Spiritual Self and Nature:

The Impact of Daily Activation of Spirituality on Environmental Friendliness

by

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Supervisory Committee

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Abstract

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Spirituality and environmental friendliness (i.e., nature connectedness, environmental attitudes and behaviours) are inextricably linked. They share the common basis of transcendence (Grouzet, 2011; Grouzet et al., 2005). However, the relationship between the two lacks empirical support. The current study employed experimental and daily diary methods to investigate the influence of spirituality upon environmental friendliness. Spirituality was marginally, but not significantly, increased through guided daily reflection among religious participants and slightly decreased among non-religious participants. This, subsequently, led to greater sense of connection to nature, but no other changes in environmental friendliness. These findings provide preliminary evidence of the relation between spirituality and environmental friendliness.

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Acknowledgments

This thesis is part of a broader research project on transcendent intrinsic goals and ecological well-being led by Dr. Frederick Grouzet. Findings presented in this thesis are based on partial data collected in September 2012 as part of the research protocol entitled "Reflecting on Daily Experiences - Goals."

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Introduction

The earth and all of nature is tied together in a complex ecosystem of which humans are a part. The integration of humans and nature goes beyond biological dependence, but extends to transcendent connections. Transcendence is a psychological mechanism that is proposed to metaphysically or intangibly connect humans and nature. Therefore it is not surprising to see that spirituality and environment are tightly linked, from the personal recognition of nature as sacred to spiritual experiences taking place within nature. In the context of nature and its protection, one can thus predict that spirituality will be related to environmental friendliness (i.e., nature connectedness, environmental attitudes and behaviours). In psychology, spirituality and environmental friendliness share numerous conceptual overlaps, including the perception of nature as sacred. Also, theoretical and empirical research on human values and goals proposes that spirituality and environmental friendliness are closely related transcendent pursuits (Grouzet, 2011). In the following section I will discuss these links in conjunction with the relation that religion shares with both spirituality and environmental friendliness. These relations will be delineated by first explaining definitional elements (i.e., environmental friendliness and then spirituality) and conceptual overlaps. Then, existing empirical literature will be discussed.

Environmental Friendliness: Protecting the Environment with Attitudes and Actions

Psychology has been responding to the growing public awareness and rising trend of environmental issues. The field has shared many names from conservation psychology (Clayton & Brook, 2005) to the psychology of sustainable behaviour (Manning, 2009).

Continuing with the inconsistency of nomenclature, the field has yet to agree on a specific term for attitudes and actions that people take to protect the natural environment. Therefore, I will be using the term environmental friendliness. Environmental friendliness can manifest itself in attitudes and behaviours, both individually and collectively. These attitudes could include feelings of connectedness to nature, such as nature relatedness (Nisbet, Zelenski, & Murphy, 2009) or orientations to protecting it, such as the New Ecological Paradigm (Dunlap, Van Liere, Mertig, & Jones, 2000). The behaviours are not limited to active behaviours that may enhance or protect the natural environment, but also include avoiding potentially harmful behaviours. In this thesis, the focus will be on daily behaviours that may have an enduring impact upon ecological well-being. The concept of environmental friendliness is also related to ecological well-being as one of its components (see Grouzet & Lee, in press).

Spirituality: A Complex Concept

Psychology has seen a resurgence of interest in spirituality and religion in recent decades (e.g., Gorsuch, 2002). While the psychology of religion research has seen considerable focus since the dawn of psychology (i.e., James, 1892/1961), the psychology of spirituality is a relatively young field. Belzen (2009) notes that throughout its history, the psychology of religion has seen substantial debate over definitions and operationalizations with very little consensus. He warns that the study of spirituality may suffer the same fate. Thus, it is important to find agreement in psychological literature with other definitions of spirituality, otherwise validity and reliability can fall victim due to poor and inconsistent operationalization (Newberg & Lee, 2005). Newberg and Lee discuss the evolving nature of spirituality and suggest that “any definition of religion and

spirituality will benefit from being considered dynamic and able to adapt and change according to future findings and analyses" (p. 473).

A broad and adaptable definition of spirituality is that any sort of transcendence is spiritual (Belzen, 2009). Transcendence commonly involves a "concern for something higher" than the self (Grouzet et al., 2005, p. 811). Equating spirituality with transcendence produces an inclusive, but impractical definition. With such a definition, our investigation of spirituality and environment as separate concepts linked through transcendence would be unnecessary. A relationship between spirituality and environmental friendliness must also have transcendence present (Hodge, 2003). In a review of conceptions of religion and spirituality, Ellor and McGregor (2011) find that definitions of spirituality can be classified in four categories: (1) religion as a noun; (2) religion as a human descriptor; (3) spirituality as linked with a divine being; and (4) spirituality as linked with creation. The latter two are spiritual relationships that humans may have. Unfortunately, Ellor and McGregor (2011) fail to further expound how an individual may have a relationship with a divine being or creation.

Hyland, Wheeler, Kamble and Masters' (2010) definition of spirituality addresses the nature of the relationship between an individual and a divine being or creation by referring to spirituality as a sense of special connection felt while experiencing the world. Spirituality is further categorized according to three facets: (1) self-perceived spirituality that is open to interpretation (e.g., one's level of religious spirituality or one's level of connection to the world); (2) explicit connections to tangible spiritual experiences, places, or things perceived as spiritual (e.g., expressing love to everyone); and (3) things, physical or metaphysical, that are not overtly spiritual or religious, but could be

interpreted to have a spiritual connection (these are referred to as implicit connections).

The sense of connection is further refined by Worthington and Aten (2009) who define spirituality as "a feeling of closeness and connection to the sacred" (p. 124). Their definition extends to religious spirituality, humanistic spirituality, nature spirituality, or cosmos spirituality which are experiences of connection or closeness to a multitude of potentially sacred spheres. These factors encompass and outline a theoretical basis for spirituality that will be used for the current project. In sum, spirituality is based upon a sense of connection to a wide array of potential experiences, places, people, or things. One such connection that was discussed is the connection with the divine, which is often a defining factor in religion. This connection is present because spirituality and religion are "distinct, but overlapping, constructs" (Hodge, 2003, p. 41). As such, religion needs to be discussed here.

Spirituality and Religion. In contrast to spirituality as a sense of connection or closeness, religion is more rigid and involves an institution with definable practices (Ellor & McGregor, 2011). However, an overlap between spirituality and religion exists, for instance, in Christian spirituality which involves personal, communal, and sacred practices. These practices remind the individual of the reverential nature of the world around them (Cummings, 1991). This is in line with previously mentioned forms of spirituality which determine a sense of connection with a higher power or divinity. Due to the overlapping nature of religion and spirituality, both will be discussed in relation to environmental friendliness.

Spirituality, Religion, and the Natural Environmental

The previously mentioned overlaps between spirituality and religion extend further into overlaps that the two share with the natural environment. For instance, many spiritual retreats take place in wilderness settings as nature can be a great facilitator of spirituality (O'Neill, n.d.). Retreats into nature are known for their beneficial effects upon well-being (Nisbet, Zelenski, & Murphy, 2011). In addition, spiritual and religious organizations often associate themselves with sustainability or conservation messages. For instance, a local Victoria, BC church hosts an annual earth day festival, St. Francis of Assisi authored prayers praising God and creation as early as the twelfth and thirteenth century, and conservation areas such as the *Bow in the Clouds Preserve*[1] in Michigan were created in reference to sacred scriptures. Considering these environmental and spiritual links in contemporary society, I expect spirituality to influence environmental friendliness (i.e., nature connectedness, environmental attitudes and behaviours). Although these links have to do with spirituality, religion is quite prevalent. Different religions share several links with environmental friendliness.

Judeo-Christianity and the environment. There is some debate over what the Bible says about the environment. However, prominent Christian messages are that the earth is God's creation and humans are called not to waste, which can be interpreted as environmental messages (Hart, 2006). Christianity often teaches a counter-cultural message of non-materialism; it is not a message of prosperity. Furthermore, Judeo-Christian history has several examples of ecological crises and survival, such as the flood

[1] In reference to Genesis 9:13 which states that the rainbow is a sign of the Lord's covenant with the earth (Bonfiglio, 2012).

and Noah's survival (Wielenga, 2003). These examples of ecological crises could serve as motivators towards environmental concern or increased awareness of survival through crises.

A well-known theory of Judeo-Christian environmental views is White's (1967) tracing of the current ecological crisis to Christian-based Western expansion and technological progression. White claims that a Christian mindset of exploitation of the earth for humanity's gain is rooted in Genesis when God gave humans dominion over the earth. This theory has received mixed support in psychological literature. Aspects of Christian belief have been found to be negatively related to environmental attitudes and behaviours. For instance, fundamentalism is negatively related with willingness to spend for environmental purposes and environmental behaviours (Boyd, 1999). Belief in biblical literalism is negatively related with a desire to protect the environment and positively related with exploiting the environment (Eckberg & Blocker, 1989; Sherkat & Ellison, 2007). Christian orthodoxy is negatively related to pro-environmental intentions and willingness to pay for environmental protection (Truelove & Joireman, 2009). Conservative eschatology is negatively related with environmental protection and having a priority of environmental issues (Guth, Green, Kellstedt, & Smidt, 1995). Religious conservatism is negatively related with belief in the seriousness of environmental problems and a willingness to sacrifice for the environment (Sherkat & Ellison, 2007). Finally, belief that humans have dominion over the earth is negatively related with environmental behaviours (Wolkomir, Futreal, Woodrum, & Hoban, 1997; Woodrum & Hoban, 1994). However, it is important to note that dominion attitudes are not associated with biblical literalism or conventional Christianity (Woodrum & Hoban, 1994), which means that the findings do not extend to all Christians. In fact, some religious variables

such as church attendance have very low correlations with environmental concern (Kanagy & Willits, 1993).

Conversely, stewardship is thought to be the opposite Judeo-Christian view, which is an encouraging environmental position. It has been found to be positively related with beliefs in the seriousness of environmental problems and willingness to sacrifice for the environment (Sherkat & Ellison, 2007). Furthermore, certain Judeo-Christian behaviours have been found to be positively related to environmental behaviours, such as prayer (Boyd, 1999). Prayer is a behaviour that is the manifestation of communion with a higher power. This link between prayer and environmental friendliness supports the current proposal that spirituality has an influence on environmental friendliness (i.e., nature connectedness, environmental attitudes and behaviours).

Eastern Religious Perspectives. Hinduism has a rich history of environmental links. The Vedas (Hindu scriptures) mention interconnections and interdependence of the universe, from earth to sky, which must be cared for (Dwivedi, 2003). Air is thought to be the basis of human life according to the Vedas. Moreover, the Vedas state that pollution of the air will result in catastrophic consequences for the earth. Furthermore, trees are regarded as sacred because they produce oxygen, and air is the basis of human life. Therefore, trees are seen as the protectors of humankind and receive sacred status. In recognition of the reciprocal interconnection of human life and nature, the Vedas also state “O mother Earth! Do not harm us nor shall we harm you” (Dwivedi, 2003, p.9).

Another Eastern religious tradition that shares a long history of relations with the natural environment is Buddhism. Buddhism is concerned with nature and how it is

governed by sacred laws, morality, and teachings (Prasad, 2003). Recognition of the interdependence of human life and nature is the basis of Buddhist respect for nature. Buddhists may feel a sense of personal obligation or responsibility towards ecological stewardship because of karma. Karma insinuates that the interconnection of the universe translates into hurting the environment is hurting oneself. This recognition of interdependence is a strong basis of the connection between Buddhism and the natural environment. The Buddhist solution to the ecological crisis is to lose the present, self-focused idea of self-fulfillment and replace it with the proper balance of self-indulgence and self-deprivation. Furthermore, the Buddhist idea of reduced duality of body and mind helps encourage a greater sense of connection the environment, therefore better treatment of it (Nath, 2010).

