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# The Role of Serial Dependence in Animal Perception: Increasing Conservation Efforts for Scary and Repulsive Species

## *01. Introduction*

Animal conservation efforts are often given to more preferred animals [4, 10]. Maintaining biodiversity is crucial for ecosystem health. One way of helping maintain biodiversity is by changing human beliefs about disliked and underrepresented animals, so that they are more well-liked [5]. This study uses a well-known psychological phenomenon called serial dependence, which describes how prior stimuli affect how current stimuli are perceived, in hopes that the perception of known disliked animals [8] may be influenced by being shown known charismatic animals prior [1, 8, 9]. This study's purpose is to see if, by using serial dependence [9], prior stimuli, being charismatic animals [1], can alter the perception of scary or repulsive animals [8], and cause them to be more well-liked. This is done in hopes of protecting biodiversity amongst animal species [4], by causing unlikeable animals to become more well-liked.

## *02. Hypothesis*

Participants who first view a charismatic species will rate a subsequent scary or repulsive species more positively and show greater willingness to support its conservation compared to participants who first view a neutral stimulus (fixation cross).

*Null Hypothesis:*
*H0* (null hypothesis): Block 1 and Block 2 will not have a significant difference in Likert Responses

**Scary/Repulsive Stimuli** [8]: bull, cockroach, maggot, roundworm, snake, spider, tapeworm, wasp
**Charismatic Stimuli** [1] : cheetah, elephant, giant panda, gorilla, lion, tiger, wolf, zebra

## *03. Methods*

Using an Online Web-Based Experiment:

- Experimental Design
  - Participants were unaware if they were randomly placed in Block 1 or Block 2
  - Between-participant design

Scary/Repulsive Stimuli:
- Randomly selected between 8 different images, no repeats

Charismatic Stimuli:
- Randomly selected between 8 different images, no repeats

**Block 1**

Charismatic Species

Likert Questions
1] This Animal is funny
2] This Animal is motherly
3] This Animal is friendly
4] This Animal is cute
5] This Animal is protective of their young
6] You would help support this species conservation if they were going extinct

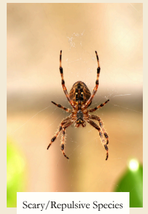
Scary/Repulsive Species

Likert Questions
1] This Animal is funny
2] This Animal is motherly
3] This Animal is friendly
4] This Animal is cute
5] This Animal is protective of their young
6] You would help support this species conservation if they were going extinct

**Block 2**

+

Fixation Cross
(CONTROL STIMULI)



Scary/Repulsive Species

Likert Questions
1] This Animal is funny
2] This Animal is motherly
3] This Animal is friendly
4] This Animal is cute
5] This Animal is protective of their young
6] You would help support this species conservation if they were going extinct

## *04. Data Collection:*

- Record Participants Block (1/2)
- Record Participants Likert Scale Answers

Block 1:
- charismatic: 8 images x 6 questions = 48 Answers
- scary/repulsive: 8 images x 6 questions = 48 Answers
  - 96 data points collected

Block 2
- fixation cross: no data collected
- scary/repulsive: 8 images x 6 questions = 48 Answers
  - 48 data points collected

## *05. Data Analysis (Simulated Data, rejecting null hypothesis)*

Used simulated data

Block 1
- 44 participants
  - Each participant answered 6 Likert scale questions for 8 charismatic species stimuli and 8 scary/repulsive species stimuli
    - Data was cleaned so **only scary species stimuli** responses were analyzed

Block 2
- 44 participants
  - Each participant answered 6 Likert scale questions for 8 scary/repulsive species stimuli

**Block 1 Simulated Data**: Likert scale questions with randomly generated numbers between **1-5**

**Block 2 Simulated Data**: Likert scale questions with randomly generated numbers between **1-4**

**** Block 2 should have a lower average score of likert scale responses**

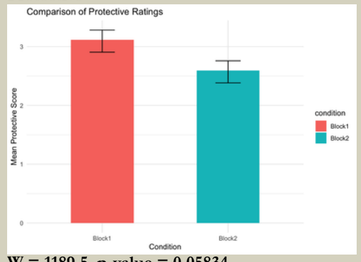
## *06. Results*

- **Mann-Whitney U Test**: **Block 1** (Scary/Repulsive Stimuli: Likert Responses) vs. **Block 2** (Scary/Repulsive Stimuli: Likert Responses)
  - $\alpha = 0.5$
  - Effect Size $d$=0.8 (medium effect size)

