Pilot Test for Reliability and Validity of a New Assessment Tool Measuring Relationships between Individual Health and Environmental Sustainability

By
Laura Bartlett

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ABSTRACT

This study surrounds the creation of a comprehensive assessment tool designed to measure the relationships between individual health and environmental sustainability. The existing literature surrounding health and sustainability shows there is currently no assessment tool of this kind available. A self-reporting survey comprised of 103 questions divided among ten categories was created based on the existing literature. The five categories for health include: Mental Health, Physical Health, Physical Functioning, Eating Habit, and Stress/Relaxation. The five categories of sustainability are: Recycling, Energy Consumption, Greenhouse gas (GHG) Emissions, Water Usage, and Connection with Nature. The survey was tested for several reliability and validity measures. Participants (N=60) were students from Dalhousie University. Results of the pilot test show the tool to be reliable and valid in many of the psychometric categories. Recommendations to improve reliability, validity, and to create a more usable tool are included.

Key Words: environment, health, sustainability, reliability, validity, pilot test, survey, self-report

Contents

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Introduction

Research Question

Do people relate their health to sustainability? Can this be observed by correlating self-reported health behaviours and behaviours that relate to sustainability? If so, in what specific areas are these correlations drawn and how powerful are these connections?

Purpose

The purpose of this study is to create a valid assessment tool to determine if, and to what extent, people associate their health with sustainability. Using a series of reliability tests, it will be determined whether or not the tool produces psychometrically valid data. The data itself will be analyzed to see if there are associations among health behaviours and behaviours related to sustainability. Conducting this research and collecting the data are necessary before concrete suggestions for improving behaviour can be made. If it can be demonstrate that a strong connection between individuals' self-reported health and sustainability behaviours, it can be shown that health behaviours should be an integral part of the current sustainability discourse. Thus, the overall goal is for the results of this research to add significantly to this discourse and eventually lead to behaviour modification that enhances sustainability.

Statement of the Problem

"Sustainability", as the term is used today, was first used in the 1970s (Cheney et al., N.D.). Sustainability is now a fluid term fitting the need of the user, naturally leading to contradictions and confusion on the values of sustainability. Today, the discourse surrounding sustainability focuses on economics, development, and preserving that which people value most (McMichael et al, 2003). What people value the most, in places such as Canada and the United States, is anything that supports opportunity, autonomy, security, and health (McMichael et al, 2003). Sustainability has become a means to an end - it no longer has much to do with nature itself. Reducing greenhouse gas emissions is important because these emissions negatively affect human health and cause climate change, which threatens safety and security. For instance, Protecting fish populations is important to protect the longevity of fishing industries and the economic stability and opportunity that exists within that industry. This is meant to be a statement rather than a value judgement. Concerns for security, health, and prosperity are no less important than concerns for the environment. The problem is that environmental sustainability often gets lost among the rest of the big concerns.

It is forgotten that economics are dependent on the biosphere (McMichael et al, 2003). It is forgotten that poverty and world hunger will be made exponentially worse as climate change continues, climate change to which humans contributed significantly (McMichael et al, 2003). By securing the health of the environment, autonomy, safety, and human health can be protected. While many people undoubtedly still wish to protect nature for its inherent value, large scale environmental sustainability projects are often motivated by security, opportunity, autonomy and health (McMichael et al, 2003). The fact that these concerns are now being used as potential motivators opens up a unique set of opportunities for those primarily concerned about the state of the environment.

The framing of the sustainability discourse is crucially important. There are meanings attached to certain objects and actions, and these meanings can be changed with interventions and targeted promotion (Taylor, 2000). This idea is something that has only just begun to be used to its full potential. The economic benefits of sustainability are being heavily endorsed. Green products are for sale everywhere, and the savings from washing with cold water and turning off lights are being promoted at every turn. Increasing personal investment in the status of the environment and curbing its degradation will help change behaviour (Nisbet and Gick, 2008). Money is a very powerful motivator. Dinda's (2004) research on the Environmental Kuznets Curve shows an inverted U-shaped relationship between environmental stress and income levels. Environmental degradation increases along with GDP until a threshold is reached, at which point environmental degradation begins to decline as people have the means to pay for a healthier environment (Dinda, 2004). A problem arises when environmental problems are externalized. For example, if the site for a landfill is moved far enough away that it is no longer a bother to citizens, the concern for waste management is decreased and the curve does not fall as income increases (Dinda, 2004). It is important to keep people personally invested in environmental problems regardless of income levels.
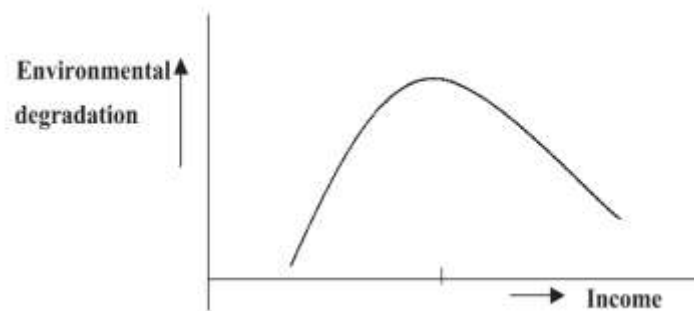

Figure 1. Environmental Kuznets Curve showing the relation between environmental degradation and income (Dinda, 2004, p.434).

It is impossible to argue that there is no connection between sustainability and money; thus, money is a potentially powerful tool to encourage behaviour change related to sustainability, but the motivational discourse becomes stale

when only focused on money. O'Brien (2008) used the Happy Planet Index as an alternate marker for development. It was found that GDP is not sufficient as a sole indicator of progress in a nation. McKenzie-Mohr (2000) has also found that economic incentives only work part of the time and only in specific scenarios.

We can therefore argue that there needs to be a more consistent and holistic form of motivation regardless of income or economic status. The implications of one's personal health are difficult to escape; thus personal health could also act as a powerful motivator. It is impossible not to walk into a store or participate in any form of the media without being bombarded by ideal images of health, beauty, and desirability. Magazines at the checkout of the grocery store advertise the newest way to a better body for bathing suit season. There are always new super fruits, fad diets, healthy living techniques that are bound to change your life. It is even affecting children. Edwards et al. (2013) noted that media played a significant role in children's decision making, affecting food and clothing choices and the sustainability of those actions. They found that increasing exposure to digital media had an effect on children's nature experiences; nature became something to be consumed and the accessories that go along with spending time outside became more important than the activity itself (Edwards et al., 2013). Edwards et al. (2013) cautioned that there could be long term effects on sustainability and health behaviours based on exposure to digital media. There is no escaping the fascination with health. The industries involved in food, health, and beauty are all multi-billion dollar industries; it is impossible to escape economics. Kim et al. (2012) cited a 2010 report from the Natural Marketing Institute stating approximately $290 billion (US) was spent on health, environment, social justice, personal development and sustainable living. The environment and health form a profitable combination.

The connection between health and sustainability is an expanding field of research. Popular topics include chemical use in food growth and how a person's environment affects smoking habits. There are always new ways to connect both subjects, and it is becoming a complex body of work. With any new relationship comes excitement and the existing dialogue is covering every combination imaginable but there is a serious lack of basic, congruent data. Human health could be a powerful motivator for encouraging sustainable behaviours but the existing literature lacks a certain continuity, which makes it difficult for outside parties interested in fostering change to implement desired transformations. There is no existing tool available for analysing several aspects of health and sustainability to provide basic data on the relationships between the two. As it is, most behavioural and health promotion programs and studies have not been translated into actual practice (Glasgow et al., 2004). Behaviour change cannot happen without basic data informing those changes. The tool that will be developed as part of this thesis will be used to assess a wide variety of possible relationships between health and environment, and, if none are present, that knowledge is equally as valuable as knowing what connections exist. Knowing that there is no connection between certain aspects of health and sustainability will inform people interested in creating behaviour change that efforts should be focused elsewhere where a connection is already present. Alternatively, programs can be created to help foster a connection between two desired behaviours that they do not already relate well to each other.

Significance of the Study

The purpose of this study is to create a tool that can be used to more comprehensively assess the relationship between categories of sustainability and health. By discovering how individuals relate sustainability and health, people can be encouraged to live more healthfully and sustainably. This study will add to the growing interdisciplinary discourse surrounding sustainability behaviours and their important relation to health behaviours.

Literature Review

Health and Sustainability

Health and sustainably are undeniably linked. McMichael (2006; McMichael et al, 2003) advocates that sustainability is actually about health. All environmentally friendly behaviour is really to protect human health; maintaining the complex systems that are threatened in the environment also protects health, because human life and health are dependent on those systems (McMichael, 2006; Nisbet and Gick, 2008). There is such breadth and diversity in the ways health has been linked with sustainability and vice versa in the emerging literature surrounding the two. Sustainability and health is a relatively new area of research, because for so long health and environmental professionals have failed to link the two topics together (McMichael, 2006). Partnerships between health and environmental sectors should be encouraged to promote contact with nature (Maller et al., 2005).

More than ever there is a need to study how health and sustainability affect each other as environmental degradation increases and new health concerns are becoming crises, like obesity and depression. Jackson (2003) analysed the impact of urban design on human health and notes the rise in asthma, allergies, obesity, diabetes, heart disease, and depression. Asthma and allergies can be exacerbated by air pollution, including fumes from transport vehicles, while obesity, diabetes, and heart disease can be reduced by increased physical activity. There are many health risks associated with individual behaviour that when changed could help the environment, such as driving less. But, obesogenic environments, environments reinforcing sedentary lifestyles and poor nutrition, are on the rise as the built environment is increasingly car dependant and fast food is in abundance and cheap (O'Brien, 2008; French et al.,2001). Hill et al. (2003) also cite increased time pressures in people's lives from society and work, leading to less time to prepare healthy meals, more driving to save time, and other seemingly time-saving activities, such as taking the elevator instead of the stairs. There is a direct link between increased car use and diminishing amounts of physical activity (O'Brien, 2008; French et al., 2001, Hill et al., 2000).

The positive effect of nature on mental health and fortitude is a relatively well documented subsection in the health and sustainability literature. An increased connection with nature has been found to increase well-being, while better well-being has consequences for better health with a similar relationship shown in the other direction (Nisbet et al., 2008, 2011; O'Brien, 2008; Gebhardt et al., 2001). Feelings of well-being have been linked to increased happiness, and happy people are more environmentally friendly (Nisbet et al., 2011, 2008). Similarly, Kaplan and Kaplan (2003)

found that people have declining effectiveness in their lives due to mental fatigue and stress. This can be helped by time spent in nature. By increasing accessibility of the environment to people, the amount of time spent outdoors has grown (Kaplan and Kaplan, 2003).

