Sadness: Exploring the Impact of Emotional Manipulation on Environmental Behaviours

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Summary

This study examined whether inciting sadness on UBC students increased their likelihood of being more aware of their environmental behaviours and subsequently more willing to act environmentally friendly. The study began by asking participants to fill out a survey (specific to their condition), and was finished by presenting the participants with a Great Canadian Shoreline Cleanup sign-up sheet. The study contained two conditions. One condition was labelled the "emotional" condition and the other was labelled the "statistical" condition. The first hypothesis of the study was that the participants in the "emotion" condition would be more willing to engage in environmentally friendly behaviours, which was measured by examining how many boxes they checked on the environmental actions checklist. The second hypothesis was that the participants in the "emotion" condition would be more likely sign up for the Great Canadian Shoreline cleanup. The participants in this study were UBC students, who filled out the survey at the Life and the Nest Buildings on UBC campus. The results revealed that the participants in the "emotion" condition did not have an increased willingness to engage in more environmentally friendly behaviours. The results show that both stimulus have some amount of impact on the levels of concern per an individual. Additionally, the manipulation of emotion was found to increases participants levels of concern for the environment in both conditions.

Keywords - environment emotions sadness

Introduction

There exists a somewhat substantial body of research on the link between individuals' emotions and their impact on actions taken (or intentions) to combat climate change. Many of these studies have been successful in suggesting that "inducing effects such as fear and worry may have positive effects" (Sundblad, Biel, & Gärling, 2014) on increasing individuals environmentally- friendly behaviour. A study from Harth, Leach and Kessler examined the link between the emotions of guilt, anger and pride, and individuals' intentions to take environmentally-friendly actions (2013). The researchers predicted that the emotion of guilt would be heavily linked to the desire to help combat climate change (Harth, Leach & Kessler, 2013). The results of the study supported the hypothesis, in that guilt did predict participants intentions to help reverse the damage (Harth, Leach & Kessler, 2013) that humans have inflicted on the earth. In another study completed by Sundblad, Biel, & Gärling, the objective was to investigate whether worry would "influence people's intentions to change consumption-related personal activities causing carbon dioxide emissions" (2014). The study concluded that worry did increase participants intentions to change their environmental impact behaviours (Sundblad, Biel, & Gärling, 2014). Lastly, a study completed by Onwezen, Bartels, and Antonides anticipated that emotions such as pride and guilt "help individuals to behave in line with their personal and social standards regarding the environment" (2014). The results of the study were consistent with the researchers hypothesis, in that invoking the emotions of guilt and pride did impact participants standards regarding environmental behaviours. After reviewing a series of studies, we decided to add to the growing amount of research completed on the link between individuals emotions and their behaviours in regards to the environment. Because there seemed

to be insufficient research on the link between sadness and environmental behaviours, we decided to focus on that emotion.

Research question

How does inciting sadness on UBC students increase their likelihood of being more aware of their environmental behaviours, and therefore be willing to act more environmentally friendly?

Hypotheses

Hypothesis 1: We hypothesize that our experimental group will check more boxes on our environmental checklist.

Hypothesis 2: We hypothesize that our experimental group will be more willing to sign up for our shoreline cleanup.

Methods

Participants

One hundred and twenty-two (89 females and 33 males) students at the University of British Columbia in Canada participated in this study. Faculties that participants studied in and year levels varied, and both international and domestic students were included. We did not collect the exact ages of the participants. Participants were randomly selected at the UBC Nest and Life buildings at various times throughout the day. They were asked if they would be willing to participate in a voluntary psychology study by answering a survey, and all participants gave consent.

Conditions

Participants were randomly assigned to one of two conditions. They would either complete the survey which had the emotion-based story, or the survey which had the statistics-based story. The emotion-based story used emotive language to describe the damage that human actions had on the environment, specifically on the coastal areas of British Columbia. A photograph of an oil-drenched bird accompanied this story. On the other hand, the statistics-based passage made use of practical, statistical information about plastic.