Due to the conflicting findings in the relation between religion and environment, as well as religion's marginal influence on environmental friendliness (i.e., nature connectedness, environmental attitudes and behaviours) compared to other life goals (Boyd, 1999), I am seeking to distinguish its influence from spirituality. I expect that the conflicting nature of religion's influence on environmental behaviours and attitudes can be explained because religion contains a wide array of facets, such as rituals, communal fellowship, or worship of the divine. However, it is the spiritual facet that positively influences environmental attitudes and behaviours. Consequently, I expect that the religious individuals' spirituality is a deciding factor in their environmental friendliness. Although different religious perspectives are discussed here, the present study does not make comparisons between religions. Instead, the common aspect of spirituality is being investigated in relation to environmental friendliness.

Spirituality and environmental friendliness in social psychology. There are several examples of links between spirituality and environmental friendliness (i.e., nature connectedness, environmental attitudes and behaviours) in social psychological literature. Among these links between spirituality and environmental friendliness, I chose to first review the underlying psychological mechanisms, such as transcendence. Secondly, the belief in the sanctity of nature is discussed as a direct connection between spirituality and environmental friendliness. Thirdly, the recognition of interdependence of humans and ecosystems is discussed in relation to environmental friendliness. Finally, personal connections with nature are discussed.

Both spirituality and environmental friendliness (i.e., nature connectedness, environmental attitudes and behaviours) can be considered as transcendent pursuits (Grouzet, 2011). They involve a "concern for something higher" than the self (Grouzet et al., 2005, p. 811). This concern transcends self-interest and focuses on anything external. In Grouzet and colleagues' circumplex model of goals, spirituality is classified at the transcendence pole of the vertical continuum from transcendence to physical self. The vertical continuum of Grouzet and colleagues' circumplex model is derived from James' (1892/1961) hierarchy of selves, which ranges from the bodily me to the spiritual me, with extra-corporeal material selves and social selves in between. James proposed the spiritual me as the aspect of the self that is less concerned with what is temporally proximal and current, but more concerned with what is possible and what the future may hold. What is possible for the transcendent individual, in the case of the present research, is environmental friendliness. Self-transcendence is the contemporary equivalent of James' spiritual me in psychological literature. In recent research by Grouzet (2011), the

pursuit of environmental friendliness as transcendent has been found to be closely related to Spirituality and Community Feelings, which are both transcendent goals. This ecological goal of environmental friendliness involves an orientation of oneself towards the environment and the protection of it. The concern outside of oneself is characteristic of transcendence (Grouzet et al., 2005). The objective of the present study is to further develop the understanding of this relation between spirituality and environmentalism using experimental daily diary methods to determine if spirituality can predict one's environmental friendliness.

The relation between spirituality and transcendence has also been investigated through experimental methods. Specifically, Saroglou, Buxant, and Tilquin (2008) had participants watch either self-transcendent (appreciation of nature or wonder at childbirth), humorous, or neutral video clips then report their spirituality. Participants who watched the self-transcendent videos reported higher levels of spirituality than those in the other conditions. This helps indicate the relation between self-transcendence and spirituality. Alternatively, the relation between environmental friendliness (i.e., nature connectedness, environmental attitudes and behaviours) and transcendence has not been studied experimentally, but has been investigated in correlational studies. For instance, Sabbagh (2005) found that pro-environmentalism is associated with an egalitarian worldview rather than an equitable worldview, and proposed that it is due to the underlying valuation of self-transcendence.

The transcendent connection between spirituality and environmental friendliness can also be found among individuals who believe that nature is sacred. It can be inferred that individuals care for and protect their sacred entities. Therefore, belief in the sanctity

of nature should encourage one to care for the natural environment. Former societies regarded nature and the external world as sacred, but over time the sacred was moved into religious institutions, confined to a building and a day, removing the sacred from the world. Thus, the world was opened for exploitation (Cummings, 1991). Conversely, pantheistic worldviews encourage the recognition of nature as sacred (Larson, 2010). Recognition of the entire earth as sacred could foster a sense of commitment to protection. Monotheistic traditions, such as Christianity, are not traditionally pantheistic, which means that a connection to nature may not be as strong as in other religious traditions (Wielenga, 2003).

To hold the view that everything in the world is sacred, as in pantheism, could diminish one's egoism by placing the focus outside of the self. For instance, Ignatow (2006) discusses the implications of understanding connections between humans and ecosystems. He explains that one's understanding of their position in earth's ecosystem is the basis for environmental attitudes. He explains an ecological and a spiritual model of environmental attitudes. The ecological model describes the environment and humans as part of a single, functioning ecosystem. In the spiritual model, nature is regarded as sacred and as a system that functions best independently of humans. The spiritual model provides the perspective of the sanctity of nature, but does not allow for individuals who regard nature as sacred and believe that humans can be a part of the same functioning ecosystem.

This recognition of nature as sacred is further developed in the definitions of spirituality that were previously outlined. Ellor and McGregor (2011) proposed a definition of spirituality as linked with creation. If one believes that their spirituality is

linked with nature, it is expected that they would want to care for nature. Further expounding spirituality as a sense of connection to nature, Hyland, Wheeler, Kamble, and Masters' (2010) definition of spirituality is a sense of connection to the world, which they derived from Roszak's (1992) ecopsychology foundations. Roszak (1992) holds that humans and the greater world are interconnected and interdependent, which should lead to a sense of personal connection between an individual and the world around them. Connection to nature is an element of environmental friendliness and, therefore, expected to be directly related to spirituality.

Finally, for several decades urban dwellers have sought refuge in nature. Some individuals go so far as to move themselves to rural areas to live sustainably in what has been dubbed back-to-the-land or deep-ecologist movements. Back-to-the-landers are primarily rural born, former urban-dwelling individuals who seek refuge in rural living where they can provide their own sustenance (Brinkerhoff & Jacob, 1987). The lifestyle is commonly associated with voluntary simplicity and, pertinent to the current research, quasi-religious meaning systems (Brinkerhoff & Jacob, 1999). The organized structure of religion may not be appealing to back-to-the-landers, however a more spiritual connection to the world is present. This often manifests itself in practices such as mindfulness. Mindfulness is the practice of "being attentive to and aware of what is taking place in the present" (Brown & Ryan, 2003, p. 822). Mindfulness is a spiritual practice that transcends one's self-focus. Moreover, it is associated with a number of facets of environmental friendliness from nature connectedness to ecological well-being (Brown & Kasser, 2005; Howell, Dopko, Passmore, & Buro, 2011). Back-to-the-landers are submerging themselves in a natural environment, gaining greater exposure to it.

Greater exposure to nature is associated with greater pro-environmental attitudes (Nisbet, Zelenski, & Murphy, 2009). These individuals help provide an example of an experienced relation between spirituality and environmental friendliness.

The above research provides indirect and correlational support for the relation between spirituality and environmental friendliness (i.e., nature connectedness, environmental attitudes and behaviours). The relation has been found to stem from a personal sense of connection to nature, an understanding of the interconnections and interdependence of humans and the environment, and the consideration of nature as sacred. Overall, these explanations seem to involve the underlying self-transcendent motives of spirituality and environmental friendliness. This is due to the fact that spirituality and environment are both transcendent goals (Grouzet, 2011). They represent an orientation towards something outside or above the self. A careful examination of the nature of their relation is required to help provide novel ways of fostering environmental friendliness.

Current Study

The current study aimed to investigate the relation between spirituality and environmental friendliness (i.e., nature connectedness, environmental attitudes and behaviours). Moreover, I was interested in activating participants' spirituality through guided reflection and expected this to influence their environmental friendliness.

Daily diary methods were employed for two weeks, during which participants completed measures of spirituality, nature connectedness, and environmental behaviours. While the first week served as a baseline, the second week involved the activation of spirituality (or enjoyment among the control condition). Participants were asked to reflect

on their spirituality each morning and evening during the second week of the daily diary. Finally, participants completed follow-up measures of general spirituality, nature relatedness, and environmental attitudes (i.e., New Ecological Paradigm) in a post-survey. Participants' religiosity was also assessed at the beginning of the study and used as an important individual difference.

Need for experimental and daily diary methods. The use of experimental methods allows for the inference of causation. Specifically, spirituality was activated by asking participants to reflect on the most spiritual moment of their life. This manipulation was expected to activate a greater personal sense of spirituality, which was expected to lead to greater environmental friendliness.

Daily diary methods were used because of the greater insight afforded through an aggregation of data, rather than a single measure. Participants completed questionnaires assessing spirituality and environmental attitudes and behaviours for two weeks. Natural fluctuations of these concepts may occur during this period, but the effect of the fluctuations is reduced by aggregating several days into one score. Daily diary methods also reduce retrospection errors that often plague single measures (Bolger, Davis, & Rafaeli, 2003). Asking participants to recall behaviours they performed in the past (e.g., in the past two weeks) can lead them to combining their behaviours in their recall, which is known as an aggregation bias. Having participants report their behaviours each day helps to reduce aggregation bias. A daily diary is also completed by participants in their natural environments, which helps increase external validity. To have participants complete the measures of environmental behaviours in our laboratory, a paradigm would have to be created in which participants could choose to act environmentally friendly or

not. This can impair ecological validity. Asking participants to report their environmental behaviours in a daily diary allows participants to respond with behaviours which they actually performed in that day.

Similarly, daily diary methods provide researchers with a method for measuring states and state fluctuations, as opposed to traits (Bolger, Davis, & Rafaeli, 2003; Iida, Shrout, Laurenceau, & Bolger, 2012). In the current study, traits are measured during the pre- and post-survey (i.e., general spirituality and general nature relatedness), while states are measured in the daily diary (i.e., daily spirituality and daily nature connectedness).

Hypotheses

Hypothesis 1. Participants' spirituality during a typical week (Week 1) is positively related to environmental friendliness (i.e., nature connectedness and environmental behaviours) in that week.

Hypothesis 2. Participants report higher levels of daily and general spirituality when they are instructed to reflect everyday on their spirituality (Week 2, Experimental condition) than when they are not instructed to reflect on spirituality (Week 1) or when they are instructed to reflect on the most enjoyable moment of their life (Week 2; Control condition).

Hypothesis 2b. The effect of reflecting on spirituality (vs. enjoyment) on daily and general spirituality exists only for participants who are religious.

Hypothesis 2c. Participants' daily and general spirituality is, in turn, positively related to environmental friendliness (i.e., daily nature connectedness, daily environmental behaviours, general nature relatedness, and general environmental orientation).

Hypothesis 3. Religious participants will report increasingly greater environmental friendliness (i.e., nature connectedness and environmental behaviours) each day following activation of spirituality (Week 2).

Methods

Participants

A total of 64 participants were sampled from the University of Victoria's undergraduate psychology participant pool. One participant was removed from the sample due to being an age outlier (7.33 standard deviations from the mean). Two participants who completed 3 or fewer entries in the daily diary per week were also excluded from the analyses.[2] The final sample size was thus 61. Age ranged from 18 to 25 (M = 19.62, SD = 1.86, skewness = 1.04), with 50 participants identifying as female and 11 identifying as male. More than half of the participants identified as non-religious (59%). A further 20% identified as Catholic and 8% as Protestant. One participant identified with each of the following categories: Buddhism, Islam, Judaism, Eastern religious, First Nations, other religion. Finally, one participant chose to not disclose their religious affiliation.

