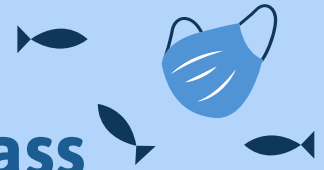




Viewing Distressed Marine Life and its Impact on Perceptions of Environmental Conscientiousness

Abby Eck & Odalys Barrientos

Dr. Lindsay Mehrkam and McKenna Douglass



Dr. Lindsay Mehrkam

- Assistant Psychology Professor at Monmouth University
- M.S. & Ph.D., University of Florida
- B.A., Franklin & Marshall College
- An applied animal behaviorist, animal welfare scientist, and doctoral-level board-certified behavior analyst.

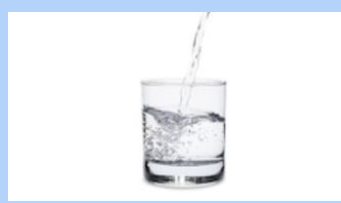


McKenna Douglass

- Graduated from Monmouth University in 2020
- Works at a clinic for autistic children
- Some of her hobbies include research, and advocating for disability rights
- She has a love for research
- Wants to work more with animals

Survey Outline

1. Pre-Test: 15 questions regarding environmental sustainability/eco-friendly behavior
2. Picture Survey (4 Distress images & 4 natural images)
 - a. Household items pertaining to water
 - b. Ocean
 - c. Seal/ Sea Lion
 - d. Sea Turtle
 - e. Sea Bird
 - i. Participants were asked how impactful they found the image and were exposed to a “fun fact” about the animals, ocean, or water depending on what condition they were in
3. Vignette
 - a. Perceived control
 - b. Perceived helplessness
4. Memory game
 - a. This was used as a distraction
5. Post- Test:
 - a. Reworded and reverse coded
6. Behavioral choice measure
7. Manipulation check
8. Demographic questions



Research Question

Does environmental conscientiousness change after viewing marine animals in distress?

Research Hypothesis

H1: The person's environmental conscientiousness will increase after viewing the images.

H2: Participants will increase their level of environmental conscientiousness by the type of animal and vignette (condition) they saw.

H3: There will be a difference in how impactful participants found the distressed and natural images by animal type.

Variables

Explanatory

Animal Type

Vignette

Distress vs natural images

Response

Difference in test scores

Level of impactfulness

Behavioral choice measure



Descriptives

391 total Participants

138 Female
249 Males

Participant ages ranged from 19 to 77 years old

min	Q1	median	Q3	max	mean	sd	n	missing
<dbl>	<dbl>	<dbl>	<dbl>	<dbl>	<dbl>	<dbl>	<int>	<int>
19	29	34	39	77	35.89717	10.9009	389	2



H1

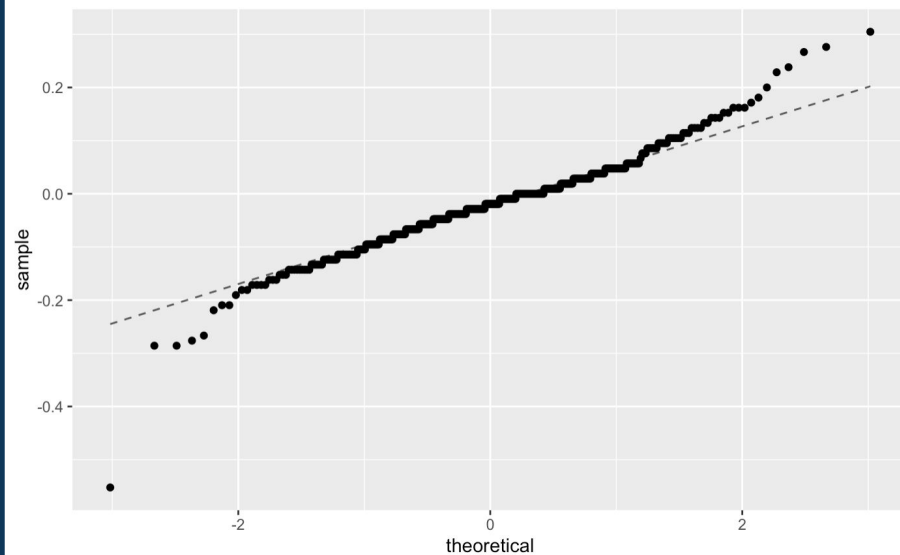
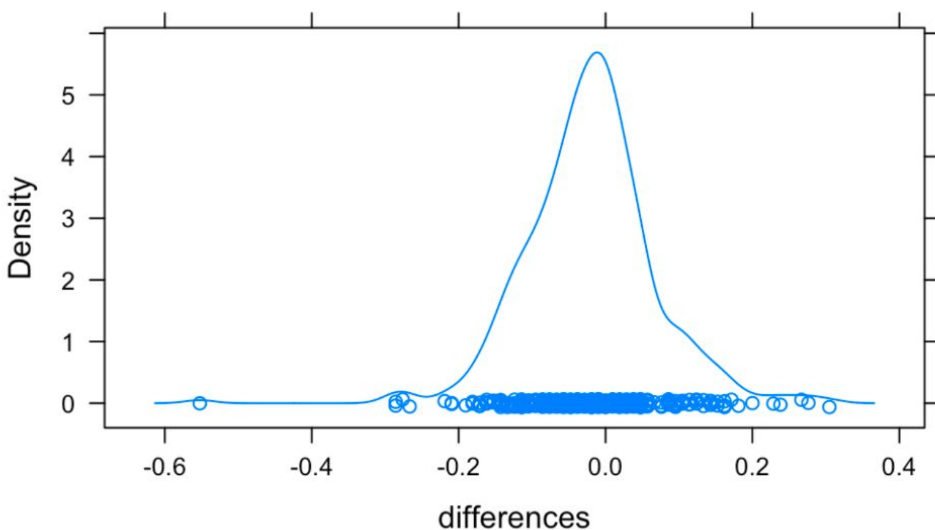
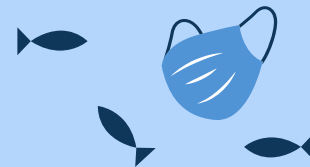
The person's environmental conscientiousness will increase after viewing the images.