Measures

A survey was given to each participant. The first four questions asked for participants' demographic information: *What year are you in? What faculty are you in? What is your gender?* and *Which one of these best describes you (Domestic student vs. International student).* We designed the following questions to assess participants' current mood, their current concerns of the environment, and environmentally friendly actions they were willing to take. To assess mood, we asked participants to select an emoji that best described them at the moment. This visual information was designed to be straightforward, catch participants' attention, and to be sufficient at providing a baseline measure of mood. To assess their environmental concern, we used a 5-point Likert scale, ranging from *Not at all concerned* to *concerned,* including a neutral option. Then, we provided a list of pro-environmental actions such as *cut down shower time, reuse water in your home, stop single-use items* etc. and asked participants to check off the ones

that they felt willing to do. Participants who were in the emotional story condition then read a short passage describing the 2018 BC oil spill, which was accompanied by a photo of a bird affected by the spill. Participants who were in the statistics story group read a short passage with plain statistics on plastic use. Afterwords, we measured mood, environmental concern, and environmentally friendly actions they were willing to take once again. Lastly, we had a Great Canadian Shoreline Cleanup sign-up sheet that the participants had the option of signing up for, if they wished to do so. Unbeknownst to the participants, the sign-up was hypothetical. This allowed us to know how many participants were actually willing to take real actions to help save the environment.

Procedure

Experimenters approached random participants at the UBC Nest or Life Buildings, and asked them if they would like to partake in a study on environmental behaviours. Participants completed the survey either on a laptop or on a smartphone. Participants were not told which condition they would be in prior to completing the survey. The data was recorded on Qualitrics in order to be later analysed. After stating whether or not they would participate in the Great Canadian Shore Clean-Up, participants were told that the sign-up sheet was hypothetical.

Results

Our overall results are shown in Appendix Table 1. In our studies we conducted three separate ANOVA tests as well as an independent t-test. To measure our variable of environmental concern (Appendix B Table 1), our RM Factor 1 was statistically significant, showing a main effect of time (df=1, F=39.651, p= <0.001). Our RM Factor 1 x Conditions was not statistically significant showing that there was no significant interaction (df=1, F=0.022, p= 0.882). Our conditions for between subjects effects for environmental concern was statistically significant (df-1, F-4.461, p=0.037) showing that our statistical and emotional based stories showed true differences in amount of environmental concerns felt by participants

Our next ANOVA test was to measure our variable of mood (Appendix B Table 2). Our results here for RM Factor 1 was statistically significant again showing a main effect of time (df=1, F=98.01, p- <.00). Our RM Factor 1 x Conditions was also statistically significant showing there was a significant interaction (df=1, F=12.64, p=<0.001). Our conditions for between subjects effects was not statistically significant stating that our statistical and emotional based stories didn't produce differences in mood (df=1, F=1.150, p=0.286).

Our last ANOVA test was to measures our environmental action checklist (Appendix B Table 3). The RM factor 1 here is also statistically significant showing a main effect of time (df=1, F=16.064, p= <0.001). RM factor 1 x Conditions was not statistically significant stating that there is no significant interaction (df=1, F= 0.139, p=0.709). Our conditions for between subjects effects was also not statistically significant showing our statistical and emotional stories did not produce any differences (df=1, F=1.466, p=0.228).

Our last test done was an independent t-test (Appendix B Table 4) to measure our variable of sign up for our Great Canadian Shoreline Clean-up. Again, this was not statistically

significant, showing that the number of sign ups from participants were not different from each other if given the statistical (M= 2.194, SD=1.435) or emotional based story (M=2.015, SD= 1.452); t (-0.695) df= 125.0, p=0.488.

Discussion

The goal of our research was to discover the relationship between sadness, environmental concern and behaviors. Specifically, we randomly selected participants to one of two conditions. In one condition, we induced sadness with an emotional description accompanied by a saddening image, and in the other condition, we simply presented them with a statistical description. We discovered that the participants in both conditions felt more sad after being exposed to their respective condition. When taking into consideration the results we received, we can suggest that people's emotions can be affected when they are exposed to both an emotional and statistical account of human's disregard towards the environment, but we cannot say that people's emotions are more easily influenced by emotional descriptions and images than by statistical data. Our results also revealed that the participants in the emotion condition felt more concern towards the environment, which suggests that these participants were more emotionally affected than by those in the statistical condition. The results suggest that people's emotional state can be more easily manipulated by images than by statistics . Lastly, we discovered that participants in both the emotional and the statistical condition increased their willingness to act in more environmentally friendly ways. Even though, we may still suggest that changing in emotion will affect people's behavior. So no matter we use image or statistical information to induce sadness, people will be influenced and make changes that help protect the environment.