Procedure

Participants were invited to complete the pre-survey in a laboratory and then received instructions for the online daily diary. After completing the pre-survey, participants were randomly assigned to either the Spiritual reflection condition (n = 31) or the Enjoyable reflection condition (n = 30).[3] During two weeks, every evening from 6:00 p.m. to 2:30 a.m. participants could log into an online daily diary anywhere they had

[2] These participants were removed because less than three daily diary entries does not allow for enough variation in multilevel model analyses (Bolger et al., 2003) and does not give enough insight into the participant's typical behaviours within a week.

[3] Randomization has been made within gender categories, so the same number of males and females are in each condition. Furthermore, random assignment was done by the computer, keeping the researchers blind to which condition the participants were in.

access to the internet to complete questionnaires assessing their daily spirituality and daily environmental friendliness (i.e., nature connectedness and environmental behaviours). During the second week, participants received instructions of guided reflection towards either spirituality or a control concept (enjoyment) every morning and evening. The introduction of guided reflection in the second week allows for a within-participant comparison of spirituality from Week 1 to Week 2 to test Hypothesis 2a. The within-participant comparison of baseline week (Week 1) to experimental week (Week 2) is more statistically powerful than a between-participant comparison between an experimental condition and a non-reflection control condition. In the Spirituality Condition, participants received instructions adapted from Stillman, Fincham, Vohs, Lambert, and Phillips' (2012) spirituality reflection guidelines.[4] More specifically, participants read a statement asking them to *"…take a few minutes to recall the most spiritual moment of your life."* Like in Stillman and colleagues' study, participants in the Control Condition were asked to reflect on *"…the most enjoyable moment of your life"* (p. 5). Finally, participants returned to the lab after the two weeks to complete a post-survey that included measures of General Spirituality and environmental friendliness (i.e., Nature Relatedness and environmental orientation) At the end of the final lab session, participants were fully debriefed and received course credit.

[4] Stillman and colleagues (2012) asked participants to recall "...the most spiritual moment of your life. What this means is up to you, but it may entail a closeness with God, a sense of connection to humanity, a closeness with nature, or feeling 'at one' with the universe" (p. 5). To allow for a more encompassing and personal definition of spirituality, I removed the second sentence.

Measures

Religiosity. In the pre-survey, participants completed a measure of Religiosity.[5] Participants were asked, "*How religious do you feel that you are?*" They responded along a 4-point Likert scale from "Not at all" to "Very." The distribution was positively skewed, with a majority of participants who indicated that they were not religious and the remaining participants indicating that they were somewhat or more religious. The nature of the responses allowed for the transformation into a dichotomous variable. Consequently, all participants who responded "Not at all" were coded Not Religious (n = 40), while all responses from "Somewhat" to "Very" were coded Religious (n = 21).

Daily Spirituality.[6] Participants indicated their daily spirituality using an adapted version of Stillman and colleagues' (2012) measure of spirituality. The daily spirituality measure consisted of two items: *"Today I felt a connection to all life"*, *"Today I felt inner peace or harmony."*[7] Participants indicated their agreement with each item along a 7-point scale from "Strongly Disagree" to "Strongly Agree". These items were averaged for each day, then the total average for each week was computed for each week. The

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[5] Trait spirituality was also assessed in the pre-survey, but not used in the analysis. Two items were taken from Hodge's (2003) measure of intrinsic spirituality. The scale assesses how much spirituality acts as a motivational force in one's life, as a function of how intrinsic one's spirituality is. The first item asked how spiritual participants considered themselves to be. Participants responded along a 4-point Likert scale from "Not at all" to "Very." The second item was concerned with the role that spirituality plays in one's life. It was a sentence completion item along a 10-point scale that asked *"When I am faced with an important decision, my spirituality: plays absolutely no role ... is always the overriding consideration"* (α = .68).

[6] Measures referred to as "daily" were completed during the daily diary. However, measures referred to as "general" were completed during the pre- or post-survey.

[7] A third item, *"Today I felt a desire for union with God or the divine,"* was removed from the analyses because it makes explicit reference to "God or the divine." These terms are often associated with religion, especially monotheistic religions.

variables used in the majority of the analyses are the Week 1 and Week 2 Spirituality. Multilevel models at the daily level (i.e., Hypothesis 3) include the average of the two items for each day.

General Spirituality. Spirituality was also assessed at the end of the two weeks, during the post-survey, with the Spiritual Experience Index (SEI; Genia, 1997; see Appendix A). The SEI is a religious or faith independent scale. It contains two sub-scales: spiritual support and spiritual openness. For the purpose of this study, these two sub-scales were combined ($\alpha = .96$). Participants indicate their agreement with each item along a 7-point Likert scale from "Strongly Disagree" to "Strongly Agree." Sample items include "I often feel strongly related to a power greater than myself" (Spiritual Support) and "Ideas from faiths different from my own may increase my understanding of spiritual truth" (Spiritual Openness).

Environmental friendliness. Environmental friendliness is operationalized in the current study as both environmental attitudes and behaviours. As described below, participants completed attitudinal measures including daily connections to nature, general nature relatedness, and general pro-environmental orientation. Participants also completed daily behavioural measures that assessed both beneficial and detrimental actions towards the natural environment.

Environmental friendliness – Attitudes. Environmental attitudes were assessed through Daily Nature Connectedness as well as General measures of Nature Relatedness (Nisbet, Zelenski, & Murphy, 2009; see Appendix B) and of General Environmental Orientation (i.e., New Ecological Paradigm; Dunlap, Van Liere, Mertig, & Jones, 2000; see Appendix C). Daily Nature Connectedness was assessed with the items "Today, I felt

connected with the nature" and "Today, I felt in harmony with nature." Participants indicated their agreement with each item along a 7-point scale from "Strongly Disagree" to "Strongly Agree". Responses from these items were averaged for each week. Missing data was replaced by the participants' average score throughout the respective week.

During the post-survey, participants also completed measures of general environmental friendliness. The first measure of general environmental friendliness, the New Ecological Paradigm (NEP; Dunlap, Van Liere, Mertig, & Jones, 2000) addressed participants' General Environmental Orientation. The NEP is designed to assess participant's endorsement of an ecological worldview. Participants responded to 15 items ($\alpha = .75$) indicating their agreement with each item along a 7-point scale from "Strongly Disagree" to "Strongly Agree." A sample item is, "When humans interfere with nature it often produces disastrous consequences."

The second general environmental friendliness measure included in the post-survey was the Nature Relatedness scale (Nisbet, Zelenski, & Murphy, 2009). The Nature Relatedness scale is designed to assess participants' affective, cognitive, and experiential connections to the natural world. It is composed of three sub-factors: self (strength of personal connection to nature), perspective (attitudes surrounding connection to nature), and experience (attraction to and physical familiarity with the natural environment). These factors are assessed with 21-items ($\alpha = .88$) that participants indicated their agreement with along a 7-point scale from "Strongly Disagree" to "Strongly Agree."

Environmental friendliness – Daily behaviours. A measure of daily environmental behaviours was created to capture daily fluctuations of environmental friendliness (see Appendix D). It was composed to account for repeated measurement and

allow for variability in responses. The construction of a new questionnaire was necessary because there are no known pro-environmental behaviour measures that are adaptable for daily use. Participants were asked to respond only for the day that they were completing the questionnaire. Some items were answered along a scale. For example, participants were asked "How long was your shower today?" Participants could respond along a 5-point scale from "Much shorter than normal" to "Much longer than usual". Other items offered participants several options to which they could select any number of the potential responses. The items were "Where did you eat breakfast today?"; "Where did you eat lunch today?"; "Where did you eat dinner today?", "While brushing your teeth, did you leave the water running?"; "How did you get to school/work?"; "At school, what did you take notes on?"; "What do you read your school readings on?"; "What did you have to drink today?"; "What did you eat for breakfast?"; "What did you eat for lunch?"; "What did you eat for dinner?" These items were tailored to allow participants to respond openly to a wide variety of potential responses.

Responses from Daily Environmental Behaviour questions were aggregated across days for each week. To aggregate Daily Environmental Behaviour responses, the dichotomous response measures were first organized into relevant categories (i.e., transportation, note-taking, reading, beverage). Aggregations were done by first creating a sum of all responses in each category for each participant for each day. Positive behaviours[8] in each category were then summed for each day and divided by the previous

[8] Positive behaviours were biking, bussing, walking/running, or skateboarding for transportation, using both sides of paper or recycled paper for note-taking, printing class notes double-sided, and using one's own bottle, mug, or water fountain when having a beverage.

sum of all possible responses in the respective category for that day. This created a relative score of behaviours for each day. For instance, if a participant biked and drove to school in one day, their score for biking that day would be 0.5. However, if someone only biked in one day, their score for biking that day would be 1. The mean of these variables was taken for each week. The same was done for Daily Negative Behaviours[9] and scale items[10]. These were then standardized into Z-scores. The result was 6 scores: Daily Positive Behaviours for Week 1 and Week 2, Daily Negative Behaviours for Week 1 and Week 2, and daily scale item behaviours for Week 1 and Week 2. Daily Negative Behaviours were then reversed by multiplying by -1. The Daily Positive Environmental Behaviours, Daily Negative Environmental Behaviours, and daily scale items for each week were averaged to create a Global Environmental Behaviour score for each week.

In sum, Environmental Friendliness was operationalized in this study through 10 variables: (1) Week 1 Daily Nature Connectedness, (2) Week 2 Daily Nature Connectedness, (3) Week 1 Daily Negative Environmental Behaviours, (4) Week 2 Daily Negative Environmental Behaviours, (5) Week 1 Daily Positive Environmental Behaviours, (6) Week 2 Daily Positive Environmental Behaviours, (7) Week 1 Daily Global Environmental Behaviours, (8) Week 2 Daily Global Environmental Behaviours, (9) General Nature Relatedness, (10) General Environmental Orientation (i.e., New Ecological Paradigm).

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[9] Negative Behaviours were driving a car for transportation, taking notes on single-sided paper, drinking bottled water or using a disposable cup when having a beverage, and eating meat for any meal.

[10] Environmental Behaviours measured along a scale were length of shower, leaving water running while brushing teeth, location of breakfast, lunch, and dinner, and recycling of breakfast, lunch, and dinner packaging.

Results

Descriptive Statistics

To begin, I calculated zero-order correlations among variables and gathered descriptive statistics, which are presented in Table 1. Weekly scores are averages of the respective daily measure for each week. Religiosity was coded with Religious participants as +1 and Non-Religious as 0. Religiosity was unrelated to Week 1 and Week 2 Spirituality (r = -.10, p = .445, r = -.05, p = .69, respectively), but was positively correlated with General Spirituality (r = .51, p < .001). Week 1 and 2 Nature Connectedness (aggregated from the daily diary) and General Nature Relatedness (from the post-survey) were strongly related (r = .37, p = .005 for Week l; r = .47, p < .001 for Week 2). All analyses involving Negative Environmental Behaviours utilized the non-reversed measure. Consequently, a higher score would indicate lower environmental friendliness. As expected, Week 1 Negative and Positive Environmental Behaviours were negatively correlated (r = -.34, p = .008 for Week 1; r = -.36, p = .004).

