FOCUS: MEASURING EXPERIENCE

Zoo Exhibit Experiences and Visitors’ Affective Reactions: A Preliminary Study

JERRY F. LUEBKE

Abstract  The purpose of the present study was to explore the types of personal experiences that were related to zoo visitors’ empathic and affective reactions at an animal exhibit. Various studies have suggested the importance of emotional empathy in motivating concern for the biosphere and pro-environmental behaviors. As such, identifying visitors’ personal experiences at an animal exhibit that may lead to empathic and affective reactions has a direct bearing on learning strategies at zoos, aquariums, and other nature-based museums. Adult day-visitors to a United States zoo were asked to provide written open-ended comments describing any “extra special” experiences they had at an exhibit. These reported experiences were then found to be highly related to visitors’ quantitative ratings regarding their concern, empathy, and sense of connection with nature and wildlife. Preliminary findings are discussed while taking into consideration the additional research questions that remain involving visitors’ empathic reactions to zoo animals.

The motivational dimension of emotional empathy has long been a focus in the psychological research literature (Eisenberg and Miller 1987). For example, Batson et al. (1987) in a series of studies found that empathic concern leads to an altruistic motivation which, in turn, can lead to prosocial behaviors regarding the welfare of another person. Cialdini et al. (1997) also demonstrated that the impact of empathic concern on prosocial behaviors is mediated through a perceived sense of connection or commonality with another person. Other studies have shown that the object of human empathy does not necessarily have to be directed at another human. Some studies have established a linkage between empathy and attitudes toward animals (Amiot and Bastian 2015). Here, empathic concern has been found to be associated with a more welfare-orientated attitude and behavior towards animals. Furthermore, studies in environmental psychology (e.g., Berenguer 2010; Kals et al. 1999; Nisbet et al. 2009; Schultz 2000; Tam 2013) have examined human empathy in relation to environmental issues. These studies, taken as a whole, suggest the importance of empathic perspective taking and emotional affinity or relatedness with nature in motivating concern for the biosphere and pro-environmental behaviors.

The implications of this association between empathic motivation and pro-environmental behaviors has a direct bearing on learning strategies at zoos, aquariums, and other nature-based museums that focus on influencing visitors’ behaviors to alleviate specific societal issues regarding environmental degradation. For example, zoos and aquariums in the United States that belong to the Association of Zoos and Aquariums (AZA) have organizational missions related to conservation and education and key aspects of their mission-related learning strategies include instilling caring for
nature and inspiring conservation action (Luebke and Grajal 2011). As such, understanding what motivates visitors to care for nature and take conservation action is critical to achieving the missions of these institutions.

But what particular experiences during a zoo or aquarium visit promote empathy towards animals and nature? Prior studies at zoos and aquariums have generally demonstrated that visitors’ positive emotional reactions to animals are related to their pro-environmental concern and caring behaviors toward wildlife and nature (e.g., Clayton et al. 2009; Myers et al. 2004). For example, Myers et al. (2004) conducted a study at Brookfield Zoo that focused on visitors’ emotional reactions to observing animals at three zoo exhibits (gorillas, okapi, and snakes). Results indicated that visitors generally tended to report various positive emotional reactions and the intensity of some positive emotions such as respect and wonder were fairly consistent across the three animal exhibits. Other reported emotions, however, such as a sense of connection and love, were found to significantly vary across the three animal exhibits. Visitors also tended to report higher levels of positive emotions across all three animal exhibits if the visitor perceived the animal was paying attention either to them or to other visitors. Similarly, visitors reported higher levels of positive emotions such as peacefulness, caring, and attraction if the animal was exhibiting active behaviors. Another important finding was when the type of animal exhibit was statistically controlled, significant correlations were found between visitors’ ratings of caring about saving the animal and their various reported emotional reactions such as caring, sense of connection, and wonder. Finally, the study found that visitors’ emotional reactions were also related to some of their background characteristics. Specially, existing personality traits of visitors regarding empathy, emotional sensitivity/expressiveness, and general animal orientation were significantly correlated with their emotional reactions to viewing particular animals.

