

Educational Videos and Exposure to Nature as Predictors of Environmentally
Responsible Behaviours among University Students

Sofia Descalzi

A thesis submitted to the Psychology Program in partial
fulfillment of the requirements for the degree of Bachelor of Arts (Honours),

Division of Social Science

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Grenfell Campus

Memorial University of Newfoundland

April 2016

Approval

The undersigned recommend the acceptance of the thesis entitled “Educational Videos and Exposure to Nature as Predictors of Environmentally Responsible Behaviours among

University Students”

Submitted by Sofia Descalzi

In partial fulfillment of the requirements for the degree of

Bachelor of Arts (Honours)

Daniel Nadolny
Thesis Supervisor

Jim Duffy
Second Reader

Grenfell Campus Memorial University of Newfoundland

April 2016

Acknowledgements

Above all, my greatest form of gratitude goes to my supervisor, Daniel Nadolny, who endured my frustrations and rants with utmost patience. I could have not asked for a more dedicated, thoughtful, and passionate mentor. Even in difficult times you cleared my doubts with efficacy and humor. You sir are a saint.

I would also like to thank all the wonderful people who supported me throughout the way and who were always ready to give me words of encouragement, especially, to my sister, Raffaella, my aunt, Pilar, and my dearest friend, Carolina. Thank you for all those Starbucks lids.

All my love and thankfulness to my parents, Mario and Sylvia, who in their own way, are the reason why I am writing this thesis. I am blessed to have had the kindest and most affectionate person as my father, and to be inspired every day by my mother's undertaking to put me through university. *Esto va por ti mamá.*

Special gratitude goes to Jim Duffy who, even in a hectic academic and administrative year, took the time to be the second reader of this thesis. I am truly humbled to have had the opportunity to be your student.

Thank you to all the participants in my study and to the psychology department who were key players for the development of my studies.

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Abstract

The purpose of this study was to examine if the effects of exposure to educational videos on climate change and exposure to a view of nature could elicit environmentalist behaviours and increase one's environmental identity. It was predicted that participants who were exposed to a view of nature and saw a video on climate change would have a higher likelihood to plant a seed and experience greater connectedness to nature. Fifty-four students (38 females, 15 males, and 1 gender fluid) with ages ranging from 18 to 47 were recruited for the experiment. A 2 (type of video) x 2 (type of view) factorial design was conducted, in which participants were randomly assigned to watch either an educational video on climate change or on popsicles, and they either had a view of outdoors or indoors. There was no significant interaction for setting and video ($p = .172$) on whether participants chose to plant a seed or not. Likewise, there was no significant interaction for setting and video ($p = .262$) on planting intentions. There was a significant effect for the video on experiencing connection to nature ($p = .039$, $\eta_p^2 = .08$). These findings suggest that this video could change one's perception of nature.

Educational Videos and Exposure to Nature as Predictors of Environmentally Responsible Behaviours among University Students

Anthropogenic climate change is an issue constantly being discussed in the media by politicians, scientists, economists, and environmental activists. The Intergovernmental Panel on Climate Change explains it as changes in climate caused by human industry (IPCC, 2007). The use of fossil fuels, the increasing rates of consumption, and a continuously growing population are just a few factors that are causing further concentration of greenhouse gases in the atmosphere, thus, making rising temperatures a reality (IPCC, 2007). Therefore, large scale societal changes need to be implemented not only to mitigate anthropogenic climate change, but also to adapt to a more sustainable lifestyle (Mayer & Frantz, 2004). However, there are several branches of distorted perceptions that hinder this socio-environmental shift. These include motivated denial, risk salience, and temporal discounting (Dunlap, 2013; Stern, 2000). Distorted perceptions also seem to be the result of insufficient education on the subject and the lack of importance modern life gives to nature (Moser & Dilling, 2004).

Education programs on climate change are then a crucial component to ameliorate the disinformation on this topic. Their main objectives are to expose people to nature in order to foster environmental identity to facilitate sustainable living, emphasize the risk of rising global temperatures, debunk bogus arguments, and teach the public to prioritize environmental behaviours over consumerist behaviours (Carrico, Truelove, Vandenberg, & Dana, 2015; Olivos-Jarra, Aragonés, & Navarro-Carrascal, 2013; Stapleton, 2015). Consequently, education through exposure to nature is essential to mitigate climate

change (Olivos-Jarra et al., 2013). However, educational programs are often lengthy and resource intensive, therefore, another innovative, cost effective, and easy way to educate could be through short YouTube videos. Both of these measures could bridge the gap between the reality of climate change and people's perceptions around it. Most importantly, they raise the question of whether exposure to nature and short educational videos can positively influence environmental intentions, behaviour, and/or increase one's environmental identity.

Educational Programs and Environmental Identity

Environmental identity can be explained as showing connection with natural settings and being cognizant of the importance of nature for the welfare of human lives and other organisms (Clayton, 2003; Stern, 2000). Oftentimes, individuals who care and enjoy nature show high levels of environmental identity (Clayton, 2003; Swim et al., 2011). This construct could be a fundamental component for educational videos, as individuals with higher environmental identity are also more likely to be concerned about the magnitude of the risks associated to climate change. As a result, they could also be more likely to adopt climate change mitigating behaviours. People who work in developing their environmental identity are more likely to be intrinsically connected with nature (Mayer & Frantz, 2004). Environmental identity incorporates nature into the concept of the self (Clayton, 2003; Mayer & Frantz, 2004; Stern, 2000). Assuming that these people generally do not engage in self-destructive behaviours, meaning that they take care of their health and wellbeing, they will not want to damage or destroy nature either since it is part of their self-concept as well (Mayer & Frantz, 2004). Just like the

human body, nature is crucial for the development and well-functioning of the individual. Instead of seeing land as a commodity, for example, individuals with high connection to nature see it as the place that allows them to exist and so they would respect and love the land (Mayer & Frantz, 2004). Therefore, there is a moderate positive correlation between environmental identity and pro-environmental behaviours. For example, Stapleton (2015) found that students who were part of an environmental education program, engaged in more environmentally responsible behaviours after its completion. The goal of the program was to develop students' environmental identity. Moreover, Zelesnki, Dopko, and Capaldi (2015) found that twelve minute videos of nature documentaries (e.g., tundra, jungles) increased participants' environmental identity and behaviour. Educational programs that expose people to nature, even artificially, seem to produce behaviour change. However, it seems that it has not been studied if short videos that evoke an emotional response to climate change could produce similar effects.

