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It’s Getting Hot in Here So Take Off All Your CO2’s: Climate Change and its Effect on Well-Being and Happiness

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Abstract

Climate change is a clear and pressing environmental, social, and psychological issue. Although it is commonly viewed as only an environmental issue, climate change has its place as a positive psychology issue as it distributes intergroup relations, well-being, happiness, and social justice. Past research has shown that practicing sustainable behaviors increases well-being by creating a sense of connectedness. Nature walks have also been shown to increase happiness and have been used to treat depression. Based on previous research, this article explores how spending one hour in nature can increase happiness. This increase in happiness may lead to more helping behavior and offset the effects of climate change. Additional research and promotion of environmental education may help combat the effects of climate change and make the world a happier and more sustainable place.

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Introduction

At the United Nations Climate Summit in September 2014, President of the General Assembly, Sam Kutesa, defined climate change as an, "urgent challenge and a potentially irreversible threat that affects livelihoods, limits development options and efforts towards eradicating poverty and achieving sustainable development". Climate change is the human increase of the "greenhouse effect" or warming that results when the atmosphere traps heat radiating from Earth toward space (NASA). The greenhouse effect is caused by the emission of heat-trapping gases, particularly carbon dioxide, methane, and nitrous oxide. Greenhouse gases allow the Earth to be warm enough to support life, but excess amounts of greenhouse gases heat up the Earth beyond survivable levels. The amount of carbon dioxide, the most common greenhouse gas, emitted per capita in the United States is 16.4 metric tons (almost 40 pounds per person) (National Wildlife Federation). The United is the second largest contributor to CO2 emissions, but it is only home to 4.4% of the world's population (National Wildlife Federation). If everyone in the world lived the way people do in the U.S., it would take four Earths to provide enough resources for everyone (National Wildlife Federation). From shifting weather patterns that threaten food production, to rising sea levels that increase the risk of catastrophic flooding, the impacts of climate change are global and unparalleled. These impacts give climate change a place in positive psychology as they affect well-being, social justice, and intergroup relations; but sustainable habits and spending time in nature may combat these effects and increase happiness.

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We're on a Highway to Hell: The Global Effects of Climate Change

To understand how climate change is related to positive psychology, one must first understand that climate change is a real issue. The evidence of climate change is clearly apparent in global temperature rise, warming oceans, shrinking ice sheets, glacial retreat, decreased snow cover, sea level rise, extreme events such as hurricanes, and ocean acidification. NASA has reported that the average sea level is expected to rise 1-6 feet before the end of this century. In 1910, Glacier National Park was home to an estimated 150 glaciers, but that number has now decreased to 25 as of December 2016. The National Wildlife Federation predicts that at the current pace of global temperature rise, 25 to 35 percent of plant and animal species are at increased risk of extinction. The National Oceanic and Atmospheric Administration reports that the world's coral reefs are facing a global mass die off and as of 2015, coral bleaching has impacted 40% of the world's coral reefs, killing 4,630 square miles of reefs. Some of the most recent effects have been seen in the 2017 hurricanes, Hurricane Irma and Hurricane Harvey, that have been wreaking havoc in the United States. The Intergovernmental Panel on Climate Change (IPCC) forecasts a temperature rise of 2.5 to 10 degrees Fahrenheit over the next century. The United States' Third National Climate Assessment Report predicts that if disastrous human habits do not stop, the U.S. can expect temperatures to continue to rise, frost-free and growing seasons to lengthen, a change in precipitation patterns, more droughts and heat waves, hurricane to become stronger and more intense, sea levels to rise 1-4 feet by 2100, and the Artic to melt.

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Drop it like it's Hot: The Human Causes of Climate Change

There is a number of ways in which humans cause climate change and just changing simple habits can help save the world while increasing well-being and happiness. The three-main greenhouse-gas emissions that cause climate change are carbon dioxide (CO2), methane, and nitrous oxide. Humans produce excess amounts of CO2 when they burn fossil fuels such as coal, oil, and gas (NASA). Deforestation also has a huge impact on CO2 emissions as trees store CO2 as they grow and clearing and burning forests releases that CO2 (NASA). CO2 is also released in the use of electricity, which almost all Americans use every day. Methane is most commonly seen in the meat and dairy industry. Animals release excess amounts of methane in their fecal matter, and as demand for more meat continues, more methane is released. Methane is also released during fossil fuel extraction and in the decay of organic waste in landfill sites (NASA). Key sources of nitrous oxide include agriculture and industrial processes. Nitrous oxide is especially prominent in nitrogen-fertilized soils and in livestock waste (NASA). Other examples of ways human activity causes climate change include vapor trails from planes, soot from fires, and pollution. Humans have a great impact on this world and if habits do not change, the effects of global warming will increase.

