Attitudes, Beliefs, Intended Behaviors, and Exhibit Evaluation

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Exhibits are often designed to provide a learning experience for visitors. One type of visitor learning that may occur, either intentionally or unintentionally, is the formation or alteration of attitudes toward some aspect of the exhibit content. This may be an attitude pertaining to any entity such as a person, place, object, issue, or behavior. An exhibit can be designed or improved to increase the effectiveness of attitude learning.

Attitude learning or change is a controversial goal for exhibits. It can be argued that exhibits should emphasize factual information and avoid content that could influence attitudes. In practice, however, avoiding attitude learning is very difficult. Even if attitude change is not a goal, there is apt to be some influence on beliefs. For example, visitors may use exhibit content to confirm attitudes they already have.

Furthermore, modern exhibits often stress issues such as environmental problems. Modern exhibits are often issue-oriented and include a topic like global survival (Sullivan, 1992). Attitude learning can occur even if exhibit planners are careful to avoid overt propagandizing (i.e., use of emotional language, one-sided messages). However – and here is the paradox of attitude learning – information may fail to have any affect on attitudes.

Most people do not just accept information, but evaluate the information they are getting. Evaluation includes attitude learning and can focus on a number of questions. What are the prevalent attitudes? Are there serious misconceptions involved? Does exposure to an exhibit change attitudes in any way? Does an exhibit prompt visitors to change their actions or behaviors toward some topic?

The topic of attitude persuasion has been a concern for many social psychologists for some 40 years. Methodological and theoretical advances in this area can be applied to the design of exhibits in an effort to increase their attitude learning effectiveness and to evaluate visitor attitudes in general.

First, we will define the concepts attitude, belief and behavior, and we will describe how to appropriately measure these concepts. Second, we will

discuss how the concepts are related and also how they are related to future behaviors. Third, a technique for designing or improving an exhibit to increase the likelihood of visitor attitude change will be explained. Finally, we will present an example from a study we recently performed on the *Close To Home* exhibit, which is an exhibit on urban wildlife at the Denver Museum of Natural History.

One of the more empirically founded theoretical frameworks of beliefs, attitudes and behaviors is the **Theory of Reasoned Action** developed by Icek Ajzen and Martin Fishbein (1980). The theory is based on the premise that a person's attitude toward an entity is determined by the integrated information the person possesses about the entity. Thus, the theory assumes that people rationally process the information available to them and use the information to make behavioral decisions. We have adapted their measurement techniques for use in visitor evaluation.

Definitions and Measurement of Attitude

Attitudes and beliefs are not synonymous terms, but they are closely related. An attitude is a general positive to negative feeling toward some entity such as a person, place, object, issue, or behavior. The statement, "I like museums" is said to be a positive attitude toward museums. Beliefs are the information, either factual or subjective, that a person possesses pertaining to the entity. For instance, "Museums are very credible," or "Museums are keepers of knowledge" are belief statements related to museums. Reading about museums or visiting one are museum-related behaviors.

An effective means of discovering the salient beliefs people possess related to some entity is to ask thirty or so individuals what they think about the entity. The attributes or beliefs mentioned most frequently by the sample can then be culled from the pool of their responses and listed on a standardized questionnaire. Another sample of survey participants is asked to agree strongly to disagree strongly with each of the beliefs related to the entity.

There are a number of ways to measure attitudes toward some entity once attributes or beliefs are identified. One efficient technique is the **semantic differential** (Osgood, Suci and Tannenbaum, 1957). The survey respondent is asked to rate the target entity on a few scales with bipolar adjective pairs on the scale ends. The bipolar adjectives chosen should represent some evaluative dimension of the entity, such as "good" to "bad" or "beneficial" to "harmful." The bipolar scales can also reflect the attributes or beliefs revealed in the thirty or so interviews mentioned above. It is best to use at least three to four of these scales so respondents can adequately report their attitude toward the entity. The mean value across the three or four scales is the measure of the attitude. The semantic differential

technique highly correlates with other more difficult to construct attitude measures (Petty and Cacioppo, 1981).

Attitude/Belief/Intended Behavior Relationships

According to the **Theory of Reasoned Action** (Ajzen and Fishbein, 1980), people's attitudes toward an entity are derived from the primary beliefs they maintain about the entity. Primary beliefs are the sub-set of the total set of beliefs the person holds about the entity that predict his or her attitudinal position. For example, a person may maintain many beliefs about museums, but only some of the beliefs are important for deriving a person's attitude toward them. Although the person may believe that museums are complex, this belief may have little impact on their attitude toward them. The belief that museums are credible sources of information may belong to the sub-set of primary beliefs that make up the favorable attitude.