The Western world has constructed a lifestyle where there is little interaction with nature in daily life, and that could partly explain why people are not reacting to global warming with the required imminence and concern (Mayer & Frantz, 2004). Individuals who do not feel part of their own environment are also less likely to protect it (Schultz, 2000). Pretty (2002) explains that for as long as humans were hunter-gatherers there was a characteristic sense of belonging to nature. In contemporary life, the influence of media, disengagement from nature, inability to properly assess the risk on climate change, and temporal discounting are factors that deeply influence whether people will develop

an environmental identity and/or engage in environmentally responsible behaviours (Stern, 2000; Swim et al., 2011).

Environmental identity does not appear out of thin air, for it needs to be sowed and watered with time and effort (Clayton, 2003; Mayer & Frantz, 2004; Olivos-Jarra et al., 2013; Stapleton 2015; Swim et al., 2011). Stapleton (2015) found that as participants engaged in more pro-environmental behaviours, they showed higher levels of environmental identity, thereby, suggesting that behaviour is intertwined with the self. Moreover, having others see you as an environmentally friendly person also fosters environmental identity (Stapleton, 2015). The key to establishing a solid connection with nature is by encouraging strong education programs regarding this issue (Chawla & Cushing, 2007; Olivos-Jarra et al., 2013; Stapleton, 2015; Swim et al., 2011). The aims of such programs are: making people aware of environmental problems (e.g. climate change), seeing oneself as a contributor to those problems, and also seeing oneself as an environmentalist with the possibility to change unsustainable behaviours (Stapleton, 2015).

Educational programs can be as creative as the developers want them to be, however, they must meet certain criteria for their success. They need to be empowering and aimed at eliciting intentions to change behaviours, at the very least (Moser & Dilling, 2004). These objectives cannot be attainable without assertive, persuasive, and knowledgeable speakers (Moser & Dilling, 2004). The content of educational programs on climate change should also include the effects in different affected areas of the world, the relevance of endangered species, and the economical shortcomings of an

unsustainable system (Chawla & Cushing, 2007; Olivos-Jarra et al., 2013). The objective is to increase risk salience about climate change in order to change behaviour (Carrico et al., 2015).

Exposure to Nature

Olivos-Jarra et al. (2013) suggest that there needs to be a solid connection between individuals and nature. In order to foster environmental identity individuals have to be in touch with nature or at least be exposed to it. For example, Sommer (2003) found that residents in a suburb area grew fond of the oak trees on the street by just passing by them in their daily life. When the municipality wanted to cut the trees down, these residents firmly opposed this decision and went out of their way to plant even more trees. This study shows that being constantly exposed to nature can increase environmental consciousness and lead to pro-environmental behaviour. Therefore, people would benefit from programs where they will have to go outside and experience being connected with nature. This approach builds shared responsibility, values, and habits that are consistent with environmentally friendly behaviours (Olivos-Jarra et al., 2013). However, individuals are often unable to delay gratification, even when this comes at the cost of their greater purposes (Stern, 2000). For example, a person may have strong feelings against deforestation but that does not necessarily mean that he or she limits the amount of paper he or she uses. This problem could possibly be resolved by increasing people's environmental identity through exposure to nature. For example, buildings could have big windows facing a natural setting to remind people of its importance and beauty.

Visual Persuasion

It has been shown that short educational videos on nature elicit environmental behaviours, but the limits on how short these videos can be while remaining effective needs further research (Zelenski et al., 2015). Perhaps the length is not as important as the structure of the video itself, making shorter, effective videos a useful educational method. For example, landscape visualization is an innovative line of research that uses visual communication as a tool to motivate people to change their behaviours in a more environmentalist direction (Sheppard, 2005). It creates digital three dimensional models with high realism (Sheppard, 2005). This tool is able to summarize difficult information visually (e.g., climate change issues), while also eliciting strong emotional responses (Daniel & Meitner, 2001; Nicholson-Cole, 2005). Although there needs to be more research on this topic, landscape visualisation seems to effectively engage the general public in environmental problems by making the effects of climate change more personally relevant (Sheppard, 2005) and increasing people's risk salience on global warming (Carrico et al., 2015). For example, the movie *The Day After Tomorrow*, which has vivid visualisations of the effects of global warming, prompted more concern, anxiety, and willingness to change behaviour, although the latter was in the short term (Lowe et al., 2005). Even though the film was not completely accurate, strong visual depictions could be an initial answer to change people's attitudes on climate change.

It is important to increase risk salience of the impacts of climate change, as a considerable portion of individuals in the United States do not see climate change as an immediate risk. Thus, they fail to make appropriate changes in their lifestyle to diminish

their carbon footprint (Swim et al., 2011). One of the reasons for this mindset is that climate change manifests itself gradually; changes in average temperature, precipitation, and the frequency of natural disasters do not occur rapidly enough for people to be concerned or aware about them (Swim et al., 2011; Whitmarsh, 2008). In fact, migration to other places is oftentimes seen as more feasible than changes in behaviour (Swim et al., 2011). Moreover, Whitmarsch (2008) found that 10.4 percent of the respondents affected by air pollution thought that climate change will bring global destruction, as opposed to 3.1 percent from their counterparts who were not affected by this environmental issue. Furthermore, out of this sample, 31.6 percent of air pollution victims and 36.3 percent of not affected participants believe that there is too much conflicting evidence about climate change to know whether it is happening. Evidently, bogus arguments denying climate change made by a handful of scientists has a detrimental effect on people's perception on this issue.

The present study

Attitudes towards climate change do not always elicit matching behaviours. This is caused by motivated denial, unwillingness to act, and lack of widespread environmental education programs. Moreover, past studies have focused on lengthy educational programs to encourage pro-environmental behaviour (Chawla & Cushing, 2007; Olivos-Jarra et al., 2013; Stapleton, 2015). This study aimed to use a short educational video, which incorporated some of the elements of landscape visualisation, in the hope of eliciting similar behaviour that was found in previous studies (e.g., Daniel & Meitner, 2001; Nicholson-Cole, 2005; Sheppard, 2005; Zelenski et al., 2015).

Specifically, I wanted to investigate if educational videos could elicit behaviour that would help mitigate the effects of climate change. I hypothesized that by educating people with short, emotionally charged, and factual videos on climate change, they would show higher environmental intentions, behaviour, and identity. Therefore, this video made individuals estimate their personal risk higher, so that they might be more willing to engage in pro-environmental behaviors. It is also hypothesized that participants would show more environmental intentions, behaviour, and environmental identity if they were exposed to nature. Although they were not in direct contact with nature, they had a view of it. Education in this regard is crucial; the more programs that are implemented to portray the real and imminent consequences of climate change, the more people will start accommodating their behaviour (Chawla & Cushing, 2007; Olivos-Jarra & Navarro-Carrascal, 2013).

