

# Effects of Providing Information About Common Bottlenose Dolphins' (*Tursiops truncatus*) Behavior on Anthropomorphic Responses

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## Abstract

Many people believe that there are other living beings in our world that can experience the same emotions and feelings as we do, including love, compassion, pain, heartbreak, and sadness. Due to the tendency for people to use their own self-concept to understand a nonhuman agent (i.e., to anthropomorphize it), the present study tested whether there is a difference in anthropomorphic responses from participants exposed to either a narrated or non-narrated video of dolphins interacting under human care. Epley et al. (2008) suggest that transforming the perception of a nonhuman agent into a human one through anthropomorphic thinking can fulfill a basic need for understanding, control, and predictability. Therefore, this study also explored if anthropomorphic responses would be moderated by the basic need for understanding, control, and predictability (i.e., effectance motivation). One hundred and thirty one college students watched either a narrated or non-narrated video of five male dolphins interacting under human care and completed surveys that measured their anthropomorphic responses before and after watching the video, as well as their level of effectance motivation. Participants in the narrated condition anthropomorphized less than participants in the non-narrated condition, but effectance motivation did not predict anthropomorphizing. These findings can be useful in zoo or aquarium settings for designing animal interaction programs or narrations of animal presentations.

**Key Words:** anthropomorphism, education, bottlenose dolphin, *Tursiops truncatus*, aquarium settings, effectance motivation

## Introduction

### *Effects of Providing Information About Common Bottlenose Dolphins' Behavior on Anthropomorphic Responses*

A little girl walks up to an underwater viewing window of a dolphin (*Tursiops truncatus*) habitat. She approaches the window. A dolphin swims up in front of where she is standing. The girl waves to the dolphin and immediately it moves its pectoral flipper back and forth creating an immediate connection between the girl and the dolphin. She starts nodding her head and the dolphin does the same. The girl spins her body and the dolphin does as well. The girl pushes her nose up to the glass, and the dolphin appears to push its rostrum up to the glass as well as if they are touching noses with each other. The girl stares into the dolphin's eyes thinking that they understand each other. From this point on, the girl believes that she will forever have a relationship with the dolphin.

Many people believe that there are other living beings in our world that can experience the same emotions and feelings, including love, compassion, pain, heartbreak, and sadness. Whether we come in contact with them when we wake up every morning to say hello to our animal companion or take a trip to the zoo to see the rhinoceros, we are inclined to project our own feelings on these animals in order to understand them on a level that makes sense to us (Serpell, 1996). However, the conclusions that we come to about these animals' behaviors are not necessarily correct.

According to Epley et al. (2007), *anthropomorphism* refers to situations in which people make inferences about unobservable characteristics of a nonhuman agent rather than describing observable behavior. More simply, anthropomorphism is attributing human behavior to a god, animal, or object (Soans & Stevenson, 2005). Epley et al. (2007) theorized that people are likely to

anthropomorphize because of their need for understanding, control, and predictability. If people were presented with information about characteristics of animals while observing them, would they anthropomorphize less? Specifically, it was predicted that people would anthropomorphize less after being given factual information about an animal's behavior than would people who were not given any factual information about the animal.

It is important to understand that anthropomorphism can have both benefits and negative consequences. It has been argued that anthropomorphism can be used as a tool to motivate conservation actions (Smith & Sutton, 2014). For example, anthropomorphism can attract people's attention by highlighting naturally occurring humanlike traits in animals to heighten perceptions of similarity and relatability. This would result in people caring more about these animals and taking more conservation actions in their everyday lives. For example, the Smokey Bear campaign has been highly successful, possibly because Smokey is so relatable. Smokey Bear is the longest-running public service campaign in U.S. history, and 96% of Americans recognize him (Russell, 2014). Furthermore, Tam et al. (2013) showed that anthropomorphism of nature was positively associated with conservation behavior.