There are some limitations of our study. Firstly, the results we generated have low external validity. That is, our samples were all UBC students, so the effect cannot be generalized to society as a whole. If the study is to be run again in the future, it should we done in places outside of UBC campus in order to increase its generalizability. Additionally, although we had 122 samples in our study, it is still not a large enough sample size, which reduces the reliability of our results. Therefore, more samples are needed if the study is to be replicated in the future. Furthermore, the purpose of our study may have been a little bit obvious for our participants. That is, we asked the same questions before and after they were exposed to their condition. Some of the participants may have recognized that we were looking to observe how their exposure to the condition would change their emotions, and possibly answered in a way they thought we wanted. In the future, additional diverse questions should be placed in the study between more obvious questions in order to divert participants from recognizing the purpose of the research. Another limitation of our study was that the two conditions we placed participants in were not connected. That is, the two conditions provided stories from different topics. One condition contained a story about how oil has polluted the ocean and affected animals, and the other condition contained a story about plastic pollution. These two different topics may have impacted people's emotions differently, and thus created a different variable to measure. In the future, the conditions of the study should only contain one topic in order to be able to compare the results more confidently. In addition, a limitation to our study was that our emotion scale did

not provide us with a proper measure of our participants emotion. That is, the order of the emotions did not follow a logistal, objective pattern. In the future, the scale attempting to measure sadness does not need to include the emotion of anger. The emotions of "sad", "neutral" and "happy" should be placed in that order, to enable proper measures of sadness to be taken. Lastly, time constraint made it not possible to do a follow-up portion to this test. In the future, it would be helpful to see if the participants that signed up for the Great Canadian Shoreline Cleanup would fully follow through and come to the assigned day that they chose. It would also be useful to follow to see if they have really done the environmental actions they stated they would from the checklist, for example, if they actually cut back shower time or stopped utilizing single-use plastics.

Recommendations for your UBC client

As a large research university, UBC has a responsibility to implement changes both at the systemic and the individual level. In order to do so, the school needs to carry out even more effective initiatives in order to steer their students away from environmentally deteriorating behaviours. The results of this research experiment reveal that eliciting sadness can cause people to show more concern for the environment. One suggestion of how to make people show more concern about the environment is to utilize places like the UBC Botanical Gardens. The gardens are an ideal location to help exhibit how pristine and beautiful nature can be when actively protected by humans. The gardens could start a community engagement programme where students (and the general public) can take a tour and learn more about the plant life at the gardens. They could be told of the specific ways that humans environmental actions take a toll on the livelihood of these plants and their environment, and how this degradation affects humans as well. By hosting people in the gardens, they may be forced to think more critically about the consequences of their behaviours in regards to the environment, and be more inclined to change said behaviours. As the results from our research suggest that eliciting sadness could possibly increase individuals positive behaviours towards the environment, UBC could also launch an environmental initiative that focuses on eliciting this emotion in its students and faculty. Posters that depict saddening images of environmental degradation could be placed in washroom stalls, on garbage bins, in hallways, on doors, or anywhere else that is easily noticeable and visible to people. This will hopefully increase the amount of environmentally friendly behaviors that students and faculty at UBC engage in. One problem in the study was that participant did not understand that the they the break between the part of the survey and the shoreline clean up was for us to talk to them . Many participants continued on without the instruction for the shoreline sign up, which could have impacted their answer for the sign up sheet .

References

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Appendix A

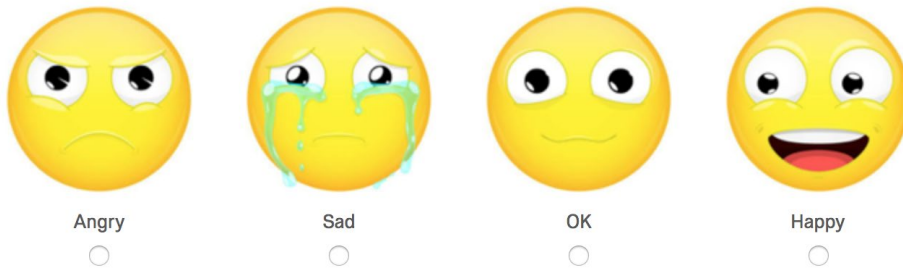**Survey Questionnaire**

Mood Test

Figure 1. Above is our mood test that will be used on each participant in our study before and after they are shown our short stories. Participants will have to circle which emotion is applicable to them.