Difference = PreScore - PostScore

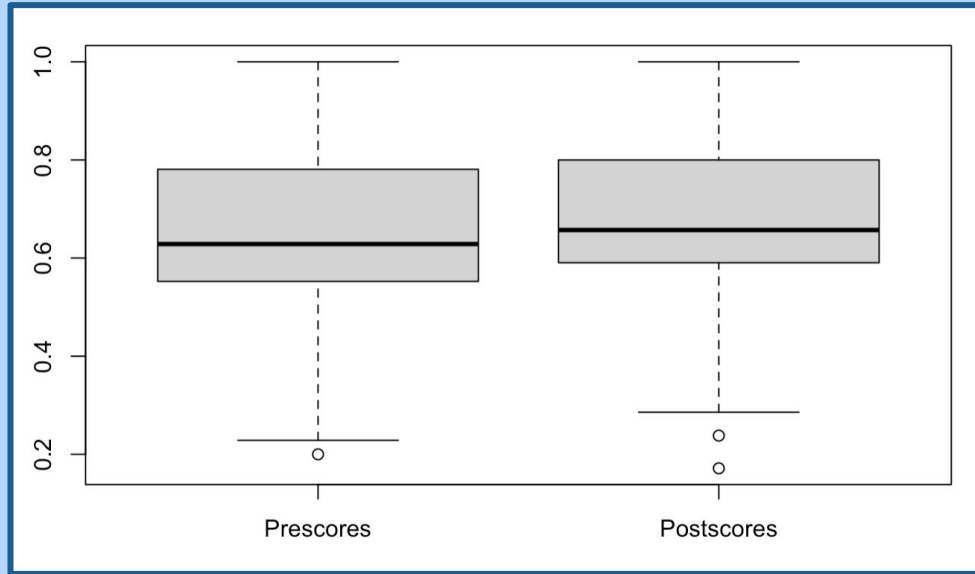
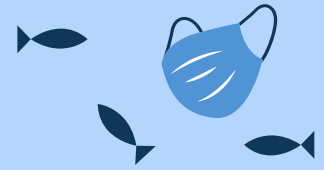
We are looking for a negative difference.



Density Plot of difference in test scores



H1: Bootstrapped Paired T-Test



Using a bootstrapped paired t-test we tested for the difference in Pre and Post scores

- P-value < 0.001
- 95% Confidence Interval for difference in scores (-0.030, -0.013)

H2

Participants will increase their level of environmental conscientiousness by the type of animal and vignette (condition) they saw.