In contrast, there is also evidence to suggest that anthropomorphism can be detrimental. According to Schilhab (2002) and Horowitz et al. (2007), anthropomorphism blinds people, preventing them from recognizing what is observable, likely, and proven. Horowitz et al. state that in studies of animal behavior, there is a high consensus that anthropomorphism should be avoided whether it is in the scientific community or the general public's conception of animals. It has been suggested that anthropomorphism involves invalid methods and should be avoided in favor of neutral descriptions of the interaction of animals with their environment (Schilhab, 2002).

If following non-anthropomorphic ways of describing dog behavior, dog owners may describe their dog's actions using expressions such as "jumps, barks, and pants" instead of describing their dog as "impatient," which can be inaccurate (Allen, 1995). Using neutral terms such as *jumps*, *barks*, and *pants* keeps people from attributing to their dogs a mental state that could be inaccurate. Being able to keep neutral terms in mind when analyzing a dog's behavior can then allow for more accurate reinforcement of desired behavior. That is, anthropomorphism is seen as detrimental when training an animal. Animal trainers are taught to avoid considering what the animal is thinking or feeling and to only rely on counts of observable behavior. Anthropomorphizing while

making training decisions can cause trainers to reinforce an animal incorrectly, which may cause aggressive behaviors (Ramirez, 1999).

Epley et al. (2008) found that people tended to anthropomorphize a dog that behaved unpredictably more than one that behaved predictably. These authors suggest that giving the unpredictable dog human traits through anthropomorphic thinking can fulfill a basic need for understanding, control, and predictability. The basic need for understanding, control, and predictability can be defined as a personality characteristic called *effectance motivation*. Effectance motivation can vary in degree across people. Effectance motivation and anthropomorphism go hand-in-hand because anthropomorphism aids in drawing conclusions about nonhuman animals.

Instead of allowing anthropomorphic thinking to help people fulfill their need for understanding, control, and predictability when observing animals, providing them factual information about the animal they are watching could make anthropomorphic thinking unnecessary. Therefore, this study explored the possibility that the effect of narration on the tendency to anthropomorphize would be especially strong for people high in effectance motivation.

It is important to look at specific situations that may trigger anthropomorphism. One such situation in which people are likely to anthropomorphize is an aquarium setting. Research has been done on the positive effects of visiting aquariums that offer dolphin shows and encounter programs. Miller et al. (2013) found that people who attended dolphin shows demonstrated a short-term increase in conservation-related attitudes, knowledge, and intended behavior relative to before the shows. Viewers of the dolphin show reported engaging in more conservation-related behaviors 3 mo after the show than they did 3 mo before the show. This study suggests that factual information in a dolphin show can change attitudes, knowledge, and behavior of guests, an effect predicted for the present study. However, Miller et al. did not have a control group, so the cause of the changes cannot be identified definitively. Therefore, the present study employed both an experimental group and a control group that did not receive factual information.

The present study examined whether there is a difference in anthropomorphic responses in those who watched either a narrated vs a non-narrated video of dolphins interacting under human care and whether this effect also varied as a function of people's degree of effectance motivation. Consistent with Miller et al. (2013), it was expected that people exposed to the narrated condition would anthropomorphize less than

people exposed to the non-narrated condition. It was also important to explore whether degree of effectance motivation would moderate the effects of narration. To the extent that narration provides answers that heighten the feeling of control, predictability, and, most importantly, understanding of these observable behaviors, it was predicted that the narration might provide the necessary information to fulfill the needs that effectance motivation desires, reducing the need for people high in effectance motivation to anthropomorphize in order to gain understanding, control, and predictability.

## Methods

### Participants

One hundred and thirty one men and women enrolled as undergraduate students at The University of South Florida (USF) participated in the study. All of the participants received two extra credit points in exchange for participation. There were no restrictions on age or gender. Out of 131 participants, 77% were female. There were 64 participants in the narrated condition and 67 in the non-narrated condition. Four additional participants were excluded from the data analysis because of a technical problem during their run.

