Chapter 28

THE RELATIONSHIP AMONG INTEREST, ATTENTION AND LEARNING IN A NATURAL HISTORY MUSEUM

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Abstract

Research on visitor behavior in museums and other informal settings frequently reports "attracting" and "holding power" of exhibits. From these data researchers have inferred interest, attention and learning. Although psychological studies have explored the effect of interest on attention and learning, similar data have not been reported in museum literature. Conventional wisdom suggests that if an individual is interested in a topic, he/she will pay more attention to the topic and learn more about the topic. Research with both narrative prose and unrelated sentences suggests that this relationship does indeed exist. In these studies, increased attention is devoted to elements of a text in proportion to their interest. Because of the extra attention and processing activities supported by the extra attention, elements of interest are learned better than other elements. However, these results have not always been consistent.

In this study, 47 College of Education undergraduates observed a sequence of 11 static case exhibits. All 11 exhibits were dealing with aspects of Florida natural history. A Likert scale containing 11 items was designed and used to assess interest, and the amount of time visitors spent observing the exhibit was used as an indication of attention. A criterion test with 56 possible correct responses was used to assess learning from the exhibits.

Multiple regression analysis indicated that there was a significant relationship between attention and the score on the criterion measure, with greater attention yielding higher test scores ($p < .05$). Similarly, increased interest resulted in greater attention ($p < .05$). However, the total variance accounted for in a general linear model indicated that attention, not interest, accounted for the highest percent of variance.

Introduction

Scholars who study learning in informal settings have recognized for a long time that attention is a critical factor in visitor learning from museum exhibits (Wittlin, 1968; Shettel, 1973; Koran, Koran & Longino, 1986b; Koran, Koran, Dieking & Foster, 1988). Many have observed that in order for an exhibit to be educationally effective it must attract viewer attention, maintain attention, and provide useful information. Some of the significant early research done in museums specifically dealt with techniques for directing and controlling attention (Screven 1974, 1975). In these studies, instructional design procedures and adjunct media were incorporated in exhibits to study their attention directing and focusing attributes. Adjuncts such as pretests, behavioral objectives, "punchboards", audio cassettes, and inserted questions were variables in these early studies. The assumption was made that if attention was focused, learning should, and would, follow (Koran, Koran, & Longino, 1986b). Given visitor attention to exhibits, researchers have inferred both interest and learning (Falk, 1983a, 1983b; Screven, 1986).

Although psychological studies have explored the relationship of interest, attention, and learning to each other (Shirey & Reynolds, 1988), similar research has not appeared in museum, aquarium, and zoological publications. Conventional wisdom, however, suggests that if an individual is interested in a topic he or she will pay more attention to the topic and learn more about the topic. However, researchers examining the effect of interest, attention, and learning have had difficulty demonstrating a linear relationship between the three variables. Shirey and Reynolds (1988) reported that children may devote more attention to interesting material, but this does not show any relationship between increased attention and learning. Shirey and Reynolds also reported a negative relationship between interest and attention for adults, when adults were aware of an impending test on the information being studied. Shirey and Reynolds hypothesized that two forms of learning are occurring with adult learners: task relevant learning that becomes effective when a strategy involving attention as a mediating factor is engaged; and internally driven learning that occurs without extra effort on the part of the learner. Since most visitors to informal learning centers do not expect to be tested at the end of their visit, it was our expectation in this study that a linear relationship between interest, attention, and learning would not be found.

Method

Forty-seven College of Education undergraduates were randomly assigned to either view 11 exhibits and take a criterion test or take the criterion test alone (47 treatment, 26 control). Each exhibit depicted biologic specimens or phenomena which were related to each other. Visitors entered the exhibit hall on a schedule and were guided to the sequence of 11 exhibits. They were provided with written instructions telling them to observe the exhibits in sequence. They were not aware of the fact that they would take a test on the material. The exhibits were part of the Florida Museum of Natural History and dealt with the following topics: Poisonous Snakes of Florida, Bird Identification, Amphibians and Reptiles of Florida, Mammal Invasion and Introduction, Formation of Fossils, Bird Habitats, Genetic Variation in Mammals, Tropical Ice Age Mammals, Florida Land or Sea, Fresh Water Clams of Florida, Fossil Invertebrates and Living Counterparts. A control group visited the museum, but not this exhibit sequence, and took the knowledge test only. A researcher timed the visitors as they viewed each exhibit and administered an interest test and the criterion test when they finished. Interest level was measured by a Likert Scale of 1 to 5 with very dull being a 1 and the range going to dull (2), average (3), interesting (4), and very interesting (5). Attention was measured using a stop watch which was started when the visitor faced the exhibit. The researcher gathered attention time for each visitor and exhibit independently. When the visitors finished viewing the last exhibit in the sequence, they were seated at a table and took a 57-item criterion test with approximately five items from each exhibit. The reliability of the criterion test was .7.