Although respondents may have reported their amount of agreement with a number of salient beliefs related to the entity, it is still important to reveal the two or three beliefs that are most primary in deriving the attitude. We have used a statistical technique known as **stepwise multiple regression** (see, for example, Tabachnick & Fidell, 1983) to accomplish this task, where we have defined the belief ratings as the predictor variables and the attitude measure as the predicted variable. This technique will enter the belief that accounts for the most variability in attitude scores into the equation first. It will then pick the belief that accounts for a significant addition in attitude score variability above the amount accounted for by the first belief that was entered. This process will stop when no more beliefs can be entered that significantly add to the prediction of attitudes. The beliefs that were entered into the regression equation represent the set of primary beliefs related to the entity. It is these beliefs that should be the focus of any effort to change attitudes.

Knowing people's attitudes can be extremely useful when they can predict their future behaviors. The attitude-behavior relationship has received much attention in social psychology. Early studies in attitude research demonstrated a lack of association between people's attitudes toward an entity and a single, specific behavior related to the entity (for example, see Corey, 1937). Weigle and Newman (1976), however, demonstrated that general attitudes were significantly associated with a multiple-set of related behavioral activities. The researchers measured people's general attitudes toward the environment, and then attempted to predict specific environmental protection behaviors such as signing a petition to prevent offshore drilling. The correlations between the general attitude measure and the specific behaviors were in the r=.20 to r=.30 range, but the correlation between the attitude measure and the multiple-set of the behaviors was r=.62. In other words, a general attitude measure significantly predicts a

range of possible behaviors related to the entity, but not one specific behavior.

The Theory of Reasoned Action (Ajzen and Fishbein, 1980) states that an attitude toward a behavior will strongly predict an intended behavior (usually it will not directly predict an actual behavior), as long as the action is defined by a specific time and context. For instance, to get an accurate measure of voting behavior toward an incumbent, the researcher must ask the voters if they will vote for the incumbent in an upcoming election on November 4 (specified time) at the local church (specified context). The intermediary factor of intended behaviors strongly predicts people's actual behaviors. Intended behaviors have significantly predicted actual behaviors in a variety of behavioral domains, such as birth control use, voting, product purchases, etc. (Ajzen and Fishbein, 1980).

Obviously, it is easier to get a measure of intended behaviors than actual behaviors because it is not necessary to maintain contact with the respondents to ask them or observe if they actually performed the behavior. Since intended behaviors specified by time and context have adequately predicted actual behaviors across a variety of situations, collecting measures of intended behaviors is sufficient.

Improving or Designing Exhibits to Change Attitudes

Remember, however, that only attitudes toward a specific behavior significantly predict intentions to perform that behavior. Thus, if the goal of an exhibit is to increase visitor performance of one specific behavior, the exhibit should be designed to change visitor attitudes related to the behavior. If the exhibit's goal is to increase visitor performance of one or more behaviors of a multiple-set related to the entity, the exhibit should be designed to change general visitor attitudes toward the entity. When evaluating the effectiveness of the latter type of exhibit, visitors should be asked to report their intentions for performing a number of related behaviors.

The Theory of Reasoned Action (Fishbein, 1979) clearly contends that any attempt to persuade people to change their attitudes and behaviors must be directed at changing their primary beliefs. Thus, education, which is defined here as the presentation of factual information pertaining to some entity, is only effective if the information addresses these beliefs. Perhaps many attempts at altering attitudes toward some entity by education have failed because primary beliefs were not addressed. For example, if the belief that birds transmit diseases to people is targeted as an avenue to alter people's attitudes toward birds living in urban areas, education is likely to be futile, if that belief is not a primary one. Providing information about how birds increase the aesthetic value of a community, however is likely to be effective, if increasing aesthetic value is a primary belief.

In summary, if the content of an exhibit is designed to alter general attitudes toward a topic, the visitors cannot be expected to increase their likelihood of intending to perform one specific behavior related to the topic – only to a multiple-set of related behaviors. If increasing the visitors' intentions to perform a specific behavior is the objective, then the exhibit should be designed to alter attitudes toward performing that behavior.

An Example of Measuring Visitor Attitudes/Beliefs/Intentions

Now we will present findings of a study we recently completed that assessed the effectiveness of the *Close To Home* exhibit, an exhibit on urban wildlife of Colorado, in changing visitor attitudes toward wildlife existing in urban regions. It should be noted that the exhibit was not explicitly designed to change visitor attitudes toward urban wildlife, but to create an awareness that many species inhabit urban regions.