In the midst of one of the most pressing issues of the twenty-first century, this study aimed to look for methods in which people will effectively respond to climate change and incorporate sustainable behaviours into their daily life. There is a need to act now before mitigation methods shift to damage control. This study emphasizes what others have reiterated before: education is the foundation for change (Chawla & Cushing, 2007; Olivos-Jarra et al., 2013; Stapleton, 2015; Swim et al., 2011). Furthermore, it aims at giving supporting evidence to the notion that green spaces could determine environmental behaviors and cities should provide its citizens greener areas for this to happen.

Method

Participants

A convenience sample of 54 undergraduate students from Grenfell Campus, Memorial University of Newfoundland volunteered to take part in a study on predictors of environmental behaviours. They were recruited from an undergraduate psychology research participation pool and by showing the recruiting advertisements through social media. The participants were 38 females ranging from 18 to 47 years old with a mean age of 21.47 ($SD = 4.85$), 15 males ranging from 18 to 26 years old with a mean age of 20.53 ($SD = 2.07$), and 1 gender fluid.

Materials

The consent form (Appendix A) contained the purpose of the study, details concerning anonymity, and who to contact to get the results. There were two educational videos: one concerning climate change and another concerning the history of popsicles (Appendix B) (BrainStuff, 2015; Prince Ea, 2015). The first dependent variable was whether participants agreed if they wanted to plant a seed or not, (i.e. *Plants help the environment by producing oxygen. Do you want to plant a seed for you to keep?*) and the second dependent variable was engaging in such behaviour. This was done to test whether participants' intentions were reflected in their behaviour and whether the factors in each experimental condition caused a change in behaviour. Specifically, participants had the opportunity to plant a seed (*Thymus vulgaris*—Thyme) as a mitigation effort for climate change. The materials for this activity included: used and cleaned “Keurig” cups that served as pots, medium size Starbucks lids that were used to keep the plant hydrated,

a spoon and toothpicks for planting, soil mix, and a cleaned dishwasher bottle with water. All these materials were placed inside a bigger container along with a plasticized copy of the instructions for planting (Appendix E). These instructions showed step by step how to plant the seeds in these small containers (see Appendix C).

The last dependent variable was to test participants' connectedness to nature. This variable measured people's perceptions towards nature, and has been suggested to be influential in people's environmental behaviour Mayer and Frantz (2004). In order to do so, section number three of the questionnaire tested the participants' pre-existing environmental identity (e.g., *I feel as though I belong to the Earth as equally as it belongs to me*). This connectedness to nature scale was developed by Mayer and Frantz (2004) and can be found in the *Journal of Environmental Psychology*.

The questionnaire was divided into five different sections. The first section assessed the attitudes about nature and climate change across conditions. For this end, the General Attitudes on the Environment Scale (GAE) was created (see Appendix D). There were sixteen questions that analyzed four different topics. These questions were specifically developed for this study. The first category evaluated whether participants were influenced by the aesthetics of having a plant (e.g., *A flower will make my apartment look nicer*). The second category evaluated whether participants chose to plant a seed because they legitimately care about preserving the environment (e.g., *I think planting a seed will help mitigate climate change*). The third category evaluated participants' attributions of individual accountability (e.g., *My actions will affect climate change*). The last category evaluated participants' possible extenuating circumstances for

not taking part in the planting activity (e.g., *Caring for a plant is time consuming*). Participants were asked to rate these statements from 1 to 5, 1 being “strongly disagree” and 5 being “strongly agree”.

The following four scales were meant to control for possible confounding variables. Section number four of the survey used a shorter version of the Marlowe-Crowne Social Desirability Scale developed by Strahan and Gerbasi (1972), which is designed to control inhibiting behaviour due to social pressure. Participants had to indicate whether a series of statements were true or false (e.g., *I always try to practice what I preach*). Section number five of the questionnaire measured participants’ Big Five personality traits. This section was included to control for the variability that can be caused by different personalities in choosing to engage in unusual activities for a university setting. This study used Gosling, Rentfrow, and Swann Jr.’s (2003) Big-Five instrument test. Participants were asked to rate from 1 to 7 (1 being “strongly disagree” and 7 being “strongly agree”), characteristics that might or might not pertain to their personality (e.g., *dependable, self-disciplined*). The last section of the questionnaire asked participants for their demographic information.

Procedure

Students from Grenfell Campus were asked to participate in a study regarding attitudes towards current social issues for an honours thesis. The participants were later debriefed that the purpose of the study was to study factors influencing environmental behaviour. The study design was a 2 x 2 factor model. The first independent variable was the type of educational video being shown and the second independent variable was the

location where the experiment was carried out. Within each variable there were two levels: a video on climate change vs. a video on popsicles, and a place with a view of nature vs. a place without a view of nature. The experimental condition for the type of video showed a video about the current and future effects of climate change (Williams, 2015). The control condition for this variable showed an educational video on the history of popsicles (Clark, 2015) (Appendix B). The reasoning behind choosing a video on how popsicles were made is that it was an informative and engaging video that was unlikely to evoke emotional responses or existential thoughts that could interfere with the experiment. The experimental condition for the location variable took place in the second level of the AS Atrium in Grenfell Campus. The reason for this is that this lounge has a big window that faces several trails and a bay. The control condition took place on the same floor, but participants were facing a wall.

Participants were randomly assigned to one of the four conditions. They set appointments with the experimenter by e-mail, and they were told to meet in the second floor of the AS Atrium. There was a laptop set with the online survey ready to be administered. On the table, there was also a container with the materials needed for the planting activity. The experimenter went over the informed consent form with the participant, and then the experimenter stepped aside to a near location. The participant either watched the video about climate change or the video about popsicles, and then she or he was asked to answer the first question of the online survey (i.e., *Plants help the environment by producing oxygen. Do you want to plant a seed for you to keep?*). After the participant decided whether he or she would do the activity, he or she completed the

rest of the survey. After the experiment was finished, the experimenter gave the participant the debriefing form, answered any questions the participant may have had, and thanked him or her for his or her participation.

Participants were aware that their participation in the study was voluntary and that they could withdraw from it if they chose to do so. In order to guarantee anonymity, they agreed with the informed consent form by clicking next prior to completing the electronic survey. Contact information was provided if participants had any questions regarding this study. After completing the study, information was automatically submitted to a database.