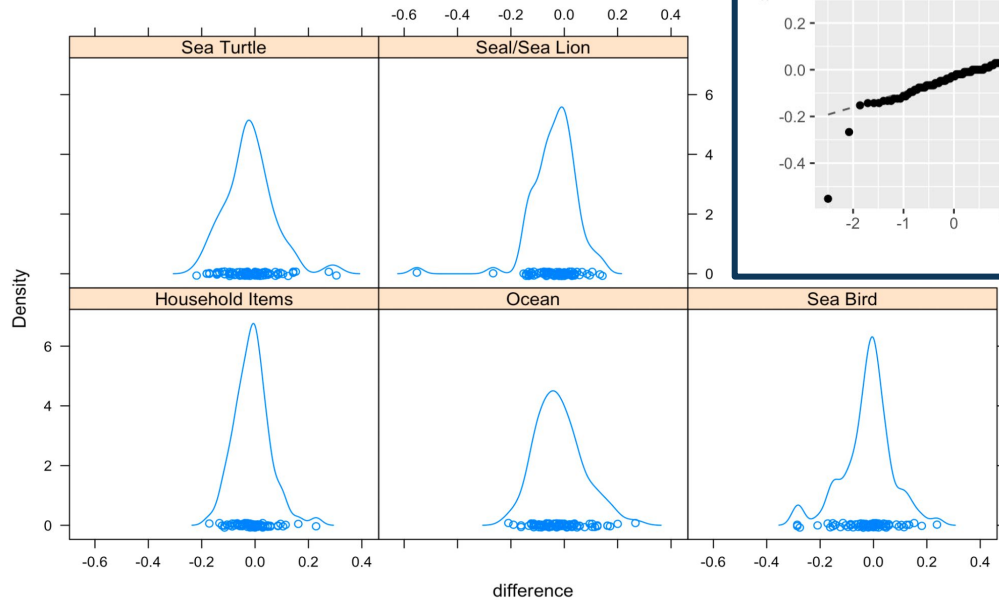
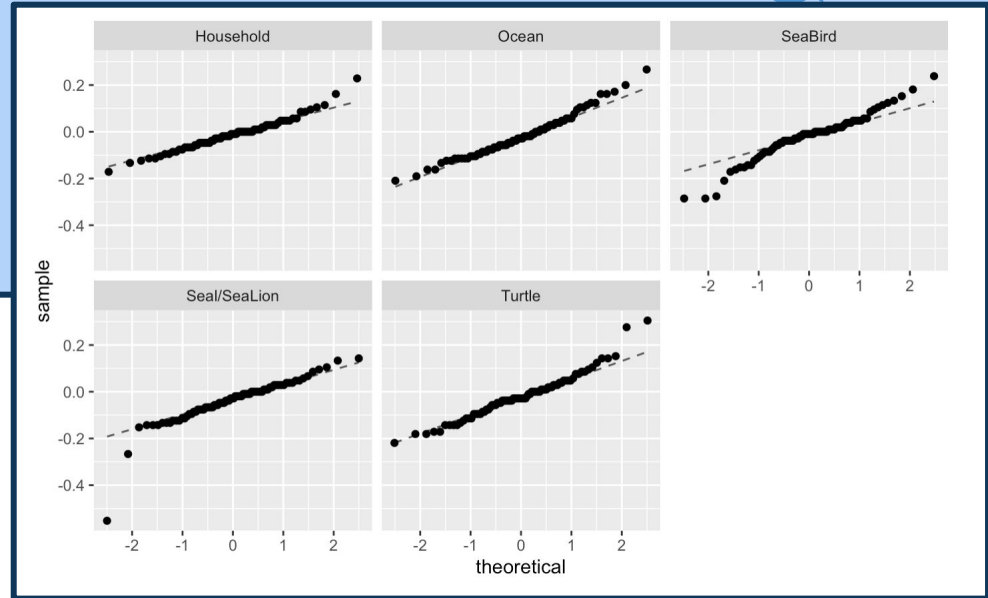