O'Brien (2008) has found that physical activity is strongly connected with quality of life and overall well-being, findings that are supported by Hawthorne et al (1999). O'Brien (2008) studied sustainable happiness, which means the pursuit of happiness that does not exploit people, the environment, or the future. Sustainable happiness inspires change through compassion for others and the environment, leading to increased happiness (O'Brien, 2008). O'Brien (2008) discovered that subjective well-being correlates to better physical health and that individual health promotion can be supported by looking into individual happiness. Nature can provide a population-wide strategy for decreasing the risk of poor health and for preventing mental illness (Maller et al., 2005). Maller et al. (2005) discovered that patients recovered faster with a natural view and that even thinking about nature relieves stress. Just knowing green space is in close proximity is important, even if it is not used (Maller et al. 2005).

Nisbet and Gick (2008) found a striking connection between health and sustainability, but campaigns designed to promote sustainability were rarely framed in terms of health or rarely made use of health behaviour models to implement change. Maller et al. (2005) also found that public health strategies have not fully tapped into the resources and benefits nature can supply. Even popular health promotion messages like the food pyramid actually have very little data available to assess their effectiveness (French et al., 2001). Cunningham et al. (2010) saw the importance of connecting sustainability with occupational health and safety, because both require large-scale behaviour changes to implement them effectively. Industries could achieve better health and safety by adopting commitment strategies and consequence interventions that are used in many sustainability campaigns (Cunningham et al., 2010). Like McMichael (2006, McMichael et al. 2003), Nisbet and Gick (2008) emphasise that the environment affects health, while people affect the environment in both positive and negative ways. In order to protect human health, the environment must be guarded as well. Framing sustainability in terms of health may give inspiration to the discourse providing novel approaches, motivation, and perspectives (Nisbet and Gick, 2008).

Behaviour Change

Though environmental sustainability and health is an important combination of research topics, the problem then becomes using the basic information to create real and lasting behaviour change. There are many opinions on what creates effective behaviour change, but there are several common themes that emerge from the literature, one of which is that current environmental messaging programs are largely ineffective.

An important problem is that many actions are automatic, like driving or smoking, and the actions have delayed consequences as do many prevention based behaviours (Nisbet and Gick, 2008). People are unrealistically optimistic about climate change, the state of the environment, and their own personal health risks (Nisbet and Gick, 2008). When behaviors are believed to have delayed consequences, either good or bad, or the results feel insignificant at the time people are less inclined to take action or change behaviours (Nisbet and Gick, 2008). Gebhardt et al. (2001) also saw

that healthier behaviours develop when people value the expected outcomes and feel they have control over the results. The long-term and geographically distant outcomes of environmental impacts make it difficult for there to be a feeling of urgency. To combat the lack of immediacy of environmental problems, frightening messages are often used to instill a sense of urgency and gravity to the current situation. In general, this strategy is not conducive to change. This makes problems seem inevitable and any behaviour change as inconsequential (O'Brien, 2008). Overall, there is a need to increase awareness about how actions affect the environment and individual health but also counteract the feeling of helplessness that comes with environmental issues being on a global scale (Nisbet and Gick, 2008). Negative messaging is not encouraging. Similarly, self-sacrificing behaviour is ineffective because there is a perceived detraction from happiness and well-being, while happiness has been found to be a powerful personal motivator (O'Brien, 2008). Behaviour change happens when people feel enabled (i.e., not helpless) and feel capable of making the changes that need to be made (O'Brien, 2008; Strecher et al., 1986, Nisbet and Gick, 2008). Nisbet et al. (2011) show that not only does a positive mood lead to positive action, but that positive actions can lead to positive moods, which can become a self-perpetuating cycle in the best way. Nisbet et al. (2008) also believe like Kaplan (2000; Kaplan and Kaplan, 2003), that when dictating behaviour, the human desire to learn and explore is more powerful than concern or fear. The same is effective in changing health-related behaviours; Love et al. (1996) found that intentions to change, self-efficacy, and social support are important influences of health behaviour. Strecher et al. (1986) examined the role of self-efficacy as a predictor of health behaviour change and maintenance and found that self-efficacy can be enhanced to influence behaviour. Similarly, LeCheminant and Merrill (2012) discovered that long term health behaviour change is more likely if awareness, education, motivation, skills and strategies, and support are all included into the program.

Nisbet and Gick (2008) found that many health and sustainability intervention campaigns are information-based under the assumption that information leads to action, which is not always the case. Knowledge does not always lead to behaviour change unless the interest is already there (McKenzie-Mohr, 2000; Nisbet and Gick, 2008). Economic self-interest, which currently dominates in environmental behaviour change, does not always work, because it is information-based, meaning it is dependent on specific information and reasoning to be effective (McKenzie-Mohr, 2000).

However, not all information is ineffective. Information can be powerful when used appropriately. Nisbet et al. (2011) concluded that more environmental education could increase a feeling of connection with nature and that positive connections are linked to personal growth and changing thinking. Nisbet and Gick (2008) studied various health behaviour change models that could be applied to sustainability interventions as well. They investigated the Health Belief Model where people must feel personally vulnerable or invested in making change while also feeling competent in their ability to make change. Once again the delayed effects of environmental behaviours make it difficult for people to feel vulnerable to the effects of climate change, unless there has been some sort of trigger, like a flash flood or drought. Nisbet and Gick (2008) also evaluated the use of the Theory of Planned Behaviour in which a better attitude, stronger perceived support, and greater perceived control will lead to stronger intention to perform a specific behaviour, findings that are also supported by LeCheminant and Merrill (2012). This theory requires a behaviour to become socially acceptable or uncceptable (as in the case of smoking). The Theory of Planned Behaviour has been successful in many health campaigns and strongly suggests that attitudes are good indicators of behaviour

(Nisbet and Gick, 2008). Finally, Nisbet and Gick (2008) evaluated the use of the Transtheoretical model like the one used by LeCheminant and Merrill (2012). Overall, there is a need to increase awareness about how actions affect the environment and individual health but also counteract the feeling of helplessness that comes with environmental issues being on a global scale (Nisbet and Gick, 2008). Each model has its benefits and is appropriate in different situations, but it is clear there is overlap between useful health behaviour change models and uses in sustainability.

LeCheminant and Merrill (2012) used the "Transtheoretical" model in their behaviour change campaigns. They had studied work site health, because places of work create a micro-culture making behaviour change easier and simpler to observe. LeCheminant and Merrill (2012) discovered that long-term health behaviour change is more likely if awareness, education, motivation, skills and strategies, and support are all included within the program. The Transtheoretical model identifies which stages people occupy with respect to changing a specific behaviour. Depending on the author, there are varying amount of steps, but the stages can range from people having given no thought to changing a behaviour to contemplation about changing a behaviour, to action and maintenance. The idea is that by identifying which stage a person occupies with respect to behaviour change, targeted messaging and programs can encourage a shift to the next stage. If an individual has given no thought to changing their behaviour, then awareness campaigns can be important. When moving from action into maintenance of a behaviour, support groups are more valuable at this stage than at the pre-contemplation stage. The factors that move people between stages differ for every problem (Nisbet and Gick, 2008). Most notably, the Transtheoretical model was successfully used in much of the smoking cessation literature (Nisbet and Gick, 2008).

While identifying the stage of a person or community when changing behaviour it is also important to discover the motivating factors behind that change. Kaplan (2000) looked at a people-oriented approach to encouraging environmentally friendly behaviours. Kaplan (2000) explains that the altruism approach that most environmental literature currently takes is contributing to the feeling of helplessness that leads to inactivity. Altruism limits motivation. Kaplan (2000) expressed the need to focus on quality-of-life enhancing benefits of environmentally conscious behaviour. Self-centered motivation is good; fear of how global warming will affect your life is motivating to the average person (Kaplan, 2000).

Inspired by Kaplan (2000), Shultz's (2001) work focuses on categorizing motivations for environmental change. Environmental issues and behaviours are the result of underlying behaviours, motivations, and attitudes (Shultz, 2001). Shultz (2001) narrowed down environmental concerns into three distinct groups: altruistic, biospheric, and egoistic. People with altruistic tendencies will perform actions because they are compelled by the greater good; they do not mind self-sacrificing behaviours (Shultz, 2001). People with Biospheric tendencies will perform certain actions for the benefit of the environment alone; these people usually have a close connection with nature or have been galvanized by a serious environmental issue (Shultz, 2001). Egoistic concerns are positively correlated with self-enhancement (Shultz, 2001). These people will perform actions only when there is some perceived personal benefit (Shultz, 2001). People who show self-enhancement tendencies appreciate self-benefit and do not associate other things, such as the environment or other people, in relation to their self (Shultz, 2001). Personal health belongs under egoistic behaviours.

Continuing Shultz's (2001) work, Shultz and Zelezny (2003) studied the three clearly defined categories of environmental concerns to better reframe environmental messages to appeal to the greatest number of people. No person exists in only one of the categories, but rather belongs to a mix of them, depending on personal history and motivation. However, the United States and Canada have been shown to have predominantly egoistic citizens (Shultz and Zelezny, 2003). Egoistic and self-enhancing people tend to engage in fewer environmentally friendly behaviours (Shultz and Zelezny, 2003; Kollmuss and Agyeman, 2010). At face value, self-enhancing values often appear at odds with environmentally friendly behaviour, but what is required is value-based environmental messaging (Shultz and Zelezny, 2003). Currently, environmental messages are filled with altruistic values, requiring self-sacrifice, which repels those with self-enhancing tendencies. Shultz and Zelezny (2003) suggest that by appealing to the lowest common denominator of motivations, egoistic, more people are more likely to change their behaviour. Altruistic people will already be performing the desired behaviour, because they have been effectively targeted by previous messages and are acting out of a self-sacrificing nature and desire for the greater good (Shultz and Zelezny, 2003). Biospheric people will also already be acting in the desired manner because of their connection and concern for nature (Shultz and Zelezny, 2003).   By targeting egoistic people, showing them how being environmentally friendly is self-enhancing, a great portion of the population will change their behaviour for the better.

