

Visitor Circulation Through A Changing Exhibits Gallery

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Introduction

How visitors circulate through exhibition spaces has been studied by many investigators (e.g., Bitgood and Richardson, 1987; Melton, 1935; 1972; Parsons and Loomis, 1973; Shettel-Neuber and O'Reilly, 1987; Yoshioka, 1942). Melton (1935) demonstrated that an open door exerted a strong attracting force on visitors as evidenced by their tendency to leave the gallery when an exit door is encountered whether or not they have explored a significant portion of the gallery. When an open door was closed so that visitors could not exit, visitors circulated through a larger proportion of the gallery. Melton also found that, in the absence of more powerful cues, ~~visitors had a tendency to turn right as they entered a gallery.~~ For more on visitor circulation, see Bitgood (1988); Bitgood and Patterson (1987); and Loomis (1987).

Miles, Alt, Gosling, Lewis, and Tout (1982) provide a detailed discussion of considerations for visitor circulation based on the experience of the British Museum (Natural History). In the course of this discussion, these authors caution against the use of island displays in exhibit galleries because of the impact on visitor circulation. They point out that island displays generally reduce the width of the path, create increased crowd congestion, and make systematic viewing of exhibits confusing. However, no supporting data was provided.

The current study consisted of visitor tracking through five traveling exhibits at the Anniston Museum of Natural History. By using the same exhibit space with a variety of layouts for exhibit objects, it was hoped that the results would help to answer three questions:

- How much influence does the spatial arrangement of objects within a gallery have on the behavior of visitors?
- How much do the characteristics of exhibit objects influence visitor behavior?
- How effective are techniques for increasing visitation to a changing exhibit hall?

Exhibits Evaluated

Treasures from the Collection. The Museum dusted off objects from its storeroom for this very popular exhibition. It included a variety of objects such as mounted animals, paintings, and cultural artifacts (e.g., Native American head dress, aphrodisiac pills made from rhino horns). The spatial arrangement of objects and displays for this exhibition can be seen in the diagram of Figure 1.

The Dinosaur Show. This was a traveling exhibition organized by the Boston Museum of Science. It consisted of dinosaur images that ranged from paintings to models to videotapes. There were no mechanical moving creatures as in the very popular Dinamation show. Figure 2 illustrates the spatial arrangement of this exhibition.

Seeing the Unseen (Edgerton). This exhibition consisted of photographs by Harold Edgerton who used the stroboscope to make stop-action photographs. On exhibit were many of the photographs that were televised on a recent NOVA show. To illustrate stroboscopic photography, one photograph showed a bullet just after it passed through an apple. Figure 3 shows the spatial arrangement of this exhibition.

Pioneers of Bird Illustration. This consisted of a collection of bird illustrations organized by the Bell Museum of Natural History at the University of Minnesota. It included works by John James Audubon, Thomas Bewick, Mark Catesby, and Alexander Wilson. See Figure 4 for the spatial arrangement of this exhibition. Note that this "peninsula" arrangement differs from the "island" arrangement found in the other exhibitions.

Faces of Destiny. The exhibition contained photographs of Native Americans taken at the 1898 Indian Congress. It was organized by Spencer Museum of Art from the collections of Haskell Indian Junior College in Lawrence, Kansas. Figure 5 shows the spatial arrangement of this exhibition.

Method

This paper reports only the observational tracking data collected during our study of these temporary exhibitions. Visitors were unobtrusively observed as they walked around the changing exhibition hall and their circulation path and each stop was recorded on a map of the gallery. Gender and age were recorded as well as other factors deemed important by the observer.

Visitor traffic flow and stopping patterns were analyzed as a function of: general spatial arrangement of the displays; specific placement of objects;

size of objects; color versus black-and-white photos; and techniques for attracting visitors to the gallery.

General spatial arrangement differed on the basis of whether objects were placed on displays that formed islands in the gallery, or on displays next to the wall, or on peninsulas of displays jutting out from the wall (see *Pioneers of Bird Illustration* in Figure 4 for an example of the peninsula spatial arrangement).

Size of objects and color versus black-and-white were examined in the *Edgerton (Seeing the Unseen)* exhibition since the photos differed in size and some of the photos were in color.

The percentage of visitors who entered the changing exhibition gallery was also determined in an effort to assess whether any of three techniques assisted in attracting visitors into the gallery. These techniques were:

- The use of music or sound to attract visitors into the gallery;
- The placement of exhibit objects in the hallway leading to the gallery.
- The use of a strobe light to attract people into the gallery.