### Design

This was an experimental study with the between-subjects independent variable being the video (narrated vs non-narrated), a continuous predictor variable (effectance motivation), and a dependent variable (anthropomorphic responses).

### Materials

**Dolphin Videos**—To create a situation that puts people in a position to anthropomorphize, participants watched a video of dolphins interacting. A video was put together of dolphins under human care interacting in a social setting (the video and the Supplemental Appendices for this article are available under “Supplementary Material” on the *Aquatic Mammals* website: [www.aquatic-mammalsjournal.org/index.php?option=com\\_content&view=article&id=10&Itemid=147](http://www.aquatic-mammalsjournal.org/index.php?option=com_content&view=article&id=10&Itemid=147)). The two versions of the video footage were identical with the exception of the narration (see Supplemental Appendix A, “Narration Script”). The video was filmed at Marineland Dolphin Adventure in St Augustine, Florida, where they had 14 bottlenose dolphins. The video consisted of dolphins engaging in social behaviors with each other as well as interacting with enrichment devices. They were not engaging in any training sessions or other interactions with people. The experimental version of the video included a

narration that consisted of information and behavioral descriptions about the dolphins’ behaviors and how they are related to their behaviors in their natural environment. Some information about their natural history and their anatomy was included. A male radio sportscaster narrated the experimental video. Whether the gender of the sportscaster had any effect on the results was not tested. The control video had no narration. The videos were 5 min long.

### Measures

**Anthropomorphism**—Anthropomorphic responses were measured using the *Perceived Differences Between Humans and Animals* measure created by Haslam et al. (2008) that asks participants to rate the extent to which they think different targets (e.g., animals, robots, and supernatural beings) possess the ability to experience various psychological states. In the present study, the targets were specified as dolphins. The psychological states included in the questionnaire are perceptions (e.g., smelling, tasting), wishes (e.g., attraction, desiring), thoughts (e.g., imagining), intentions (e.g., intending, planning), primary emotions (e.g., anger, disgust), and secondary emotions (e.g., admiration, enjoyment). In the interest of time, only 20 out of the 37 original psychological states that represented all but perceptions were included. These 20 were selected by a group of three psychologists who served on the Studies Committee at USF. These 20 were selected as being potentially most applicable to the anthropomorphism of dolphins. In the current study, this scale was used for both the pretest and posttest. In the pretest, participants were asked, “If you were watching dolphins, how well could you tell that they were feeling and expressing the following characteristics?” For the posttest, participants were asked, “After watching these dolphins in the video, how well can you tell that they are feeling and experiencing the following characteristics?” Participants rated each of these characteristics on a 7-point scale ranging from 1 (“Not at all”) to 7 (“Extremely well”) with an option to choose N/A (“Dolphins can’t feel or experience this”) (see Supplemental Appendices B & C).

A short questionnaire based on Epley et al. (2008) also measured anthropomorphic responses. In the current study, the questionnaire asked participants to evaluate the extent to which dolphins were aware of their emotions, had a conscious will, and had a “personality.” The scales ranged from 1 (“Not at all”) to 7 (“Very much”) and is referred to as the *Dolphin Ratings* scale in the current study. Two different measures of anthropomorphism were chosen to see if they would come out with different results (see Supplemental Appendices D & E).

*Effectance Motivation*—Effectance motivation was assessed by the 20-item *Need for Control* measure, which was used in Thomas et al. (2011). This scale measures the need for control as a trait rather than a state (Epley et al., 2008). The measure asked participants to evaluate items such as “I prefer a job where I have a lot of control over what I do and when I do it” on scales that range from 1 (“The statement does not apply to me at all”) to 7 (“The statement always applies to me”). The responses operationalized participants’ need for control (see Supplemental Appendix F). This scale contained five reverse-scored items; therefore, those items were recoded.