Sample Mean Difference in Test Scores Split By : Animal Type and Vignette

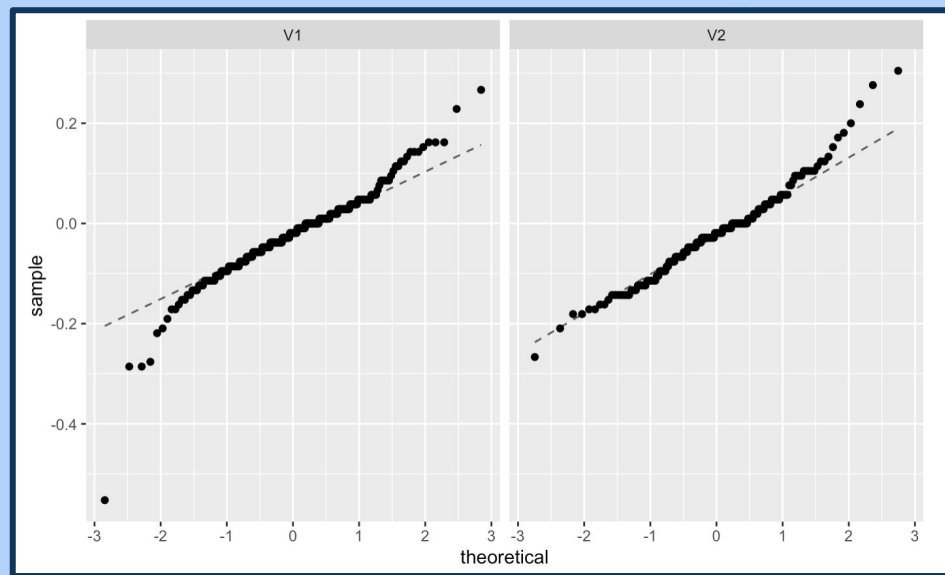
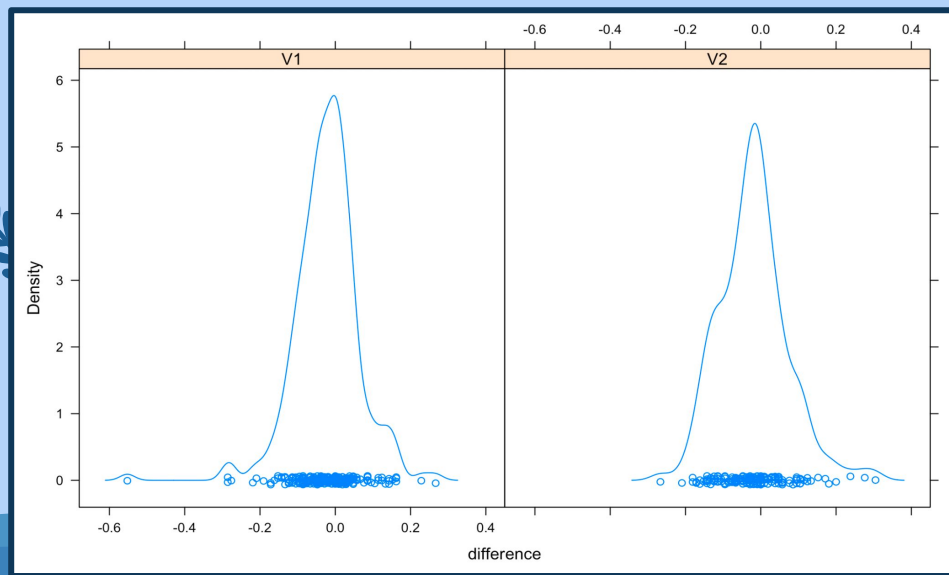
AnimalType <chr>	meanDiff <dbl>
Household Items	-0.01135029
Ocean	-0.01772152
Sea Bird	-0.02180451
Sea Turtle	-0.01893287
Seal/Sea Lion	-0.03880952

