

Evaluating Visitor Behaviour in a Museum Gallery

Hannah Devine-Wright & Glynis Breakwell

Evaluation is particularly important when users have high expectations about the quality, accessibility, functionality and aesthetics of the designed environment. A multi-method approach including: behavioural mapping, structured interviews and self-completion questionnaires provided information about use of a museum glass gallery. The research supported the findings of Melton (1935) and Klein (1993) in that the majority of visitors traversed the gallery in a counter-clockwise direction despite a clockwise chronological organisation to the gallery. Other important factors included: time spent in the gallery and the level of aesthetic appreciation. The design implications of this research are related to maximisation of visitor satisfaction and knowledge gain in a gallery environment.

Keywords: museum evaluation, behavioural mapping, aesthetics.

SUMMATIVE EVALUATION IN CONTEXT

In certain circumstances, summative, or “post-installation” evaluations rather than the more fashionable front-end evaluations are appropriate (e.g. Rubenstein *et al.*, 1993). Summative evaluations assess the worth of finished exhibitions under real conditions and frequently adopt a variety of techniques to gather data e.g. behaviour observation, focus groups, (semi-) structured interviews and surveys (Miles *et al.*, 1982). Critics have noted that summative evaluations often occur too late, post-design and installation, when financial resources have been used up, which limits their effectiveness as a modification tool (Miles and Clarke, 1993).

Conditions under which a summative evaluation is appropriate include: when a gallery or museum evaluation of any kind, is perceived as threatening. This may arise, for example, when museum and/or curatorial policies are well-established and evaluation is conducted under the auspice of wider changes to administration or staffing policies. Furthermore, a summative evaluation may be suitable if the evaluation is part of an on-going programme of gallery or museum development. The research is particularly valuable if it can be modified for application to a variety of exhibitions or galleries within the museum.

The aims of this study were, using a variety of evaluation methods which could provide a modular evaluation programme, suitable for use

in a variety of galleries within the museum, to establish what message and information visitors received from the gallery and the extent to which way-finding and the layout of the gallery contributed to their experience; and to monitor the pattern of movement within the gallery to establish whether there was a counterclockwise dominance of movement of visitors as observed in previous research (Melton, 1935; Klein, 1993).

BACKGROUND INFORMATION ABOUT THE GLASS GALLERY:

Victoria and Albert Museum

The Victoria and Albert Museum in London was established to house and display an extensive collection of British and international applied art. Within the museum, gallery evaluations tended to be in-house, conducted by those responsible for the display and management of exhibits. The development of the new Glass Gallery at the V&A, was identified as an opportunity to involve external researchers in the evaluation of the gallery, with the aim of developing a modular evaluation tool for use with future exhibition or gallery re-developments.

A traditional style of exhibiting objects in wooden showcases was used in the previous gallery: “Glass at the V&A used to be displayed in rank upon rank of Victorian mahogany cases. It was tempting, if perverse, to be sentimental about these ill-lit, invariably deserted ceramics-and-glass galleries sequestered

on the upper floors of the museum; they seemed to be neutral zones, giving us the objects straight, free from fashionable interpretation" (Harrod, 1994). The new Glass Gallery opened at the Victoria and Albert Museum, London on the 19th April 1994. Its design was akin to an art gallery with an emphasis upon the display of a selection of beautiful objects combined with a traditional style of presentation of the bulk of the collection in a study area on a mezzanine connected to the ground floor by a specially commissioned glass stair sculpture. The press responded positively to the new design. The evaluation study was conducted between July–September 1994. The aim was to examine whether the new gallery was achieving the objectives set for it by its designers and users.

METHODS USED IN THE EVALUATION

A multi-method approach was adopted which included: interviews with a variety of key groups; behaviour observation of movement around the gallery and the development and administration of a questionnaire survey. A variety of techniques were employed to establish, firstly, what the objectives of the designers and users actually were; secondly, how the gallery was used and finally, how users reacted to it. There were six phases in the evaluation procedure:

Phase 1: interviews were conducted with gallery curators and designers to identify the rationale for the gallery design (N = 7). This involved asking the designers to specify their objectives for the gallery. For example, to make a gallery which was available, attractive and informative to the lay public. That the design should achieve visual impact, the direct communication of object to eye based on an aesthetic response, and do so in such a way that visitors are not made to work too hard to see the themes or stories underlying the object arrangement.