Daily Spirituality and Environmental Friendliness (H1)

In the first hypothesis, I proposed that spirituality is related to environmental friendliness (i.e., nature connectedness, environmental attitudes and behaviours). The correlation matrix (see Table 1) shows that Week 1 Spirituality is significantly related to Week 1 Nature Connectedness (r = .70, p < .001). However, Week 1 Spirituality is not related to Week 1 Negative Environmental Behaviours (r = -.08, p = .531), Week 1 Positive Environmental Behaviours (r = -.04, p = .777), or Week 1 Global Environmental Behaviours (r = .02, p = .866).

Table 1

Correlations and Descriptive Statistics of Variables Used in the Analysis.

	Measure	M	SD	Range	Skew	Kurtosis	1	2	3	4	5	6	7	8	9	10	11	12	13
1	Religiosity	1.34	0.479	0-1	0.67	-1.60	-												
2	Week 1 Spirituality	2.86	1.011	1-7	0.26	-0.41	-.100	-											
3	Week 2 Spirituality	2.90	1.097	1-7	0.00	-0.85	-.052	.798***	-										
4	General (Post-)Spirituality	3.75	1.083	1-7	0.40	-0.54	.505***	.264*	.281*	-									
5	Week 1 Negative EB	0.2	0.118	-0.9-1.6	0.69	0.64	-.134	-.082	-.089	.047	-								
6	Week 2 Negative EB	0.21	0.128	-0.8-1.8	0.88	1.51	-.194	.071	-.058	-.082	.782***	-							
7	Week 1 Positive EB	0.56	0.111	-1.3-1.3	0.12	-0.18	.127	-.037	.035	.175	-.336**	-.357**	-						
8	Week 2 Positive EB	0.58	0.104	-1.4-1.6	0.13	0.40	-.057	-.026	.040	.148	-.166	-.363**	.753***	-					
9	Week 1 Global EBs	.18	0.089	-1.1-0.7	-0.73	0.67	.116	.022	.100	.060	-.738***	-.621***	.813***	.554***	-				
10	Week 2 Global EBs	.19	0.091	-1.2-0.7	-0.60	0.92	.051	-.057	.114	.098	-.491***	-.733***	.647***	.817***	.722***	-			
11	Week 1 Nature Connectedness	2.59	0.840	1-7	-0.06	-0.78	-.068	.700***	.561***	.291*	-.094	.019	.033	.078	.036	.041	-		
12	Week 2 Nature Connectedness	2.71	1.038	1-7	0.38	-0.64	-.020	.555***	.779***	.386**	-.055	-.131	.014	.040	.050	.165	.656***	-	
13	New Ecological Paradigm	4.79	0.585	1-7	-0.52	2.41	.154	-.214	-.060	.072	-.161	-.224†	-.090	-.045	.053	.122	.062	.010	-
14	Nature Relatedness	3.95	0.589	1-7	-0.63	-0.23	.123	.243†	.365**	.442***	-.115	-.149	.035	.030	.083	.045	.372**	.474***	.182

Note. EB = Environmental Behaviours.

†. $p < .10$. *. $p < .05$. **. $p < .01$. *** $p < .001$

Table 2

Interaction between Religiosity and Week 1 Spirituality as Predictors of Week 1 Environmental Friendliness

	Week 1 Negative EB			Week 1 Positive EB			Week 1 Global EB			Week 1 NC		
	β	*t*	*p*	β	*t*	*p*	β	*t*	*p*	β	*t*	*p*
Week 1 Spirituality	-.062	-.389	.699	.012	.073	.942	.042	.260	.796	.679	5.909	.000
Religiosity	-.147	-1.116	.269	.121	.916	.364	.118	.894	.375	.004	.038	.970
Week 1 Spirituality×Religiosity	-.061	-.383	.703	-.065	-.404	.688	-.013	-.084	.933	.037	.318	.751
R^2	.029			.020			.015			.491		

Note. EB = Environmental Behaviours; NC = Nature Connectedness.

To determine if religious participants were more likely to demonstrate a relation between spirituality and greater environmental friendliness, the interaction between Week 1 Spirituality and Religiosity was investigated. Week 1 Nature Connectedness, Week 1 Negative Environmental Behaviours, Week 1 Positive Environmental Behaviours, and Week 1 Global Environmental Behaviours were regressed on Week 1 Spirituality, Religiosity, and Week 1 Spirituality×Religiosity. As shown in Table 2, religiosity did not moderate the association between spirituality and any of the indicators of environmental friendliness.

Activation of Spirituality and Daily Spirituality (H2a)

In Hypothesis 2, I proposed that the activation of spirituality through daily reflections would increase participants' daily spirituality (from Week 1 to Week 2). A multilevel model was constructed to test this hypothesis where Level 1 corresponds to week level (i.e., Week 1 vs. Week 2) and Level 2 refers to the individual.[11] Therefore the Level 1 equation is:

$$Weekly\ Spirituality_{ij} = \beta_{0j} + \beta_{1j}(Week_{ij}) + e_{ij} \quad (1)$$

The Level 2 intercept and slope equations are:

$$\beta_{0j} = \gamma_{00} + \gamma_{01}(Condition_i) + u_{0j} \quad (2)$$
$$\beta_{1j} = \gamma_{10} + \gamma_{11}(Condition_i) + u_{1j} \quad (3)$$

[11] Multilevel analyses were chosen over multiple linear regression because they permit the within- and between-participant comparisons, within a single analysis. Conducting a multiple linear regression with Condition and Week 1 Spirituality predicting Week 2 Spirituality would only yield a between-participant comparison of Conditions on Week 2 Spirituality, while controlling for Week 1 Spirituality. However, multilevel modelling involves restructuring a dataset to include multiple measurement points within the dependent variable. Inclusion of Week 1 and 2 Spirituality as dependent variables in the multilevel analysis with Condition, Week, and Condition×Week as predictors provides within- and between-participant comparisons to help increase robustness of the results.

The Enjoyable condition was coded as 0 and the Spiritual condition is coded as +1, while Week was coded with Week 1 as 0 and Week 2 as +1. Therefore a positive relation between Condition and Weekly Spirituality would indicate that participants in the Spiritual condition reported greater spirituality during Week 2 than in Week 1. Because the change in spirituality is only expected to occur among participants in the Spiritual condition, the interaction between Week and Condition is important. I expected that participants in the Spirituality Condition would report greater spirituality during Week 2, which is represented in an interaction between Week and Condition.

As shown on Table 3, Condition was unrelated to Spirituality (estimate = 0.498, SE = .335, p = .143). Moreover, the interaction of Condition×Week was also unrelated to Spirituality (estimate = −0.156, SE = 0.173, p = .370).

Interaction with Religiosity (H2b). In the second part of Hypothesis 2, I proposed that the manipulation will only be effective for participants who are religious. To investigate this interaction, Religiosity was included in the previous model as an interaction term with Condition×Week (see Table 4). The three-way interaction of Condition×Week×Religiosity was significantly related to Weekly Spirituality (estimate = 0.454, SE = 0.211, p = .035). The interaction of Condition×Week was further examined separately among Religious and Non-Religious participants. Results, shown in Table 5, reveal that for Religious participants the interaction of Condition×Week was positively but not significantly related to Weekly Spirituality (estimate = 0.301, SE = 0.277, p = .290). However, the interaction of Condition×Week was significantly negatively related to Weekly Spirituality for Non-Religious participants (estimate = -0.413, SE = 0.216, p = .064). To further understand these interactions (significant or not), four multilevel models

Table 3

Multilevel Model of Predictors of Week 1 and 2 Spirituality

						95% CI	
Fixed Effects	Estimate	SE	*df*	*t*	*p*	Lower	Upper
Intercept	2.570	0.235	59	10.927	0.000	2.100	3.041
Condition	0.498	0.335	59	1.486	0.143	-0.173	1.170
Week	0.117	0.121	59	0.963	0.340	-0.126	0.360
Condition×Week	-0.156	0.173	59	-0.903	0.370	-0.503	0.190
						95% CI	
Random Effects	Estimate	SE		*Z*	*p*	Lower	Upper
Intercept	1.315	0.294		4.470	0.000	0.848	2.039
Week[b]							
Residual	0.080	0.042		1.903	0.057	0.029	0.224

b. This covariance parameter is redundant.

Table 4

Multilevel Model of Predictors of Week 1 and 2 Spirituality including the Moderating Effect of Religiosity

						95% CI	
Fixed Effects	Estimate	SE	*df*	*t*	*p*	Lower	Upper
Intercept	2.726	0.251	61.90	10.859	.000	2.224	3.228
Week	0.117	0.119	58.47	0.983	.330	-0.121	0.355
Condition	0.557	0.337	58.43	1.654	.103	-0.117	1.231
Religiosity[a]	-0.536	0.304	73.18	-1.765	.082	-1.141	0.069
Condition×Week	-0.338	0.189	64.41	-1.785	.079	-0.716	0.040
Condition×Week×Religiosity[a]	0.454	0.211	73.07	2.152	.035	0.034	0.874
						95% CI	
Random Effects	Estimate	SE		*Z*	*p*	Lower	Upper
Intercept	1.341	0.293		4.573	.000	0.873	2.058
Week[b]							
Residual	0.074	0.040		1.836	.066	0.026	0.216

a. Categorical religious versus not religious.

b. This covariance parameter is redundant.

Table 5

Multilevel Investigation of Condition×Week Interaction Predicting Weekly Averages of Spirituality as a Function of Religiosity

	Non-Religious				Religious			
Fixed Effects	Estimate	SE	*df*	*p*	Estimate	SE	*df*	*p*
Condition	0.646	0.438	38.00	.148	0.332	0.526	19.00	.535
Week	0.194	0.145	38.00	.188	-0.073	0.209	19.00	.731
Condition×Week	-0.413	0.216	38.00	.064	0.301	0.277	19.00	.290

were conducted. The effect of Condition on Spirituality was examined among Religious participants in Week 1 and then in Week 2. Then it was examined among non-Religious participants in Week 1 and then in Week 2. The expected influence of Week upon Spirituality for Religious participants in the Spirituality Condition was not significant (estimate = 0.288, SE = .210, p = .300; see Table 6 and Figure 1 for full results). While these results are not significant, the relations are in the expected directions.

In the previous findings, the effect of the Spirituality (vs. Enjoyment) reflection was tested on the change between Week 1 and Week 2. In further tests of the hypotheses, I decided to investigate between-participant comparisons of Conditions in Week 2 and Post-Survey measures. Week 2 Spirituality was thus regressed on Condition, Religiosity, and Condition×Religiosity. As shown on Figure 2, Condition×Religiosity significantly predicted Week 2 Spirituality (β = .407, t(57) = 1.888, p = .064; see Table 7 for full results).[12] The interaction was investigated by splitting the sample into Religious and Not-Religious groups and separately regressing Week 2 Spirituality on Condition for the Religious and Non-Religious groups.[13] The effect of Condition was found among Religious participants (β = .409, t(18) = 1.956, p = .065), but not among Non-Religious

[12] Dummy coding is used in the present analyses, which creates ease of interpretability of the regression coefficients (Aiken & West, 1991; West, Aiken, & Krull, 1996). This is primarily done in the context of interactions between continuous and categorical predictors. However, the interactions being probed in the present analysis involve only dichotomous predictors. This means that the intercept represents the mean of what is coded as 0 (i.e., Not-Religious) and 0 (i.e., Enjoyable Condition). Furthermore, the coefficients represent differences between the cell means and the intercept.