Results

Connectedness to Nature Scale

It was hypothesized that participants viewing outdoors and who saw the video on climate change will have higher connection to nature. A 2 (type of video) by 2 (type of view) independent measures ANOVA indicated a significant difference in scores of the connection to nature scale ($\alpha = .75$) between the popsicle and climate change themed videos, $F(1,50) = 4.49$, $p = .039$, $\eta_p^2 = .08$. Participants who saw the video on climate change scored higher ($M = 3.95$, $SD = 0.51$) than the ones who saw the video on the history of popsicles ($M = 3.64$, $SD = 0.52$) (See Figure 1). The main effect for the type of view was not significant $F(1,50) = 0.24$, $p = .628$, $\eta_p^2 = .05$. Thus, there was no significant difference on scores from completing the questionnaire with a view outdoors ($M = 3.84$, $SD = 0.55$) or indoors ($M = 3.74$, $SD = 0.52$). The interaction between the theme of the video and the type of view was also not significant $F(1,50) = 0.52$, $p = .473$, $\eta_p^2 = .01$.

General Attitudes on the Environment Scale (GAE)

The scale was constructed in the hope to understand the reasoning behind participants' intentions and behaviours. It consisted of 15 items ($\alpha = .75$) that assessed possible attitudinal explanations for showing environmental behavior. A 2 (type of video) by 2 (type of view) independent measures ANOVA showed no significant difference on the scores on attitudes of type of video, $F(1,50) = 1.13$, $p = .294$, $\eta_p^2 = .02$, or setting, $F(1,50) = 3.08$, $p = .085$, $\eta_p^2 = .06$. Likewise, there was no significant

difference in the interaction between the type of video and setting, $F(1,50) = 1.25, p = .269, \eta_p^2 = .02$.

Environmental Intentions

It was hypothesized that people who had a view of nature and saw the video on climate change would elicit pro-environmental intentions. A logistical regression showed no significant differences (see Figure 2) in having the intention to plant a seed or not between the video on climate change and the video on popsicles, and between outdoors and indoors views, $\chi^2(1, N = 54) = 4.00, p = .262$. One person reported having allergies, making it impossible for him or her to participate in the activity, and so that person was removed from this portion of the analyses.

Environmental Behaviour

It was hypothesized that exposure to nature and watching an educational video on climate change would cause participants to plant a seed. A logistical regression was conducted to assess if the type of view and video theme predicted whether or not participants chose to plant a seed. Again, the person who reported to have allergies was removed from this study (see Figure 3). There were no significant results among conditions, $\chi^2(1, N = 54) = 4.99, p = .172$.

Exploratory Analysis

The data acquired in this study gave the opportunity to look into results that were outside the specific hypotheses. However, future research needs to test whether these effects are valid and not the results of Type I errors. Regarding the relation of connectedness to nature and personality traits, there is a main effect for the type of video

on conscientious people, $F(1,50) = 5.52, p = .023, \eta_p^2 = .10$. Participants who saw the video on climate change scored higher on conscientiousness ($M = 5.74, SD = 1.00$) than the ones who saw the video on the history of popsicles ($M = 5.06, SD = 1.09$) (see Figure 4). Moreover, the type of video also had a significant effect on social desirability, $F(1,50) = 4.87, p = .032, \eta_p^2 = .09$. People who were in the popsicle condition scored higher in social desirability ($M = 1.25, SD = 0.10$) than those in the climate change condition ($M = 1.19, SD = 0.10$) (see Figure 5).

As for the GAE scale, there are several individual scale items with noteworthy results. There was a significant main effect for setting on the statement: *I feel I have no control over climate change*, $F(1,49) = 4.74, p = .034, \eta_p^2 = .09$. Marginal means showed that people with an outdoors view had lower scores ($M = 3.19, SD = 1.44$) than people with an indoors view ($M = 4.19, SD = 1.80$) (see Figure 6). There was also a significant effect for setting on the statement: *I think that plants will make my apartment messier (e.g. falling leaves)*, $F(1,50) = 5.58, p = .022, \eta_p^2 = .10$. Participants in the indoor view condition scored higher ($M = 2.81, SD = 1.39$) than the ones in the outdoor view condition ($M = 2.00, SD = 1.00$) (see Figure 7). Lastly, there was a significant effect for setting on the statement: *My individual actions will affect climate change*, $F(1,50) = 5.87, p = .019, \eta_p^2 = .11$. Participants in the outdoor view condition had higher scores ($M = 5.67, SD = 0.92$) than participants in the indoor view condition ($M = 4.78, SD = 1.60$) (Figure 8).

Discussion

This study aimed to assess the effects an educational video on climate change and limited exposure to nature had in regards to environmental identity, willingness to mitigate climate change, and environmental behaviour change. For this objective three predictions were made. It was hypothesized that people who saw a video on climate change awareness, and had a view of the outdoors would score higher on connection to nature. Likewise, this group of people would be more willing to help the environment, and would also change their behaviours in order to do so. Overall, there were no significant differences in whether participants felt more motivated to act on climate change, or in showing more environmentally friendly behaviours (planting a seed). However, there was a significant difference in connection to nature when participants viewed the video on climate change regardless of their condition in setting.

This video seemed to increase people's environmental identity, leading to greater incorporation of the environment into their self-concept (Mayer & Frantz, 2004). Some of the reasons for this finding may involve the visual effect of the video as well as the way in which the message was portrayed. The video had a background of a desert that could have elicited a strong emotional response. This effect could be similar to the ones found in the landscape visualisation literature (Daniel & Meitner, 2001; Nicholson-Cole, 2005; Sheppard, 2005). There was also a clear structure used to frame climate change. The first portion of the video presented the problem, this was followed by raising awareness that explained how the lay public is an active contributor to climate change, and the last portion motivated the audience to take action and change their behaviour.

This sequence follows the guidelines for successful environmental educational problems suggested by Stapleton (2015). In this way, the video presumably enhanced the risk salience of climate change while also making the viewer self-expand his or her identity to incorporate nature (Carrico et al., 2015; Mayer & Frantz, 2004). The video could have also brought participants' attention to climate change, which could have possibly not been there because, as global warming happens gradually, it is not directly observed in everyday day life, and it can slip out of consciousness fairly easily (Swim et al., 2011, Whitmarsh, 2008).

The performer in the video draws attention to the threats connected to anthropogenic climate change such as rising sea levels, pollution, and deforestation. This in turn could have increased concern for the environment and at the same time it could have established a connection with nature (Carrico et al., 2015). One possible explanation for this effect could be found in the way language was used. The message was delivered through spoken word, which involves the use of rhymes. McGlone and Tofighbakhsh (2000) found that participants believe messages that rhyme as being more truthful than messages that do not rhyme. Therefore, the message could have resonated in the participants' minds more strongly because of its metre.