Vignette <chr>	meanDiff <dbl>
V1	-0.02344974
V2	-0.01979346

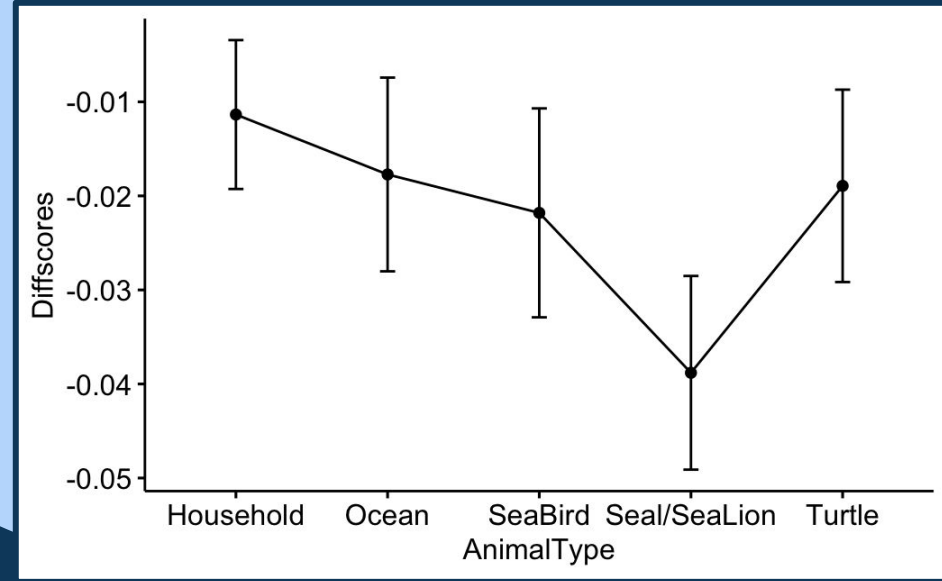
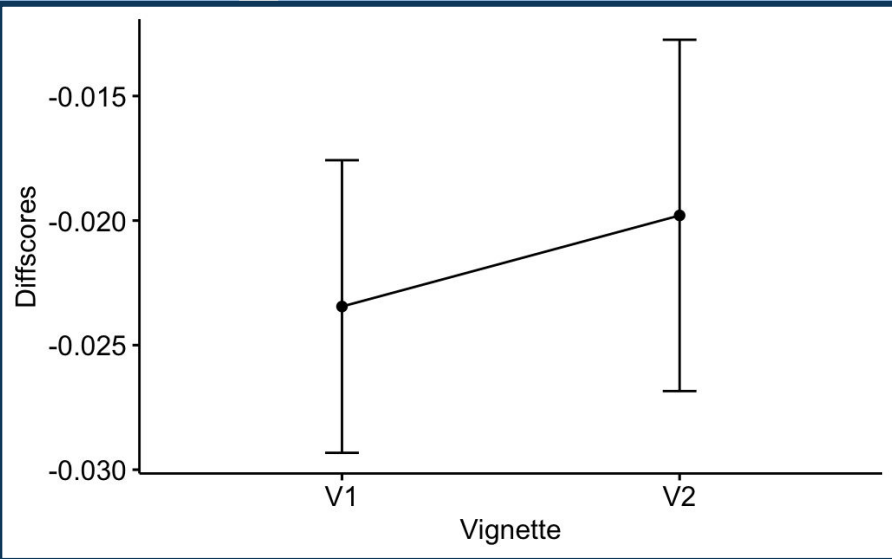
Density plot of difference in scores split by Animal Type



Density plot of difference in scores split by Vignette



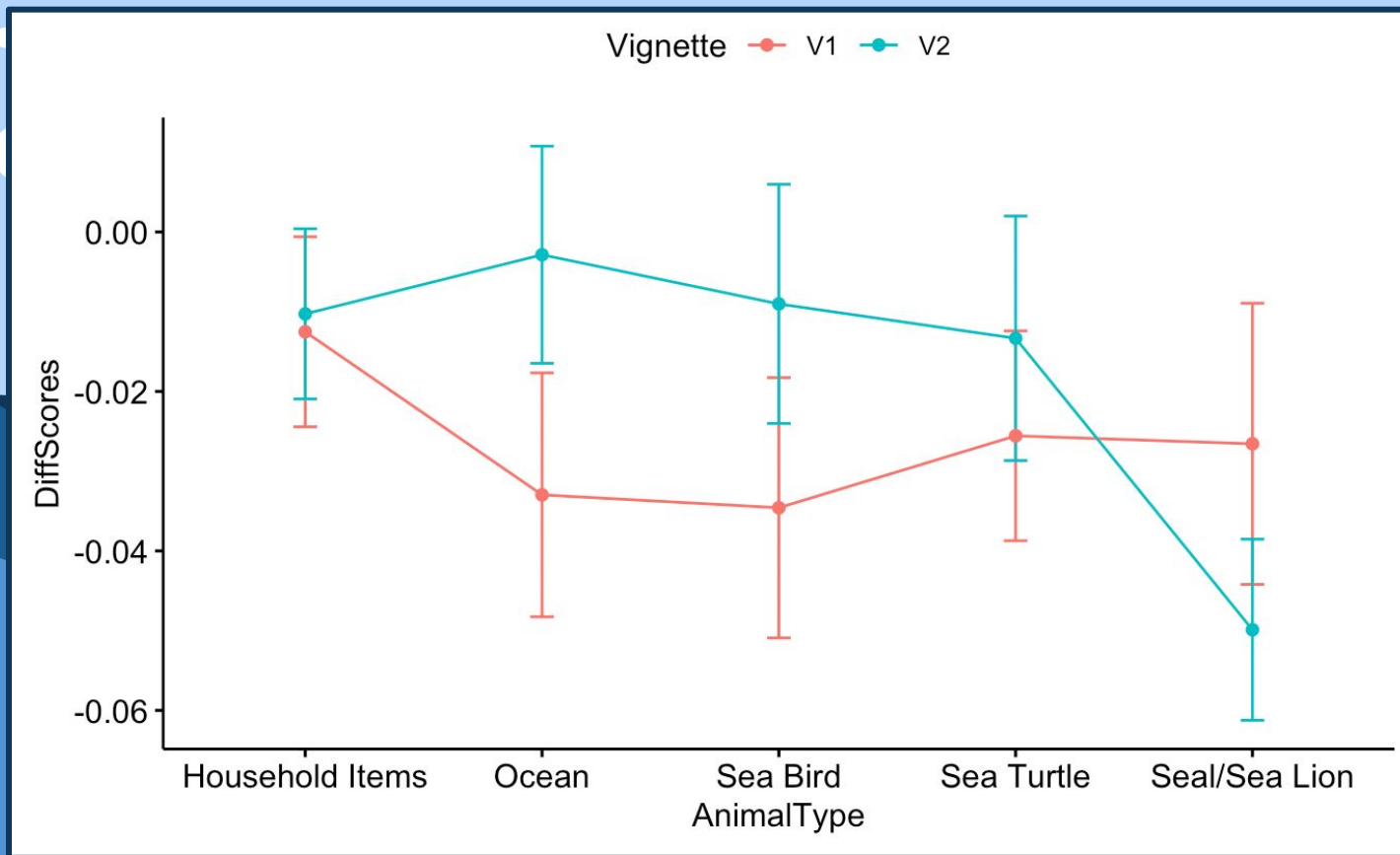
Difference in scores split by Vignette and Animal Type