Kaplan (2000) suggested working with the existing motivations of the population to create change. Telling people what to do will not create change, but rather showing them how they can benefit from changing behaviours is much better motivation (Kaplan, 2000). Knowing that most of the United States and Canada share egoistic tendencies, addressing self-enhancing motivations in environmental messages will likely reach the majority of the population. Personal health is seen as self-enhancing so this could be a highly effective direction to take the environmental messaging.

Kaplan and Kaplan (2003) looked at health, environments, and the Reasonable Person Model. The Reasonable Person Model suggests that people are more helpful when the immediate environment meets personal informational needs (Kaplan and Kaplan, 2003). Activities like exploration and understanding, meaningful action, and restoration are all positive feelings that need to be met by the environment for a person to be better (2003). As mentioned previously, Kaplan and Kaplan (2003) also found that there is declining effectiveness in life due to mental fatigue, which can be relieved by time spent in nature. Simply by increasing accessibility of the environment to people there will be increased time spent outdoors in healthier, more active lifestyles (Kaplan and Kaplan, 2003).

McKenzie-Mohr (2000) discussed how sustainable behaviour can be promoted using community-based social marketing, which creates programs to foster behaviours by examining and removing barriers preventing that behaviour. Kollmuss and Agyeman (2010) also identified possible barriers preventing people from environmentally friendly behaviour by basing the study off of pre-existing models. It was found that the early models assumed that environmental knowledge leads to a better environmental attitude, which, in turn, leads to pro-environmental actions, a theory that was shown by others to be untrue (McKenzie-Mohr, 2000; Kollmuss and Agyeman, 2010). Kollmuss and Agyeman (2010) concluded that to be pro-environmental one must understand the issue, know what actions must be taken, feel as if they are in control, have a positive attitude, express a verbal commitment, and possess an individual

sense of responsibility. The biggest barriers to environmentally friendly behaviour are individuality, responsibility, and practicality, especially if a person had expressed no prior concern about the environment (Kollmuss and Agyeman, 2010). Kaplan and Kaplan (2003) found that people only want control in certain situations but generally avoid responsibility. Giving people the responsibility of saving the planet will not result in positive action. Actions must have meaning and be achievable with obvious results (Kaplan and Kaplan, 2003). Identifying barriers is important and rarely done because program leaders often believe that the barriers are well known or are plagued by short delivery periods and financial constraints (McKenzie-Mohr, 2000).

Categories of Health and Sustainability

Several overarching categories of health and sustainability emerge from the literature. Bogart and Uyeda (2009) used community-based participatory research to look at asthma, cardiovascular disease, cancer, obesity, and smoking among a specific community population. Yen and Syme (1999) reviewed the social environment and health epidemiological literature. Several important categories emerged from their review. Smoking, stress, diet and weight loss were popular health-related issues. Age, sex, and race are important in determining health. Disability, chronic disease, physical activity, and depression were worrisome issues in the health literature, with many of these findings supported by Cutter et al. (2003) and Jackson (2003). Reidpath (2001) found that increased access to fast food restaurants meant increased prevalence of obesity, while Kruger et al (2009) conducted a community-based health survey and examined the effects on local health policy. Topics of interest were alcohol, drug and tobacco use, obesity, physical activity, nutrition, access to health care, and community engagement (Kruger et al., 2009).

As for sustainability, Poortinga et al. (2004) looked at values, household energy use, quality of life, and the connections between the three. Recycling, greenhouse gas emissions, transportation, energy use, and water use are all identified as important sustainability factors by McKenzie-Mohr (2000). An extensive list of environmental problems, including air quality and emissions, water quality and use, waste, energy use, and transportation volumes were used in Dinda's (2004) research.

All these categories were prevalent in the health and sustainability literature. One of the most important pieces supporting different categories under health and sustainability is from Poortinga et al. (2004); reminding the reader that environmental behaviours are not one common group but are individually supported by different values and motivations. The same should be said about health behaviours, the reasons someone smokes may not be similar to that person's poor eating habits. While there may be important similarities among behaviours, linking all environmentally friendly or all healthy behaviours together does a disservice to the field. The connections must be soundly verified before grouping categories together.

Survey as a Tool

When assessing environmental sustainability, various indices are used. Bohringer and Jochem (2006) reviewed a series of Sustainable Development indices that are used to identify useful indicators to report on economic,

environmental, and social factors. They noted there are over 500 different Sustainable Development efforts around the world, using various forms of these indices. Siche et al. (2006) examined different sustainability indices used to look at nation-wide sustainability, specifically using Ecological Footprint, Environmental Sustainability Index. Both papers noted there is a need for a cohesive and comprehensive tool that can be used to give better data that are then more comparable across the board (Bohringer and Jochem, 2006; Siche et al., 2006). Bohringer and Jochem (2006) noted that most of the sustainability indices failed to meet scientific requirements, because there were problems with the types of data being inputted into the index. This makes the tool inherently useless for influencing change; however, no tool will ever be perfect. Constant development and tweaking will be required. The goal is to give a snap shot of the situation in the hope of giving a starting point for improvement (Siche et al., 2006).

Even though no tool will ever be perfect, that does not mean there is not important information that can be garnered from pre-existing surveys and similar tools. Kruger et al. (2009) expressed the importance of survey data to fill the needs required by policy changers and suggest that custom tailoring of a survey to target an area and demographic can result in better quality data. The majority of the literature surrounding health, sustainability, and behaviour change will draw on survey data. Surveys are widely used, because they are effective at collecting data in almost any situation, but surveys are not infallible. There can be categories not measuring what is intended, ambiguous wording, poor response rates, response bias, and results that are not useful (Greener, 2011). Regardless of the possible negatives of a survey, it is still the most effective way at quickly and comprehensively assessing behaviours, values, and attitudes, especially in sustainability and health as seen in the sheer number of studies using surveys as data sources.

For example, Gebhardt et al. (2001) used a revised Health Hardiness Index to assess the reliability and validity properties of the index with self-reported behaviour and health. Gebhardt et al. (2001) defined hardiness based on Kobasa's 1979 definition which stated that hardiness was a person's ability to deal with life stresses and included commitment, challenge, and control in one's life. The Health Hardiness Index is comprised of a 5-point scale which assesses belief statements related to an individual's health commitment, health challenge, health control, and health competency. It was discovered that hardiness is positively associated with better self-reported health. Gebhardt et al. (2001) also saw that health behaviours develop when people value the expected outcomes and feel they have control over the results. Based on the testing, it was concluded the Revised Health Hardiness Index is a reliable and valid tool, useful in assessing self-reported health and behaviours associated with hardiness. Testing for reliability and validity increases the likelihood that results are actually representative of what was intended to be tested, making the data far more useful and dependable.

The design of the survey itself can influence the responses given. Chanson et al. (2005) analysed how well self-reporting intentions lead to actual future behaviour; it was concluded intentions do not perfectly predict future behaviour, with this study focusing on purchases and purchase intentions. Self-Generated Validity theory shows that pre-existing intentions are brought to the surface of the memory, or are newly formed, due to questions prompting memories which can lead respondents to form judgements that might otherwise not have been formed (Chandon et al., 2005). Godin et al. (2010) looked at how survey questions can be used to change behaviour. The idea is called the

mere measurement effect, whereby receiving a questionnaire about a behaviour increases the likelihood of people performing that behaviour. Chandon et al. (2005) did discover the potential use of prompting judgement change through asking well-designed questions. Godin et al. (2010) found that measuring implementation intentions had the most positive effect on behaviour. Implementation intentions are plans that set up pathways between future situations and responses that will ensure a person will follow through with the intention.

It is also important to differentiate between attitude and behaviour in a survey (Kollmuss and Agyeman, 2010). There is a difference between being asked if one cares about the environment and asking if one recycles. Nisbet and Gick (2008) found that attitudes are a good indicator of behaviour, but Poortinga et al. (2004) caution that attitudinal variables, like values, may be too limited to explain all environmental behaviour. Past experiences, context, and motivation are all important aspects to environmental behaviour (Poortinga et al., 2004).

There are myriad tools available to any researcher interested in sustainability or health. It is evident there is a need for condensed tools that combine multiple areas of interest. Combination tools are more valuable to this research field than another index surveying sustainability. A comprehensive survey on health and sustainability would streamline the process of creating behaviour change, because valid and reliable results to base behaviour change programs off of would be available after the completion of one short survey which could be administered even remotely to any target population.

Methods

This project began with the intention to inspire environmental friendly behaviour using personal health as a motivator. Upon researching the topic it became apparent there was a serious lack of data supporting how health could be used as a motivator for sustainable behaviour. In response, the methods for this project took a three-tiered approach in an attempt to fill this gap: survey construction based on existing literature, pilot testing the survey, and running reliability and validity tests on the data to ensure the usefulness of the results.

Survey

An extensive literature review was conducted on the relationship between health and sustainability. It was during this phase that it became apparent that a new assessment tool would have to be created as a tool to comprehensively asses various categories of health with sustainability categories did not exist at this time. Through the literature review several categories emerged and questions associated with each category were compiled. Five categories for health and five for sustainability were decided upon because of the diverse range of interests they would be able to cover.

Five questions were originally generated for each category along with how they would be scored based on previous assessments and emerging questions from the literature. Upon further consideration it was deemed

necessary to have more questions which would either provide additional information or act as a test for one of the existing questions by rewording it. Appendix B has the full list of categories and questions. It is easier to remove questions if the pilot test proved them to be unhelpful rather than having to add new questions and repeat testing.

Because the assessment tool is an entirely new creation it was important to build in ways to test for different forms of validity and reliability. By including questions in each category that were very similar, only slightly reworded or inverted to the negative form it would help test for consistency, or reliability, of participant responses. The questions were designed not only to assess opinions and attitudes but also specific actions. The diversity of questions was intended to help increase the content validity of the survey. Questions were sorted based on response type: word response, number fill in the blank, or 7-point Likert scale. The questions were then arranged into survey A and survey B which both contained all the questions, simply in different orders.

Pilot Testing

Once the survey was complete testing was scheduled. This was the first testing of this tool and was designed to be completed in person rather than online to reduce outside distraction. It was decided that students at Dalhousie University would act as the population for this initial testing because they are relatively easy to recruit and act as a homogenous group of people with many similarities in demographic terms but would still be comprised of unique individuals. This would be very effective for determining the reliability and validity of the assessment tool. In order to proceed with the pilot testing the project required approval from the Dalhousie Research Ethics Board. Appendix D shows the completed and approved ethics application.