[13] Aiken and West (1991) argue against splitting a sample to investigate interactions. However, this argument is primarily discussed in the context of median splits of continuous predictors. The loss of power that results is usually due to the transformation of a continuous variable into categorical, which reduces variability and ability to detect an effect. However, in the context of the present analysis, the predictors are already categorical and, therefore, permit splitting without losing any information.

participants (β = -.084, $t(34) = -0.519$, $p = .606$). The effect of the manipulation can be seen in Figure 1 where Religious participants in the Spiritual Condition seem to show an increase in Spirituality from Week 1 to Week 2. Contrastingly, Non-Religious participants in the Spiritual Condition seem to show a decrease in Spirituality from Week 1 to Week 2.

Further analysis of Hypothesis 2b involved the investigation of the effect of the activation of spirituality on General Spirituality (assessed in post-survey). The analysis of Condition, Religiosity, and Condition×Religiosity predicting General Spirituality was conducted to test whether the effect of the manipulation continued beyond Daily Spirituality and impacted General Spirituality, with Results presented in Table 8. Again, the interaction of Condition×Religiosity is significantly related to General Spirituality (β = .521, $t(52) = 2.808$, $p = .007$). Interactions were probed by splitting the sample into Religious versus Non-Religious participants and then regressing General Spirituality on Condition for each of these two groups. Further investigation into the moderating role of Religiosity revealed a positive relation between Condition and General Spirituality among Religious participants (β = .407, $t(18) = 1.892$, $p = .075$). Conversely, a negative relation was found between Condition and General Spirituality among Non-Religious participants (β = −.297, $t(34) = −2.067$, $p = .046$). This provides further support for the divergence in Spirituality levels among Religious and Non-Religious participants.

Table 6
Multilevel Test of Three-Way Interaction. The Effect of Week upon Week 1 and 2 Spirituality for Religious and Non-Religious Participants in Each Condition

	Enjoyable Condition				Spiritual Condition			
	Estimate	SE	*df*	*p*	Estimate	SE	*df*	*p*
Religious	-0.073	.151	8.37	.641	0.288	.210	11	.300
Not Religious	0.194	.165	21	.250	-0.218	.129	17	.108

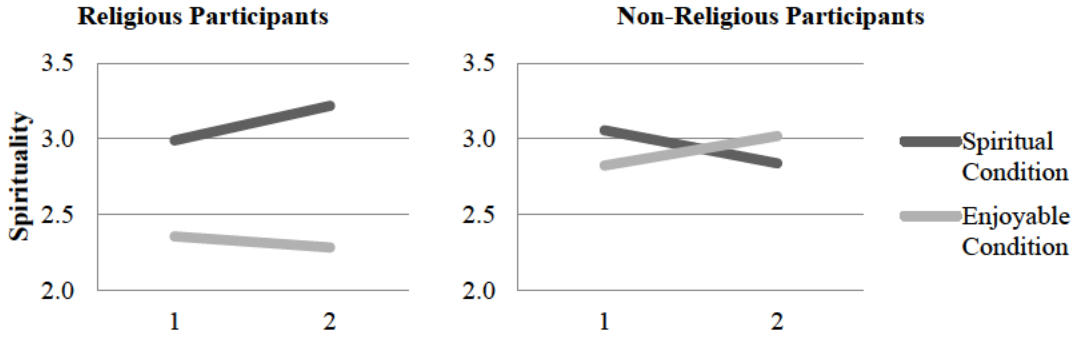

Figure 1. The effect of the activation of Spirituality in Week 1 and Week 2 among Religious and Non-Religious participants in the Spiritual and Enjoyable Condition.

Table 7
Regression Analysis Predicting Week 2 Spirituality.

Variable	B	SE(B)	β	*t*	*p*
Intercept	3.017	0.232		13.031	.000
Condition	-0.179	0.345	-.082	-0.520	.605
Religiosity	-0.735	0.430	-.321	-1.710	.093
Condition×Religiosity	1.114	0.590	.407	1.888	.064
R^2	0.069				

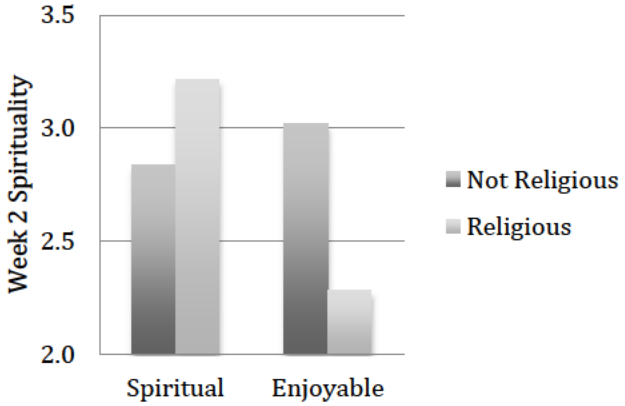

Figure 2. Week 2 Spirituality by Condition "Spirituality" and "Enjoyable" and Religiosity.

Table 8
Regression Analysis Predicting General Spirituality.

Variable	B	SE(B)	β	*t*	*p*
Intercept	3.626	0.205		17.668	.000
Condition	-0.593	0.299	-.276	-1.987	.052
Religiosity	0.404	0.362	.180	1.116	.270
Condition×Religiosity	1.406	0.501	.521	2.808	.007
R^2	0.355				

Mediation from Condition to Environmental Friendliness through Spirituality (H2c). Hypothesis 2 culminates by combining the previously investigated relations into a between-person moderated-mediation between Condition and Environmental Friendliness variables. It is proposed that the effect of the manipulation influences spirituality, which, in turn, influences environmental friendliness. Because a moderating effect of religiosity was found in Hypothesis 2, I predicted that the mediation would occur for participants who are religious, but not for participants who are not religious. The path from Condition to Spirituality is proposed to be moderated by Religiosity. This model was tested using Hayes' (2013) method for investigating moderated mediation. In the proposed model, Religiosity moderates the paths from Condition to Spirituality and Condition to Environmental Friendliness[14]. The conditional indirect effect is tested through bootstrapping procedures with 5000 resamples. Significance in bootstrapping is based upon 95% Confidence Intervals (C.I.; $\alpha = .05$). If 0 is outside of the 95% C.I., the null hypothesis of no conditional indirect effect can be rejected (Preacher, Rucker, & Hayes, 2007). The first step of the moderated mediation analysis involves regressing the mediator onto the independent variable, the moderator, and the independent variable×moderator interaction term (Hayes, 2013). The second step involves regressing the dependent variable on the independent variable, the mediator, the moderator, and the interaction between the independent variable and the moderator. The relevant regression coefficients from these analyses are presented in Figures 3 through 8.

[14] Environmental Friendliness includes Daily Nature Connectedness, General Nature Relatedness, General Environmental Orientation (i.e., New Ecological Paradigm), Daily Positive Environmental Behaviours, Daily Negative Environmental Behaviours, and Daily Global Environmental Behaviours and therefore 6 moderated mediation analyses were conducted.

The third step involves investigating the conditional direct effects of the dependent variable on the independent at different levels of the moderator. Finally, the conditional indirect effect is assessed as different levels of the moderator. The conditional indirect effects and regression analyses of the mediations are presented in Tables 10 through 15. Spirituality was included as the mediator in these models because I activated Spirituality through daily reflections and expected it to lead to an increase in environmental friendliness. The reflection instructions were broad to be inclusive of all spiritual beliefs, but not broad enough to directly influence environmental friendliness.

Week 2 Spirituality explained the relation between Condition and Week 2 Nature Connectedness for Religious participants (indirect effect = 0.693, Lower 95% C.I. = 0.023, Upper 95% C.I. = 1.413), but not for Non-Religious participants (indirect effect = -0.133, Lower 95% C.I. = -0.629, Upper 95% C.I. = 0.342). General Spirituality explained the relation between Condition and Nature Relatedness for Religious participants (indirect effect = 0.242, Lower 95% C.I. = 0.017, Upper 95% C.I. = 0.616), and Non-Religious participants (indirect effect = -0.176, Lower 95% C.I. = -0.453, Upper 95% C.I. = -0.030).

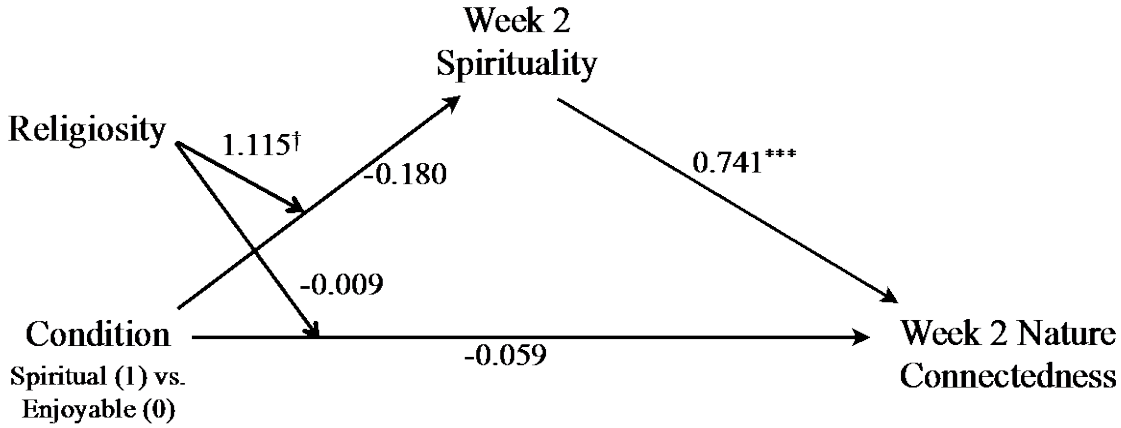

Figure 3. Moderated-mediation model of the effect of Condition on Week 2 Nature Connectedness as mediated by Week 2 Spirituality. The lines from Religiosity indicate the moderation of Religiosity on the respective relationships.
† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 9
Indirect Effect of Condition on Week 2 Nature Connectedness through Week 2 Spirituality

	N	Indirect Effect	SE	95% C.I. Lower	95% C.I. Upper
Not Religious	40	-0.133	0.244	-0.629	0.342
Religious	21	0.693	0.357	0.023	1.413

Note. Bootstrap results are significant if 0 is outside of C.I.

Table 10
Hierarchical Multiple Regression of Mediation of Week 2 Nature Connectedness

Predictor	B	SE(B)	β	*t*	*p*
Step 1					
Condition	-0.192	0.332	-.093	-0.578	.565
Religiosity	-0.486	0.413	-.225	-1.177	.244
Condition×Religiosity	0.817	0.568	.316	1.439	.156
Step 2					
Condition	-0.059	0.214	-.029	-0.276	.784
Religiosity	0.058	0.273	.027	0.213	.832
Condition×Religiosity	-0.009	0.377	-.003	-0.023	.982
Week 2 Spirituality	0.741	0.082	.783	9.038	.000
ΔR^2	.57				

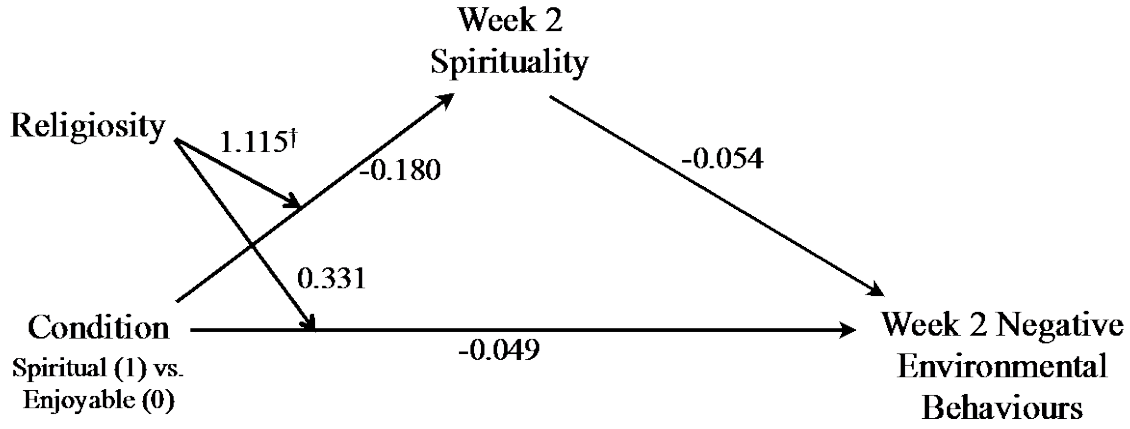

Figure 4. Moderated-mediation model of the effect of Condition on Week 2 Negative Environmental Behaviours as mediated by Week 2 Spirituality. The lines from Religiosity indicate the moderation of Religiosity on the respective relationships.
† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 11
Indirect Effect of Condition on Week 2 Negative Environmental Behaviours through Week 2 Spirituality

		Indirect		95% C.I.	
	N	Effect	SE	Lower	Upper
Not Religious	40	0.010	0.032	-0.020	0.132
Religious	21	-0.050	0.065	-0.232	0.042

Note. Bootstrap results are significant if 0 is outside of C.I.