Environmental Concern Scale

Figure 2. Above is our environmental concern scale that will be given to each participant after
the first mood test. Participants will circle which condition refers most appropriately to their
level of concern about the environment.

Environmental Action Checklist

- ☐ Adopt to vegan, plant-based or vegetarian diet
- ☐ Cut down shower time
- ☐ Drink only tap water
- ☐ Shop from thrift stores or only wear hand-me-downs
- ☐ Reduce consumption of fast fashion
- ☐ Reuse water in your home
- ☐ Strictly take public transport or active transport (e.g. cycling)
- ☐ Use natural cleaning products
- ☐ Shop at least 75% local
- ☐ Stop single-use items (e.g. plasticware, disposable razors, diapers, etc)

Figure 3. Above is our environmental actions checklist which will be distributed to every participant after they have read the short story that they were randomly selected to. They will check the boxes for actions that they are willing to engage in.

Statistical Short Story

Plastic product usage has been prevalent for the last 70 years. It seems like people cannot live without them because of the convenience they bring to us. Nowadays, people consume nearly 300 million tons of plastic products per year, half of which is for single use. More than 8 million tons of plastic is dumped into the ocean every year. Packaging is the largest end use market segment accounting for over 40% of total plastic usage. It is estimated that 500 billion plastic bags are used worldwide annually. More than one million bags are used every minute. A plastic bag has an average "working life" of 15 minutes. Over the last ten years we have produced more plastic than we did during the whole of the last century.

Figure 4. Above is the statistical story that will be given to participants that were randomly assigned to view and read this version of our short stories in our study.

Emotional Short Story

The image below is becoming a common sight in the waters of BC. This bird was covered in thick sludge following a diesel spill in the Howe Sound in February 2018. Hundreds of litres of diesel were bumped into the ocean, and such incidents will occur more frequently when the Kinder Morgan pipeline be extended. The 70% INCREASE in ship traffic in the area would be extremely hazardous to the local wildlife and, most importantly, greatly alter the way of life of the Squamish nation, who have lived on and preserved this land for several generations. Thousands of lives, human and non-human, would be adversely affected by the this. Oil spills like this will become more common, and will contribute to the widespread destruction to the coast of BC.

Figure 5. Above is the personal short story and attached photos that will be distributed to participants that were randomly assigned to read this version of our short stories in our study.

The Great Canadian Shoreline Clean-Up

	9:30 am	12:30 pm	3:30 pm
March 9th (Saturday)	☐	☐	☐
March 16th (Saturday)	☐	☐	☐
March 23rd (Saturday)	☐	☐	☐
March 30th (Saturday)	☐	☐	☐
No, I cannot make it	☐	☐	☐

Figure 6. Above is the Shoreline cleanup sheet that we will hand each participant at the end of our study. Participants will jot down there name in the time and day that they would be inclined to sign up to participant in a hypothetical shoreline cleanup on the upcoming weekend.

Appendix B

Tables

Table 1
The table of Repeated ANOVA test showing participant's environmental concern with df, F, and
p-values from both the statistical and emotional based story conditions.

Repeated Measures ANOVA ▾

Within Subjects Effects

	Sum of Squares	df	Mean Square	F	p
RM Factor 1	16.135	1	16.135	39.651	< .001
RM Factor 1 ＊ Conditions	0.009	1	0.009	0.022	0.882
Residual	50.865	125	0.407		

Note. Type III Sum of Squares

Between Subjects Effects

	Sum of Squares	df	Mean Square	F	p
Conditions	7.345	1	7.345	4.461	0.037
Residual	205.812	125	1.646		

Note. Type III Sum of Squares

Graph 1

Graph of participant's environmental concern. After stories read, there is an increase in amount in environmental concern, than before stories were read.The graph lines are very close showing that there is no interaction, and no difference between conditions.
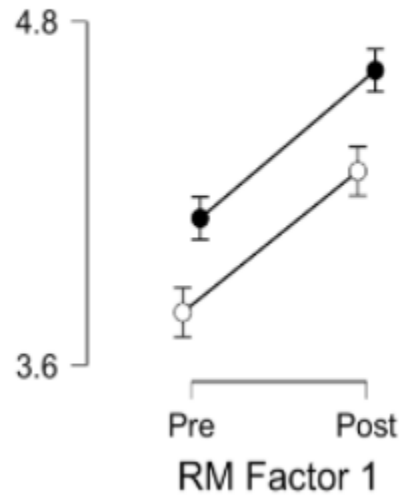
Descriptives ▼

Descriptives Plot

Table 2

The table of Repeated ANOVA test showing participant's mood with df, F, and p-values from both

the statistical and emotional based story conditions.