Posters with information about the pilot testing were posted around campus in order to attract a diversity of students. In the end, the most effective recruitment came from Dr. Wright who advertised the study to students in her classes, the majority of the students being psychology or neuroscience students, with a few other science majors included. This further limited outside variables that could negatively influence the data from the survey. For example, by limiting the involvement of Environmental Sustainability students you exclude students who are most likely to have an extreme opinion about environmentally friendly behaviours. A variety of science students should display a more inclusive array of opinions and behaviours.

Participants were required to be Dalhousie students over the age of 18, who could commit to two sessions approximately a week apart. Two sessions were required to measure the test-retest reliability of the assessment tool. The survey was different for both sessions to help counteract participants remembering their exact response from the previous testing, adding to the reliability of the assessment tool. Each session took place on the Dalhousie University campus in a reserved room. Participants had up to one hour to complete the survey if they needed the time however most participants completed the testing in 15 to 20 minutes. Participants were given the opportunity to withdraw from the study at any time along with instructions as to how their data could be removed from the study. Participants were also told that they did not have to answer any questions that made them feel uncomfortable. Participants created a participant code so their answers would remain anonymous but the answers could be compared from one

session to the other. The desired number of participants was between 25 and 50 students. 60 participants completed the first session and 56 students returned for the second session.

Data Analysis

Data from both sessions were entered into SPSS software and recorded under the unique codes of each participant. Several of the scale response questions were recoded for simplifying the analysis of results. For example, a score of one in response to 'Eating health is too time consuming' meant the participant strongly disagreed with the statement and therefore felt eating healthy was an important use of time. As healthy eating habits are positive behaviours the score of one was recoded into a score of seven. The wording of the question was not affected, only the score, which may lead to some confusion when analysing the results. Appendix C has the complete list of recoded variables.

The number and diversity of questions made it impossible to analyze every possible relation between questions, categories, and testing sessions. Due to the time limitations and the purpose of creating a valid and reliable assessment tool, only a few types of analysis were completed. Intra-category correlations both within a single session and between sessions were conducted to make sure questions within a category were accurate in assessing similar attitudes and behaviours while also checking for test-retest reliability of each question. 45 inter-category correlation matrices were created to test for significant correlations between questions from each category. Every category was compared against every other category from both sessions, which included all questions except those with word responses. This would show test-retest reliability and correlations between certain questions from different categories to show there are in fact possible relationships between health and sustainability.

Results and Discussion

The purpose of this study was to create a valid tool to determine if and to what extent people associate their health with sustainability. Various forms of reliability and validity were built in and tested throughout the study. This section will systematically analyze the different types of reliability and validity in relation to this study and their results from testing. Some discussion is included concerning each psychometric test and what the results indicate. Table 6 highlights a few questions from different categories that have a strong relationship to each other. This is included to once again emphasise that there is a significant relationship between human health and environmental sustainability.

Content Validity

Content validity refers to how much an instrument fully assesses the subject matter (A. Hebert, personal communication, November 9, 2013; Miller, N.D.). This means taking into account the full range of possible answers, opinions, or for the purpose of this study, the full range of relationships between health and sustainability. For

example, this tool would have poor content validity in testing the relationship between health and sustainability if it only assessed the mental health and the water usage of a person. Five categories each for health and sustainability ensure that a wide range of relationships can be assessed. It also acknowledges the complexity of both human health and environmental issues.

Within each category the questions attempted to incorporate the breadth of that topic. For example, questions in the Water Usage category asked not only about personal water usage habits but also inquired after their opinions on water pollution on a wider scale. Content validity is not a strong form of validation, but is important none the less (A. Hebert, personal communication, November 9, 2013). The assessment tool exhibits strong content validity.

Face Validity

Face validity is a form of content validity (Miller, N.D.). It is also a weak form of validation as its purpose is to make sure the instrument is measuring what it is supposed to asses (A. Hebert, personal communication, November 9, 2013, 2013; Miller, N.D.). The questions and categories of the assessment tool ask about self-reported opinions, attitudes and behaviours with respect to individual health and environmental sustainability. This means that the tool has face validity because it is indeed trying to assess the relationship between health and sustainability.

Criterion-Related Validity

Criterion-related validity looks at the degree of correlation between scores of one measurement instrument and a behaviour or attitude that the assessment should be related to (A. Hebert, personal communication, November 9, 2013; Miller, N.D.). For example, to assess the criterion-related validity of the Energy Consumption category a participant's score on that portion of the survey should be comparable to their actual energy consumption which could be assessed by reading their electricity meter. Alternatively, a participant's score on this test could be compared to their score on a different assessment tool that measures the same relationship. This is difficult to measure because there is no tool currently available that does a similar assessment to this tool which means a participant would have to take numerous surveys to create a composite score to be compared to a score given by this assessment. Such testing would be time consuming and was beyond the scope of this study. Another important note is that this assessment tool is not yet at the stage where a 'score' can be given.

The closest to criterion-related validity the assessment tool reaches is that several findings can be supported by what was discovered in the literature review. For example, many of the questions within Physical Health and Physical Functioning were closely correlated as would be expected. 45 correlation matrices were created which means that every category was correlated with every other category; many of the resulting significant correlations have been touched on at one point or another by scholars in this field. Once again the problem remains that other assessments only measure parts of what this tool measures. For these reasons, the criterion-related validity of this assessment tool is tentative at best at this point. This does not mean the tool is no longer valid, it merely implies that further study needed.

Construct Validity

The construct validity of this assessment tool runs up against many of the same problems that criterion-related validity experiences. Construct validity is the amount an instrument is actually tapping into the theoretical concept it is supposed to assess (A. Hebert, personal communication, November 9, 2013; Miller, N.D.). Once again the results of the Energy Consumption category should be compared to behaviours related to energy consumption, like actual energy meter readings which is outside the scope of this project. Much of the conflict in construct validity can be removed when the self-reporting nature of this tool is highlighted. This assessment tool relies solely on self-reported behaviours and opinions. Self-reporting tools have their own limitations as results are only as accurate as a person's memory and beliefs. However, due to the intended future use of this tool to assess motivations and relationships, only self-reported behaviours will continue to be used and it will not be necessary to assess construct validity. However, this could be an area for future research.

Equivalence

Equivalence is a type of reliability measured through parallel forms. It measures the relationship between two or more instruments at nearly the same point in time (A. Hebert, personal communication, November 9, 2013; Miller, N.D.). This means alternate forms of the same tool are given to the same or different groups of participants. Good equivalence reliability means that questions, though slightly different, will have similar answers across testing. Equivalence reliability was incorporated into the assessment tool in two ways. Questions are repeated within each category with slight variations in wordings or inverted to the negative form. The second way parallel forms of reliability have been worked into the survey is by rearranging the order of the questions for the second testing session. This prevents participants from creating relationships between questions due to ordering.

As the assessment tool is formatted right now it is not useful to test for equivalence reliability in most cases. It is redundant because this form of reliability would be covered under internal consistency. Looking at parallel forms of reliability would, under Physical Functioning, assess relationships between questions like 'do you lead a sedentary life?' and 'are you physically active?' two different question that ask about a person's level of physical activity. However, all the other questions under Physical Functioning are also very similar to each other. 'Do you frequently find yourself to be out of breath after performing physical activity?' and 'if you had to walk for one hour at a brisk pace, how much do you think this would deplete your energy?' are indirect ways of assessing a person's level of physical activity. The association between all these similar questions within a category are assessed when calculating for internal consistency, making it redundant to also test for equivalence reliability. This is only applicable to this assessment tool because each category acts like its own measurement.

The only time it is important to test for equivalence reliability in the case of this tool is when the alpha calculation needed for internal consistency is not appropriate for the category. The alpha used to test for internal consistency can only compare questions that respond with the same scale of answers. This is a problem when the

majority of questions within a category were not scale responses, as is the case for Physical Health. Mental Health should also be included as an exception because the questions for best determining a person's mental health were not scale responses. Relationships between questions of these two categories should be done with equivalence reliability as it is a better measure of reliability than internal consistency in these cases.

The equivalence reliability was tested by correlating all questions in one category from survey A and survey B. There is good equivalence reliability if the responses between similar questions are highly correlated and are significant. See appendix A for the tables documenting the results of the equivalency reliability testing for the Mental Health and Physical Health categories.

There are many possible reasons why certain questions may not be significantly correlated with the other questions in the category. Questions under Mental Health that were not significantly correlated to other questions in the category include 'I am very aware of the feelings of those around me.' 'I feel happier when I am by myself.' and 'I feel more at peace when I am in nature.' It is understandable why these questions are not showing strong correlations because these three questions are poor indicators of mental health. They are important questions for behaviour because of the attempt to assess if a person is introverted and whether or not they are in tune to the feelings of those around them, as social pressures may be a strong motivation for an individual. Only ten categories were chosen to display the range of human health and environmental sustainability, not all questions will fit neatly into these categories. However, based on the results of equivalence reliability these questions should be removed from the Mental Health category and either removed completely from the tool, moved into more appropriate categories, or a new category should be formed to accommodate them.

For the Physical Health category poorly correlated questions include 'how many times in your life have you been diagnosed with a chronic illness?' 'how many different medications do you take for physical health problems?' 'on average, how many times per year do you suffer from colds or flus?' and 'I am not concerned about the status of my physical health.' Many of these questions appear to be appropriately placed within the Physical Health category. In this case, discrepancies could be accounted for because they are self-reported answers and involve human error. Some of the questions could use more clarification; for example a participant might understand medications for physical health problems as using over the counter medications like Ibuprofen when they have sore muscles from exercise. It should be clarified that this question is asking about prescription medications of more persistent health concerns such as an inhaler for asthma. 'I am not concerned about the status of my physical health' is a poorly worded question. Being concerned for one's health could either mean they have health issues that should be worried about or the participant is merely aware of their body and take great care of their physical health. This question is ambiguous as a determinant of physical health and should either be worded more precisely or removed entirely. Clarity and proper placement of questions within categories will help eliminate the poor equivalence reliability results that the assessment tool is presenting in these categories.

Stability

Stability reliability, or test-retest, occurs when similar results are found when repeating the assessment with the same group of participants (A. Hebert, personal communication, November 9, 2013; Miller, N.D.). If there is a high degree of reliability there will be significant correlations between responses. Participants were required to attend two sessions in order to effectively conduct test-retest reliability.

Test-retest reliability was determined by correlating all questions in one category from survey A and survey B. A significant correlation between responses to questions from survey A to the same question in survey B means there is good stability reliability. Due to the significant number of questions, all correlations were found to be significant except for those listed in Table 1.