V1 -Perceived Control Vignette

V2- Helplessness Vignette

Interaction plot (Animal type and Vignette)



H2: Bootstrapped ANOVA

```
anova.diffscores <- ANOVA.boot(Diffscores ~ AnimalType + Vignette + Vignette*AnimalType, B = 1000, data = Survey)
```

H0: There will be no difference in the difference of scores by the animal the subject viewed

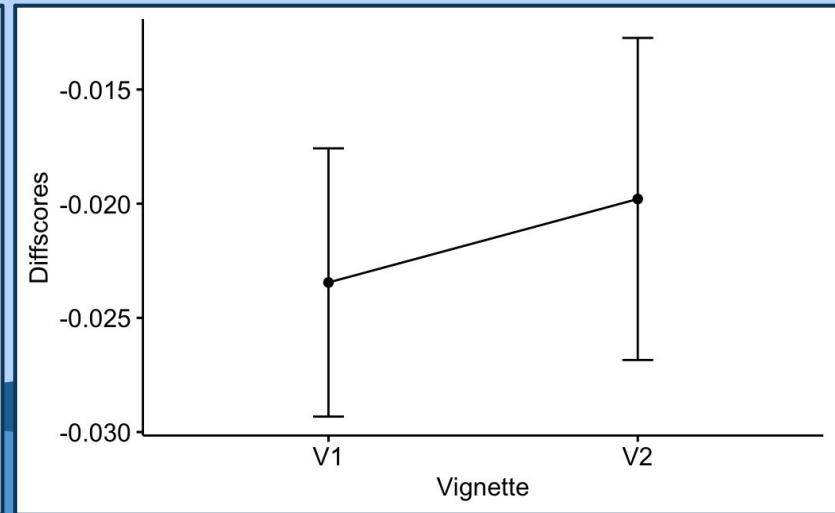
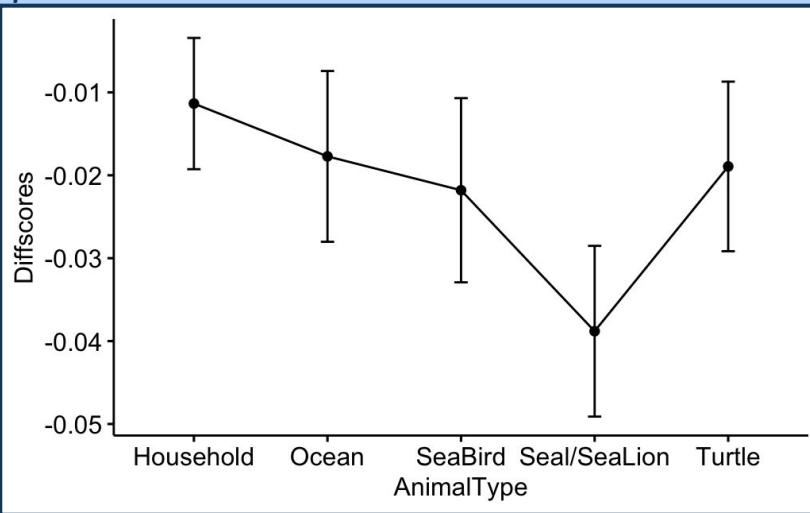
p = .378

