

# Idaho Falls Zoo's Results on Using an Empathy-based Model to Measure Conservation Behavior in Guests

Sunny Katseanes, Dr. David Pennock, Julie P. Atkinson, Colin Addington, Dr. Jericho Whiting, Dr. Garrett Saunders, Alyssa Wilson, Bailey Seamons, and David Langlois

## Abstract

Idaho Falls Zoo (IFZ) has been implementing an innovative model for empathy development since 2021. This iterative model, the Inspiring Conservation through Empathy Model (ICE-M), establishes a way for zoos to collaboratively develop empathy for general zoo visitors [1-4]. Currently, there is not a clear method or model on how to incorporate established empathy best practices within zoo exhibits and systems for the general visitors' experience. IFZ hopes the ICE-M will address this gap in the field.

IFZ has used the ICE-M to design and offer a truly immersive empathy-based visit for all guests of the zoo. Important conservation topics have been woven into the space to help visitors understand how the choices they make can affect local and global habitats. IFZ has been collecting data from zoo guests to evaluate the effectiveness of ICE-M by measuring changes in empathy development, knowledge, and conservation action.

## Methods

Empathy best practices were incorporated into on-grounds education in multiple settings to try to enhance guest experiences with animals. The following are some examples of the activities undertaken during the ICE-M in 2022 and 2023.

Ambassador animal carts were designed in 2022 with an emphasis on empathy and used on-grounds in 2023. The goal was to increase guests' feelings of empathy towards animals by seeing their personalities and use of choice and control; these traits are often overlooked when animals are being handled. IFZ also worked with their digital content/app partner, Liingo, to overhaul the existing content to embrace empathy best practices like framing animals, describing behaviors, and physiological adaptations as contrasted with humans. New content was added focusing on the empathy best practice of activating imagination by putting guests in the role of an animal acting within its environment. Other empathy enhancements included empathy training courses for volunteers and zoo staff.

IFZ employed the following measures and tools during the 2022 and 2023 seasons to measure changes in guest experiences related to empathy, knowledge gains, and conservation action: Semantic Differential Scale (SDS) [5], Expressions of Empathy and Related Emotions Towards Animals (i.e., observational tool) [6], IFZ Experience Survey, and 30-Day Follow-Up Survey.



Bailey and Alyssa demonstrating the "Wild Wagon" which accommodates larger ambassador animals like "Pickles," a three-banded armadillo.



Bailey demonstrating the "Critter Cart" which accommodates smaller ambassador animals.

## Results

### Empathy Scores

Data from the SDS were analyzed using an independent samples t-test and found a statistically significant difference between summer of 2022 guests' empathy scores ( $M = 4.29$ ,  $SD = 0.49$ ) and summer of 2023 guests' empathy scores ( $M = 4.40$ ,  $SD = 0.58$ );  $t(493) = -2.104$ ,  $p = 0.04$ . General visitors' empathy scores significantly increased from the 2022 season to 2023 (see top figure).

Next, SDS data used an independent samples t-test to compare empathy scores of zoo guests who used the digital content with guests who did not. A statistically significant difference was found between the empathy scores of guests who accessed digital content ( $M = 4.60$ ,  $SD = 0.35$ ) and the empathy scores of guests who did not access digital content ( $M = 4.38$ ,  $SD = 0.46$ );  $t(208) = -3.116$ ,  $p = 0.002$ . Visitors who accessed digital content reported significantly higher empathy scores than those who did not access digital content.

Observational data from 2022 and 2023 were analyzed using an independent two sample t-test to compare empathy responses of zoo guests from each year. A statistically significant difference was found between observed guests' empathy responses in the summer of 2022 ( $M = 26.48$ ,  $SD = 3.11$ ) and the observed guests' empathy in the summer of 2023 ( $M = 28.52$ ,  $SD = 3.52$ );  $t(560.39) = -7.9595$ ,  $p < 0.001$ . Guests visiting in 2023 were observed to have significantly higher empathy scores than those who visited the zoo in 2022.