*Video Quiz*—A short quiz was given to the participants about the video they just watched to make sure they were paying attention. Items asked questions about major parts of the video—for example, “How many dolphins were featured in the video?” and “What types of items were the dolphins interacting with?” Participants’ video quiz scores indicated that they all paid adequate attention (see Supplemental Appendix G).

*Demographics*—Demographic questions such as age and gender were asked of the participants. Questions included whether participants currently owned a pet (and, if so, how many and what kind of pets), how often they visited zoos and aquariums yearly, and why they visited zoos and aquariums (or if not, why they chose not to visit zoos or aquariums). These items were only used to describe the sample and were not used to see how these demographics affected the results. Any potential effects of participants’ demographics could be looked at in future studies (see Supplemental Appendix H).

### *Procedure*

Groups of participants ranging in size from one to ten were assigned to receive either the narrated or non-narrated video through counterbalancing. The time slot that participants signed up for determined which condition they experienced. It was explained that the study would be looking at thoughts on dolphin behavior; after which, they would be given the consent form, which indicated they would receive extra credit toward specific class requirements or just general extra credit.

The participants were first given the 20-item *Need for Control* measure in hard copy and told they would watch a video of dolphins interacting in a social setting at an aquarium. It was explained that after the video ended, they would complete questionnaires reporting what they observed and thought of the dolphins. After this explanation, the participants filled out the pretest anthropomorphism measures. Once they finished watching the video, they were given the posttest on anthropomorphism measures and a short quiz

about the video. The participants completed the questionnaires/quiz in hard copy in the same room in which they watched the video. It took between 20 to 30 min to run each group of participants. The participants did not talk to each other before, during, or after the study.

### *Statistical Analysis*

*Design*—This was an experimental study with the between-subjects independent variable being the video (narrated vs non-narrated), a continuous predictor variable (effectance motivation), and a dependent variable (anthropomorphic responses).

*Analysis*—To test the hypothesis that people will anthropomorphize less when presented with a narrated video than a non-narrated video and that this effect would be moderated by degree of effectance motivation, two regression analyses were conducted—one with the *Perceived Differences Between Humans and Animals* measure as the dependent variable and one with the *Dolphin Ratings* measure as the dependent variable. The outcome variable, anthropomorphic responses, was regressed onto the narration condition (narrated vs non-narrated), centered effectance motivation scores, and the 2-way interaction between condition and effectance motivation. The time 1 ratings (pretest questionnaires) were used as a covariate (control variable) in the regressions.

## **Results**

Demographics for the sample appear in Table 1. The mean age of the 131 participants was 20 y old ( $SD = 3.9$ ); 77% participants were female, 58% reported owning a pet, 58% reported visiting zoos yearly, and 55% reported visiting aquariums yearly. Of the participants who visited zoos yearly, 43.5% said the reason they did so was because they enjoy animals. Of the participants who reported visiting aquariums yearly, 41.2% also said they enjoy seeing animals. Of the participants who did not report visiting zoos yearly, 13% said they did not do so because they had no interest. Of the participants who did not report visiting aquariums yearly, 15.3% had no interest. Chi square analyses and a  $t$  test revealed no significant differences between participants in the two conditions on any demographic variable.

Descriptive statistics for all measures of effectance motivation and anthropomorphic responses appear in Table 2. Cronbach’s alpha was used to assess the internal consistency reliability of the five scales. Four of the scales had acceptable reliability (*Dolphin Ratings* pretest:  $\alpha = 0.826$ ; *Dolphin Ratings* posttest:  $\alpha = 0.874$ ; *Perceived Differences Between Humans and Animals* pretest:  $\alpha = 0.843$ ; and *Perceived Differences Between Humans and*

**Table 1.** Demographics

Narrated	Non-narrated
Male: 15 participants Female: 49 participants	Male: 14 participants Female: 53 participants
Median age: 19 Mean: 19 SD: 3.46	Median age: 19 Mean: 20 SD: 4.31
Owned pet: 36 participants	Owned pet: 40 participants
Visit zoos at least once a year: 38 participants	Visit zoos at least once a year: 39 participants
Visit aquariums at least once a year: 41 participants	Visit aquariums at least once a year: 32 participants