Phase 2: a small sample of users were interviewed to determine their requirements from the gallery. Two categories of users were identified: expert users (N = 12) (e.g. collectors, artists or curators) and the general public user (N = 6). Both types of user were interviewed to establish what they wanted from the gallery e.g. an identifiable start and finish to the optimum route around the gallery (perhaps linked to a catalogue) and a visually pleasing experience with mementos in the form, for instance, of post-cards.

Phase 3: unobtrusive structured observation in the gallery of 152 people was used to map user movements (i.e. time spent with exhibits, flow

through the gallery, use of the computer terminals) and was conducted over a five day period. All observations were recorded on schematic maps of the gallery using lines to show direction of movement and circled time (in seconds) to show areas in which the visitor stopped within the gallery. There were two entrances to the gallery. Entrance 1 is situated near the lift and is the main entrance to the gallery. Entrance 2 is reached by a footbridge from an adjacent gallery. Table 1 provides a summary of the amount of time these people spent in the gallery and the entrance used.

Phase 4: structured interviews with a broad range of user types (differing in age, sex, race, time spent in gallery, etc) were conducted (N = 71). Some were interviewed prior to entry to the gallery about their expectations, others were interviewed concerning their opinions about and reactions to, the gallery's various aspects. Visitors identified what they thought were the strengths and weaknesses of the gallery, alongside the opportunities for and obstacles to development.

Phase 5: the interview data were used to develop a self-completion questionnaire.

Phase 6: users (N = 1019), were sampled randomly but stratified by time of entry to the gallery, and asked to complete the questionnaire upon leaving the gallery and return it immediately to the evaluator. The questionnaire was administered over a five day period in September 1994. This sample, representative of the population visiting the museum during this time of the year, were asked to complete the questionnaire upon leaving the gallery and hand it to the researchers. Visitors were very willing to co-operate as found in other museum studies (e.g. Talbot *et al.*, 1993 had a response rate greater than 85%), to the extent that visitors requested questionnaires at the exit.

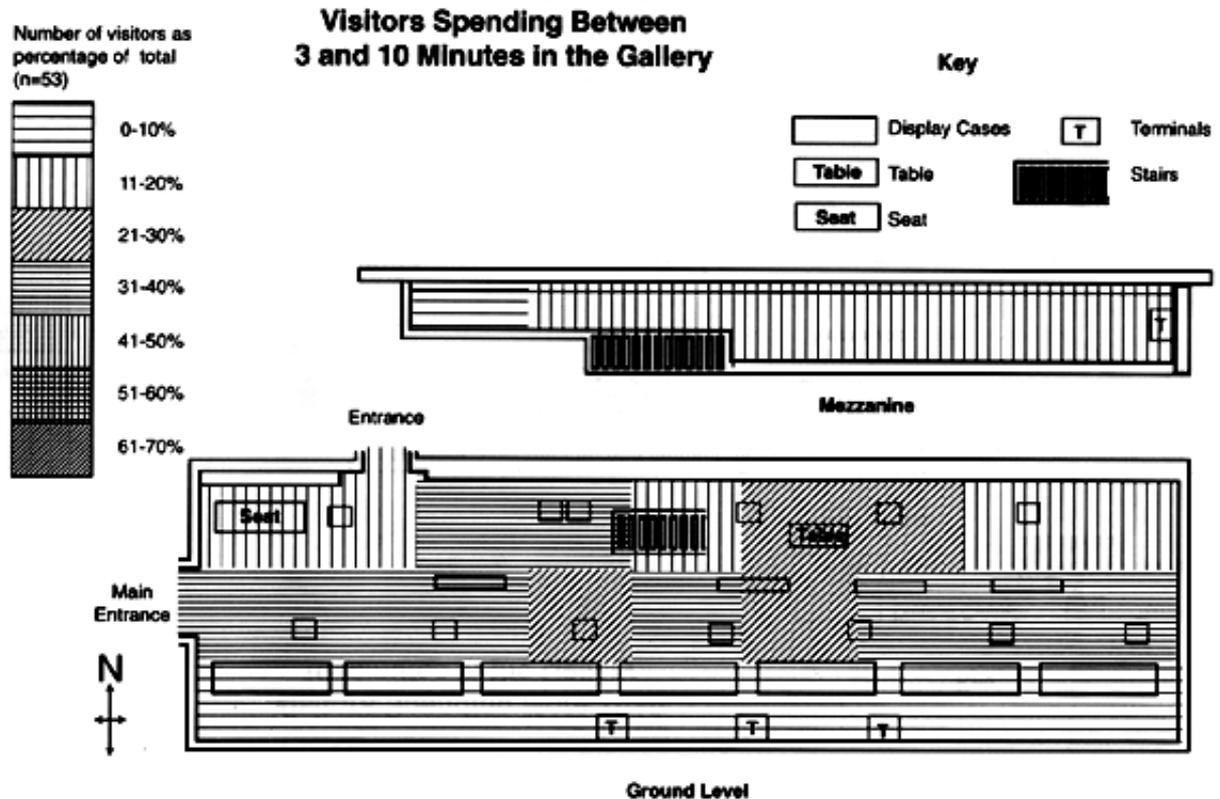
The response rate in the present study was greater than 90%. The questionnaire covered socio-demographic characteristics, including pattern of present and any previous visits to the museum and gallery, and expertise concerning glass. It requested estimates of satisfaction with the ordering of the gallery, its visual impact and the amount and quality of information offered and knowledge acquired.