Table 12
Hierarchical Multiple Regression of Mediation of Week 2 Negative Environmental Behaviours

Predictor	B	SE(B)	β	*t*	*p*
Step 1					
Condition	-0.040	0.169	-.037	-0.234	.816
Religiosity	-0.367	0.211	-.329	-1.741	.087
Condition×Religiosity	0.271	0.289	.204	0.938	.352
Step 2					
Condition	-0.049	0.170	-.046	-0.289	.774
Religiosity	-0.406	0.217	-.364	-1.874	.066
Condition×Religiosity	0.331	0.299	.249	1.106	.273
Week 2 Spirituality	-0.053	0.065	-.110	-0.821	.415
ΔR^2	.01				

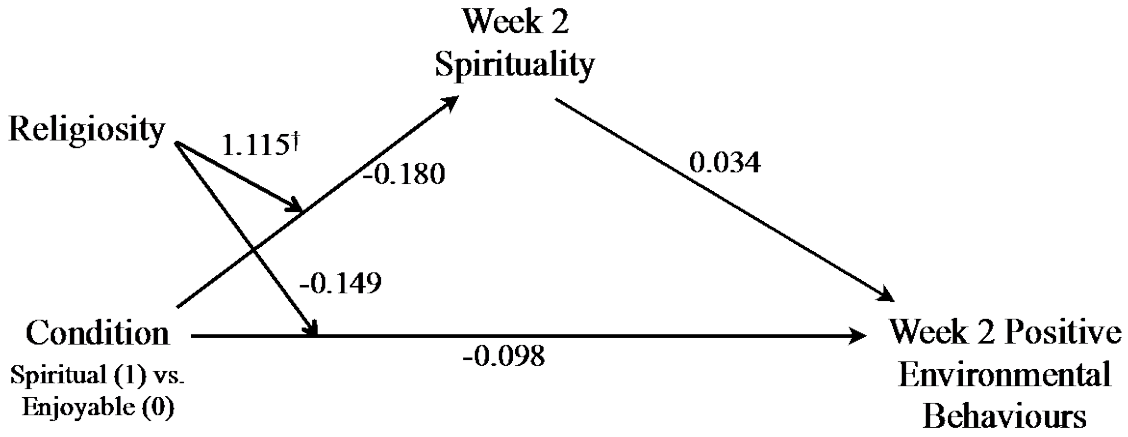

Figure 5. Moderated-mediation model of the effect of Condition on Week 2 Positive Environmental Behaviours as mediated by Week 2 Spirituality. The lines from Religiosity indicate the moderation of Religiosity on the respective relationships.
† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 13
Indirect Effect of Condition on Week 2 Positive Environmental Behaviours through Week 2 Spirituality

		Indirect		95% C.I.	
	N	Effect	SE	Lower	Upper
Not Religious	40	-0.006	0.030	-0.113	0.029
Religious	21	0.032	0.078	-0.096	0.236

Note. Bootstrap results are significant if 0 is outside of C.I.

Table 14
Hierarchical Multiple Regression of Mediation of Week 2 Positive Environmental Behaviours

Predictor	B	SE(B)	β	*t*	*p*
Step 1					
Condition	-0.105	0.192	-.089	-0.544	.588
Religiosity	0.005	0.239	.004	0.021	.983
Condition×Religiosity	-0.111	0.328	-.075	-0.338	.736
Step 2					
Condition	-0.098	0.194	-.083	-0.508	.614
Religiosity	0.030	0.247	.024	0.122	.904
Condition×Religiosity	-0.149	0.341	-.100	-0.437	.664
Week 2 Spirituality	0.034	0.074	.063	0.458	.649
ΔR^2	.00				

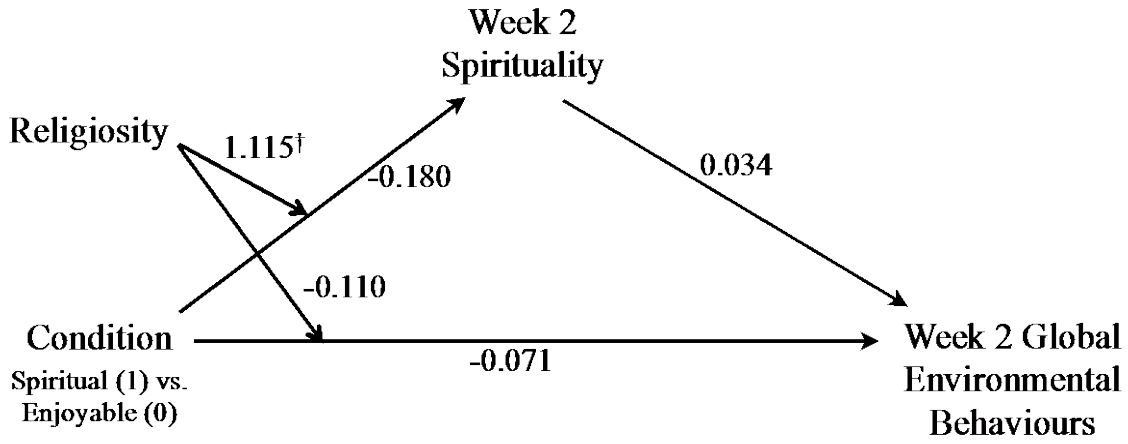

Figure 6. Moderated-mediation model of the effect of Condition on Week 2 Global Environmental Behaviours as mediated by Week 2 Spirituality. The lines from Religiosity indicate the moderation of Religiosity on the respective relationships.
† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 15
Indirect Effect of Condition on Week 2 Global Environmental Behaviours through Week 2 Spirituality

	N	Indirect Effect	SE	95% C.I. Lower	95% C.I. Upper
Not Religious	40	-0.009	0.023	-0.091	0.017
Religious	21	0.045	0.047	-0.020	0.185

Note. Bootstrap results are significant if 0 is outside of C.I.

Table 16
Hierarchical Multiple Regression of Mediation of Week 2 Global Environmental Behaviours

Predictor	B	SE(B)	β	*t*	*p*
Step 1					
Condition	-0.079	0.115	-.112	-0.691	.493
Religiosity	0.080	0.143	.107	0.557	.580
Condition×Religiosity	-0.056	0.196	-.063	-0.287	.775
Step 2					
Condition	-0.071	0.115	-.100	-0.615	.541
Religiosity	0.115	0.146	.155	0.786	.435
Condition×Religiosity	-0.110	0.202	-.124	-0.545	.588
Week 2 Spirituality	0.048	0.044	.148	1.095	.278
ΔR^2	.02				

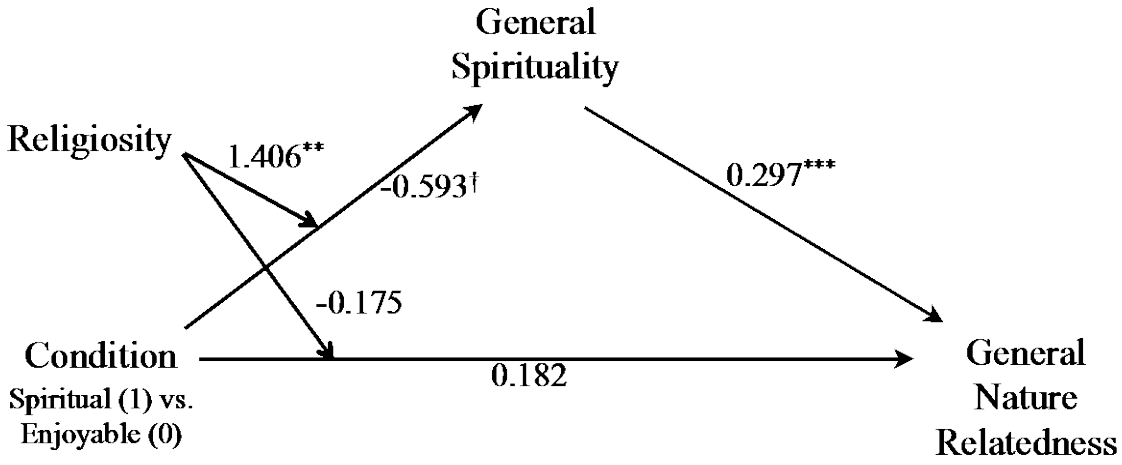

Figure 7. Moderated-mediation model of the effect of Condition on General Nature Relatedness as mediated by General Spirituality. The lines from Religiosity indicate the moderation of Religiosity on the respective relationships.
† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 17
Indirect Effect of Condition on General Nature Relatedness through General Spirituality

	N	Indirect Effect	SE	95% C.I. Lower	95% C.I. Upper
Not Religious	37	-0.176	0.101	-0.453	-0.030
Religious	19	0.242	0.149	0.017	0.616

Note. Bootstrap results are significant if 0 is outside of C.I.