Results

Multiple regression analysis was used to examine main effects (treatment vs. control) as well as the relationship between interest, attention, and learning. It was found that individuals viewing the 11 exhibits scored significantly higher on a test of exhibit content than the control group ($p < .05$). The general linear model also permitted the determination of the amount of variance accounted for by each independent variable. When the amount of time spent at each exhibit was examined in relation to the total amount of time spent at all exhibits, it was found that time spent permitted the development of an "attention hierarchy". More time was spent viewing Poisonous Snakes of Florida (12.8% of total), while the least time was spent on Fossil Invertebrates and Living Counterparts (6% of total). From top to bottom the percent of total time spent observing the 11 exhibits was as follows:

Poisonous Snakes of Florida (12.8)
Bird Identification (11.9)
Amphibians and Reptiles of Florida (10.8)
Mammal Invasions and Introductions (10.7)
Formation of Fossils (9.2)
Bird Habitats (8.6)
Genetic Variation in Mammals (7.9)
Tropical Ice Age Mammals (7.8)
Florida Land or Sea (7.8)
Fresh Water Clams of Florida (6.1)
Fossil Invertebrates and Living Counterparts (6.0).

Similarly, interest in the exhibits ranked them as follows:
Poisonous Snakes of Florida (4.2)
Bird Identification (4.1)
Bird Habitats (3.8)
Amphibians and Reptiles of Florida (3.7)
Mammal Invasions and Introductions (3.7)
Genetic Variation in Mammals (3.4)
Formation of Fossils (3.3)
Tropical Ice Age Mammals (3.3)
Florida Land or Sea (3.2)
Fossil Invertebrates and Living Counterparts (3.1)
Fresh Water Clams of Florida (2.6)

A perusal of the mean attentional data and the mean interest data indicated a close correspondence in the top half and the bottom half of each list. Some topics were clearly of more interest than others and in general they attracted and maintained attention longer as a result. Subsequent multiple regression analysis confirmed these data.

Multiple regression analysis also indicated that there was a significant relationship between attention and the score on the criterion measure, with greater attention yielding greater learning ($p < .05$). The data revealed that the relationship between these three variables was not linear. This result was supported by other research findings.

Discussion and Interpretation

It is clear from the data gathered that learning from exhibits is more complex than a linear model relating interest, attention, and learning might suggest. Visitors in this study selectively allocated attention to exhibits that they perceived as interesting and perhaps those with content for which they had previous knowledge or familiarity. Poisonous Snakes of Florida and Bird Identification ranked high in interest as well as attention. The same was true

of Amphibians and Reptiles of Florida, Bird Habitats, and Mammal Invasion and Introductions. Some exhibits were marginally attended to and of marginal interest, i.e., Genetic Variation in Mammals and Formation of Fossils. Less familiar content exhibits, those with less commonly known content, elicited little interest and attention. Research studies with young children report similar results (Shirey & Reynolds, 1988) where subjects identified information as important that they found interesting, familiar, or culturally relevant. While studies with adult prose learning report that "better learned, interesting information was allocated less attention"; in this study the opposite appeared to be true.

The results of this study suggest that attention is indeed essential for learning. However, interest is not as important to learning as it is to attention. Since visitors in museums may selectively attend to exhibits, those exhibits of most interest receive the greatest attention; however, the factor that was most important to learning was the length of attention. Previous knowledge apparently fueled interest and appeared to be a critical factor in this study as in other research on learning in museums (Shettel, 1973). The exhibits that received the highest degree of interest and attention were those that would be expected in a state such as Florida, rich in flora, fauna, and a diversity of interesting and dangerous reptiles. Although interest was not as significantly related to learning as attention was, it still appears to be a vital component in the acquisition of knowledge from exhibits. Preliminary preparation of school groups and casual visitors in the content of exhibits appears vital to the stimulation of interest and subsequent attention. Museum researchers should recognize, though, that while interest is necessary, it is not sufficient for learning to occur. So current efforts to influence visitor attention in a variety of ways still appear to be productive options.

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