Moreover, as participants were exposed to the causes and the originators of the problem, this could have attenuated the cognitive discrepancy between facts and beliefs on climate change (Carrico et al., 2015). However, this information is discomfoting and evidently threatens the current way of life. Then, how did the video seemingly achieved to enhance participants' connection to nature? A possible explanation could be the

performer's use of self-affirmations. For example, the title and refrain, *Dear Future Generations: Sorry*, highlights the basic human need of taking care of our offspring. Perhaps participants felt that they needed to be more aware of the very element that gives life: nature. Furthermore, the video also could have debunked the skepticism that some climate change deniers have created around the issue (Dunlap, 2013; Moser & Dilling, 2004). For example, media channels and political figures who support the reliance on fossil fuels and negate the threats of climate change were overtly criticized (i.e., Fox News and Sarah Palin).

The setting condition did not yield significant results, however it provided noteworthy exploratory data. It is important to be cognizant that these effects are only suggestions and need to be further tested. Participants who were facing a wall agreed more with the statement that said they did not have control over climate change than did participants who could see outside. This effect may be caused by low risk salience from the indoor condition. People who did not see outside might have not been conscious that nature was threatened because it was not in front of them. In other words, nature could have been out of their awareness, therefore, participants did not see it was at risk. Another explanation could be that participants did not attribute personal responsibility to climate change. This explanation aligns with Whitmarsh's (2008) finding, in which more respondents attributed responsibility of climate change to corporations and the government than to themselves.

Participants in the indoor condition also agreed more that plants would make their apartment look messier. This could be due to temporal discounting. Participants could

have possibly given more importance to the immediate gratification that is having a clean space over the long-term purpose of producing more oxygen by having a plant.

Moreover, participants in the outdoor condition attributed the causes of climate change to more personal factors than participants in the indoor condition. Again, this could have been due to a heightened risk salience on climate change. The view had a combination of nature with urban life (e.g., roads, cars, a mill) and this contrast could have made people more aware of the impact humans have on nature.

Further exploratory results revealed that participants in the climate change video condition were presumably more conscientious than participants in the popsicle video condition. Conscientious people are characterized by being disciplined and responsible. Possibly, the video could have increased that trait by conveying messages of dutifulness, but this suggestion begs for further testing. Moreover, people who saw the video on popsicles reported to have higher level of social desirability than the ones who saw the video on climate change. People who show less social desirability are more sincere and express their true motives of their behaviour, because they are not as concerned about what others think of them. Therefore, presumably eliciting conscientiousness could be due to the self-affirmations supposition, in which the video could have given participants a higher purpose to be fulfilled. This in turn, could have decreased participants' need to feel more accepted by others. Nonetheless, there is also the possibility that all of these effects are caused by failure of random assignment.

This study had several limitations. The sample size, fifty-four participants, is considerably low to show significant results, and there is a possibility of having a Type II

error in the intentions and behaviour change conditions. Moreover, the outdoor condition of the setting had way too many components of modern life to be truly categorized as a view of nature. This could have been a confounding variable for this condition. Perhaps future studies should have a view solely of nature. Furthermore, the dependent variable of planting a seed could have not been a good measure to mitigate climate change. People might have not seen the connection of having a plant that produces oxygen, which helps to clean the carbon footprint as readily as it was expected. In regards to the environmental identity, it is not clear whether the video increased connection to nature or if participants who had already high connection to nature happened to watch the video on climate change. Further research needs to be done to clarify these limitations.

The educational video chosen for this study could have promising implications for the future. It gives evidence that technology could be a useful tool when educating people on climate change. Videos like this one could be shown in movie theatres' previews and before other YouTube videos to try to reach out to as many people as possible and educate them about environmental issues. However, this should be done with caution to avoid habituating people to these messages, which could lead individuals to ignore them. Moreover, it would be interesting to particularly test for the effects that visual imagery and poetry can potentially have in instructing people on climate change. This research would combine different fields, such as environmental science, psychology, and art to work together towards combatting climate change. Lastly, finding the boundary conditions of exposure to nature and length of educational videos could also

shed light into how to make educational programs on climate change the most effective in today's busy lifestyle.

This study was designed to answer the question if educational videos on climate change paired with exposure to nature could influence people's intentions to do more environmental actions, promote environmental intentions, and enhance connection to nature. This study support previous findings that short educational videos increase people's environmental identity, but not change in environmental willingness to act or behaviour (Zelesnki et al., 2015). It also expands the notion that not only videos that show information of nature could elicit higher levels of connection to nature, but videos on climate change could presumably do that as well. In the broader picture, this type of educational videos could be one of the elements used for a shift towards a more sustainable living that the world desperately needs. Moreover, exposure to nature is also a key factor in order to incorporate nature into the self and to elicit environmentally friendly behaviours (Clayton, 2003; Mayer & Frantz, 2004; Olivos-Jarra & Navarro-Carrascal, 2013; Stapleton 2015; Swim et al., 2011). Educational programs like emotionally charged videos on climate change could be an option to teach people about this issue, thus, mitigate climate change.

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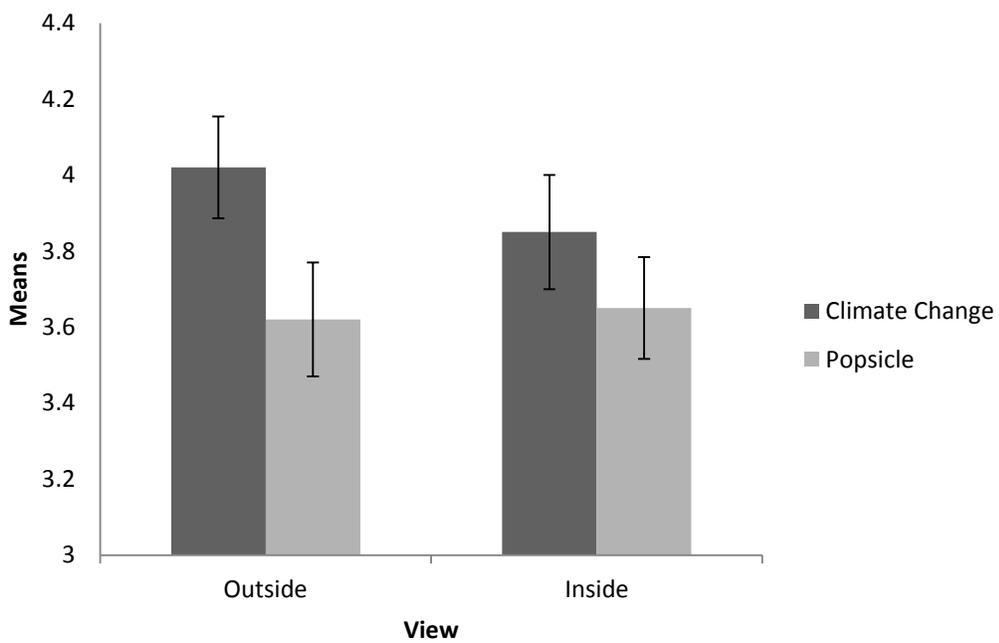


Figure 1. Mean differences in connection to nature scores across four conditions. Error bars represent standard errors.