Results and Discussion

SPATIAL ARRANGEMENT AND VISITOR TRAFFIC FLOW

The arrangement of objects in these exhibitions had a strong influence on visitor behavior. Therefore, it is important that the reader keep in mind the spatial arrangements of objects in these exhibitions shown in Figures 1-5. Note that *Treasures from the Collection*, *Dinosaurs*, and *Edgerton*, had a number of islands spread throughout the gallery. *Faces of Destiny* had a single island in the center of the room, but this island contained one label and no photographs. It also had colored lights coming out of corners formed at the center structure. The *Pioneers of Bird Illustration* exhibition is the only one with no islands; it had peninsulas which were physically connected to the wall and encouraged a linear flow around the gallery.

1. Gallery entry patterns.

As indicated by Table 1, the spatial arrangement of displays and objects appeared to influence whether visitors walked into the gallery along the left wall, toward the center, or along the right wall.

In *Treasures*, less than one-third entered the exhibition hall along the left wall, about one-third entered along the right wall, and the remaining one-third entered into the center of the gallery. Objects displayed on islands appeared to pull many visitors away from the wall and more toward the center.

In the *Dinosaur* exhibition, over three-fourths of visitors entered along the left wall, about 12% along the right wall, and about 12% moved toward the center as they entered. The *Tyranosaurus Rex* model near the left wall appeared to pull visitors in this direction. This observation is consistent

with the notion that landmark exhibits have a large influence on circulation flow (Melton, 1935; Yoshioka, 1942).

Table 1
Visitor Entry and Circulation Patterns

<i>Exhibit</i>	Entry Pattern			Circulation Direction	
	Left Wall	Right Wall	Center	Clockwise Circulation	Counterclockwise Circulation
<i>Treasures</i>	30.3%	32.6%	37.1%	28.1%	27.0%
<i>Dinosaur</i>	76.2%	11.9%	11.9%	66.7%	7.1%
<i>Edgerton</i>	60.1%	12.1%	27.8%	78.8%	9.1%
<i>Bird Illus.</i>	71.2%	12.4%	16.5%	70.9%	17.0%
<i>Faces of ...</i>	56.5%	30.4%	13.1%	56.5%	43.5%

In the *Edgerton* exhibition (*Seeing the Unseen*), 60% of visitors entered along the left wall, 12% along the right wall, and over 27% entered to the center of the gallery. The spatial arrangement appeared to pull visitors slightly more to the center than found in the *Dinosaur* or *Bird Illustration* exhibition. The presence of attractive objects on islands toward the center of the gallery probably accounted for this effect.

In the *Pioneers of Bird Illustration* over 70% entered along the left wall, about 12% along the right wall, and the remaining 18% moved toward the center. The peninsula display arrangement of the gallery was designed to create a linear flow beginning with the left wall and the design appeared to work fairly well.

Finally, in *Faces of Destiny*, over 56% followed the left wall, while about 30% turned right when entering the gallery, and 13% toward the center. This pattern seems to reflect a natural pattern for a gallery of this type in which entry is along the left wall and there are no strong landmarks to draw visitors away from the wall. For example, Melton (1935) found over 50% of visitors walked along the left wall in a similar exhibit gallery.

2. Circulation through the gallery.

In addition to the entry behavior, the arrangement of objects within the gallery also influenced the pattern of circulation after entering the gallery.

Three of the exhibits generated a high probability of clockwise circulation (*Dinosaur*, *Edgerton*, and *Bird Illustration*); *Faces of Destiny* resulted in over half of visitors circulating clockwise; and *Treasures* resulted in only about one-fourth of visitors circulating clockwise. The *Treasures* exhibition (with the lowest clockwise circulation) also had the highest percentage of idiosyncratic traffic flow patterns through the gallery, ostensibly because of a large number of direction choice points created by the display islands. The "Circulation Direction" data from Table 1 summarize these differences.

SPATIAL ARRANGEMENT AND VISITOR STOPPING

1. Wall vs. island location.

Objects located on islands in the middle of the room tended to receive less attention than objects along the wall. As shown in Table 2, this effect was stronger in the *Edgerton* than in the *Treasures* exhibition. Note that in *Treasures*, the three objects receiving the highest level of attraction (over 70% stopping) were placed next to the wall. In *Edgerton*, 11 of 13 wall objects received over 50% stopping while only 6 of 14 island objects received this much attention. While the precise location with respect to traffic flow and the inherent interest level of the object were important, it seems that the island arrangement is more likely to result in some objects receiving lower levels of attention than if placed by the wall.

2. Island versus peninsula arrangement.

As noted previously, the *Bird Illustration* exhibition was configured with peninsulas jutting from the fixed walls. There was a smaller range of differences in visitor stopping among these *Bird Illustrations* objects than in the island exhibitions. That is, the percent of stops for *Treasures* ranged from 18.7% to 79.1%; for *Edgerton*, 9.1% to 81.8%; and for *Bird Illustration* (the only peninsula arrangement), 31.7% to 80.2%. It may be that the peninsula arrangement gives all objects a better chance of receiving attention since more objects are likely to fall within the visitor's line-of-sight.

