

Chapter 9

THE (POTENTIAL) CONTRIBUTIONS OF COGNITIVE PSYCHOLOGY TO VISITOR STUDIES

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Abstract

The cognitive movement in instruction has major implications for research and practice in informal settings. While some approaches emphasize changing the environment in order to influence visitor behavior in hopes that greater interest and learning will occur, the cognitive approach emphasizes influencing how the learner perceives, thinks and acts in relation to exhibits. Learners are required to be actively involved mentally and physically. Translated to the museum context, it is just as important to focus on how the visitor perceives the museum and what the visitor thinks about museums and exhibits as it is to focus on the exhibit and its revision or reconstruction. Accordingly, the visitor is responsible for attending to exhibits and engaging in the active construction of mental elaborations. The exhibit should be designed so that the visitor can engage in the activities and interactions that facilitate the active construction of mental elaborations. Here visitors are not considered passive consumers of information, rather visitors must use their information-processing skills, search and scanning abilities, memory and intrinsic motivation to organize and understand the exhibit. Given this point of view, what cognitive research and recommended practice has potential implications for visitor studies? This paper will focus on a number of promising cognitive lines of inquiry and suggest their application to learning in informal settings.

Introduction

Koran and Koran (1986) proposed a framework for exploring museum education research. It simultaneously considered the characteristics of visitors, their processing activities, the types of exhibits they were exposed to, and the potential outcomes that might result from this exposure. Although this framework was later used (Koran, Koran, & Foster, 1988) to describe and integrate cognitive research, it could also be utilized to investigate, integrate and interpret research results in the developmental and behavioral domains or research in informal settings.

One reason the cognitive conception of learning (Wittrock, 1978; Shuell, 1986; Shirey & Reynolds, 1988) has been of interest is that it emphasizes influencing how learners perceive, think, and act in relation to exhibits rather than attempting to alter the exhibit environment in order to influence visitor behavior. In the context of museums, zoos, and aquaria it may be as important to focus on how the visitor perceives the museum and what the visitor thinks about museums and exhibits as it is to focus on redesigning exhibit to shape visitor behavior. While exhibit design and redesign are often expensive and time consuming projects, influencing the learner in ways that permit the learner to "act on" the exhibit is less expensive and more easily adapted to individual differences and the informal climate of a museum or theme park.

As Wittrock (1978) points out, in the cognitive conception, the visitor (learner) is responsible for attending to the instruction (exhibit) and for active construction of mental elaborations. The exhibit designer (teacher) is responsible for designing and conducting activities and interactions that facilitate the active construction of mental elaborations.

In research on informal settings behavior has been easily observed and quantified. Visitor behavior could be measured with instruments that record what the visitor does and says (Dierking, 1987; Falk, Koran, Dierking, & Dreblow, 1985). A greater inferential step is necessary in cognitive studies. Information gathered through observation of the learner is used to infer memory structure, strategies used, coding activities, modes of perception, and retrieval of information. A number of lines of research, which may be productive in informal settings, that illustrate this will follow.

Salomon: Amount of Invested Mental Energy

This research considers the degree visitors can be influenced by the manipulation of their perceptions. Salomon (1983) described AIME (amount of invested mental energy) as the number of non-automatic mental elaborations applied to a unit of material. By non-automatic mental elaborations he means that when things are considered easy,

mental elaborations are considered automatic and processing of information is often superficial (it turns out that in a recent study [Koran, Foster & Koran, 1989] museums were perceived as easy and fun), consequently one might expect few non-automatic mental elaborations. Conversely, when the number of non-automatic mental elaborations is high, the task is perceived as difficult. Learning depends on the different ways sources of information are perceived. If we can provide visitors with information that communicates that the museum presents complex concepts or relationships that require in-depth thought, we can influence what Salomon calls the perceived demand characteristics of the museum and foster a greater mental effort. The deeper processing that results is reported to be related to improved long term memory (of text material), recall of conceptual information, and transfer to new material.

Recommendation: Create information handouts in museums, theme parks, etc. that are designed to influence visitor perception by describing the complexity of conceptual relationships, or employ other ways to increase the number of non-automatic mental elaborations.

Anderson, Pichert, and Shirey: Research on Perspectives

Perspective research (Anderson, Pichert & Shirey, 1983) suggests that one can alter what is learned and remembered (from text) by giving different learners different perspectives. Rather than influencing the learner's perception of a task as easy or difficult (Salomon, 1983), in this research, treatments were designed to influence perspectives. For example, a burglar's perspective as one visits a home versus a home buyers perspective. Different things in the home are remembered depending on the perspective, accordingly acquisition and retention have been influenced.

Recommendation: Create written information or audio tapes of the museum and exhibits that can influence perspective. For example, "Please think of yourself as an explorer identifying the diversity of plants in a messic hammock, etc."

Bandura: Research on Modeling

The research on modeling done by Bandura (1977) and others over the past 25 years indicates that people learn how to perform in a variety of contexts through observation and imitation. When an observer sees a model exhibiting a sequence of behaviors he/she acquires responses having cue properties matching those that had been noted. A watches B confronted with an unfamiliar object or events and acquires B's behaviors without replicating them immediately and without external reinforcement.

Modeling involves attentional activities, coding activities, memory activities and retrieval activities. Its use in museums was recently reported by Koran, Koran, Foster, and Dierking (1988).