**Table 2.** Descriptive statistics for measures of effectance motivation and anthropomorphic responses

Measures	Minimum	Maximum	Mean	Mean: Standard error	Standard deviation
<i>Need for Control</i>	2.95	13.40	5.1610	0.09983	1.12506
Pretest: <i>Perceived Differences Between Humans and Animals</i>	0.75	11.00	3.9197	0.12650	1.42559
Posttest: <i>Perceived Differences Between Humans and Animals</i>	0.70	10.15	3.8736	0.12817	1.44443
Pretest: <i>Dolphin Ratings</i>	1.33	22.67	5.5774	0.17345	1.95471
Posttest: <i>Dolphin Ratings</i>	1.67	7.00	5.3858	0.12885	1.45201

*Animals* posttest:  $\alpha = 0.796$ ), but the scale that measured effectance motivation did not have acceptable reliability (*Need for Control* scale:  $\alpha = 0.584$ ). Nonetheless, this scale was used for exploratory purposes and interpreted with caution.

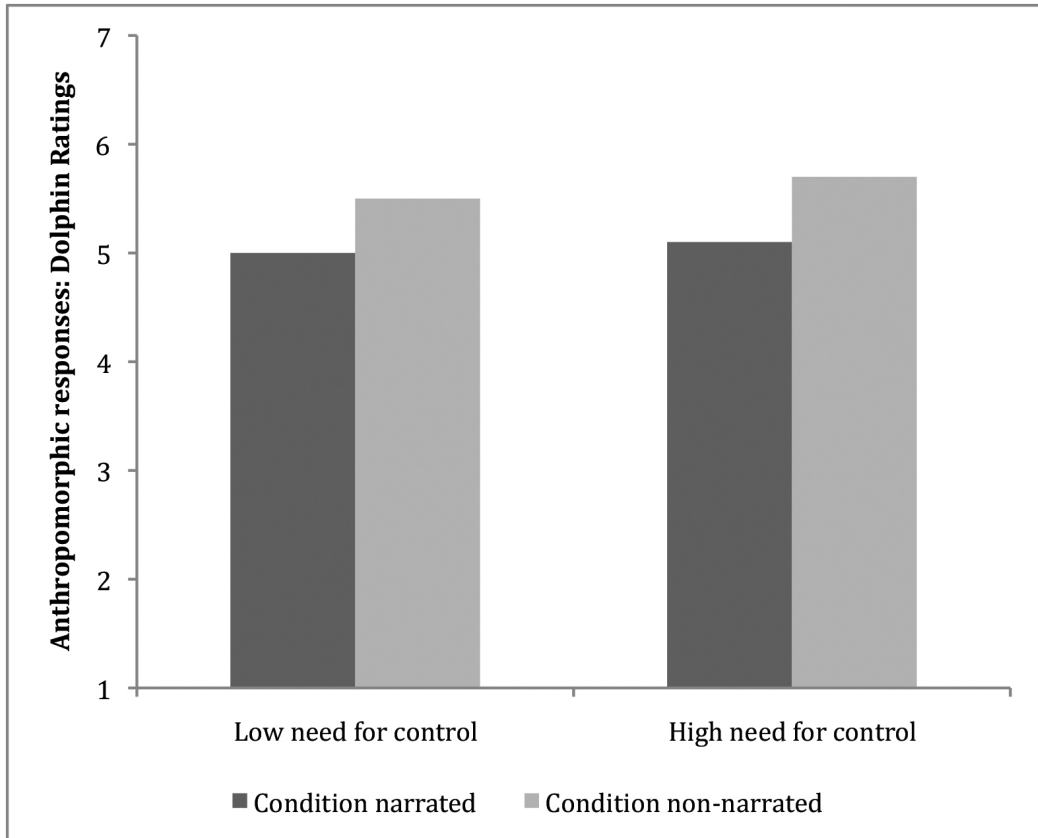
*Dolphin Ratings*

In this analysis, the *Dolphin Ratings* pretest was used as a covariate to control for any baseline differences. Pretest ratings, condition (narrated or non-narrated), centered effectance motivation (the raw *Need for Control* scale minus the mean *Need for Control* score), and the interaction between effectance motivation and condition were entered into the regression analysis (using *PROCESS* macro for *SPSS*; Hayes, 2012) with the *Dolphin Ratings* posttest as the dependent variable. There was only a significant effect of condition on posttest anthropomorphic responses (*Dolphin Ratings*):  $\beta = 0.55, t(126) = -2.25, p = 0.026$ . Posttest anthropomorphic responses were lower for participants in the narrated condition ( $M = 5.04$ ) than the non-narrated condition ( $M =$

5.56). There was no significant effect of effectance motivation or interaction between condition and effectance motivation (see Figure 1).

*Perceived Differences Between Humans and Animals*

In the second regression analysis, the pretest perceived differences ratings was used as a covariate to control for any baseline differences. Pretest ratings, condition (narrated or non-narrated), centered effectance motivation (*Need for Control*), and the interaction between condition and effectance motivation were entered into the regression analysis (again using *PROCESS* macro for *SPSS*) with the *Perceived Differences Between Humans and Animals* scores as the dependent variable. There was not a significant interaction between effectance motivation and condition:  $\beta = -0.08, t(126) = -0.59, p = 0.55$ , nor was there a significant effect of condition on anthropomorphic responses:  $\beta = -0.21, t(126) = -0.9, p = 0.36$ .