Figure 2. Differences in intentions of planting a seed.



Figure 3. Differences in behaviour of planting a seed.

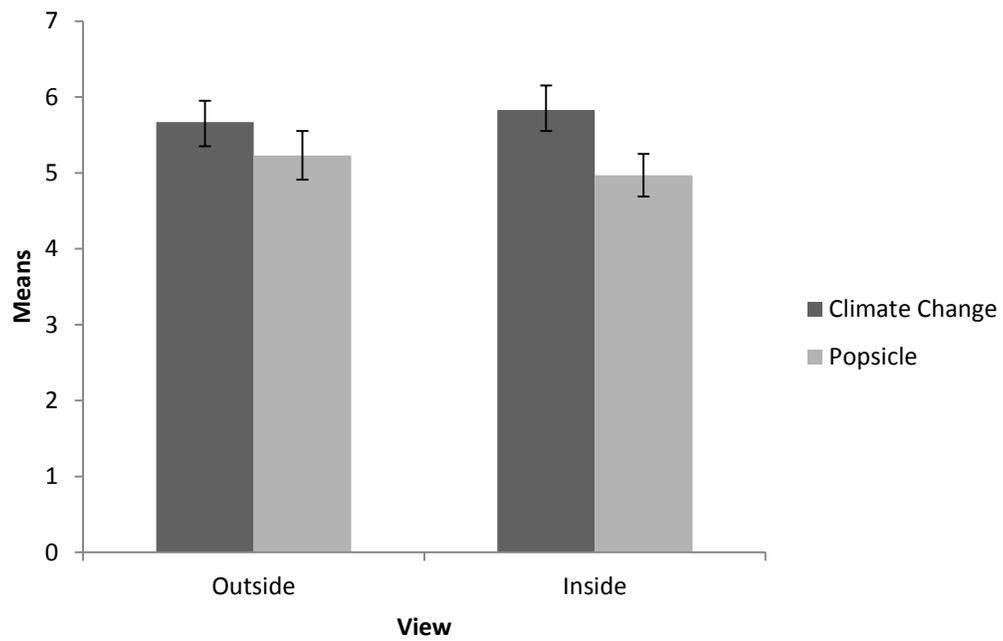


Figure 4. Mean differences in conscientiousness scores across four conditions. Error bars represent standard errors.

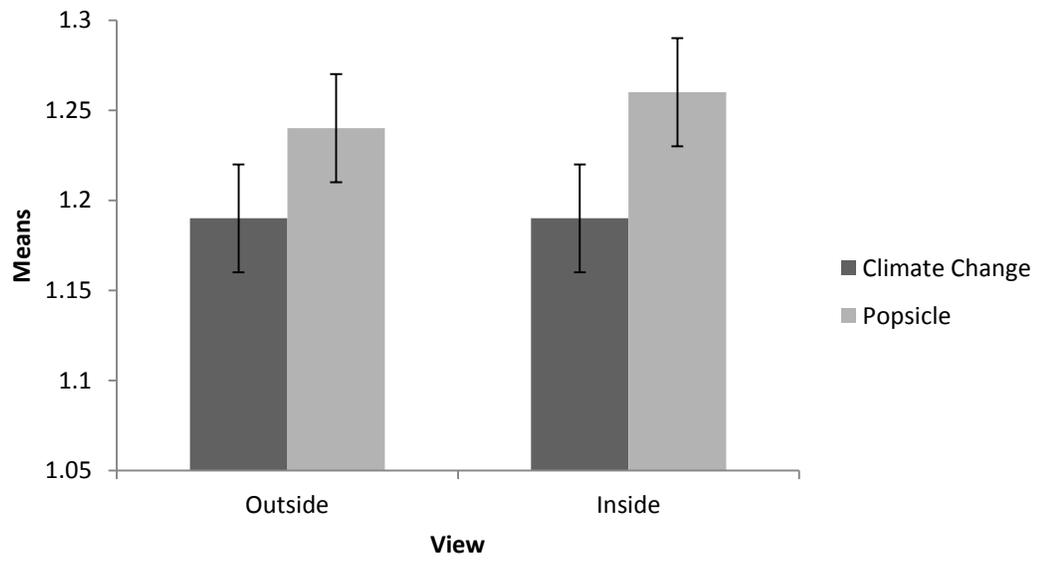


Figure 5. Mean differences in social desirability scores across four conditions. Error bars represent standard errors.

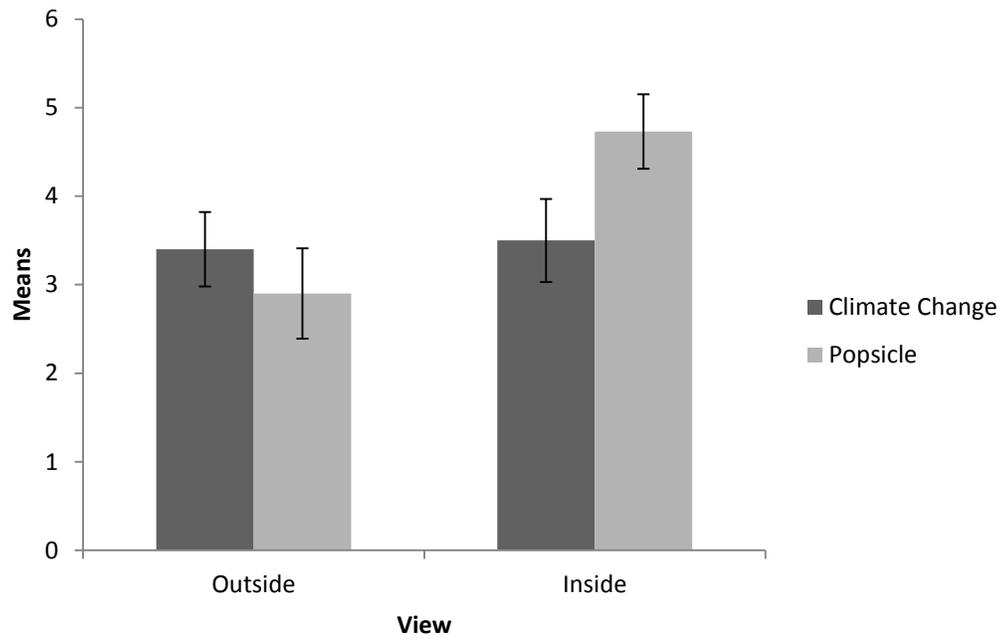


Figure 6. Mean differences in scores in the item of the GAE scale, I feel I have no control over climate change across four conditions. Error bars represent standard errors.