** Data was discarded if participant has N/A values, or answered all questions with same rating

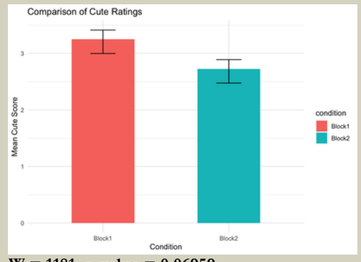
To conduct a Mann-Whitney U test, the Data was separated into block 1 and block 2:
- In each Block, the Likert question responses were found
  - E.g., comparing Block 1 average: *Funny* responses, to Block 2 average: *Funny* responses
- Error bars represent the standard error of the mean

**Protective**



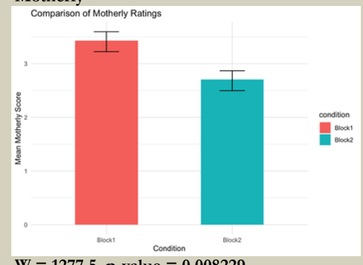

**W = 1189.5, p-value = 0.05834**

**Cute**



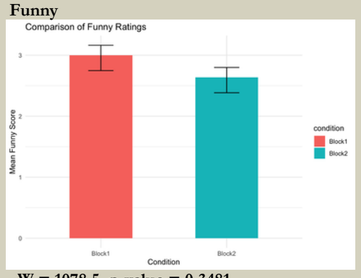

**W = 1181, p-value = 0.06959**

**Motherly**



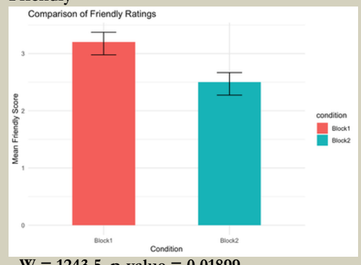

**W = 1277.5, p-value = 0.008229**

**Funny**



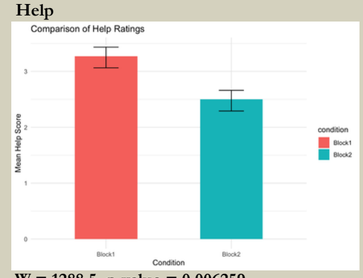

**W = 1078.5, p-value = 0.3481**

**Friendly**



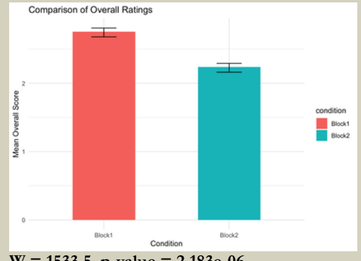

**W = 1243.5, p-value = 0.01899**

**Help**




**W = 1288.5, p-value = 0.006259**

**Overall**




**W = 1533.5, p-value = 2.183e-06**

## *07. Conclusion*

Using the simulated data, results show:
- Significant difference ($p$ <0.05) in:
  - **Motherly** and **friendly** ratings.
- Significant difference ($p$ <0.05) in:
  - How much someone would be **willing to help with that species conservation** (**help**)
- Significant difference ($p$ <0.05) in:
  - **Overall ratings**

(Likert scale went from 1-5, with 5 always being a more positive attribute or outlook on the species.)

The significant difference between Block 1 and Block 2, with Block 1 having higher overall ratings, suggests that showing charismatic stimuli first may cause the scary/repulsive stimuli to be ranked higher. This may suggest that serial dependence may have an impact on animal perception.

Further research should be done. But these preliminary findings suggest ways in which we can help underrepresented/unliked species conservation, further helping increase biodiversity in our ecosystems.

*References*

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