Table 1. Questions with Poor Test-Rest Reliability

Category	Question	Pearson Correlation	N
Physical Functioning	How many times a week do you do strength training exercises?	.253	54
Physical Health	I am not concerned about the status of my physical health.	.385	55

It should be noted that the question from the Physical Health category also had poor equivalency results, likely for the same reason; the reason being the ambiguity of the wording. It is recommended that this question is either rewritten to remove any ambiguity or to be removed from the assessment tool all together.

The discrepancy in test-retest correlations exhibited by 'how many times a week do you perform strength training exercises?' can likely be contributed to human error. This question required a participant to fill in a blank with their response. Participants may have recorded different amounts of time in each test. It should also be mentioned that no unit was given for this question. A participant may have recorded the number of times they visited a gym to do strength training exercises or the number of minutes they spent preforming strength training activities. This question should either be re-written to include a unit or removed from the assessment tool entirely.

Internal Consistency

Internal consistency tests the reliability of each question to assess what it is actually designed to test, or their homogeneity. For example, internal consistency measures all questions the Eating Habits category to assess if they all actually measuring similar traits.

Internal consistency was measured with Cronbach's alpha (α) (A. Hebert, personal communication, November 9, 2013; Miller, N.D.). The internal consistency of this assessment tool is limited at this point. Cronach's alpha is only useful when analysing responses that have a scale response. Some questions in each category do not use a scale response and cannot be included in the alpha calculation, limiting the reliability of the alpha as a determinant for internal consistency.

The results of the internal consistency are reported below in Table 2. The alpha is reported at for each category from both surveys. Results are reported with a minimum, maximum and average alpha. The average includes all scale response questions in each category. The minimum and maximum column show a new average alpha if one question were to be removed from a category. It is widely accepted that results can be considered reliable when α>0.7 (Miller, N.D.).

 Removing the question that would create the minimum alpha means taking out the question that is most strongly correlated with all the other questions and the best representation of that category. To achieve the maximum alpha, it requires removing the question that is least correlated to the remaining questions in a category. The table only shows the result of removing *one* question at a time. For particularly low average alphas it is worth considering more than one question should be removed from a category. For example, Energy Consumption and Water Usage are likely having discrepancies in subject matter between more than one question in their respective categories. Questions either need to be examined for possible ambiguity, re-categorised, or removed entirely from the assessment tool. Mental Health and Physical Health both have very poor alpha scores, this was addressed with equivalency reliability and those recommendations would likely help improve the alpha score as well.

Table 2. Internal Consistency Alphas from Survey A and Survey B

Category	N	Survey A			Survey B		
		Min α	Max α	Avg α	Min α	Max α	Avg α
Mental Health	5	-0.175	0.451	0.110	0.030	0.528	0.326
Eating Habits	10	0.734	0.830	0.789	0.827	0.866	0.856
Physical Health	3	0.032	0.736	0.395	-0.27	0.862	-0.015
Physical Functioning	10	0.724	0.775	0.763	0.696	0.792	0.752
Stress/ Relaxation	6	0.528	0.699	0.638	0.619	0.752	0.712
Recycling	7	0.715	0.799	0.778	0.786	0.810	**0.814**
Energy Consumption	8	0.588	0.751	0.687	0.556	0.746	0.665
GHG Emissions	8	0.527	0.669	0.647	0.678	0.759	0.751
Water Usage	6	0.547	0.687	0.659	0.541	0.739	0.699
Connection with Nature	13	0.730	0.790	0.772	0.807	0.825	**0.827**

In survey B, Recycling and Connection with Nature both have higher average scores than the maximum α. This means that the questions work well together and removing any single question would be a detriment to the category as a whole. Ideally, once the remaining categories and questions are adjusted they would exhibit similar results.

Inter-Category Correlations

It is apparent from the previous psychometric tests that many of the questions contained in each category need to be reworked to maximize reliability. The assessment tool is not yet ready to generate 'scores' for each category. In an attempt to still exhibit that there is a strong relationship between health and sustainability each category was correlated against every other category in an attempt to see what relationships are already emerging from the assessment tool. Some of the significant correlations were unsurprising, especially between categories closely related like Physical Health and Physical Functioning. Which, while not contributing new information to the field of research, is reassuring that the assessment tool can come to similar conclusions as other measurement tools currently in use. Several interesting correlations between certain questions did emerge, especially between categories of health and sustainability.

Table 3 Example Question Pairings and Significant Correlation Results

	How effective do you think you are at dealing with stress? (Survey A)	How effective do you think you are at dealing with stress? (Survey B)
Do you actively try to conserve water? (Survey A)	**0.048***	**0.035***
N	56	55
Do you actively try to conserve water? (Survey B)	.065	**0.010****
N	55	60

**p<0.01
*p<0.05

When looking for strong relationships between two different questions several different scenarios can arise. In some cases there are no significant correlations between question pairings. Occasionally one out of four matches shows a significant correlation but as the remaining three are not significant this is likely a coincidence. However, as exemplified in Table 3 occasionally two or three matches are significant with the remainder not being significant in its own right but being so close that if all the correlations were averaged the result would also be significant. The questions in Table 3 have an average significant correlation of 0.039 (p<0.05). This suggests that there is still a strong relationship between the questions and should not be disregarded simply because one match is slightly out of the acceptable range of significance.

Table 4 shows a sampling of question pairings that were found to have significant relationships. Those pairings that were significant in all four matches have been marked in bold though only significant average correlations are reported.

Table 4 Sample Question Pairings and Average Significant Correlation

Questions	Avg Correlation	Questions	Avg Correlation
1. How effective do you think you are at dealing with stress? 2. Do you actively try to conserve water?	0.039*	1. Eating healthy is important to me. 2. Do you attempt to repurpose items before throwing them away?	0.035*
1. I try to fit in extra physical activity into my daily life (ex. Taking the stairs instead of the elevator). 2. Is renewable energy important?	0.031*	**1. Eating healthy is too time consuming.** **2. Do you turn off lights when leaving a room?**	**0.000****
1. I try to fit in extra physical activity into my daily life (ex. Taking the stairs instead of the elevator). **2. When choosing a mode of transportation: The convenience of driving outweighs any negative effects that driving may have.**	**0.012***	1. Do you choose organic food when it is available? 2. Large businesses and corporations should be held responsible for the amount of harmful emissions they produce.	0.037*
1. If you had to walk for one hour at a brisk pace, would this deplete your energy? **2. Do you choose to bike or walk to locations instead of using the bus or driving when given the option?**	**0.025***	**1. I give little thought to where my food is grown/produced.** **2. I am not concerned with how much water I use each day.**	**0.014***
1. Would it bother you if you were bedridden for a week and unable to conduct any physical activity? 2. Freshwater is a scarce resources on Earth and should be protected.	0.036*	1. Eating healthy is important to me. 2. The Earth has a great capacity to recover so my actions do not matter.	0.015*
1. I try to fit in extra physical activity into my daily life (ex. Taking the stairs instead of the elevator). **2. Do you keep your showers short?**	**0.017***	**1. Approximately how many times per year do you see your family physician?** **2. Human are superior to animals.**	0.026*
1. I give little thought to where my food is grown/produced. **2. Recycling is too complicated and time consuming.**	**0.033***	1. I feel better when I am physically active. 2. Even in the city, I notice nature around me.	0.033*
1. Do you buy locally grown/produced food? **2. Do you sort your garbage where you live?**	**0.016***	**1. How would you rate your physical Health?** **2. Fresh water is a scarce resource on Earth and should be protected.**	**0.017***
1. How would you rate your psychological health? **2. I am concerned about the rate at which species are becoming endangered and extinct.**	**0.016***	1. How many times in your life have you been referred to a psychiatrist or other mental health professional? 2. Do you recycle the following? Please check all that apply	0.049*

The results Table 4 is displaying are a select few of the significant correlations between categories of health and sustainability. These are not the only significant question pairs. These results are encouraging because it shows there is value in creating this assessment tool because correlations have been found between different questions from different categories. It is important to note that while these results show significant relationships it is impossible to tell the direction of the relationship at this time. This means it is unknown whether or not recycling a variety of materials leads to better mental health or people who have poor mental health do not have the time or capacity to thoroughly recycle. Regardless, it is interesting discover there is an existing connection between the number of times a person has been referred to a mental health professional and the variety of materials they recycle.

Limitations and Future Research

This was the first step in creating a comprehensive assessment tool to begin to understand the relationships between health and sustainability. This tool, when completed, will be best used for discreet communities and populations. Inter-category relationships will be different with every population. Car use and dependency on personal transportation vehicles was low in this population because students have free metro transit passes, they likely live near campus, and many other population dependant reasons. If this assessment tool where used on families living outside of the downtown core their associations between health and sustainability may vary quite drastically. In many ways this will make the assessment tool more powerful as it will provide precise results for a specific community. Future studies should attempt to gather participants from a multiple or a diverse range of communities for comparative testing.

It is important to remember this was the pilot stage of testing. There is more work to be done before this tool is complete. Areas for future research include re-examining questions to assess for ambiguous meaning and correct those flaws, and redefining categories and ensuring questions are in the appropriate category. For the sake of usability, non-scale questions should be reworded so that they will fit into the 7-point scale for better data analysis. More questions on demographics should be included as they can be important social determinants of health. Questions should be formatted in such a way that aggregate results from each category can create a score for ranking people or communities.

When these changes are implemented it is important to re-evaluate for reliability and validity. Construct and criterion-related validity should be included in future studies. Factor loading, another way to test the reliability of questions within a category, should also be tested. Once the assessment tool is more complete then it can be used to collect data for other research, hopefully inspiring positive behaviour change.

Conclusion

In 1988, McLeroy et al. discussed the ethics of imposing restriction on individuals with negatively associated behaviour, specifically smoking. They questioned whether or not it was fair to a person who smokes if laws and restrictions were imposed on their behaviour. McLeroy et al. (1988) also wondered about all the non-smokers who are adversely affected by being exposed to second-hand smoke. Was it not important to protect the right to good health for non-smokers? While no definitive solution was given, it is important to think about the ramifications of any behaviour. This discussion could easily be moved into environmental terms. What about restricting excessive water usage for one person because of the negative impact it has on another person's right to a healthy environment? What if it is not about individuals but groups of people like communities or even countries? How would this impact people who feel that climate change is not a pressing issue because the consequences are happening far outside of their geographic borders.