H0: There will be no difference in the difference of scores by the vignette the subject viewed

p = .301

H0: There will be no interaction between the animal and the vignette the subject viewed

p = .327



H3

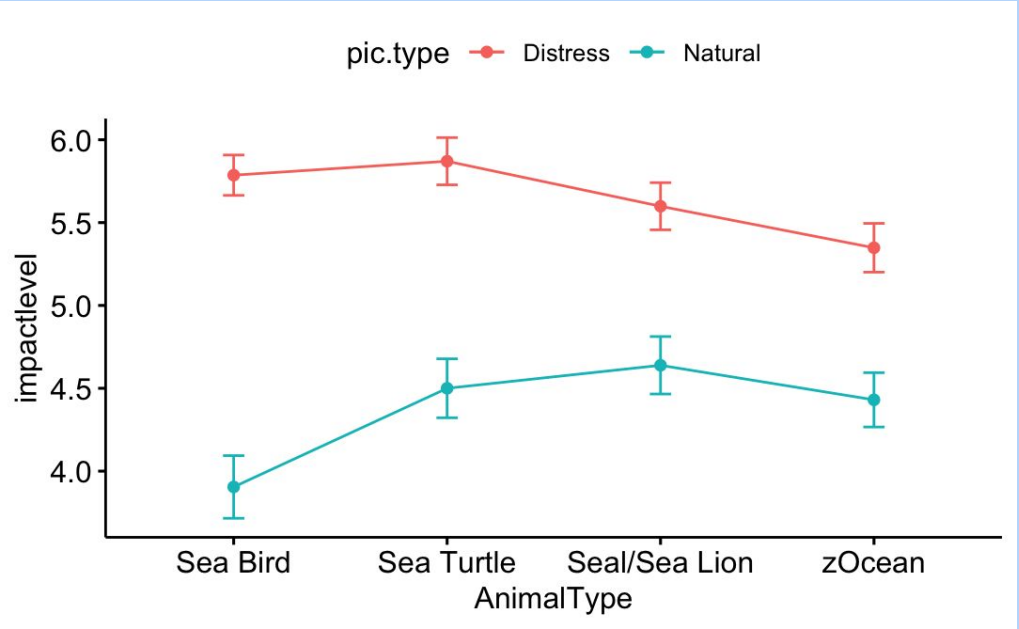
There will be a difference in how impactful participants found the distressed and natural images by animal type.
(distressed photos vs. natural environment photos)



Using the Anova, we saw there was an interaction between picture type and Animal Type.

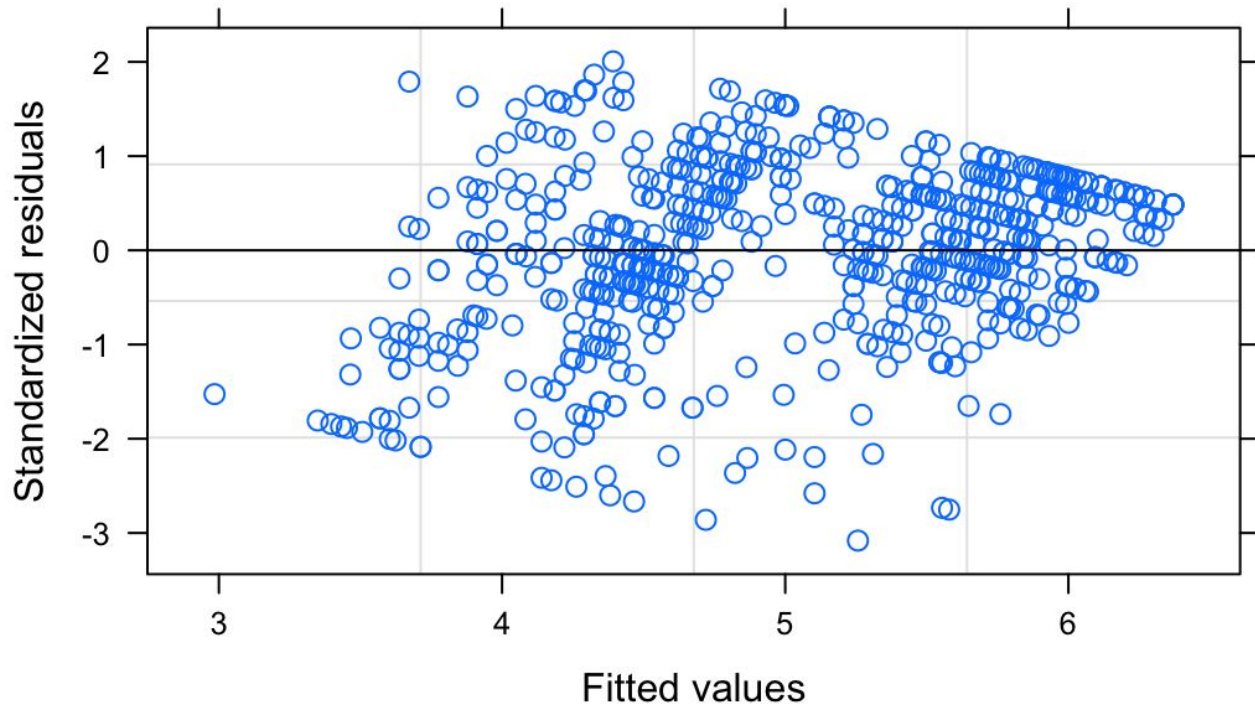
Using lme there was a statistically significant difference between ocean in the natural state and Sea Bird in a distressed state.