You're Hot Then You're Cold, Yes Then You're No: Climate Change and Psychology

Climate change is a positive psychology issue as well as an environmental issue because it represents a massive threat to well-being, threatens social justice, and threatens stable intergroup relations (Clayton, 2017). Well-being is threatened through several slow changes that are not usually mentioned when the topic of climate change comes up. An increased spread of

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vector-borne diseases, such as Lyme disease and the West Nile virus, are spread by insects whose range is increasing as the climate changes (Clayton, 2017). Food insecurity is also a major threat as climatic conditions threaten crops and researchers project that by 2050, half a million people per year could die due to the impacts of climate change on food availability and quality (Clayton, 2017). Research has also documented serious threats to mental health that accompany significant storms such as Hurricane Katrina (Clayton, 2017). This can also lead to an increased number of refugees as people are forced to leave their homes. Furthermore, the impacts of climate change are not evenly distributed and the countries that are most effected are those with fewer resources; the same countries that are the least responsible for climate change. Intergroup relations are important to having a "good life" but they are also threatened by climate change. The U.S. Defense Department has classified climate change a threat to national security because it is predicted to lead to an increased risk of conflict (Clayton, 2017). This is caused by the threat of climate change having the potential to encourage people to focus on the well-being of their own group and reject outsiders. Increased competition for diminishing resources will also lead to more conflict. Climate change has an effect on psychological well-being and disrupts social justice and intergroup relations.

The Earth is Hot Stuff Baby Tonight: Sustainable Habits and Positive Mood

Studies have shown that have a personal identity that is connected to nature has several advantages (Clayton, 2017). Spending time in nature is positively correlated with psychological well-being and this is attributed to an increased feeling of connection. This is because a sense of connection is a basic human need in the self-determinism theory. Those who adopt sustainable

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habits and are aware of the effects of climate change believe that they are part of a larger and greater whole. They begin to think of themselves as not just an individual but as part of everything else. Connection to nature may also increase autonomy by promoting a sense of self-efficacy because feeling "grounded" or "rooted" in the nature may contribute to one's understanding of personal resources (Clayton, 2017). Several studies have found a correlation between connection to nature and positive social relations. In general, environmentalists are shown to be more altruistic than non-environmentalist because they are doing more for others (Clayton, 2017). In a study of over 600 Mexican students, Corral-Verdugo et. al. (2011) found that sustainable behavior is associated with happiness and can actual produce a "warm glow". Spending time in nature is also linked to positive mood and happiness. Simply taking an hour walk in nature has been reported to increase one's overall mood. Nature walks have even become part of therapeutic intervention for depression in some institutes (Korpela, Stengdrd, & Jussilia, 2016). If sustainable habits and caring for nature can increase well-being and positive mood, what does that mean for the future of climate change?

It's the Remix to Ignition, Hot and Fresh Out Carbon Emissions: Experiments in Nature

Method

Based past studies, the researcher conducted his own research to see how spending time in nature can change individual mood. For his experiment, the researcher had 15 undergraduate students (n=15) spend one hour in nature five days a week for four weeks. This amounted to 20 days of experimentation in total. For the experiment, nature was defined as any place away from buildings, with an open landscape, and with plenty of plants/wildlife. Common places

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participants stayed were Lake Yosemite, the park, the road leading to the Vernal Pools, and Yosemite National Park. While in nature, the participants were not allowed to use technology or do anything else to distract them from nature, such as homework or reading. They had to appreciate their natural surroundings. Before going into nature every day, the participants would take the University of Pennsylvania's Subjective Happiness Scale (see Figure 1). After spending an hour in nature, the participants would take the scale again to see how their answers changed. At the end of the 20 days, the researcher added up the ratings for each of the four questions and took the average of the scores for each question.

For each of the following statements and/or questions, please circle the point on the scale that you feel is most appropriate in describing you.