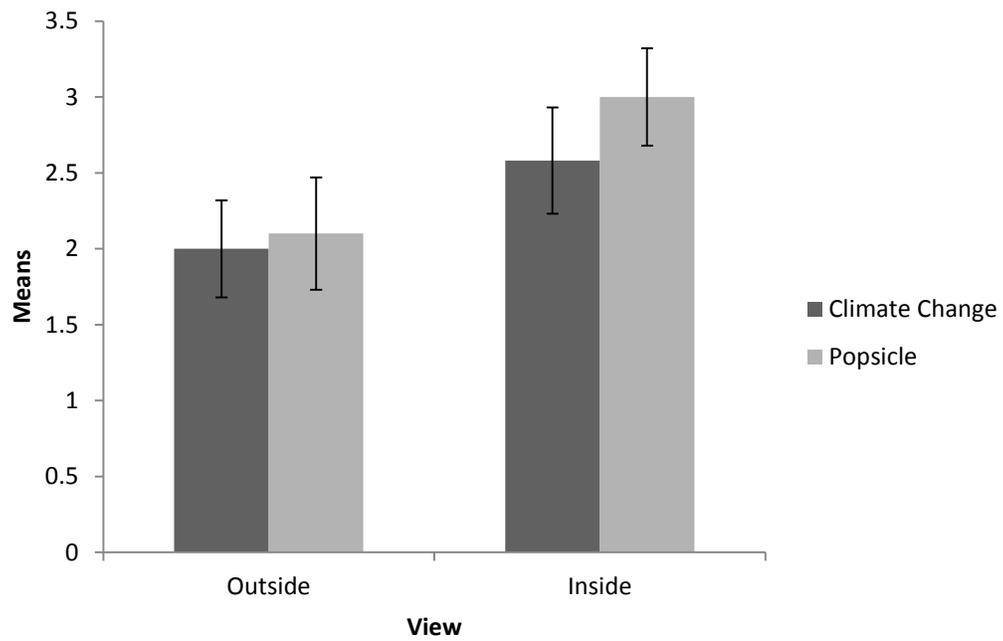


Figure 7. Mean differences in scores in the item of the GAE scale, *I think that plants will make my apartment messier* across four conditions. Error bars represent standard errors.

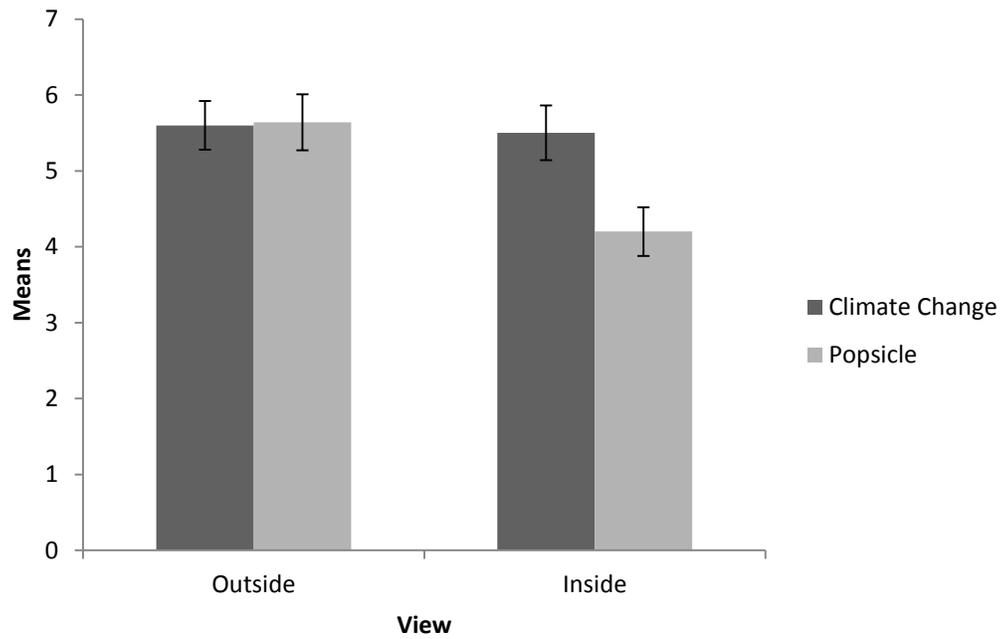


Figure 8. Mean differences in scores in the item of the GAE scale, My individual actions will affect climate change across four conditions. Error bars represent standard errors.

Appendix A

Attitudes towards Current Social Issues

Informed Consent Form

The purpose of this Informed Consent Form is to ensure you understand the nature of this study and your involvement in it. This consent form will provide information about the study, giving you the opportunity to decide if you want to participate.

Researchers: This study is being conducted by Sofia Descalzi as part of the course requirements for Honours Project in Psychology II, 4959 under the supervision of Dr. Nadolny.

Purpose: The study is designed to investigate attitudes of university students towards current social issues. The results will be used to write a lab report as part of the course requirements. The study may also be used in a larger research project and may be published in the future.

Task Requirements: You will be asked to watch a video and complete a survey and will be given the opportunity to partake in a seed planting activity. There are no right or wrong answers to the attitude statements; we are only interested in your opinions. You might be contacted by e-mail two weeks afterwards for a follow up on the study. You may omit any questions you do not wish to answer.

Duration: The study will take approximately 20 minutes to complete.

Risks and Benefits: There are no obvious risks or benefits involved with your participation in this study.

Anonymity and Confidentiality: Your responses are anonymous and confidential. Please do not put any identifying marks on any of the pages. IP addresses will not be collected. All information will be analyzed and reported on a group basis. Thus, individual responses cannot be identified. If you wish to engage in the follow up activity anonymity will be ensured by assigning you a special code. The on-line survey company, SurveyMonkey, hosting this survey is located in the United States and as such is subject to U.S. laws. The US Patriot Act allows authorities access to the records of internet service providers. Therefore, anonymity and confidentiality cannot be guaranteed. If you choose to participate in this survey, you understand that your responses to the survey questions will be stored and may be accessed in the USA. The security and privacy policy for the web survey company can be found at the following link:
http://www.SurveyMonkey.com/monkey_privcy.aspx.