Repeated Measures ANOVA ▾

Within Subjects Effects

	Sum of Squares	df	Mean Square	F	p
RM Factor 1	28.356	1	28.356	98.01	< .001
RM Factor 1 * Conditions	3.656	1	3.656	12.64	< .001
Residual	34.140	118	0.289		

Note. Type III Sum of Squares

Between Subjects Effects

	Sum of Squares	df	Mean Square	F	p
Conditions	0.396	1	0.396	1.150	0.286
Residual	40.666	118	0.345		

Note. Type III Sum of Squares

Graph 2

Graph of participant's Mood. There is a significant decrease in participant's mood from before to after they are given their statistical or emotional based story. After stories read, participants felt sadder. The graph lines are overlapping showing an interaction, and a difference between conditions.
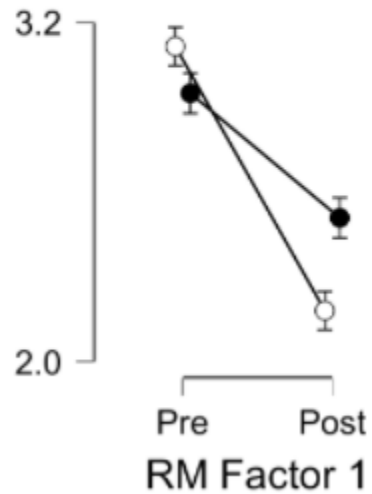
Descriptives ▼

Descriptives Plot

Table 3

The table of Repeated ANOVA test showing participant's Environmental actions checklist with

df, F, and p-values from both the statistical and emotional based story conditions.

Repeated Measures ANOVA

Within Subjects Effects

	Sum of Squares	df	Mean Square	F	p
RM Factor 1	19.313	1	19.313	16.064	< .001
RM Factor 1 * Conditions	0.168	1	0.168	0.139	0.709
Residual	155.092	129	1.202		

Note. Type III Sum of Squares

Between Subjects Effects

	Sum of Squares	df	Mean Square	F	p
Conditions	17.06	1	17.06	1.466	0.228
Residual	1501.25	129	11.64		

Note. Type III Sum of Squares

Graph 3

Graph of participant's environmental actions checklist. After stories read, there is a increase in amount in environmental actions checked off, than before stories were read. The graph lines do not overlap showing that there is no interaction, and no difference between conditions.
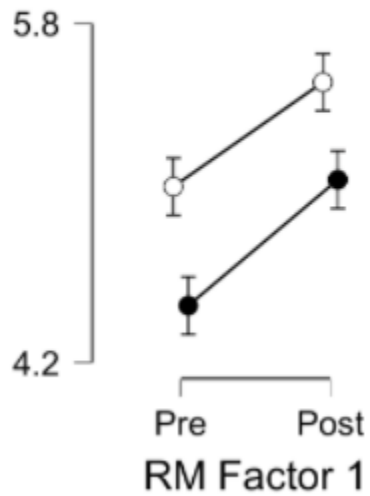
Descriptives

Descriptives Plot

Table 4
The table of independent t-test showing participants willingness to sign up for our Great Canadian Shoreline Cleanup with t, df, p values, the means, and standard deviations for both our statistical based story condition and our emotional based story condition

Independent Samples T-Test

Independent Samples T-Test

	t	df	p
number of sign ups	−0.695	125.0	0.488

Note. Student's t-test.

Graph 4
A table from our independent t-test for our Great Canadian Shoreline Cleanup, showing the means, and standard deviations for both our emotional based and statistical based conditions.

Descriptives

Descriptive Statistics

	number of sign ups	
	emotion	stats
Valid	65	62
Missing	0	0
Mean	2.015	2.194
Std. Deviation	1.452	1.435
Minimum	0.000	0.000
Maximum	6.000	6.000