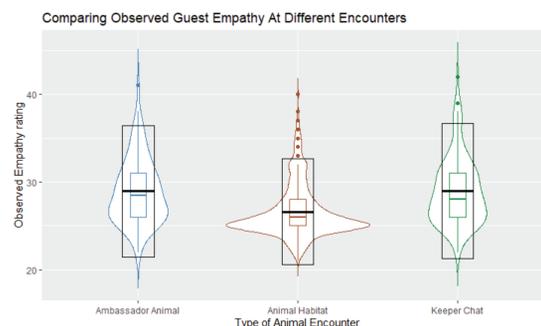
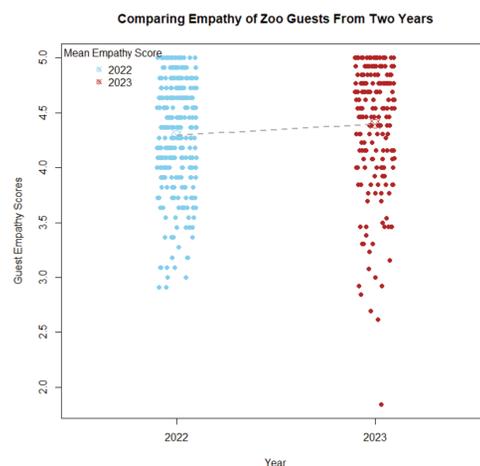
Data from the observational tool were also analyzed using a one way ANOVA to compare empathetic responses of zoo guests at different experiences offered at IFZ. A statistically significant difference was found between the empathy displayed by zoo guests at animal habitats/exhibits ( $M = 26.60$ ,  $SD = 3.01$ ), empathy displayed by visitors with ambassador animals ( $M = 28.94$ ,  $SD = 3.73$ ), and empathy displayed by guests at keeper chats ( $M = 28.95$ ,  $SD = 3.85$ );  $F(2,677) = 37.21$ ,  $p < 0.001$ . A Tukey HSD post-hoc test was used to verify that visitors viewing ambassador animals or those participating in keeper chats displayed significantly more empathy than zoo guests viewing animals within a traditional exhibit/habitat (see middle figure).

### Knowledge Gains

Guests were asked to rate their level of knowledge about animals, conservation, and IFZ's role in local and global conservation efforts before and after their visit on a scale from 0 = no knowledge, to 5 = very knowledgeable on the IFZ Experience Survey. Paired sample t-tests were performed to compare guest knowledge before and after visiting IFZ related to each area. The table on the bottom left shows outcomes highlighting statistically significant increases in their mean knowledge scores after visiting IFZ in all areas.

### Conservation Action

On the 30-Day Follow-Up Survey, zoo guests were asked to rate their level of agreement with the following statement on a scale from 0 = strongly disagree to 5 = strongly agree, 'Since my visit to the zoo, I feel that my actions can make a difference for animals and their habitats.' The average level of agreement was  $M = 3.67$  and  $SD = 0.91$ . Since their visit to IFZ, 78.12% of guests had shared what they learned about animals and their habitats with others. Further, 28.12% of zoo guests had taken action to help animals and their habitats.



Topical Area	M Before	M After	t	p
Animals	3.29	4.26	-11.38	< 0.001
Conservation	3.07	3.96	-8.05	< 0.001
IFZ's role in local and global conservation efforts	2.68	3.80	-8.32	< 0.001

## Conclusion and Next Steps

Preliminary data offer promising outcomes for the ICE-M project. Results show that general zoo visitors report and express higher levels of empathy during the 2023 season after empathy and conservation enhancements have been made. Further, visitors report significant increases in knowledge. Lastly, guests are also reporting they are sharing information and taking conservation action after visiting IFZ.

IFZ will continue to collect data from visitors for the remainder of the 2023 season. Then, the data will be analyzed and reviewed by IFZ and partners to look at what worked and where improvements could be made. IFZ will continue to seek funding to support work of the ICE-M to further enhance and imbed empathy development, and to document the model as a promising practice for other zoos and aquariums.

## Citations

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