glimmer of light through the dense foliage constitutes a strong promise of further information, then you will conclude that mystery should be higher in the low-access category and that mystery standard is the more valid measure. On the other hand, if you feel that the more compelling impression is one of visual blockage, you will conclude that mystery should not be higher in the low-access category and that any tendency to rate it higher represents a confusion of mystery with surprise. Thus, you will favor mystery expanded as the more valid measure. Although recognizing that reasonable people may differ, we incline toward the latter view. We think that the standard definition of mystery malfunctions for the low-access within-forest category by defaulting inappropriately to visual access. The result is that mystery is confused with surprise. The expanded definition of mystery, which makes explicit the distinction between mystery and surprise, eliminates the confusion. And when the confusion is eliminated, mystery and preference are positively correlated even within the low-access category.

Thus, we would recommend using the expanded definition of mystery when dealing with low-access forest settings. Whether the recommendation should also apply to low-access settings in other domains is open to future research.

Our results also replicate several previous findings involving perceived danger (see Herzog & Kirk, 2005, for a review). First, preference and danger were negatively correlated ($r = –.59$) only in the low-access setting category. This fits with previous research indicating that the two variables tend to be negatively correlated, but the relation is not of sufficient magnitude to suggest that danger is simply the inverse of preference. Second, the predictor variables in this study were generally more strongly related to danger than to preference. This pattern corroborates the danger-saliency hypothesis of Herzog and Kirk (2005). On evolutionary grounds, danger should be more salient than preference because preferences can be deferred, but danger must be given high priority or survival will be threatened. Third, although visual access was not always related to preference, it was always strongly related (negatively) to danger. This replicates several prior studies and implies that when it comes to danger, visual access is always relevant.

We acknowledge the potential limitations of our study. First, we have already noted that the results apply strictly only to forest settings. Generalization to other setting domains is yet to be determined. Second, results for predominantly female college students might not generalize to other age and gender groups (Balling & Falk, 1982; Herzog, Herbert, Kaplan, & Crooks, 2000; Zube, Pitt, & Evans, 1983). Third, use of color slides to present environmental settings may raise concerns (e.g., Heft & Nasar, 2000; Scott & Canter, 1997), but the validity of the medium for aggregate results and static visual attributes of environments is supported (e.g., Hershberger & Cass, 1973; Hull & Stewart, 1992; Zube, Simcox, & Law, 1987). Fourth, the reliability of the mystery-expanded measure could have been better, but the pattern of results for the measure made good sense, suggesting adequate validity.

We conclude with some practical implications. Methodologically, when investigating mystery, one may be misled by looking at a broad setting domain without breaking it down into categories. Mean differences across categories may create negative correlations between mystery and preference when there are no negative relations within categories. Likewise, one may need to pay careful attention to the definition of mystery when dealing with certain setting categories, particularly those characterized by low visual access. Our results suggest that the definition should distinguish mystery from surprise in such situations. Finally, given the renewed support for a broadly positive relation between mystery and preference suggested

by our results, strategies for enhancing mystery without triggering danger/fear reactions should be noted. Such strategies will necessarily involve trying to strike an adequate balance between mystery and visual access. Specific suggestions for achieving these goals can be found in Herzog and Kutzli (2002), Herzog and Leverich (2003), Herzog and Miller (1998), Kuo, Bacaicoa, and Sullivan (1998), and Nasar and Jones (1997).

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