There are no easy answers to these questions. Effective campaigns transformed the public perception of smoking. The same could be done for environmental and other health concerns. For now, it is important to gather all available research to inform future decisions. Part of that information requires a comprehensive understanding about how individual health and environmental sustainability are related. This pilot study leads the way in creating an inclusive assessment tool that could be a valuable instrument for encouraging positive behaviour change. There is more work and testing to be done before the tool is ready, but the ground work has been laid. So far, the tool has been proved to be valid and reliable and recommendations have been made to increase the reliability and validity of the survey.

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Appendix A

Table A1. Survey A Mental Health Category Equivalence Reliability with Pearson Correlations

	1	2	3	4	5	6	7	8	9
(1) How many times have you been hospitalised for a mental illness?	—	.334	.358	**.033***	.155	.963	.331	**.032***	.145
(2)How many times in your life have you been referred to a psychiatrist or other mental health professional?		—	**.000****	**.000****	.302	.332	.525	.468	.462
(3)How many times in your life have you been prescribed medication for a mental illness?			—	**.000****	.367	.583	1.000	.889	.317
(4)How many times in your life have you been diagnosed with a mental illness?				—	.080	.565	.776	.134	.755
(5)I feel more at peace when I am in nature.					—	.359	.093	.416	.856
(6)I feel happier when I am by myself.						—	.141	.346	.887
(7) I am very aware of the feelings of those around me.							—	.283	.336
(8) How would you you're your psychological health?								—	**.000****
(9) How would you rate your mental health?									—

*p< 0.05 level
**p< 0.01 level
N=60

Table A2. Survey B Mental Health Category Equivalence Reliability with Pearson Correlations

	1	2	3	4	5	6	7	8	9
(1) How many times in your life have you been diagnoses with a mental illness?	——	**.000****	**.000****	**.027***	.693	.276	.493	.307	.662
(2) How many times in your life have you been prescribed medication for a mental illness?		——	**.000****	**0.016***	.636	.530	.169	.276	.815
(3) How many times in your life have you been referred to a psychiatrist or other mental health professional?			——	**0.048****	.808	.973	.200	.339	.787
(4)How many times have you been hospitalised for a mental illness?				——	.106	.437	.196	.980	1.000
(5)I am very aware of the feelings of those around me.					——	.662	.920	.340	.644
(6)I feel happier when I am by myself.						——	.091	.579	.519
(7)I feel more at peace when I am in nature.							——	**0.034***	**0.045***
(8) How would you rate your mental health?								——	**.000****
(9) How would you rate your psychological health?									——

*p< 0.05 level
**p< 0.01 level
N=56

Table A3. Survey A Physical Health Category Equivalence Reliability with Pearson Correlations

	1	2	3	4	5	6	7	8
1.How many different medications do you take for physical health problems?	___	.552	.155	.517	.445	.448	.095	.508
2.Approximately how many times per year do you see your family physician?		___	.279	.686	.850	.916	.595	.700
3.On average, how many times per year do you suffer from colds or flus?			___	.912	.211	.950	.266	.076
4.How many times per year do you miss school/ work due to illness?				___	0.000**	.480	.238	.587
5.How many times in your life have you been diagnosed with a chronic illness?					___	.578	.315	.224
6.I believe I am of good physical health.						___	.901	.000**
7.I am not concerned about the status of my physical health.							___	.530
8.How would you rate your physical health?								___

**p< 0.01 level
N=60

Table A4. Survey B Physical Health Category Equivalence Reliability with Pearson Correlations

	1	2	3	4	5	6	7	8
1. How many times in your life have you been diagnosed with a chronic illness?	___	.384	.573	.642	**0.002****	.834	.949	.761
2. How many different medications do you take for physical health problems?		___	.161	**0.005****	.983	.935	.951	.457
3.On average, how many times per year do you suffer from colds or flus?			___	.226	.467	.248	.247	.590
4.Approximately how many times per year do you see your family physician?				___	.441	.871	**0.043***	.502
5.How many times per year do you miss school/work due to illness?					___	.470	.347	.369
6.I believe I am of good physical health.						___	.230	**.000****
7.I am not concerned about the status of my physical health.							___	.215
8.How would you rate your physical Health?								___

** p< 0.01

* p<0.05

N=56

Appendix B
Master List of Survey Questions and SPSS Codes

Mental Health

<u>Fill in the Blank</u>

MH1- How many times in your life have you been diagnosed with a mental illness?

MH2- How many times in your life have you been prescribed medication for a mental illness?

MH3- How many times in your life have you been referred to a psychiatrist or other mental health professional?

MH4- How many times have you been hospitalized for a mental health illness?

<u>Scale</u>

MH5- I am very aware of the feelings of those around me.

MH6- I feel happier when I am by myself.

MH7- How would you rate your mental health?

MH8- How would you rate your psychological health?

MH10- I feel more at peace when I am in nature.

Eating Habits

<u>Word answer</u>

EH1- Do you follow a special diet? (ex. Vegan, vegetarian, gluten-free etc.)

<u>Scale</u>

EH2- Eating healthy is important to me

EH3- I drink enough water each day

EH4- Eating organic is more important than eating locally

EH5- Eating healthy is too complicated

EH6- Eating healthy is too time consuming

EH7- I give little thought to where my food is grown/produced.

EH8- I am give a lot of consideration to the food I choose to put in my body.

EH9- How healthy would you describe your eating habits as?

EH10- Do you try to choose organic food when it's available?

EH11- How often do you buy locally grown/produced food?

Physical Health

<u>Word Response</u>

PH1- Do you have any pre-existing health conditions?

<u>Fill in the Blank</u>

PH2- How many times in your life have you been diagnosed with a chronic illness.

PH3- How many different medications do you take for physical health problems.

PH4- On average, how many times per year do you suffer from colds or flus?

PH5- Approximately how many times per year do you see your family physician?

PH6- How often do you miss school/work due to illness a year?

<u>Scale</u>

PH7- I believe I am of good physical health

PH8- I am not concerned about the status of my physical health.

PH9- How would you rate your physical health?

Physical Functioning

<u>Fill in the Blank</u>

PF1- How many minutes a week do you spend working out/ exercising?

PF2- How many times a week do you do strength training exercises?

<u>Scale</u>

PF3- Being physical fit is not important to me

PF4- I try to fit in extra physical activity into my daily life (ex. Taking stairs instead of the elevator)

PF5- I feel better when I am physically active.

PF7- Do you frequently find yourself to be out of breath after performing physical activity?

PF8- Do you lead a sedentary life?

PF9- Are you physically active?

PF10- If you had to walk for one hour at a brisk pace, how much do you think this would deplete your energy?

PF11-Do you ever find yourself to be physically debilitated?

PF12- Would it bother you if you were bedridden for a week and unable to conduct any physical activity?

PF13- Do you think that you are more physically fit than most people of your age and sex?

Stress/ Relaxation

<u>Fill in the Blank</u>

SR1- How many times per week do you take at least one hour during the day to relax?

<u>Scale</u>

SR2- How effective do you think you are at dealing with stress?

SR3- Do you suffer from anxiety or panic attacks?

SR4- When you are feeling stressed, how much do you feel that it interferes with your daily activities of living?

SR5- Do you consider yourself to be a person who experiences a lot of stress in your everyday life?

SR6- Do you consider yourself to be a relaxed person?

SR7- Do you practice mindfulness or meditation techniques?

Recycling

<u>Check off</u>

RC1- Do you recycle the following?

Paper

Magazines

Paper egg cartons

Shredded Paper

Pizza Boxes

Glass Bottles and Jars

Steel & Aluminum Cans

Milk Containers

Plastic bags including

<u>Scale</u>

RC2- Recycling is crucial to the long-term health of our planet.

RC3- Recycling is too complicated and time consuming.

RC4- I am comfortable knowing what products can and cannot be recycled

RC5- I frequently compost

RC6- Do you sort your garbage where you live?

RC7- Do you attempt to repurpose items before throwing them away?

RC8- When given 4 or 5 different bins to sort waste in public, do you take the time to sort them accurately rather than throwing it all in the trash?

Energy Consumption

<u>Word Response</u>

EC1- What type of heating does your place of residence use?

EC2- What source of energy is used to generate electricity at your place?

<u>Scale</u>

EC3- Nuclear energy is dangerous.

EC4- Wind turbines can be bad for human health and animal safety.

EC5- Nothing I do will change the problems in other places on the planet.

EC6- Do you try to turn off lights when leaving a room?

EC7- Do you unplug/turn off electronics when they are not in use?

EC8- Do you try to use energy efficient products when available?

EC9- Is saving energy to you?

EC10- Is renewable energy important to you?

GHG Emissions

<u>Fill in the Blank</u>

GE1- Do you have a car?

GE2- If yes, how many times a week is it used?

<u>Scale</u>

GE3- I am waiting in a car while a friend runs into the grocery store to pick up some snacks. Not knowing how long they will be, I let the car idle.

GE4-Large businesses and corporations should be held responsible for the amount of harmful emissions they produce.

GE5- Since there are so many large industries around the world producing a lot of harmful emissions, my individual actions make no difference.

GE6- When choosing mode of transportation: The convenience of driving outweighs any negative effects that driving may have.

GE7- Biking is a great way to get around the city.

GE8-I own a bike and use it frequently.

How often do you choose to bike or walk to locations instead of using the bus or driving?

GE9- Do you drive or take a bus to work, school, or to run errands even if they are within walking distances?

GE10- Do you choose to bike or walk to locations instead of using the bus or driving when given the option?

Water Use

<u>Word Response</u>

WU1- What is the source of your drinking water?

<u>Fill in the Blank</u>

WU2- With your best guess, how much water do you think the average Canadian uses per day?

<u>Scale</u>

WU3- Fresh water is a scarce resource on Earth and should be protected.

WU4- I am not concerned with how much water I use each day.

WU5- Water pollution is a serious problem

WU6- Oceans can handle a lot of pollution because they are so large

WU7- Do you actively try to conserve water?

WU8- Do you keep showers short and turn off the tap in between uses?

Connection with Nature

Fill in the Blank

CN1- How many times a week do you find time to spend outdoors/ in nature?

Scale

CN2- I feel very connected to all living things and the Earth.

CN3- Even in the city, I notice nature around me.

CN4- Humans are superior to animals.