It asked a series of questions about their use of the electronic labelling system and how effective it was in providing information. It also queried whether respondents would be returning and whether they would encourage others to visit the gallery. These questions were designed to allow us to assess how visitors responded to and understood the Gallery structure including its visual impact; the arrangement of stories and

themes and the presentation and display of material.

Inferential, as well as descriptive statistics were used to analyse the questionnaire data. Multivariate analyses were conducted. These

were used to unravel interactions between factors which predicted knowledge-gain during the visit, use of the computer terminals, and willingness to encourage other people to come to the gallery.



RESULTS

The Observation Study Results

In providing maps of the movement within the gallery, two groups were identified: those who spent between three and ten minutes and visitors who spent more than ten minutes in the gallery. A 34-square grid of the gallery was overlaid on each visitor's trace of movement within the gallery. From this a frequency matrix was produced which summarised where within the gallery people in each group had visited. The frequency measures were converted to percentage scores.

These scores are presented using a colour continuum from blue to red in which "cold" areas of the gallery (i.e. those which were infrequently visited) are blue whilst "hot" areas of the gallery (i.e. those often visited) are depicted as red. This provides a clear visual representation of the density of visitors to all parts of the gallery.

The "movement maps", showing usage of the gallery (Figures 1 and 2) are reminiscent of Bechtel's (1967) Hodometer method.

Figure 1 shows where people ($N = 53$) who spent between three and ten minutes in the gal-

lery chose to visit.

The extent to which these visitors penetrated the gallery is shown by the relative coolness of the mezzanine and the area along the south wall behind the cases. Visitors who spent between three and ten minutes in the gallery tended to use the middle of the gallery. The stairwell may have been obstructing flow along the north wall as shown by the dark green area around the stairs.

Figure 2 summarises the parts of the gallery visited by people who spent more than ten minutes in the gallery.

Visitors who spent more than ten minutes in the gallery were likely to use both levels of the gallery as shown by the "warmth" of the mezzanine for this group.

Similarly, use of the terminals was associated with increased length of stay in the gallery, this was confirmed by analysis of the survey data.

The positioning of the electronic terminals within the gallery appears to have been secondary to the siting of the cases and consequently, the visual accessibility to visitors of the terminals was reduced by their positioning behind cases within the gallery. They are in what are markedly "cold" areas.