The exhibit begins with an entrance panel consisting of newspaper clippings about problematic occurrences of wildlife interacting with humans. Exhibit text presented both positive and negative reviews of urban wildlife. An adjacent panel defines wildlife and speaks about Colorado's expanding Front Range population, while another panel discusses larger animals such as mule deer, black bears, and mountain lions existing in metropolitan Denver. The remainder of the exhibit consists of showcases containing bird, insect, and small mammal specimens displayed in urban scenarios, such as barn swallows perched on a traffic light, sparrows resting on a neon sign, insects at a night-lit soda dispenser, and a raccoon getting into a garbage can. Text accompanies the specimen showcases. The text discusses topics such as wildlife range and location in the Front Range, eating and breeding habits, and how the animals adapt to the urban region. A positive and negative statement regarding the animal's urban existence accompany most showcases. For instance, the squirrel showcase has both pro and con statements: "They're fun to watch hide their food" (pro), and "They get into things they should not" (con).

In Colorado, the majority of people live along the eastern foothills of the Rockies known as the Front Range. There are suburban fringe regions that reach up into forested terrain where many deer, fox, bears and mountain lions reside. Consequently, there has been an increasing number of confrontations between people and mountain lions in the last year. Recently, a lion killed a teenager while jogging, and lions have been known to raid barns and kill livestock and pets.

Because people may have different attitudes toward certain wildlife living in urban regions, we thought it best to develop three separate questionnaires measuring attitudes toward birds, small and/or docile mammals (such as deer and squirrels), and the more threatening bears and

lions. We will describe the kinds of questions we asked by using the bird questionnaire. First, we measured attitudes toward urban birds by asking the visitor to respond on three semantic differential scales to the question, "Birds living in urban regions are _____ to me." The three bipolar set of adjectives we used were: "annoying" to "not annoying;" "good" to "bad;" "harmful" to "beneficial." The next set of questions related to the salient beliefs people possess toward urban birds. These items were based on interviews with 30 visitors who were asked to think of benefits and disadvantages of birds living in urban regions. The most frequently states ones were used for the standardized survey. There were nine salient belief statements in which the visitor was asked to "strongly agree" to "strongly disagree." Some of these statements were: "Urban birds are a nuisance;" "They are enjoyable to observe;" and, "They increase the property value of homes in a community."

To assess the effectiveness of the exhibit in changing visitor attitudes toward the three types of urban wildlife, half of the visitors sampled were asked to complete one of the three surveys while they were entering the exhibit, and half of those sampled were asked while they were exiting. The former group was the control and the latter group the treatment.

Figure 1 shows the mean attitude scores for each of the six conditions. There was a main effect for animal type. Attitude scores toward the three different types were significantly different, $F(2, 84) = 18.68$, $p < .05$.

Three follow-up t-tests comparing attitude scores across the three animal types were performed to examine which scores differed. Mean attitudes toward birds ($M = 6.44$, S. D = 0.82) did not significantly differ from mean attitudes toward docile mammals ($M = 6.08$, S. D = 1.00), $t(58) = 1.55$, $p > .05$. Mean attitudes toward docile mammals, however, were significantly higher than mean attitudes toward bears/lions ($M = 4.89$, S. D = 1.43), $t(58) = 3.73$, $p < .05$. Likewise, mean attitudes toward birds were significantly higher than mean attitudes toward bears/lions, $t(58) = 5.16$, $p < .05$.

Further, there was a main effect for experimental condition, $F(1, 84) = 10.01$, $p < .05$. This indicates that the control and treatment group mean attitude scores (across all three animal types) significantly differed. Three follow-up t-tests were performed comparing mean attitude scores for the treatment and control groups in each of the three animal type conditions. For the bear/lion survey, mean attitude scores were significantly more favorable for the treatment group ($M = 5.64$, S.D = 1.36) than for the control group ($M = 4.09$, S.D = 1.07) $t(28) = 3.47$, $p < .05$. The mean attitude scores for the treatment group ($M = 6.49$, S.D = .69) and control group ($M = 6.40$, S.C = .95) did not significantly differ for those who received the bird survey, $t(28) = .29$, $p > .05$. Likewise, the mean attitude scores for the treatment visitors ($M = 6.31$, S.D = 1.03) and control visitors

($\underline{M}$ = 5.84, S.D = .95) that received the docile mammal survey did not significantly differ, $t(28) = 1.29, p > .05$.

Thus, a trip through the exhibit improved visitor attitudes toward the bears/lions, but not the birds and docile mammals. This is an interesting finding because only a very small portion of the exhibit is allocated to the bears/lions. Perhaps a visit to the exhibit creates an acceptance of animals co-existing with humans. Also, notice a ceiling effect with attitudes toward birds and docile mammals. The control group's attitudes were already very positive so there was less room for change.

Recall that primary beliefs that influence attitudes can be identified by using stepwise multiple regression. Table 1 shows the primary beliefs of visitors related to attitudes for each of the three animal types. Only a few beliefs account for a significant amount of variability in attitude scores. Notice for the bear/lion attitudes that causing residential property damage was the sole belief that was entered into the regression equation. Again, this makes sense considering the recent lion raids of farm property.