CN5- Being alone in the wilderness is frightening

CN6- Animals, bird, and plants deserve to have fewer rights than humans

CN7- My feelings about nature affect my actions

CN8- I am concerned about the rate at which species are becoming endangered and extinct

CN9- My actions have no effect on nature

CN10- The earth has a great capacity to recover so my actions don't matter

CN11- I am rarely concerned with the suffering of animals.

CN 12- Do you think of how your actions affect the environment?

CN13- Do humans have the right to use natural resources any way they want?

CN14- Do you enjoy being outdoors?

Appendix C

Recoded Variables in SPSS
The A or B at the end of the code indicates which survey the variable belongs with.

(1=7) (2=6) (3=5) (4=4) (5=3) (6=2) (7=1)

EH5B EH6B EH7B PH8B PF3B RC3B EC4B EC5B GE3B GE5B GE6B WU4B WU6B CN4B CN5B CN6B CN10B CN11B CN9B GE9B PF7B PF8B SR3B SR4B PF10B PF11B SR5B SR5 PH10 PH11 CN13 PF8 CN13B PF7 SR4 GE9 SR3 GE6 EH6 PF3 CN10 WU4 EC5 RC3 GE3 PH8 CN11 CN5 CN6 EC4 CN4 WU6 CN9 EH5 EH7 GE5 EC3B EC3

Appendix D
Approved Ethics Submission
UNDERGRADUATE STUDENT SUBMISSION

RESEARCH ETHICS BOARDS

DALHOUSIE UNIVERSITY

This form should be completed using the guidance document http://researchservices.dal.ca/research_7776.html

SECTION 1. ADMINISTRATIVE INFORMATION   [File No: _____]

Office Use

Indicate the Research Ethics Board to review this research:

☐ Health Sciences   OR   ☐ Social Sciences and Humanities

Project Title: Pilot Study of Positive Behavioral Practices

1.1 Student researcher: Laura Bartlett			
Department	College of Sustainability		
Degree program	Combined Honours Sustainability and Sociology		
Email	Lr789015@dal.ca	Phone	902-471-4346
I agree to conduct this research following the principles of the Tri-Council Policy Statement *Ethical Conduct for Research Involving Humans* and consistent with the University *Policy on the Ethical Conduct of Research Involving Humans*. Student signature:			

1.2 Supervisor Name: Tara Perrot/ Lisa Wright

Department	Psychology and Neuroscience		
Email	Tara.perrot@dal.ca / lisa.wright@dal.ca	Phone	902-494-1875/ 902-494-3385

I have reviewed the attached ethics application prior to its submission for ethics review, including the scientific/scholarly methods of the research project which is described in the ethics application, and believe it is sound and appropriate. I will ensure this research will be conducted following the principles of the Tri-Council Policy Statement *Ethical Conduct for Research Involving Humans* and consistent with the University *Policy on the Ethical Conduct of Research Involving Humans*.

Supervisor signature:

1.3 Department/unit ethics review (if applicable). Minimal risk research only.

This submission has been reviewed and approved by the research ethics committee.

Authorizing name and signature:

Date of approval:

SECTION 2.   PROJECT DESCRIPTION

2.1   LAY SUMMARY   [500 words]

In lay language, briefly describe the rationale, purpose, study population and methods.

"Much discussion about sustainability treats the economy, livelihoods, environmental conditions, our cities and infrastructure, and social relations as if they were ends in themselves; as if they are the reason we seek sustainability. Yet their prime value is as the foundations upon which our longer-term health and survival depend." (McMichael 2006, p. 579)

Health and Environment are two important topics but the connection between the two is often under represented. Using health to promote environmentally friendly behavior, and vice versa, can be a powerful motivator that is not currently fully understood (Nisbet & Gick, 2008). The purpose of this project is to create a survey to assess any correlations that may be present between individual human health and environmental sustainability. The objective is to create a survey that supplies valid and reliable results. In order to test for the validity and reliability of the survey, a pilot study must be conducted. The desired outcome of the project is a useable survey that provides valuable results that can be used to further the field of sustainability and its relation to human health. In the long run, the hope is that this survey will be used to motivate behavior change to healthier, environmentally friendly behaviours.

Because the project is only in the pilot testing phase the survey will only be administered to Dalhousie students, as it is a large and varied population that is relatively easy to recruit.

Briefly, the methods involved in this project are simple. The first step is survey creation, basing questions on existing literature and attempting to fill any noticeable voids. Some questions are repeated but reworded slightly to test for internal validity, or to see if participants will answer the same way when posed similar questions. Once the survey is created the next stage is to being testing the survey. Students will be recruited by posters, and via professors mentioning the survey to students. Small groups of students (no more than 10) will be tested twice, at two different times, approximately a week apart. They will be given the same survey both times but with the questions in different orders. Students have as long as they need to complete the survey, but it will likely take less than 60 minutes to complete each session. Once survey administration is complete the results will be analyzed to look for consistency and validity. Questions that show no obvious correlations or helpful data will be removed. A final, streamlined survey that is proven to give reliable results is the desired outcome of this project. Participants will have access to the results of the final project but no individual results will be disclosed.

Sources

McMichael, A. J. (2006). Population health as the 'bottom line' of sustainability: A contemporary challenge for public health researchers. *European Journal of Public Health, 16*(6), 579-582.

Nisbet, E. K. L., Glick, M. L. (2008). Can Health Psychology Help the Planet? Applying Theory and Models of Health Behaviour to Environmental Actions. *Canadian Psychology,* 49(4), 296-303. Doi: 10.1037/a0013277

2.2 RESEARCH QUESTION

State the hypotheses, the research questions or research objectives.

Can individual health be related to environmental sustainability? The survey and pilot study are intending to capture correlations between aspects of health and sustainability, if any are present. The research objective of this project is the creation of a reliable and valid survey.

2.3 RECRUITMENT

2.3.1 Describe how many participants are needed and how this was determined.

Ideally, 25 to 50 participants will be recruited for this project. Participants will need to commit to two sessions in order to be eligible. Due to time constraints with the project's anticipated end date of April 14th, 2014 and the length of time it will take to gather survey data from participants and calculate results, any more than 50 participants is unreasonable. A minimum of 25 participants will help give strength to the data collected and help make the survey more valid and

reliable.

| 2.3.2 | Describe recruitment plans and append recruitment instruments. Describe who will be doing the recruitment and what actions they will take, including any screening procedures. Describe any inclusion / exclusion criteria. |

The primary researcher will be doing the bulk of the recruitment. Posters will be placed throughout Dalhousie campus in the attempt to get a diverse range of students. Additionally, the researcher will approach various professors and ask them to provide the information to their students. The professors will be asked to show a slide that summarizes the survey (all the same information as given on the poster) to make students aware of it, not to coerce students in any manner to participate. All participants will be instructed to contact the primary researcher to set up a date to administer the survey. Only participants who can commit to two sessions will be recruited.

2.4 METHODS AND ANALYSIS

| 2.4.1 | Discuss where the research will be conducted, what participants will be asked to do and the time commitment, what data will be recorded using what research instruments (append copies). Discuss any blinding or randomization measures. Discuss how participants will be given the opportunity to withdraw. |

The research will be conducted in a room on the Dalhousie campus during regular hours, most likely in a group testing room in Psychology & Neuroscience department of the Life Sciences Centre. The researcher will go through the consent process and ensure all participants sign the consent form. Each participant will then be given a survey to complete. The survey should take no longer than 60 minutes, though participants can take as much time as the need. This process will be repeated for a second session about a week later. Participants have the opportunity to withdraw at any point; they may also choose not to answer any questions that they feel uncomfortable answering. Should a participant wish to withdraw during the administration of the survey, they must simply return the survey (which will promptly be destroyed). Should they wish to remove themselves at any point after the first survey is administered they should inform the researcher and tell them their participant code so that their data can be removed from the study.

| 2.4.2 | Describe your role in this research and any special qualifications you have that are relevant to this study (e.g. professional experience, methods courses, fieldwork experience). |

My role in this part of the research is to administer the survey to the participants and analyses the data. I have taken the primary role in creating the survey and reviewing the necessary background information. I have taken the required methods courses for the Sociology and Social Anthropology department, along with numerous classes with an emphasis on dealing with people in this manner. I have almost four years of experience with the subject matter.

2.4.3 Describe plans for data analysis in relation to the hypotheses/questions/objectives.
The responses to the survey will be recorded in an Excel spreadsheet in order to prepare for statistical analyses. Results will be kept with the participant code in case verification of answers is necessary and to be able to compare the first survey with the results of the second survey. The results will be assessed for reliability and validity as well as a range of statistical analysis. Many questions in the survey are redundant in order to ensure consistent responses. Similar questions will be combined if they have similar results. This will reduce the length of the survey for future use. Questions will be assessed as to how they relate with other questions and whether or not comparisons and correlations can be made. The data analysis will lead to a streamlined version of the survey with statistically sound questions.
2.4.4 Describe and justify any use of deception or nondisclosure and explain how participants will be debriefed.
The study will not explicitly state that it is comparing environmental and health factors. This is to reduce the risk of participants making connections between the two topics, which may alter responses. A short debrief will be conducted at the end of the second survey to thank participants are reveal the intended purpose of the study. The amount of deception is very minimal, as participants will likely conclude the topics of the survey once they have commenced ☐ Not applicable
2.4.5 Describe any compensation, reimbursement or incentives that will be given to participants (including those who withdraw).
Not applicable

2.5 INFORMED CONSENT PROCESS

Describe the informed consent process (i.e. how and when the research will be described to the prospective participant and by whom, how the researcher will ensure the prospective participant is fully informed of what they will be asked to do). If non-written consent is proposed, describe why and the process. If a waiver of informed consent is sought, address the criteria in the

guidance document and TCPS articles 3.7 and/or 5.5. Address how any third party consent (with or without assent) will be managed. Describe any plans for ongoing consent, and/or community consent. Discuss how participants will be given the opportunity to withdraw (their participation and/or their data, and any limitations on this).

Append copies of all consent forms or any oral consent script.

All participants will be required to sign a consent form (attached) at the start of each session. The consent form will be reviewed, verbally, at the beginning of each session. The consent form will include all necessary information for participants to understand what is required of them by the survey. Participation is voluntary and participants can remove themselves and their results from the test at any time. Should they wish their results be removed they must inform the researcher of their participant code in order to fully remove their results. All results are anonymous and will not be associated with the participant. Testing will often be done in a group setting. The consent form also requires participants to not disclose any information to other participants. All participants will be aware of the group nature of the testing as it will be included on any recruitment documentation and also reiterated upon setting up a testing time. There is no expected risk associated with this survey. At the end of the second session all participants will be debriefed as to the nature of the survey and where they can find the final product.