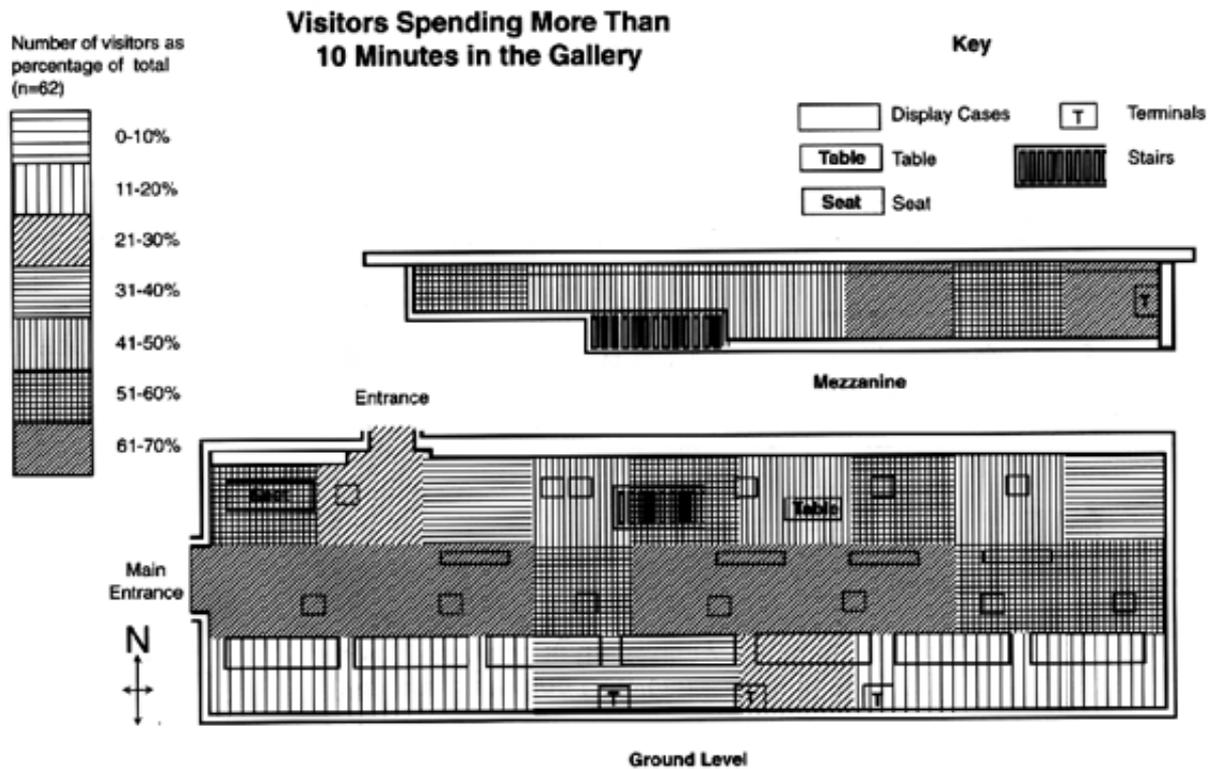


Table 1. Movement around the gallery

Time in gallery	Exit one clockwise	Exit one anti-clockwise	Exit two clockwise	Exit two anti-clockwise	Total
2-10 minutes	8 (19%)	15 (35%)	14 (33%)	6 (14%)	43
More than 10 minutes	9 (18%)	26 (52%)	6 (12%)	9 (18%)	50
Total	17 (18%)	41 (44%)	20 (22%)	15 (16%)	93

From 116 of the observations of movement around the gallery, it was possible to identify whether the individual was consistently moving in a clockwise or counter-clockwise direction in 93 cases. In total, 37 (40%) visitors moved in a clockwise direction (i.e. following the chronological layout of the gallery) and 56 (60%) moved in a counterclockwise direction (i.e. opposite to the chronological layout of the gallery). This dominance of a counterclockwise flow was unexpected, since the gallery had been designed to tell a story of glass from a historical perspective, starting from ancient times through to a display of contemporary pieces and to do so by having the visitor move in a clockwise fashion around the gallery. One interviewee said, "We were systematically following our noses" in what turned out to be the opposite

direction to the predominant organising principle of the displays. However, this counterclockwise dominance of movement of visitors around a museum has been observed in previous research (Melton, 1935, p.93; Klein, 1993) and is not an artifact of this particular gallery.

Within the present study, the position of the two entrances created variation in terms of dominance of route adopted by the visitor. The direction taken was affected by the entrance they used to access the gallery and the length of time spent in the gallery. This is illustrated in Table 1.

The counter-clockwise movement of visitors was more dominant if they entered by Entrance One. This might be expected since on entering through Entrance Two, visitors are immediately adjacent to the chronological "beginning" of

the exhibition and will be encouraged to move clockwise. This seems to be particularly true when they spend a shorter period in the gallery. Of course, they may spend less time in the gallery because they take the clockwise route and find that the information they are seeking is unfolded to them systematically and efficiently. In general, more people going counter-clockwise do seem to spend more time in the gallery.