Analysis of Deviance Table (Type III Wald chisquare tests)					
Response: impactlevel					
	Chisq	Df	Pr(>Chisq)		
(Intercept)	1123.3155	1	< 2.2e-16	***	
factor	19.6747	1	9.181e-06	***	
AnimalType	6.3911	3	0.094056	.	
factor:AnimalType	13.8530	3	0.003112	**	



Distress: Sea Bird	0.299582	0.09063763	315	3.30527	0.0011
Distress: Seal/ Sea Lion	-0.161269	0.08872340	315	-1.81766	0.0701
Distress: Sea Turtle	0.044034	0.08801187	315	0.50031	0.6172

Residual Plot



Violation of equal variance assumption

Using `robustlmm`: an R package for robust estimation of linear mixed-effects model we could create a model we trust.

Behavioral Choice Measure

Participants were shown a flyer relating to waterway cleanups. They were asked if they would participate in cleanups in their area. With the use of a chi-square test we analyzed if participants answered yes(1) as opposed to no(2).

Behavior	AnimalType				
	Household Items	Ocean	Sea Bird	Sea Turtle	Seal/Sea Lion
1	63.01370	59.49367	63.15789	66.26506	60.00000
2	36.98630	40.50633	36.84211	33.73494	40.00000

Behav	Vignette	
	V1	V2
1	64.36170	60.59113
2	35.63830	39.40887

Behav	Conditions									
	1	2	3	4	5	6	7	8	9	10
1	60.52632	58.13953	71.05263	63.63636	60.52632	65.78947	56.41026	60.97561	74.28571	54.05405
2	39.47368	41.86047	28.94737	36.36364	39.47368	34.21053	43.58974	39.02439	25.71429	45.94595

Reliability Analysis

Cronbach's Alpha

A measure of consistency / reliability

Pre Questions:

Attitudes Toward Recycling: 0.82

Opinion of Responsibility: 0.84

Sacrifice of Convenience: 0.70

Post Questions:

Attitudes Toward Recycling: 0.59

Opinion of Responsibility: 0.86

Sacrifice of Convenience: 0.67

$$\alpha = \frac{N^2 \overline{Cov}}{\sum s_{item}^2 + \sum Cov_{item}}$$

N= number of items(questions)

Cov=average covariance between questions

s_{item}^2 =variance between the questions

Cov_{item} =covariance between the questions

Reliability without
subsections 0.91

An underwater-themed illustration with a light blue background and dark blue foreground. The word "Questions?" is centered in a bold, dark blue font. The scene is decorated with various elements: a white pill bottle with a blue cross on the left, a blue surgical mask on the right, several small black fish, white bubbles, and stylized coral and seaweed. A hand is visible at the bottom center, reaching up.

Questions?

Personal Reflections

Abby:

Stats

- I learned more about how R works and how to troubleshoot

Content

- I learned about the Likert Scale
- I learned how different survey questions affect the person's response

Myself

- Public speaking is not as terrible as it seems. I gained more confidence the more we practiced throughout the semester.

Odalys:

Stats

- I learned what a Linear Mixed Effects Model is
- I learned how to learn new topics on my own

Content

- I learned how and why surveys are reworded and reverse coded
- I learned about the importance of taking care of the environment

Myself

- I learned that complicated projects aren't always as scary as they seem
- From this whole class I've learned to work independently and always challenge my statistical abilities