1. In general, I consider myself:
not a very happy person 1 2 3 4 5 6 7 a very happy person

2. Compared with most of my peers, I consider myself:
less happy 1 2 3 4 5 6 7 more happy

3. Some people are generally very happy. They enjoy life regardless of what is going on, getting the most out of everything. To what extent does this characterization describe you?
not at all 1 2 3 4 5 6 7 a great deal

4. Some people are generally not very happy. Although they are not depressed, they never seem as happy as they might be. To what extent does this characterization describe you?
not at all 1 2 3 4 5 6 7 a great deal

Figure 1. Subjective Happiness Scale from the University of Pennsylvania

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Results

Figure 2 shows the results of the experiment. The results show a slightly significant increase in overall happiness after spending an hour in nature. On average, the participants rated higher on feeling happier as well as believing they are happier than most of their peers (questions 1 and 2). The results also show a slight increase in believing that everyone is happy (question 3) and a slight decrease in believing that everyone is not happy (question 4).

Figure 2. Results of Subjective Happiness Scale before and after spending an hour in nature

This may imply that spending time in nature may actually make an individual feel happier. Being able to disconnect from society and people may help people to destress and feel like they are more connected with nature. The participants felt happier after the study and had a more positive outlook on their peers. Happiness has been positively correlated with helping behavior and this increase in happiness could cause people to be more willing to help care for the

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environment. By spending more time in nature and feeling more connected to nature, positive mood can increase and this may cause an increase in sustainable habits. This may, in turn, lead to a positive helping cycle. If people spend more time in nature, they will be happier. These happy people will be more likely to help others and take care of the environment through sustainable behavior. These sustainable behaviors can decrease greenhouse gas emissions and lessen the impact of humans on climate change. As climate change decreases, well-being and happiness can increase and allow for more helping and sustainable behaviors. This then leads to a larger decrease in greenhouse gas emissions and the cycle continues.

Discussion

This experiment was not perfect and there were plenty of things that I would change in the future. There was plenty of bias and my experiment was not generalizable because of such a small sample size. I would also use a different scale next time because the scale did not focus on individual happiness but happiness as a whole, which was not what I was trying to measure. The experiment also needed more control. I should have picked a specific time every day for participants to spend time in nature and picked a specific location. Future studies hopefully use better scales and have larger sample sizes. However, I feel my experiment was a good stepping stone in the right direction as it offers insightful implications. I have expanded on the research of nature and happiness and I hope that my impact will allow for more studies in the future.

Following my experiment, I wanted to educate my peers on climate change and the importance of sustainability and spending time in nature. I gave a presentation in class about the harmful effects of climate change and offered ways that students can live sustainably and

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increase their overall well-being by helping nature. This will hopefully allow for my peers to increase their well-being by feeling connected to nature and understand the ways in which climate change can affect their happiness and their “good life”. I believe that educating people on the effects of climate change and its threats to well-being and happiness will allow them to understand their impact and cause behavior change. I hope that my presentation and research will help motivate my peers to save the planet and take care of it so that they can increase their happiness and allow our natural resources to thrive.

Climate change is a clear and pressing environmental, social, and psychological issue. It effects the well-being of society and threatens intergroup relations, which positive psychology highlights is the important key to a “good life”. Research has shown a correlation between helping to stop climate change and positive well-being as well as increased happiness when spending time in nature. Experiments on undergraduate students have shown that spending just an hour in nature can increase happiness. Education is what is needed to help stop climate change so that well-being and intergroup relations are not threatened. Planet Earth is in danger, and human beings must do what they can to save it.

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Christian Laspada is a third-year undergraduate student at the University of California, Merced pursuing a Bachelor's of Art degree in Psychology with a minor in Writing. He has taken a number of courses in his major including Human Behavioral Genetics, Health Psychology, and Clinical Neuropsychology and is working towards becoming a researcher. He is an active member of Psi Chi, the International Honor Society in Psychology. He works as an EcoRep intern on campus where he promotes sustainability and sustainable habits to students, staff, and faculty. Mr. Laspada has been a Learning Assistant for psychology at his university's Bright Success Center since March of 2017, where he tutors peers in various subjects in psychology. In the future, he plans to research how to increase sustainable behavior with social psychology, how people interact with each other and the natural world, gender differences in sustainable behavior, and climate action and mitigation.