The Survey Results

Of the 1019 sampled, 60% of those reporting their sex were female (17 did not declare whether they were male or female). The majority of the sample were aged between 25–34 with few younger than 18 and few over 75 years of age. Those who visited specifically to see the gallery spent longer on average in the gallery. This may explain why length of time spent in the gallery was related to reactions to the gallery. People who were there longer, were more motivated to be there in the first place. Furthermore, they were less likely to be first time visitors to the gallery.

After the visit, there were marked increases reported in knowledge on three counts: knowledge of styles of glass, knowledge of the use of glass and knowledge of making glass. The greatest increase in knowledge was reported by those visiting the gallery for the first time. A multiple regression, which calculates which are the most significant predictors of a particular outcome, showed that increases in knowledge were also associated with having found the gallery visually pleasing; informatively ordered; having had a prior interest in the study of glass and having read the information in case displays. These factors accounted for around 12% of the variability in knowledge increase ($F = 10.2$, $df 9, 720$, $p < 0.001$). Other factors which were not measured using the questionnaire would have been responsible for the remainder of the variability. Nationality, age and sex were unrelated to knowledge-gain nor was using the computer terminals for information. This may arise because the most knowledge-gain occurred for those initially most ignorant and computer terminal use was associated with higher baseline levels of knowledge.

Discriminant analysis was also used to identify the factors which contributed to the prediction of who would encourage others to come to the gallery. This showed that those who would be encouraging others to come to the gallery

were those who had found it more visually pleasing, had spent longer in the gallery, had read the information on offer, were interested in glass before coming, liked the staircase, did not find the layout confusing, were not visiting alone, had used the terminals and were resident in an English-speaking country. A statistical procedure was used which found that these factors explained a fair amount of the variance between those who would encourage others and those who would not (Canonical correlation 0.52, Wilks' Lambda 0.72).

Of those who spent more than ten minutes in the gallery, a higher proportion (52%) entered through Entrance 1 than Entrance 2 (30%). This may be explained if visitors who intended to concentrate upon this particular gallery came directly from the main entrance to the museum. It may also be that the design of the gallery has created an illusion of depth and spaciousness for visitors who enter from the main entrance which is enhanced by the use of mirrored walls and cases aligned with the length of the gallery. Some people commented that they did not notice the mirrored walls until they walked into them. "I thought I was going to keep going down there and all of a sudden that was it." However, for visitors entering from the bridge (entrance 2), the illusory effect is not so striking or eye-catching. This design feature may be maximising the likelihood that people who enter through the main entrance will stay.

DISCUSSION

Despite the heterogeneity of museum art gallery visitors, it was possible to distinguish between two dominant visitor groups; expert and non-expert users. These groups used different parts of the gallery and had differing expectations about the layout and design of the Glass Gallery. However, the layout of the gallery was regarded positively by most visitors. The layout of the new glass gallery came as a relief to some who had come to the gallery from other parts of the V&A. For example, one retired man said "It was difficult to find the gallery from the restaurant. [However] the layout is exciting and when you have trudged through the traditional [galleries] it comes as a relief after the oak cabinets."

Someone else crystallised the views of many when she said: "[We are] bombarded with cheap entertainment and it takes a lot of patience to walk around.

Table 2. Time spent in the gallery

Length of time spent in the glass gallery	Entrance 1 (N = 88)	Entrance 2 (N = 54)	Total observed (N = 152)
Entered and exited the gallery without looking at the exhibits	12 (14%)	6 (11%)	18
Paused in the gallery	14 (16%)	5 (9%)	19
Between three and ten minutes	25 (28%)	28 (52%)	53
More than ten minutes	46 (52%)	16 (30%)	62

“So if you attract someone into the gallery and inspire them with a look, ... so that they will stay and look around, you have accomplished something”.

After visiting the gallery, people reported significant gains in knowledge about the styles, use and making of glass. It was intriguing that knowledge-gain was linked strongly to finding the gallery visually pleasing.

This further justifies the emphasis in gallery design upon visual and aesthetic impact. Their very positive reactions to the gallery led a substantial majority to claim that they wished to learn more about glass, would be returning to the gallery and would be encouraging others to come to the gallery.

In many ways, the Glass Gallery achieved its objectives:

The gallery as a whole was perceived to be well-ordered by most people.