The purpose of the present study was to extend the findings of the Myers et al. (2004) study by exploring in more depth the possible subjective positive experiences of visitors that may be related to their overall affective and empathic reactions at an animal exhibit. Using a mixed-methods approach, visitors were asked to provide written open-ended comments describing any “extra special” experience they had at an exhibit. These personal experiences were then examined in relation to their affective and empathic quantitative ratings on a questionnaire.

**METHOD**

The data presented here are from a larger study conducted at Brookfield Zoo regarding visitors’ various perceptions and reactions to their personal experiences in an animal exhibit. Brookfield Zoo is located in a suburban area outside of Chicago, Illinois, USA. The zoo covers 216 acres and features 25 major exhibit areas representing more than 400 animal species. Four exhibits were selected for the study to obtain a wide range of different animals and exhibit settings that zoo visitors would see and experience. Three exhibits were indoor immersive exhibits and the fourth was an outdoor naturalistic exhibit. Each of the exhibits contained multiple species with various individual habitats and interpretive displays and signage. Animals that visitors observed included primates, small mammals, birds, amphibians, reptiles, invertebrates, and underwater viewing of various marine life. A sample of adult recreational day visitors to the zoo was used for the study and a questionnaire was used to capture their various perceptions and reactions. Trained data
collection staff systematically approached every second adult group that crossed a predetermined line at the exit of each exhibit. The start time of data collection for each exhibit was randomly scheduled on a daily basis between the hours of 11:00 AM and 2:00 PM. Visitors who voluntarily agreed to participate in the study were given a paper questionnaire on a clipboard and asked to read and complete it on their own. Only one individual from each selected visitor group completed the questionnaire.

Included on the questionnaire were three rating items that focused on visitors’ affective/empathic reactions to the exhibit. The items were: (1) Visiting the exhibit has made me more concerned about the well-being of wildlife; (2) The exhibit inspired me to wonder about the thoughts and feelings of the animals I saw; and (3) I have a greater sense of connection with nature as a result of visiting this exhibit. All three items were rated on a 7-point scale ranging from Not at all (1) to Very much so (7). Another item on the questionnaire asked visitors whether they experienced anything “extra special” while they were at the exhibit (yes/no format). If visitors responded yes, an open-ended follow-up question asked them to describe their experience and how they felt about it. This question had been used in previous unpublished internal studies at Brookfield Zoo to probe deeper into visitors’ subjective positive experiences at animal exhibits.

A qualitative analysis was performed on visitors’ open-ended written comments by using a two-step open coding strategy (Flick 2002). First, individual comments were assigned detailed codes related to the focus of the comment. Next, the detailed comment codes were grouped into descriptive categories of comment themes. This procedure was conducted independently by two judges who compared their results and came to agreement on the assignment of all comment codes. The general comment themes were then tallied to determine the prevalence of various themes across visitors.

RESULTS

Given the exploratory nature of the study, data analysis focused on the overall collective results across the four exhibits to obtain a more generalized perspective of visitors’ subjective positive experiences at animal exhibits. In total, 825 adult visitors completed questionnaires across the four exhibits. The overall response rate to the questionnaire was 40%. The majority of respondents were females (70.0%); identified themselves as Caucasian (82.8%); were with children younger than 11 years old (60.9%); were visiting the zoo in a social group that ranged from 2 to 5 people (79.8%); and lived within 75 miles from the zoo (83.5%). Respondents’ ages ranged from 18 to 83 years old with an average age of 38.4 years old. About one-third (32.7%) of the respondents were zoo members. Overall, respondents were generally representative of frequent adult visitors to Brookfield Zoo with 90.3% indicating they had previously visited the zoo and 50.9% indicating they visited the zoo within the last year.

Slightly more than a third (36.4%) of respondents reported having an “extra special” experience during their time in the exhibit. In regard to respondents’ written comments, the findings are summarized in Table 1. About 71% of all comment themes were either focused on animals (45.3%) or focused on the respondent’s own personal experiences in the exhibit (25.6%). Animal themes mainly concerned observing various active animal behaviors or having a close encounter with the animals. Personal experience themes generally centered on introspective or reflective thoughts and feelings during the exhibit experience. Finally, another
19% of the comment themes were related to observing children’s reactions or to the physical features of the exhibits.