Please see the attached consent form for further details.

2.6 PRIVACY & CONFIDENTIALITY

2.6.1 Describe how data will be stored and handled in a secure manner, how long data will be retained and where, and plans for its destruction.

All participants will be given a unique code that will not be associated with their name or any other identifying information to keep results anonymous. The collected surveys will be stored for a in a locked cabinet in Dr. Perrot's office. After two years all responses will be shredded and disposed.

2.6.2 Address any limits on confidentiality, such as a duty to disclose abuse or neglect of a child or adult in need of protection, and how these will be handled. Such limits should be described in consent documents.

Not applicable.

2.6.3 Does your use of any survey company or software to help you collect, manage, store, or analyze data mean that personally identifiable information is accessible from outside of Canada?

No.

2.6.4 Describe the measures to be undertaken for dissemination of research results and whether participants will be identified (either directly by name or indirectly). If participants will be quoted in reports from the data, address consent for this, including whether quotes will be identifiable or attributed. Describe how participants will be informed of results that may indicate they may be at risk (in screening or data collection), if applicable.

The final project will be displayed for public access on Dal Space as of mid-April. Participants may also contact the researcher directly for a digital copy of the report. Participants will be in no way identified in the results. At the end of the second session information on how to access results will be given to participants. No individual results will be available.

2.7 RISK & BENEFIT ANALYIS

2.7.1 Discuss what risks or discomforts are anticipated for participants, how likely risks are and how risks will be mitigated.

There are no foreseeable risks associated with participating in this survey. Some discomfort may arise when participants are asked about their past and present physical and mental health states. This could also be potentially triggering or upsetting. We feel these questions are minimally invasive and will not likely cause a problem. However, participants are free to withdraw completely from the survey or can refrain from answering any questions that make them uncomfortable.

2.7.2 Identify any direct benefits of participation to participants (other than compensation), and the indirect benefits of the study (e.g. contribution to new knowledge)

There are no direct benefits for participating in this survey. But there are substantial indirect benefits. This field has relatively little information available and a survey of this nature could add significant data for further study. The project is a pilot test of this survey. The intended result is a useable tool for other researchers in this field. The participants get to make this tool a reality.

2.8 CONFLICT OF INTEREST
Describe whether any conflict of interest exists for any member of the research team in relation to potential research participants (e.g., TA, fellow students), and/or study sponsors, and how this will be handled.
Not applicable

SECTION 3. APPENDICES

3.1 Appendices Checklist. Append all relevant material to this application. This may include:

☐ Recruitment Documents (posters, verbal scripts, online postings, any invitations to participate, etc.)

☐ Screening Documents

☐ Consent Forms (see section 3.2 below)

☐ Research Instruments (questionnaires, surveys, interview or focus group questions, etc.)

☐ Debriefing Forms

☐ Permission Letters (Aboriginal Band Council, School Board, Director of a long-term care facility)

3.2 Consent Form

DALHOUSIE
UNIVERSITY
Inspiring Minds

CONSENT FORM

Project Title: Pilot Study of Positive Behavioral Practices

We invite you to take part in a research study being conducted by Laura Bartlett who is a student at Dalhousie University, as part of her Undergraduate Honours Thesis. Taking part in the research is your choice and you can withdraw from the study at any

time. The information below tells you about what you will be asked to do and about any benefit, risk, or discomfort that you might experience. You should discuss any questions you have about this study with Laura Bartlett.

Who Is Conducting the Research Study

Laura Bartlett, Undergraduate Honours Student- Principle Researcher

Dr. Tara Perrot, Department of Psychology and Neuroscience- Supervisor

Dr. Lisa Wright, Department of Psychology and Neuroscience- Supervisor

Purpose and Outline of the Research Study

This research looks at behavioral practices. The goal of this study is to create a tool (in this case, a survey) that will accurately show connections between different types of behaviours and opinions. A tool measuring the behaviours we are studying does not currently exist, so a survey of this nature is a big step for this particular field of research. In order to ensure that this tool is accurate, we need to test it on the same people more than once. Because of this, to participate in this study you must be able to commit to two sessions. Additional information will be given after the completion of the second survey.

Who Can Participate in the Research Study

You may participate in this study if you are a student at Dalhousie over the age of 18. You must be able to commit to two sessions approximately a week apart.

What You Will Be Asked to Do

To help us understand how different types of behavioural practices are connected we will ask you to complete a survey.

Once you contact us we will set up a time and day for the survey to take place. This survey will likely be conducted in a group setting. The location where the survey will be administered will be determined based on available rooms but will be conducted on the Dalhousie campus during regular hours. It is required that you attend **two** sessions. The two sessions will be at least one week apart. At the beginning of each session the researcher will go over this consent form with you in detail. A signed consent

form is required for participation in this survey. After the consent form is signed you will be given a paper copy of the survey to be completed. The survey should take no longer than 30 minutes but you may have as much time as you need to complete the survey. Survey questions will take a number of different forms from fill in the blank, to a scale response. Once the survey is complete please hand it back to the researcher. The researcher will be in contact to set up the second session after the first session is complete. Debriefing will happen at the end of the second session.

Possible Benefits, Risks and Discomforts

Benefits: There are no direct benefits for participating in this survey. But there are substantial indirect benefits. This field has relatively little information available and a survey of this nature will add significant data for further study. The project is a pilot test of this survey. The intended result is a useable tool for other researchers in this field. The participants get to make this tool a reality.

Risks: There are no foreseeable risks associated with participating in this survey. Some discomfort may arise when participants are asked about their past and present physical and mental health states. These questions are minimally invasive and should not cause lasting discomfort. However, participants are free to withdraw completely from the survey or can refrain from answering any questions that make them uncomfortable.

Compensation / Reimbursement

There is no compensation for being a part of this study.

Privacy and Confidentiality

Information that you provide to us will be kept private. Only the research team at Dalhousie University, identified above, will have access to this information. We will describe and share our findings in a written thesis and presentation and future publications. We will be very careful to only talk about group results so that no one will be identified. This means that ***you will not be identified in any way in our reports***. Also, we will use a participant code (not your name) in our written and computerized records so that the information we have about you contains no identifying information. All your identifying information will be kept in a separate file, in a locked cabinet, in a locked room. All electronic records will be kept secure in a password-protected, encrypted file on the researcher's personal computer.

If You Decide to Stop Participating

You are free to leave the study at any time. If you decide to stop participating at any point in the study, you can also decide whether you want any of the information that you have contributed up to that point to be removed or if you will allow us to use that information. If you would like to have your data removed, please give the researcher your unique Participant Code so that

they can effectively remove your results. You can also decide for up to one month if you want us to remove your data. After that time, it will become impossible for us to remove it because it will already be published.

How to Obtain Results

No individual results will be provided. You can obtain the final thesis, including group results, by including your contact information at the end of the signature page and by visiting Dal Space in approximately 2 months for the full thesis.

Questions

We are happy to talk with you about any questions or concerns you may have about your participation in this research study. Please contact Laura Bartlett at <u>Laura.Bartlett@dal.ca</u>, Tara Perrot (at 902-494-1875, Tara.Perrot@dal.ca), or Lisa Wright (at 902-494-3385, Lisa.Wright@dal.ca) at any time with questions, comments, or concerns about the research study. We will also tell you if any new information comes up that could affect your decision to participate.

If you have any ethical concerns about your participation in this research, you may also contact Catherine Connors, Director, Research Ethics, Dalhousie University at (902) 494-1462, or email: ethics@dal.ca

Signature Page

Project Title: Pilot Study of Positive Behavioral Practices

"I have read the explanation about this study. I have been given the opportunity to discuss it and my questions have been answered to my satisfaction. I agree to take part in this study. However I realize that my participation is voluntary and that I am free to withdraw from the study at any time."

_____   _____

   Participant Signature   Date

_____   _____

   Researcher Signature   Date

3.3 Oral Debrief Script

Oral Debrief Script (presented after the completion of the second survey)

Thank you so much for participating in this study and completing two sets of the survey.

 You may have noticed the two surveys were very similar. They are in fact the same survey except the questions have been rearranged. We did this in order to test for consistency of responses over time. If responses are consistent even though time has elapsed and the survey is formatted differently, it adds strength to the results to survey generates. Many questions may have seemed similar; this is also testing for consistency. If there are any inconsistencies that is the fault of the survey, not of your responses which is why it is important to test this.

You may have also noticed common themes among the questions. While we are looking for Positive Behavioural Practices, more specifically we wanted to study the relationship between health and environmental behaviours and opinions. The goal of this survey is to create a tool that can be used by future researchers to look closely into the relationships between environmental sustainability and individual health in an effort to promote positive change and behaviours.

. The final project can be seen online through Dal Space or you can contact me for a digital copy. If you have any questions, comments, or concerns please do not hesitate to contact me or one of my advisors.

Once again, thank you so much for your participation and have a nice day!

Want to be a part of a NEW assessment tool?

What is it?

We are conducting a pilot study of a newly created survey used to measure Positive Behaviour Practices.

What will you do?

All you need to do is contact the researcher, Laura Bartlett, to set up a time to fill out two surveys. The surveys must be taken approximately a week apart. It will take about 30-60 minutes to complete each survey. The survey and all the results are anonymous.

Who can participate?

If you are a Dalhousie Student, over the age of 18, you do not mind taking a survey in a group setting, and can commit to completing two surveys about a week apart, you are eligible!

How to get more information

Just contact Laura Bartlett at 902-471-4346 or Laura.Bartlett@dal.ca for more information or to set up a time to complete the survey.

Laura Bartlett
(Primary researcher)
Undergraduate Honours
Student
902-471-436
Laura.Bartlett@dal.ca

Dr. Tara Perrot (supervisor),
Department of Psychology and
Neuroscience
902-494-1875
Tara.Perrot@dal.ca

Dr. Lisa Wright
(supervisor),
Department of Psychology
and Neuroscience
902-494-3385
Lisa.Wright@dal.ca

Laura.Bartlett@dal.ca | Laura.Bartlett@dal.ca | Laura.Bartlett@dal.ca | Laura.Bartlett@dal.ca | Laura.Bartlett@dal.ca | Laura.Bartlett@dal.ca | Laura.Bartlett@dal.ca | Laura.Bartlett@dal.ca | Laura.Bartlett@dal.ca | Laura.Bartlett@dal.ca