**Figure 1.** *Dolphin Ratings* and need for control with condition

### Discussion

This study can serve as a reference for zoos and aquariums to illustrate that providing factual information to people observing animals (specifically dolphins) does alter anthropomorphic responses. Many people conclude that animals experience human-like characteristics (e.g., depression, psychosis) because they project their personal feelings onto animals (Kaplan, 2014). By considering animals through a more objective behavioral mindset, people may be able to understand animal behavior without being blinded by anthropomorphic thoughts.

My findings provide evidence that it is possible to influence whether people will anthropomorphize by exposing them to factual narration. People anthropomorphized less in the narrated condition than in the non-narrated condition. It is not clear that narration fulfilled the needs of effectance motivation.

It was originally hypothesized that the narration would lower anthropomorphic responses overall because the narration brings more awareness of factual information about dolphin behavior. One situation in which people are likely to anthropomorphize is an aquarium setting. As noted earlier, research has been done on the positive effects of visiting aquariums that offer dolphin shows and encounter programs. Miller et al. (2013) found that people who attended dolphin shows reported engaging in more conservation-related behaviors 3 mo after the show than they did 3 mo before the show. From these findings, it can be concluded that watching animal shows did change people's behavior. Along with Miller et al., a study conducted by Tam et al. (2013), who found that anthropomorphism helped promote conservation-related behavior, is relevant to the current study because it shows that anthropomorphism can change both thoughts and behavior. Similarly, the narration in the present study provided information about the dolphins that may have made it



unnecessary for the participants to draw their own conclusions about what was happening. Since the current study consisted of an experimental group and control group, unlike the Miller et al. (2013) study, these findings provide strong support for the role of narration in changing anthropomorphic responses.

There was no significant effect when the second anthropomorphic responses measure, *Perceived Differences Between Humans and Animals*, was used. A possible reason this scale showed no significant effect was that the original purpose of the scale was not to measure anthropomorphic responses but to measure dehumanization (Haslam et al., 2008). The explanation for the effect of the second anthropomorphic measure is unclear, but further research can look at what mediates the relationship.