To determine the effect an “extra special” experience may have had on visitors’ overall reactions, affective/empathic ratings were examined comparing those that had an “extra special” experience with those that did not. As can be seen in Table 2, respondents who reported having an “extra special” experience rated, on average, their affective/empathic reactions significantly higher than those respondents who did not have an “extra special” experience. The effect sizes (Cohen’s d) across the three items were also fairly moderate suggesting meaningful differences between the two groups.

**DISCUSSION**

The findings from this preliminary study suggest that visitors’ “extra special” experiences are highly related to their concern, empathy, and sense of connection with nature and wildlife. Visitors reported experiences were mainly concerned with observing active animal behaviors or having various close interactions or making eye-contact with the animals. These results are consistent with the results reported by Myers et al. (2004). While these findings are not totally unexpected based on other visitor research at zoos and aquariums (e.g., Goldowsky 2009; Kreger and Mench 1995), detailed comments from visitors did reveal particular insights into what they paid attention to while observing the animals. For example, observing baby animals was, of course, highly special to visitors. Just as important, however, was the nurturing or caring behaviors displayed by parents during their interactions with the infants. Some of these noted observations of parent–infant interactions were accompanied by comments regarding the similarity between humans and non-humans in nurturing behaviors toward their young.

In addition to visitors’ written comments about observing animals, some visitors also wrote comments that indicated a more deep and
reflective intellectual and emotional processing of their animal experiences. Most of these comments centered on caring thoughts and feelings about animals and the environment and how connected or similar humans are to non-humans. Other comments were about empathic concerns about the environment and the importance of conservation. All in all, these comments demonstrate that these visitors became highly engaged within the exhibits and were not merely passive observers of animals.

**Future Research Directions**

As with most preliminary studies, more questions than answers were raised regarding the various personal and contextual variables related to visitors’ exhibit experiences and empathic reactions at live animal exhibits. More systematic research, therefore, is needed as zoos, aquariums, and nature-based museums move forward with their research agendas in understanding empathic reactions of visitors. For example, the construct of empathy has generally been understood as either an individual’s stable trait or predisposition over time, or as a context specific response that can vary in different situations (e.g., Cuff, Brown, Taylor, and Howat 2016). Given this dual nature of empathy, it was not determined in the current study whether visitors’ reported empathic concern was solely the result of their “extra special” experiences, or just a response of their own personality traits related to their empathic capabilities. As more visitor research is conducted around empathy, the nature of visitors’ empathic concern as either a state or trait needs to be distinguished in order to determine whether zoos and aquariums are inducing empathic concern with their more casual visitors, or only fostering the predispositions of their more highly engaged visitors (i.e., preaching to the choir).

Another question that was not addressed concerns the exhibit experiences and empathic reactions of visitors with diverse backgrounds. The sample in the current study was fairly homogeneous consisting of mainly Caucasian visitors who lived close to the zoo and frequently visited the zoo. There was also no available information on visitors’ cultural consumption outside the zoo such as visits to other science centers, zoos, arts institutions or other out-of-

---

**Table 2.**
Mean ratings by extra special experience at exhibit

<table>
<thead>
<tr>
<th>Affective/empathic reactions</th>
<th>Had extra special experience M (SD)</th>
<th>Did not have extra special experience M (SD)</th>
<th>Significance of mean differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visiting the exhibit has made me more concerned about the well-being of wildlife</td>
<td>5.82 (1.31)</td>
<td>4.98 (1.62)</td>
<td>$t (727) = 7.06, p &lt; .001, Cohen’s d = 0.569</td>
</tr>
<tr>
<td>The exhibit inspired me to wonder about the thoughts and feelings of the animals I saw</td>
<td>5.70 (1.45)</td>
<td>4.83 (1.75)</td>
<td>$t (731) = 6.71, p &lt; .001, Cohen’s d = 0.542</td>
</tr>
<tr>
<td>I have a greater sense of connection with nature as a result of visiting this exhibit</td>
<td>5.66 (1.31)</td>
<td>4.64 (1.70)</td>
<td>$t (731) = 8.30, p &lt; .001, Cohen’s d = 0.672</td>
</tr>
</tbody>
</table>