Table 18
Hierarchical Multiple Regression of Mediation of General Nature Relatedness

Predictor	B	SE(B)	β	*t*	*p*
Step 1					
Condition	0.006	0.199	.005	0.029	.977
Religiosity	0.016	0.241	.013	0.066	.948
Condition×Religiosity	0.243	0.334	.165	0.727	.470
Step 2					
Condition	0.182	0.187	.156	0.975	.334
Religiosity	-0.104	0.221	-.085	-0.472	.639
Condition×Religiosity	-0.175	0.324	-.119	-0.540	.591
Week 2 Spirituality	0.297	0.084	.546	3.556	.001
ΔR^2	.19				

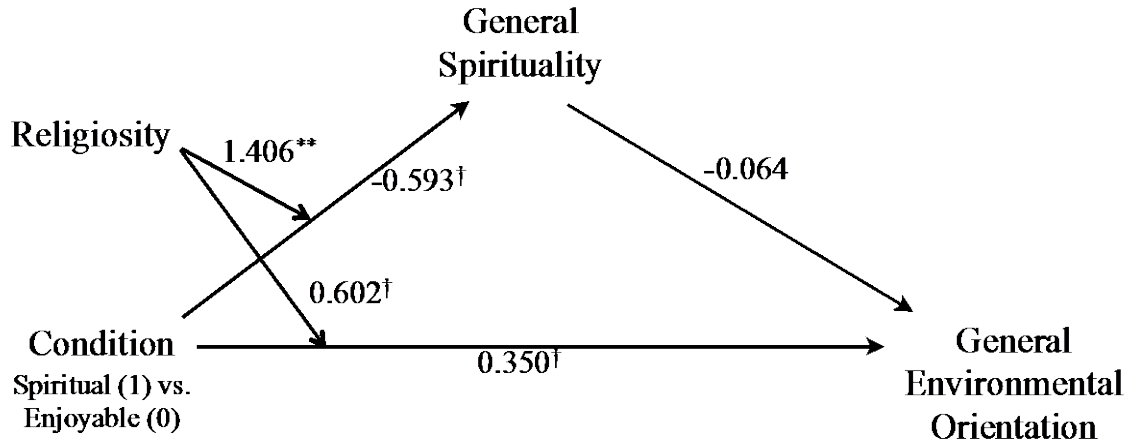

Figure 8. Moderated-mediation model of the effect of Condition on General Environmental Orientation (NEP) as mediated by General Spirituality. The lines from Religiosity indicate the moderation of Religiosity on the respective relationships.
† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 19
Indirect Effect of Condition on General Environmental Orientation through General Spirituality

		Indirect		95% C.I.	
	N	Effect	SE	Lower	Upper
Not Religious	37	0.038	0.087	-0.077	0.280
Religious	19	-0.052	0.115	-0.404	0.098

Note. Bootstrap results are significant if 0 is outside of C.I.

Table 20
Hierarchical Multiple Regression of Mediation of General Environmental Orientation

Predictor	B	SE(B)	β	*t*	*p*
Step 1					
Condition	-0.312	0.193	-.269	-1.617	.112
Religiosity	-0.070	0.234	-.058	-0.302	.764
Condition×Religiosity	0.512	0.323	.350	1.583	.119
Step 2					
Condition	-0.350	0.201	-.302	-1.742	.088
Religiosity	-0.044	0.237	-.037	-0.187	.852
Condition×Religiosity	0.602	0.348	.412	1.728	.090
Week 2 Spirituality	-0.064	0.090	-.119	-0.715	.478
ΔR^2	.01				

Growth Model of Environmental Friendliness (H3)

In Hypothesis 3 I proposed a growth model in which environmental friendliness would increase with continued reflection upon spirituality. A multilevel model was constructed with day as a fixed and random effect, predicting environmental friendliness. For the present models Level 1 corresponds to a daily level of measurement (i.e., Day 8 to Day 14) and Level 2 refers to the individual. Therefore the Level 1 equation is:

$$Daily\ Spirituality_{ij} = \beta_{0j} + \beta_{1j}(Day_{ij}) + e_{ij} \quad (4)$$

The Level 2 intercept and slope equations are:

$$\beta_{0j} = \gamma_{00} + \gamma_{01}(Religiosity_i) + u_{0j} \quad (5)$$
$$\beta_{1j} = \gamma_{10} + \gamma_{11}(Religiosity_i) + u_{1j} \quad (6)$$

The model was run only with participants in the Spirituality Condition during Week 2 to test only the effect of the manipulation. The variable Day is expected to be positively related to environmental friendliness indicating that with each day there is an increase of environmental behaviours. Furthermore, the previous analyses showed that Religiosity moderated the effect of the manipulation. Therefore, Religiosity was included as a moderator for the growth model as well. The main effect of day was not significantly related to any of the Environmental Friendliness variables (see Table 15). The interaction of Religiosity×Day was unrelated to Week 2 Nature Connectedness (estimate = 0.031, SE = .035, p = .378), Week 2 Negative Environmental Behaviours (estimate = 0.002, SE = .010, p = .870), Week 2 Positive Environmental Behaviours (estimate = -0.010, SE = .022, p = .642), and Week 2 Global Environmental Behaviours (estimate = -0.004, SE = .009, p = .628). Therefore, there was no support for a growth of Environmental Friendliness during Week 2.

Table 21
Multilevel Growth Models of Daily Environmental Friendliness in the Spirituality Condition During Week 2

	Week 2 Daily Nature Connectedness				Week 2 Daily Negative Environmental Behaviours				Week 2 Daily Positive Environmental Behaviours				Week 2 Daily Global Environmental Behaviours			
Fixed Effects	Estimate	*df*	*t*	*p*	Estimate	*df*	*t*	*p*	Estimate	*df*	*t*	*p*	Estimate	*df*	*t*	*p*
Day	-0.099	135.76	-1.626	.106	-0.039	67.38	-1.924	.059	0.050	181.83	1.245	.215	-0.009	52.71	-0.810	.421
Religiosity	-1.378	22.46	-1.567	.131	-0.159	46.10	-0.405	.687	0.384	182.24	0.542	.588	0.034	43.73	0.176	.861
Day×Religiosity	0.157	145.17	1.639	.103	0.006	67.91	0.189	.850	-0.033	184.78	-0.522	.602	-0.004	59.07	-0.239	.812

Discussion

The current study sought to examine the relation between spirituality and environmental friendliness. Using an intensive repeated-measure, experimental design I found that spirituality increased through daily reflection for religious individuals, but not non-religious individuals. This subsequently influenced environmental attitudes (i.e., nature connectedness and relatedness), but not behaviours. Therefore, religiosity seems to have a moderating role in spiritual reflections and their influence upon environmental attitudes.

In the following section I will discuss the activation of spirituality through reflection and its effectiveness among religious individuals, but not non-religious. The subsequent effect that this had upon environmentally friendly attitudes, but not behaviours will be developed and explained. A discussion of the difficulty of behaviour change, especially among habits will be offered. Finally the conceptual overlaps between religion, spirituality, and nature will be discussed.

Activation of Spirituality through Reflection

Activating spirituality as opposed to activating enjoyment seems to have an impact on religious individuals' spirituality. Religious individuals who reflected on their spirituality during a week showed a slight increase in spirituality than when they did not reflect. Contrastingly, when religious individuals reflected on their most spiritual moment, they showed a slight decrease in spirituality. Although the within-participant findings did not provide strong support to these tendencies (no significant findings were found), the comparisons between the religious and non-religious individuals provided support of the impact of reflections upon daily spirituality. When asked to reflect on

spirituality, religious individuals felt more spiritual than those who were asked to reflect on an enjoyable moment. The effect of reflecting upon spirituality was also found to have an impact on post-survey measures of general spirituality for both religious and non-religious participants. More specifically, religious participants showed an increase in spiritual support and openness (see Genia, 1997), while non-religious participants showed a decrease.

Religion commonly involves a sense of spirituality. It is clear that religiosity and spirituality are intertwined. The spiritual or transcendent aspects of religion could include communal worship, fellowship, or prayer. Hyland and colleagues (2010) described spirituality as a sense of connection to the world, either physical or metaphysical. This connection is achieved through such religious practices. Moreover, it may have been transcendent behaviours (i.e., prayer) that religious participants perform that helped foster this increase in spirituality. These transcendent behaviours associated with religion can lead to greater environmental friendliness (Boyd, 1999). Therefore, the current findings provide support that it is the spiritual (or transcendent) aspects of religious individuals' experiences that influence their environmental friendliness.

The successful activation of spirituality provides support for existing experimental spirituality research that involves the manipulation of spirituality (e.g., Stillman et al., 2012). There was no within-participant effect, or change in spirituality between weeks, that was detected. However, the between-participant analyses detected a difference between conditions in Week 2 Spirituality, which is indicative of the effectiveness of the manipulation. Although the effect was found between-participants among religious individuals, the activation of spirituality is pertinent to experimental

research in the psychology of spirituality because it provides evidence that spirituality can be activated in an experimental study.

On the contrary, the activation of spirituality through reflection was not effective for non-religious individuals. In fact, it seems to have led to a decrease in their spirituality. Religious individuals may have already had an established sense of spirituality that was being activated, which could explain their susceptibility to spiritual activation. Furthermore, the reflection instructions asked participants to recall their most spiritual moment. This may have been easier for religious individuals because their spiritual moments are tied to distinct practices that they engage in (e.g., musical worship). Contrastingly, non-religious individuals may not have had explicitly defined spiritual experiences, which would make it more difficult to recall a specifically spiritual moment.

To activate spirituality, participants were instructed each night and morning during the second week of the daily diary to think about the most spiritual moment of their life. Spirituality was not activated among participants who were not religious, likely because almost half of the non-religious individuals (40%) were neither spiritual nor religious. Therefore they were being asked to reflect on something which they had no affinity towards. In fact, the manipulation may have also had a reverse effect on participants who were not religious. Non-religious participants showed the opposite relation with the post-survey spirituality than religious participants. This may be an issue of reactance. Asking non-religious (and potentially non-spiritual) individuals to reflect on something they do not believe in might cause them to feel a lack of freedom (Rains, 2013; Worchel & Brehm, 1970). This threatened freedom would then lead to a desire to respond contrary to what they thought was expected of them.

Closely related with reactance is oppositional defiance (Vansteenkiste, Soenens, Van Petegem, & Duriez, 2013). Oppositional defiance is marked by a "blunt resistance against…authority" (p. 2). Controlling environments, as defined by Self-Determination Theory, are characterized by compliance with either interpersonal or intrapsychic demands (Deci, Eghrari, Patrick, & Leone, 1994). Controlling environments can precipitate oppositional defiance. The controlling environment created in the present study was asking participants who were neither religious nor spiritual to reflect on spirituality. They may have chosen to respond negatively, defying the perceived purpose of the study. This opposition was found in levels of post-survey spirituality, but not in environmental friendliness.

Again, the findings show limited support (i.e., were not significant) in the within-participant changes in daily spirituality that were discussed above. However, the above discussion was merited because the relations were found in the expected directions and between-group comparisons of general post-survey spirituality. A larger sample size may have helped in the detection of significant changes in spirituality after reflection. Furthermore, the noted effect of reflecting on spirituality upon general post-survey spirituality may indicate that a different measure of spirituality could detect a change in daily spirituality.

Changing Environmental Attitudes but not Behaviours

The findings suggest a conceptual link between spirituality and environmental attitudes, but not behaviours. More specifically, the sense of connection to nature was related to individuals' spirituality, but positive, negative, and global environmental behaviours were not. Previous research investigating the links between spirituality and

environment have focused on attitudes (e.g., Ignatow, 2006). For the current research, I was interested in both environmental attitudes and behaviours. The difference in findings between attitudes and behaviours could be due to the nature of attitudes as being more malleable than behaviours (Ajzen & Fishbein, 2005).

Attitudes and behaviours, though they are related, can be inconsistent (Fazio, 1986). This is the basis of cognitive dissonance (Festinger, 1957). Festinger proposed that the discomfort caused by misaligning attitudes and behaviour would motivate individuals to rectify the difference. The most common approach to appeasing this discomfort is to change one's attitudes to align with behaviours. In the case of environmental attitudes and behaviours, this is not the change that is needed to reduce one's impact upon the environment. Instead, a change of behaviours towards more environmentally friendly ones would better aid protection of the environment.