The best way to support zoos and aquariums is to use research like the current study to help effectively communicate information about zoos and aquariums' conservation- and education-related missions. A future study could use an experimental design in which participants who have not formed opinions about animals living in zoos and aquariums experience the same conditions of the current study but are asked if they support zoos and aquariums after the study. This type of design would allow future researchers to understand whether reducing anthropomorphic responses affects opinions about animals living in zoos and aquariums. Whether anthropomorphism is good or bad for the welfare of zoos and aquariums and the welfare of animals themselves is an important piece of the puzzle of the role anthropomorphism plays in zoo and aquarium settings. Building on the current study, further research should delve into conservation and animal welfare related to anthropomorphism.

There was no evidence that effectance motivation served as a moderator for condition. This may be because the *Need for Control* scale did not show acceptable reliability ( $\alpha = 0.584$ ). In fact, a previous investigation of this scale (Burger & Cooper, 1979, as cited in Thomas et al., 2011) showed that the estimated reliability of the scale is barely acceptable. It is important to note, though, that zoos and aquariums need to appeal to wide ranges of people; therefore, the applicability of the main effect of this study (narration reduces anthropomorphic responses overall) to a variety of people is vital.

#### *Practical Implications*

The current findings show that narration does affect how people respond to animal behavior, specifically their level of anthropomorphic responses. This data can be used to help shape

and design presentations and interaction programs at zoos and aquariums, highlighting the need to include descriptions of the animals' behaviors and how anatomy influences the movements and actions the animals display. As shown in this study, this type of narration will reduce misunderstandings based on anthropomorphism which can help guests understand what makes these animals act, behave, and display movements differently than people. This understanding is important because it will help clarify that there is a difference in how we behave and interact with our environment compared to animals. It is also important to understand that the narration used in this study is a broad representation, which includes factual information about animal behavior. Future studies should look at what specific information can help further enhance people's understanding of animals without having to use anthropomorphism.

Understanding can help people avoid attributing human emotions to animals based on their behavior and actions. For example, attributing human emotions can lead people to believe that killer whales living under human care are psychotic and depressed. There has been a decline in support from the media and animal activists for animals living in zoos and aquariums. Currently, SeaWorld has decided to end their killer whale breeding program and phase out their theatrical orca whale show in order to start more naturalistic presentations (Manby, 2016). The current study could help SeaWorld create a new presentation to best ensure that visitors leave with a better understanding of the animals. Misunderstandings based on anthropomorphic responses are probably contributing to the decline in support of animals living under human care.

#### *Conclusion*

Research reported herein represents a first step forward in understanding the role anthropomorphism plays in zoo and aquarium settings. Narration can lower anthropomorphic responses while watching dolphins interact, regardless of a person's level of effectance motivation. Although zoos and aquariums have contributed to elevating public consciousness by helping their guests care and be concerned about various animals, it is just as important for guests to understand the differences in how we as humans behave and interact with our environment as compared to animals. This study is an important step in a long road toward providing the best possible experience for guests while also helping them to understand and learn about zoological animals.

### Acknowledgments

I acknowledge many people who have helped me in the process of conducting this study and writing this paper. First, I thank Marineland Dolphin Adventure for allowing me to film five of their male dolphins to create the video for this study. I also thank The University of South Florida Bulls Radio for supporting the production of one of the videos for the experimental group of the study. A big thanks to my thesis committee, Dr. Judith Bryant, Dr. Sandra Schneider, and Dr. Chris Ponticelli, who took the time to give me constructive feedback both during my proposal and defense meetings. I also thank Dr. Jamie Goldenberg for conducting the honors seminar and providing critical feedback and guidance through the entire writing process. I would like to give a special thank you to my thesis advisor/mentor Dr. Bryant, who took a chance on me, an undergraduate student, with big questions I wanted to answer but such little time. Dr. Bryant took the time to guide me in all the right directions with the perfect amount of space that allowed me to explore my passion and execute it successfully.

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