Respondents were removed from these statistical tests if they had an extra special experience but did not provide any comments or only provided miscellaneous comments not related to their experience. Scale: 7 = Very much so; 4 = Somewhat; 1 = Not at all.
home learning environments that may have influenced their exhibit experiences. Given the diversity of people who visit zoos and aquariums worldwide, the generalizability of the results are somewhat limited. Consequently, more research is needed in identifying the possible mediating factors regarding visitors’ various personal characteristics and backgrounds that may promote or inhibit their empathic reactions. For example, it has long been known that culture plays an important role in how people view themselves in relation to others (Markus and Kitayama 1991). Recent cross-cultural research studies, in particular, have demonstrated how empathic reactions and prosocial behaviors can vary across cultures (e.g., Cassels et al. 2010; Chopik et al. 2017). Moreover, environmental concern has been found to not always lead to pro-environmental behaviors across different cultures (e.g., Eom et al. 2016; Tam and Chan 2017).

In addition to visitors’ various personal variables that may be related to their exhibit experiences and empathic reactions, the current study also did not examine possible key contextual variables of the animal exhibits that may have mediated visitors’ empathic reactions. For example, visitors’ possible interactions with staff or volunteers within the exhibits were not considered. Given that various studies (e.g., Patti-son and Dierking 2013; Swim et al. 2017) have demonstrated the importance of live interpretation on contextualizing a zoo visit and environmental issues, this is an important variable to investigate in future research into visitors’ empathic reactions. Another variable that was not considered was the particular animal species the visitors were observing. This was a limitation to the current study given that Myers et al. (2004) demonstrated that visitors’ affective reactions can vary across different animal species. Unfortunately, there were multiple species within each exhibit which did not allow for a more focused analysis of this contextual variable. Thus, future research needs to examine a range of animal species to determine the potential efficacy of particular animal species in fostering empathic reactions. Namely, variations in visitors’ empathic reactions may be due to a number of factors including the physical or behavioral characteristics of certain animal species.

CONCLUSIONS

Despite the various personal and contextual variables that still need to be investigated surrounding visitors’ empathic reactions to zoo animals, the findings do provide some preliminary insights into some of the exhibit experiences that can encourage empathy and other positive emotions at cultural institutions with living collections. Consistent with previous studies (e.g., Myers et al. 2004), observing the activity of animals tends to be the focal point of visitors’ affective reactions and “extra special” experiences. Nevertheless, given that animal behavior can vary throughout the course of a day, visitors at a single animal exhibit may have different experiences depending on the activity of animals. Thus, various animal experiences such as program animal encounters, up-close exhibit viewing windows, and observing active animals are all essential features that should be available to visitors throughout the course of an entire visit.

The findings also suggest that visitors’ abilities to reflect on their own sense of themselves in relation to wildlife and the natural world are highly related to their reported empathic and affective reactions. Reflection has long been seen as an important element within the meaning-making process and in the development of a personal identity (Le Cornu 2009). In this
regard, signs and displays, interactive activities, animal demonstrations, and staff-mediated formal or informal talks should go beyond providing mere facts and take a more dialogic approach that centers on the individual learner (Knapp and Forist 2014). This interpretive strategy could help visitors reflect and articulate their own values and beliefs of the natural world and allow them to focus more closely on the personal meanings they associate with non-human creatures (also see Rabb and Saunders 2005 for a discussion of conservation and caring). Finally, visitors’ comments concerning relaxation, peacefulness, and contentment suggest that the animal exhibits may have also provided some of the features of a restorative environment (e.g., Kaplan 1995; Pals et al. 2009) such as soft fascination or effortless attention that allowed visitors to focus on what they were seeing and experiencing. Accordingly, zoos and aquariums should remain mindful of the potential benefits in providing visitors with more tranquil experiences during their visit.

REFERENCES

Le Cornu, A. 2009. “Meaning, Internalization, and Externalization: Toward a Fuller Understanding of the Process of Reflection and Its Role in The