3. Beginning versus end of visit.

In general, items viewed at the beginning of the gallery visit received more attention than objects viewed last. Table 3 shows visitor stopping at first and last objects in two of the exhibitions.

SIZE OF OBJECT

Photographs from the *Edgerton* exhibition were divided into four sizes and mean stops were computed in order to assess the possible role of size on visitor attention. Table 4 summarizes the results. The average number of stops does not differ appreciably among the small, medium and large photos. The extra large photos, however, resulted in more average stops;

unfortunately, there were only three extra large photos; thus, it is difficult to draw any conclusions about this difference.

Table 2
Percentage of Stops at Island Versus Wall Placements

Treasures from the Collection

<u>Range of Stopping</u>	Number of Displays	
	<u>Island</u>	<u>Wall</u>
Less than 30% stopping	2	2
30-50% stopping	4	4
50-70% stopping	4	2
Over 70% stopping	0	3

Edgerton (Seeing the Unseen)

<u>Range of Stopping</u>	Number of Displays	
	<u>Island</u>	<u>Wall</u>
Less than 30% stopping	2	0
30-50% stopping	6	2
50-70% stopping	4	9
Over 70% stopping	2	2

Table 3
Percentage of Stops at First and Last Objects

<u>Exhibition</u>	Percent Stop	
	<u>First</u>	<u>Last</u>
<i>Edgerton</i>	64.4	53.3
<i>Bird Illustration</i>	68.2	40.0

COLOR VS. BLACK-AND-WHITE PHOTOGRAPHS

The difference between color versus black-and-white photographs were also assessed in the *Edgerton* exhibition. Comparing only the small photos, the average number of stops for color was 19.7 and for black-and-white, 18.2. This difference is not large and suggests that in the case of the current exhibition, color did not play a critical role.

RELATION OF EXHIBIT CONTENT TO VISITOR BEHAVIOR

Occasionally, landmark exhibit objects resulted in an increased amount of visitor attention. For example, the Tyranosaurus Rex in the *Dinosaur*

exhibit, and the snapping turtle in the *Treasures* exhibition received more than expected attention. Intrinsic interest appeared to be a factor in such cases. Otherwise, size of object and color (vs. black-and-white) did not seem to have a large influence.

Table 4
Relation Between Size of Photo and Visitor Stops

<u>Size</u>		<u>Square Inches</u>	<u>Mean Stops</u>
Small	(N=20)	525	18.1
Medium	(N=19)	775	17.6
Large	(N=8)	1148-1271	18.8
Extra Large	(N=3)	1813	23.7

TECHNIQUES FOR ATTRACTING VISITORS TO GALLERY

While three methods of attracting visitors to the gallery were tested, only two of them were successful:

- Placing exhibits along the hallway leading to the gallery increased visitation in the gallery by about 20% (from 60% to 80% for all exhibits in study).
- Music in the gallery appeared to attract an additional visitation of 10% (from 60% to 70%).
- Strobe light. There was no difference in the percentage of visitors entering the gallery when the strobe light was on vs. when it was off.

What Lessons Can We Learn from Results?

The current results are consistent with the observations of others with respect to visitor circulation. The following conclusions are suggested by the current results:

1. Linear traffic flow, such as was generated in the peninsula display arrangement, appears to increase the chance that all exhibit objects will fall within the visitor's line-of-sight; non-linear patterns, on the other hand, as created with the island display arrangement, appear to produce greater visitor confusion, back tracking, and missed viewing opportunities. As evidenced in this study, linear does not mean that the arrangement has to be boring and unaesthetic. The *Bird Illustration* arrangement was aesthetically pleasing as well as effective in creating a desirable traffic flow in terms of all objects receiving visitor attention.

2. Attractive exhibit objects influence how visitors circulate through the gallery. An attractive, landmark object pulls visitors in one direction or another. As a result, object placement should be carefully planned with this effect in mind.
3. Spatial arrangements involving exhibit islands create pockets of low attention (apparently because the traffic flow does not place each object within the visitor's line-of-sight). (See also Shettel, 1976, "An Evaluation of Visitor Response to *Man in His Environment*.") The advice of Miles, et al. (1982) seems to be sound. Unless there is a good reason to include islands, they should probably be avoided. If display islands are used, other devices might be used to guide traffic flow. For example, numbering exhibits might encourage visitors to view more exhibits if they wish to see exhibit objects in an orderly manner.
4. At least two methods were found to increase visitation in the gallery: (1) placing exhibit objects along the hallway leading to the gallery; and (2) playing music in the hall. The flashing strobe light was not effective. Placing objects along the hallway leading to the gallery appeared to be particularly effective in overcoming the tendency of visitors to avoid walking off the main circulation pathway.