Table 1

Primary Beliefs for Three Animal Groups as Revealed by Stepwise Regression

Attitudes Toward Birds	
1. Enjoyable to Feed,	R = .71
2. Increase the Aesthetic Value of a Community,	R = .80
Attitudes Toward Docile Mammals	
1. Enjoyable to Observe,	F = .79
2. Are a Nuisance,	R = .89
Attitudes Toward Bears/Lions	
1. Cause Damage,	R = .34

Remember, the best means of changing attitudes toward a topic is to address primary beliefs. In order to further increase visitors' positive attitudes toward bears/lions residing near urban regions, text and supporting material discussing the extent and frequency of lion-human encounters, and how humans can behave safely in these situations, could be added to the exhibit.

Visitors were also asked to report their intentions of performing future behaviors related to the urban wildlife. They were asked questions such as, "How likely is it you will spend recreation time observing urban birds," or "How likely is it you would vote for a law allocating city tax funds to

construct parks that are natural habitats for birds." Table 2 shows the relationships between attitudes toward the three forms of urban wildlife and intended behaviors related to them.

Notice that spending recreational time observing birds and docile mammals were behaviors relatively strongly related to attitudes toward the wildlife. Since attitudes toward wildlife can be considered a general attitude, it was expected that attitude scores would be more related to the multiple-set of behavior intentions rather than any single one. This outcome was true for birds, but not necessarily for docile mammals and bears/lions.

Most of the studies on this topic used actual behaviors rather than intentions. Since the relationship between intentions and actual behaviors is not perfect, measurement error may be present in our data. Ideally, we would have liked to do a follow-up survey that asked visitors to report actual behaviors. Finally, notice that intentions related to bears/lions were weakly related to attitude scores. This could be due to our choosing irrelevant behaviors related to the animals, or that attitudes toward bears/lions do not predict any related intended behaviors. Apparently, our findings indicate that although visitors' bear/lion attitudes improved from visiting the exhibit, the improved attitudes will not lead to a greater likelihood of visitors performing related actions.

Table 2

Attitudes Related to Single or Multiple Intended Behaviors

Attitudes Toward Birds	
1. Purchase a Bird Feeder,	r = .35
2. Vote for Law,	r = .23
3. Recreational Observing,	r = .46
4. Read Newspaper Article,	r = .42
Multiple-Set,	r = .57
Attitudes Toward Docile Mammals	
1. Vote for Law,	r = .35
2. Recreational Observing,	r = .44
3. Read Newspaper Article,	r = .27
Multiple-Set,	r = .45
Attitudes Toward Bears/Lions	
1. Vote for Law,	r = .09
2. Read Newspaper Article,	r = .16
Multiple-Set,	r = .18

Discussion

Though limited in scope and sample size, our study demonstrated the utility of the Theory of Reasoned Action for understanding visitor beliefs and attitudes. A number of beliefs related to exhibit content were identified in the first part of the study. Though not used in our study, focus groups could be a method for identifying beliefs, including primary beliefs. This type of study is also important for identifying beliefs that contribute to naive notions or misconceptions (Borun, 1989). That is, it is helpful to know erroneous beliefs about exhibit content.

The study also yielded limited evidence that some attitude change may have taken place as a function of visiting an exhibit. Visitors can be influenced by exhibit information. It is not necessary to "propagandize" for an exhibit to influence beliefs and attitudes. Finally, the methods discussed in this paper can identify, through the measurement of behavioral intentions, actions that people may take. Understanding behavioral intentions is especially helpful for exhibits on social issues where a goal is to increase public involvement. Consistent with the concept of multiple-set related behaviors discussed earlier, visitors can be provided with a number of potential actions. Actions could include signing a petition, making a donation to a fund, joining an association, signing up to attend a lecture or other similar behaviors.

The actions just mentioned could be included in a study of attitude learning. In fact, some self-reports or observations of behavior are often part of an attitude influence study. Because of time and cost restraints, we did not include observation of behaviors or some of the other concepts included in the Theory of Reasoned Action. For example, normative beliefs refer to how significant others evaluate a particular behavior. Does the visitor think that friends would approve him or her voting for laws to protect urban habitats? Normative beliefs can sometimes predict behavioral intentions as well as actual behaviors.

Finally, it should be noted that understanding visitor beliefs and attitudes is a logical part of front-end evaluation. Exhibit content can be sharpened and better focused if beliefs are known, including beliefs that are mistaken. Even if attitude learning is not a formal objective, understanding beliefs and attitudes can improve overall interpretive effectiveness. Our study came after installation of the *Close to Home* exhibit. Our results could have been more instructive if the study had been included in a front-end evaluation.

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Figure 1: Attitudes Toward Urban Wildlife as a Function of Animal Group and Experimental Condition (N=90, 15 per cell)