Recommendations: Live models, videotape models, written models and audio tape models have all been shown to influence observers. Curators of interpretation could utilize each of these types of models to influence attention, search procedures (in hands-on exhibits), coding activities and to facilitate memory.

Paivio: Imagery

Pioneering studies in imagery (Paivio, 1971) indicate that pictures, instructions to generate images, and concrete words all facilitate memory. Both adults and children appear to be able to create mental elaborations more efficiently under these conditions.

Recommendations: Pictures, instructions to generate images, mnemonics can all be provided for visitors in brochures as they arrive or to accompany specific exhibits.

Brown, Campione, & Day: Meta-cognition

Meta-cognition refers to the development of consciously used learning strategies and self-monitoring of thought processes when confronted with materials to be learned. For instance, Brown, et al., (1981) in her discussion of research on learning from text and the effects of training students to learn from them, makes some interesting observations which could be tested and utilized in museum settings. Subjects were trained to process and remember the types of information they would encounter in the instructional treatments. One simple training task consisted of presenting students with lists of pictures, too long for them to recall without using some deliberate memory strategy. They were told to study the lists for as long as they wished, but recall was low. The training they subsequently received provided strategies which could be used to facilitate recall including self-teaching components, and feedback allowing students to monitor their state of learning. Two effective strategies were found to be cumulative rehearsal and anticipation. These activities acted as an aid to memory and provided information about the current status of their memory if anticipation of the next picture was low. Findings were encouraging for older students with retention lasting up to a year.

Recommendation: Analyze exhibits and simplify objects, events, graphics so that basic rules can be developed to learn from the exhibits. Provide instructions on how to learn from particular exhibits. Develop

materials to accompany exhibits that teach appropriate learning strategies and introduce the concept of self-monitoring of learning strategies.

Rothkopf; Groesser & Black: Use of Questions

Rothkopf (1970) once stated you can lead a horse to water but you cannot get water into the horses stomach unless he does it. The use of questions in informal settings has the same effect. Visitors can be led to exhibits, or find them themselves, but they must themselves act to get the content of the exhibit into their cognitive structure. Questions inserted into text materials have been shown to converge attention on specific content, when they precede the content, and to produce a divergent memory search, when they follow the content. Acquisition and retention of specific kinds of information results. Similarly, questions can be designed to influence the acquisition of higher order information as well as factual information.

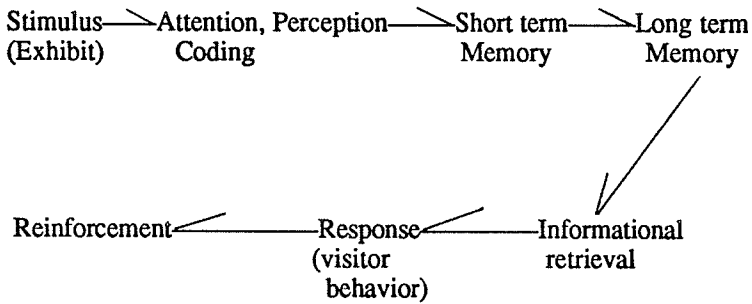
Recommendation: Orienting materials provided by museums or theme parks can be keyed to particular exhibits or the entire park. They can be designed to influence how and what visitors pay attention to, and what they come away with. Video tapes preceding or following exhibits, or docents can serve the same purpose. Carefully placed questions can have the effect of converging attention on specific types of content vs stimulating a broad mental search of the material in an exhibit or exhibit hall depending on whether they are placed before or after the experience.

Conclusion

The aforementioned review of some research activities in cognitive psychology indicates potential and in some cases actual contributions to visitor studies research and practice. Although there are many lines of research not considered here because of space and time considerations, this paper is based on the observation that visitors to museums need all the help we can provide them in learning what to attend to, how to attend to it, how to think about what is observed and to process relevant information, as well as how to monitor their thinking and retrieve information observed.

In the introduction a contrast was made between cognitive and noncognitive approaches to museum studies. Both have a place in visitor studies depending on the objectives of the researcher and practitioner. In an earlier paper Koran and Koran (1983) proposed a model to guide research and development activities which more clearly and simply depict the difference in orientation of behavioral and cognitive researchers (see Figure 1).

Figure 1



From Koran & Koran (1983)

The researcher who is behavioral in orientation would concentrate on altering the learning environment (exhibit) and observe the response (visitor behavior). The research cited here concentrates more heavily on providing learners with ways to increase their own skills in the areas of attention, perception, coding, memory, and retrieval. Less attention is given to the stimulus and response conditions per se. The implications for the activities of museum personnel is that on one hand (behavioral conception) the design, evaluation, and redesign of exhibits and exhibit halls is a prominent activity of the museum staff. These activities are costly and time consuming. On the other hand efforts can be made to extend the training of docents and utilize video, audio, and written materials to teach visitors how to learn from existing museum exhibits. Clearly prior knowledge is a critical factor in all learning, but a variety of ways have been suggested in this paper to compliment and supplement prior knowledge with visitor strategies to address information and to self-monitor progress. In both schools and museums the teacher (exhibit) is responsible for teaching; the learner (visitor) is responsible for learning. Museum curators and researchers are responsible for designing exhibits so that they require visitors to engage in a variety of mental elaborations, and providing ways to assist the visitor to approach learning effectively.

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