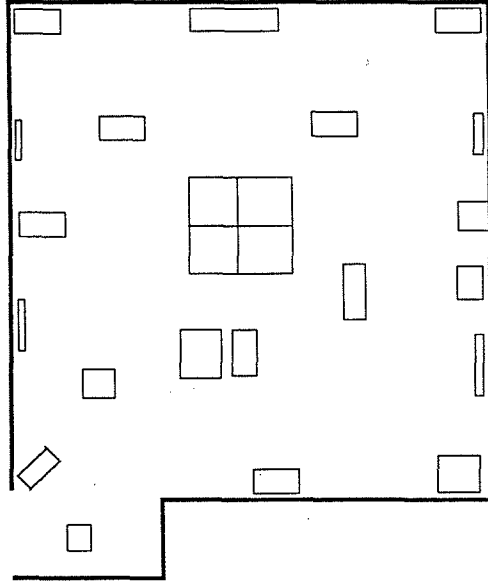
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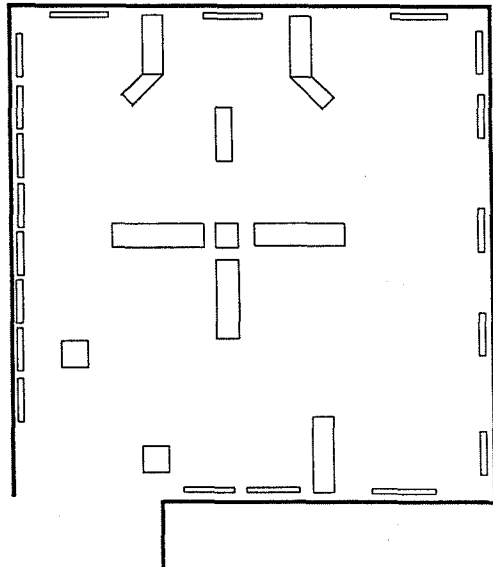
Treasures From Collection

Figure 1



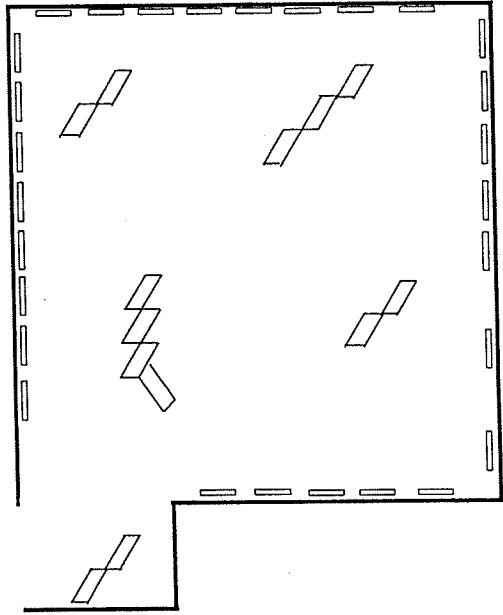
Dinosaur

Figure 2



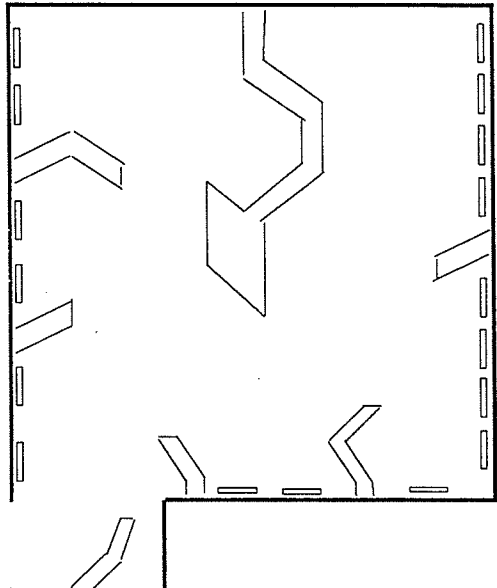
Edgerton Exhibit

Figure 3



Bird Illustrations

Figure 4



Faces of Destiny

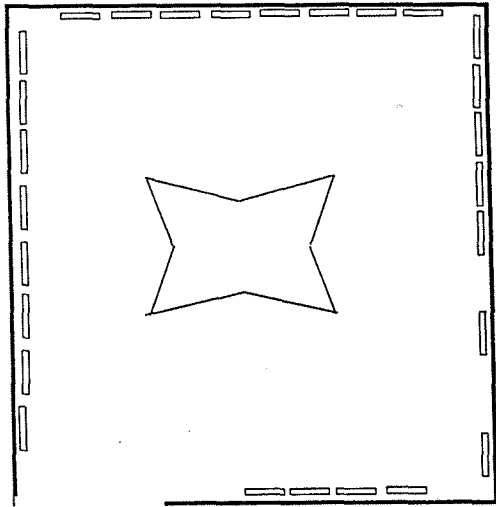


Figure 5