The majority of visitors found it visually pleasing, they liked the separation into two levels, and few actively disliked the specially designed glass staircase.

Most markedly, after visiting the gallery, people reported significant gains in knowledge about the styles, use and making of glass.

Knowledge-gain was linked strongly to finding the gallery visually pleasing. This justified the emphasis in the gallery design upon visual and aesthetic impact.

Their very positive reactions to the gallery led a substantial majority to claim that they wished to learn more about glass, would be returning to the gallery and would be encouraging others to come to the gallery.

However,

Some people would like more indication of where the gallery sequence starts and the direction in which they should travel around the gallery. The survey data showed that visitors recognised that time period was an important determiner for selection of objects for the displays in the main run of the gal-

lery. They also thought that beauty and glass technique were organising principles for display. The observations and the structured interviews showed that people were not using their awareness of the chronological principle underlying the organisation of the displays to orientate themselves. However, visitors showed no sign of experiencing dissatisfaction when they did not follow the chronological sequence.

It was notable that only those who stayed in the gallery for longer than 10 minutes went onto the mezzanine. The majority did not treat it as a prime target for exploration.

The structured interviews and observations revealed that the terminals failed to capture people's attention. The position of the terminals within the gallery was criticised. They were located in the least frequented parts of the gallery as was illustrated by the movement mapping. The positioning of the terminals may be with good reason, since, if they were in the most populated areas, they could obstruct the flow of movement and the aesthetic of the gallery as a whole. Nevertheless, their location tended to minimise visibility and militate against their use.

These conclusions led to a number of recommendations:

It would be advantageous to provide a map of the gallery which clearly indicated an advised route around it including where one should start (an aerial view was proposed) for those visitors who felt the need for a more structured experience.

The map could be used as a stimulus to encourage people to venture into those gallery areas which were less frequented, including the sites where terminals were located, and could act as a vehicle for transmitting tasty tidbits about the design and administration of the gallery itself.

This map could also act as a memento, to be taken away and perhaps used to encourage others to visit the gallery (this means that it

should be visually attractive, perhaps in post-card form).

These recommendations focus on how the use of the Glass Gallery could be optimised. They were made against a set of findings which in the main indicated that the Glass Gallery had been successful in achieving its prime objectives.

It undoubtedly does provide a “History of

Glass” for the general public who found it visually stunning and a source of new knowledge. It caters for the needs of specialists in the provision of the study collection and the gallery is currently showing as much as is physically possible of the V&A glass collection, without overly confusing visitors or losing the integrity of the story it unfolds.

Note: This research was commissioned by the Director of the V&A Museum, Kensington, London in 1994. We are grateful to the Director of the V&A Museum and the curators of the Glass Gallery for permission to use results from “The Glass Gallery: Final Report” by G.M Breakwell and H.M. Wright in this paper.

REFERENCES

- Bechtel, Robert, 1967. “Hodometer Research in Museums” in *Museum News*, Vol. 45, No. 7, pp. 23–26.
- Harrod, T., 1994. “Suddenly, it all became clear” in *The Independent on Sunday*, 24 April 1994.
- Klein, H-J., 1993. “Tracking Visitor Circulation in Museum Settings” in *Environment and Behavior*, Vol. 225, No. 6, pp. 782–800.
- Melton, A.W., 1935. *Problems of Installation in Museums of Art* (AAM, New Series, No. 14). Washington, DC: American Association of Museums.
- Rubenstein, R., A. Paradis, & L. Munro, 1993. “A Comparative Study of a Traveling Exhibition at Four Public Settings in Canada” in *Environment and Behavior*, Vol. 25, No. 6, pp. 801–820.
- Miles, R.S., M.B. Alt, D.C. Gosling, B.N. Lewis, & A.F. Tout, 1982. *The Design of Educational Exhibits*. London: Allen & Unwin.
- Miles, R.S & G. Clarke, 1993. “Setting Off on the Right Foot: Front-end Evaluation. Special Issue: Environmental Design and Evaluation in Museums” in *Environment and Behavior*, Vol. 25, No. 6, pp. 698–709.
- Talbot, J.F., R. Kaplan, F.E. Kuo, & S. Kaplan, 1993. “Factors that Enhance Effectiveness of Visitor Maps. Special Issue: Environmental Design and Evaluation in Museums” in *Environment and Behavior*, Vol. 25, No. 6, pp. 743–760.