Right to Withdraw: Your participation in this research is totally voluntary and you are

free to stop participating at any time. However, once you complete this survey and click submit, your data cannot be removed because we are not collecting any identifying information and therefore we cannot link individuals to their responses.

Contact Information: If you have any questions or concerns about the study, please feel free to contact me at my email sdescalzi@grenfell.mun.ca or my supervisor, Dr. Nadolny at 637-6200 ext. 4874 or dnadolny@grenfell.mun.ca. As well, if you are interested in knowing the results of the study, please contact me or Dr. Nadolny after April 16. If this study raises any personal issues for you, please contact the counseling centre at Grenfell, specifically, Dr. Hutchings at 637-6234 or vhutchings@grenfell.mun.ca or Maureen Bradley at 637-6211 or mbradley@grenfell.mun.ca

This study has been approved by an ethics review process in the psychology program at Grenfell Campus, Memorial University of Newfoundland and has been found to be in compliance with Memorial University's ethics policy.

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By proceeding to the next page, consent is implied.

Appendix B

Video: What's the Difference between a Popsicle and Ice Pops?

<https://www.youtube.com/watch?v=RgLdg9SJoDU>

Video: Dear Future Generations: Sorry

<https://www.youtube.com/watch?v=eRLJscAlk1M>

Appendix C

Instructions on How to Plant

1. Grab the spoon and fill the cup with soil to about half an inch from the top.
2. Add a few drops of water to moisten the soil.
3. With the toothpick, mix the soil around to allow the water to go through.
4. With the toothpick, make two holes that are half an inch deep (leave some space between the holes).
5. Place one seed in each hole (two in total).
6. Cover the holes either with the spoon, toothpick, or your finger (whichever you find more useful).
7. Place the cup in the plastic disc.
8. Add about half an inch of water into the disc. (PainChaud, 2013)

****Make sure you water your plant regularly (pouring water into the disc) and place it near a window for a few hours so it can receive sunlight****

Here is a good tip on how to know when you should water your plant:

“A good way to accurately and efficiently find out when your plant needs more water is to keep an eye on the soil. **When the soil looks dry, just stick your finger in it.** If the soil is dry in the first couple centimeters, is it probably time to give the plant more water. If your finger comes up with a little water on it, your plant is probably fine.”

(Purdy, 2009).

Appendix D
Online Survey

Section I. please read and answer this question.

Plants help the environment by producing oxygen. Do you want to plant a seed for you to keep?

- Yes
 No
 I cannot participate due to allergies

Section II.

If you will not perform the planting activity please continue on to complete the questionnaire by clicking next.

If you will do the planting activity please open the container next to you, where you will find everything you need. After you finished continue to complete the questionnaire by clicking next.

Section III. Please select a number next to each statement to indicate the extent to which you agree or disagree with that statement. There are no right nor wrong answers.

Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
1	2	3	4	5

1. I think planting a flower will help mitigate climate change.
2. Caring for a plant is time consuming.
3. I am making an effort to engage in activities that will help the natural environment.
6. When I plant a flower, other organisms will not benefit from this.

- ___7. Plants make me feel happier.
- ___8. Planting a flower is pointless.
- ___9. I feel that is my duty to care for the natural environment.
- ___10. Caring for a plant during winter is hard.
- ___11. I do not have the budget to have a plant.
- ___12. A flower will not make my apartment look nicer.
- ___13. I use resources without thinking about the consequences this behaviour has on the environment.
- ___14. I find plants to be aesthetically beautiful.
- ___15. I feel I have no control over climate change.
- ___16. I think that plants will make my apartment messier (e.g. falling leaves).
- ___17. My individual actions will affect climate change.

Section IV. Please answer each of these questions in terms of the way you generally feel. There are no right nor wrong answers.

Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
1	2	3	4	5

- ___1. I often feel a sense of oneness with the natural world around me.
- ___2. I think of the natural world as a community to which I belong.
- ___3. I recognize and appreciate the intelligence of other living organisms.
- ___4. I often feel disconnected from nature.
- ___5. When I think of my life, I imagine myself to be part of a larger cyclical process of living.
- ___6. I often feel a kinship with animals and plants.
- ___7. I feel as though I belong to the Earth as equally as it belongs to me.
- ___8. I have a deep understanding of how my actions affect the natural world.

- ___9. I often feel part of the web of life.
- ___10. I feel that all inhabitants of Earth, human, and nonhuman, share a common 'life force'.
- ___11. Like a tree can be part of a forest, I feel embedded within the broader natural world.
- ___12. When I think of my place on Earth, I consider myself to be a top member of a hierarchy that exists in nature.
- ___13. I often feel like I am a small part of the natural world around me, and that I am no more important than the grass on the ground or the birds in the trees.
- ___14. My personal welfare is independent of the welfare of the natural world.

Section V. Please mark an *F* for false or a *T* for true next to each statement. Responds honestly, there are no right nor wrong answers.

- ___1. I am always willing to admit it when I make a mistake
- ___2. I always try to practice what I preach
- ___3. I never resent being asked to return a favor
- ___4. I have never been irked when people expressed ideas very different from my own.
- ___5. I have never deliberately said something that hurt someone's feelings
- ___6. I like to gossip at times
- ___7. There have been occasions when I took advantage of someone.
- ___8. I sometimes try to get even rather than forgive and forget.
- ___9. At time I have really insisted on having things my own way.
- ___10. There have been occasions when I felt like smashing things.

Section VI. Please select a number next to each statement to indicate the extent to which you agree or disagree with that statement. There are no right nor wrong answers.

Strongly Disagree	Moderately Disagree	Disagree a Little	Neither Agree nor Disagree	Agree a Little	Moderately Agree	Strongly Agree
1	2	3	4	5	6	7

I generally see myself as:

- ____ 1. Extraverted, enthusiastic.
 ____ 2. Critical, quarrelsome.
 ____ 3. Dependable, self-disciplined.
 ____ 4. Anxious, easily upset.
 ____ 5. Open to new experiences, complex.
 ____ 6. Reserved, quiet.
 ____ 7. Sympathetic, warm.
 ____ 8. Disorganized, careless.
 ____ 9. Calm, emotionally stable.
 ____ 10. Conventional, uncreative

Section VII. Demographics

Gender: _____

Age: _____

Year of study: _____

Program of study:

___ Business

___ English

- Psychology
- Environmental Studies
- Visual Arts
- Mathematics
- Environmental Science
- General Science
- Graduate Program
- Other, please specify: _____

I already own plants in my household

- Yes
- No

If yes, how many? _____

Thank you for your participation.

Appendix E