Unfortunately attitudes do not often lead to a change of behaviours (Wicker, 1971). In fact, several intermediating factors have to be present for a change of behaviours to occur from the influence of an attitude. These factors include how much previous experience informed the attitude, the certainty of the attitude, and the degree of definition of the attitude (Fazio & Zanna, 1978). In the case of environmental attitudes and behaviours, the environmental attitude would have to be due to previous experience with environmental issues (e.g., if an individual has previously attended information sessions or has a personal relationship with natural environment in a profession that depends on the environment), the environmental attitude holder would have be sure of their attitude, and they would have to define the attitude clearly (i.e., 'I care about the protection of water systems from pollution such as detergents, fertilizers, or oil

products'). These attitudinal elements would help determine the influence of attitudes on behaviours. Unfortunately, these conditions were not assessed in the current research. Hartley, Wright, Zakriski, and Banducci (2013) warn that researchers often focus on person-specific traits when trying to predict behaviour change. Context-specific measures need to be employed to capture the situational elements, gaining a more complete understanding of what precipitates behaviour change (Fazio, 1986). Future research should take these conditions into account when considering behavioural change.

Daily behaviours: Habits are hard to break. Another way to explain the fact that behaviours were unaltered is that some behaviours are also habits, which are even more difficult to change than other behaviours. A behaviour is a habit depending on how well engrained the behaviour is in a person's lifestyle (i.e., routine or habit). More specifically, habits are automatic responses to cues that are a product of routine (Neal, Wood, & Drolet, 2013). Habits involve rote repetition with minimal conscious effort. In the context of the current study, the environmental behaviour measure was constructed to address participants' daily behaviours from an environmental perspective. It was designed for use in a daily diary study to address individuals' activities and behaviours during a typical day. Consequently, the behaviours in question may have been influenced more by habit than by personal attitudes or beliefs. For instance, the choice to drive to school may have been more influenced by the habit of driving to school for the previous year than by a decision to drive. Unfortunately breaking habits and changing behaviour is difficult. Habits are often unaffected by current goals unless commitment to the cause of the change is strong (Baca-Motes, Brown, Gneezy, Keenan, & Nelson, 2013; Neal, Wood, Labrecque, & Lally, 2012). Therefore, even though someone may be seeking to be

more pro-environmental, they will likely not break their habit of driving to school or eating meat, unless they were truly committed to protecting the environment. The individual would have to feel a strong commitment to environmental protection through eating habits to effectively break their habit of eating meat.

Throughout the two weeks of the daily diary, variance for several behaviours (transportation, beverage choices, note-taking habits, meal locations, and water while brushing teeth) was low. Low variance implies that the behaviours did not fluctuate much and were more a "force of habit" than a decision to be made. Considering this, spirituality may have exerted an influence on participants, but this influence was not manifested in their behaviours. Their behaviours were more influenced by their habits.

A suggestion for future research would be to employ an experimental situation where participants are asked to perform a behaviour that they do not normally do. For instance, offering participants a physical reward to take home after participation and a plastic bag (versus no plastic bag) to take it home in. The decision to take the plastic bag could be seen as detrimental to the environment, whereas not taking the plastic bag would be deemed environmentally friendly. Having participants engage in such a novel activity would overcome the influence of habits on behaviour.

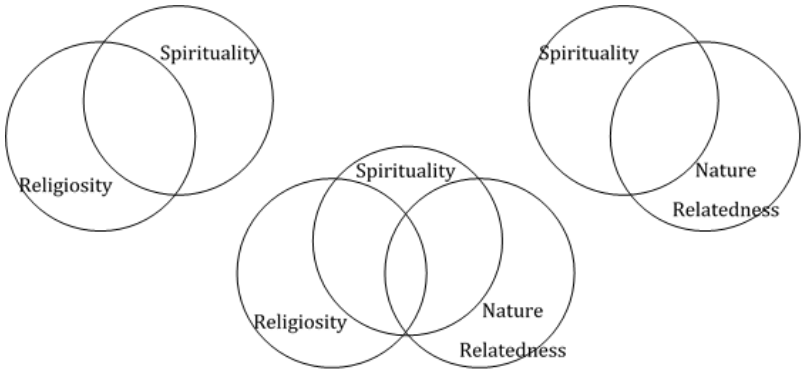

Figure 9. Conceptual overlaps of religiosity, spirituality, and nature connectedness.

Spirituality and Religiosity

The correlational findings show that religious participants experienced greater spiritual openness and support than non-religious (as evident by the positive correlation between Religiosity and the Spiritual Experience Index). This suggests a link between spirituality and religiosity. Conversely, the difference between religiosity and spirituality is evident in that religiosity was a deciding factor in the susceptibility to an increase of spirituality through daily reflection, while trait spirituality was not. These seemingly conflicting findings are an example of the "distinct, but overlapping" (Hodge, 2003, p. 41) nature of spirituality and religion (Schlehofer, Omoto, & Adelman, 2008; Tanyi, 2002; Zinnbauer et al., 1997; see Figure 9 for a visual depiction of the conceptual overlaps of spirituality and religiosity). The two are interpretable and differ between individuals. By and large, spirituality is interpreted in abstract, personal, and existential terms. Religiosity, on the other hand, is interpreted as corresponding with organizational and institutional beliefs. Conversely, they are both transcendent experiences characterized by a belief in God or a power outside of the self. They are also modestly, but significantly, correlated in the present study.

The distinction between spirituality and religiosity is a relatively recent phenomenon. In the early 20th century, James (1902) penned his book *The Varieties of Religious Experience: A Study of Human Nature*, in which, he makes no clear distinction between spiritual and religious experiences. Rather, he treats the two terms as interchangeable. However, it was written at a time of increasing recognition of science and subsequent scepticism of blind faith (Butler-Bowdon, 2005). This social change may have led to the contemporary differentiation between spirituality and religiosity.

Consequently, it is important to remember that the contemporary differentiation between spirituality and religiosity has only occurred in recent decades. Therefore, the historical context of the present research needs to be cautiously examined in the interpretation of results because it will influence participants' definitions of spirituality and religiosity.

Further complicating the relation between spirituality and religiosity is the composition of religious and spiritual ascriptions in the present sample. A large portion of the sample (25%) considered themselves neither religious nor spiritual. While even more (40%) declared themselves somewhat or moderately spiritual but not religious, no participants declared that they were religious but not spiritual. This means that people believe that they can spiritual, but not religious. They also believe that you cannot be religious without also being spiritual (Tanyi, 2002). Evidently, the distinction between spirituality and religiosity is prevalent in our study. Zinnbauer and colleagues (1997) found that this distinction is most often made by agnostic or atheist individuals. Our sample was composed of primarily individuals who identified themselves as atheist (60%)[15]. Consequently, these terms needed to be distinguished and treated appropriately in the current study.

Religiosity was chosen as a moderator to align with Stillman and colleagues' (2012) prescription that all participants be non-atheist. However, I was also interested in the effect of the manipulation on all individuals, so did not restrict the sample. Religiosity was also chosen as opposed to spirituality because our sample was composed of primarily non-religious individuals, which made the moderation much simpler. As mentioned

[15] It is important to note that the terms atheism and not-religious are not equivalent terms. For the current research, I focused on a distinction between religious and not-religious, while Stillman and colleagues (2012) focused on atheist and non-atheist.

previously, agnostic and atheistic individuals make a more clear distinction between religion and spirituality (Zinnbauer et al. 1997). Spirituality often contains a self-defined focus which would differ widely across participants (Tanyi, 2002). Conversely, religiosity has a less interpretable definition across participants. Therefore, religiosity is a more conservative moderator to use when not defining the concepts for participants.

Similarly, the use of spirituality would have led to some potential confounds. Spirituality has a much wider definition and would have required us to declare our operational definition. Unfortunately this could not be done for the current study without confounding the results. The definition of spirituality that I chose to use contained a reference to nature (Ellor & McGregor, 2011; Worthington & Aten, 2009). If it had been presented to participants, it could have influenced nature salience and, therefore, environmental friendliness. Fortunately, religiosity is a closely related, but distinct, concept that participants understand more uniformly.

Although religiosity moderated the activation and is supported by previous research and rationale, it is counter-evident to James' (1892/1961) Spiritual Me. James proposes that the Spiritual Me is present within all individuals. Therefore, I proposed that the activation of spirituality would be effective for all individuals. However, the findings suggest that spirituality is not present among all individuals. Furthermore, the susceptibility to activation of spirituality requires pre-existing religious beliefs. Otherwise, the lack of religiosity seems to be more related with a decrease in spirituality following reflection.

Spirituality and Nature

Spirituality overlaps considerably with religiosity, but also with nature connectedness (see Figure 9 for a visual depiction of the relation). The strong relation that was found between spirituality and nature connectedness is to be expected. As mentioned previously, the definition of spirituality adopted for the current research makes explicit reference to nature spirituality (Worthington & Aten, 2009). Ellor and McGregor (2011) detail a notion of spirituality as being connected to creation or nature. Pantheism is a sense religious or spiritual connection to all of the surrounding world, whereby everything is sacred (Larson, 2010). Spirituality and nature combine in pantheism. Although participants did not declare pantheistic beliefs, the inference could be made by the strong association of nature connectedness and spirituality. Pantheism's spiritual connection to the world is also evidence of transcendence.

The transcendent nature of environmentalism is made clear when discussing how humans are functioning cogs in the large system of earth (Ignatow, 2006). Regarding the ecosphere and all entities within it as equal creates a plane of existence within which all entities are treated fairly. It moves the focus of oneself as an individual beyond the self, which is characteristic of transcendence. Moreover, a pole of Grouzet and colleagues' (2005) circumplex model of goals is transcendence. Spirituality and environmental friendliness are classified as transcendent pursuits (Grouzet, 2011). The relation between spirituality and nature connectedness in the present study provides preliminary evidence of the connection through transcendence. Subsequent research might seek to also assess transcendence to understand its role in the relation between spirituality and environmental friendliness.

Limitations and Future Research

The current study sought to establish a relation between environmental friendliness and spirituality. Religious individuals' environmental attitudes were influenced. However, this finding did not extend to non-religious individuals or to behaviours. This may be due in part to the nature of the sample. Participants were undergraduate university students from a liberal university in Canada. They may have been more environmentally friendly than the average population and perform more environmentally friendly behaviours, resulting in a ceiling effect. It would be difficult to detect an increase in environmental friendliness among individuals who already score highly. However, because the behavioural measures were created for this study, a comparison to previous research is not possible. Future research could attempt to employ a more explicit measure of environmental behaviours in daily use. Including open-ended questions could also improve measurement. This would allow for participants to indicate any behaviours that they may have engaged in that were not listed in the checklist. However, this may lead to socially desirable responding.

Furthermore, the University of Victoria is not a spiritual or religious institution. The current sample is indicative of the secular composition of the university population. A majority of individuals identified as atheist, but a majority also stated that they were spiritual. I postulated that all participants had a spiritual Me (James 1892/1961) that could be activated through reflection. Perhaps a stronger or more precise activation could increase accessibility across all participants. A more precise activation could involve determining participants' personally ascribed spiritual focus (Tanyi, 2002) and emphasizing this during reflection.

Participants' general spirituality was assessed during the post-survey using the Spiritual Experience Index (Genia, 1997). The scale was created with two goals: to help make a distinction between an individual's spirituality as mature or young and to be inclusive of as many spiritual traditions as possible. However, the latter goal may suffer from the restrictive terminology of "faith" that is used in most of the items. This term is most often used in religious, especially Christian, contexts and reflects the North American bias of the scale. Participants may not have been able to interpret this in terms of their own beliefs or spirituality if they do not feel that they have a "faith."

Another limitation associated with the sample is whether the findings can be extended from the sample of undergraduate students to the general population. The daily diary was meant to assess the typical day in the life of a student. Capturing "life as it is lived" (Bolger, Davis, & Rafaeli, 2003, p. 579) is effective for understanding many complex processes in people's lives. Unfortunately, people's lives can be vastly different, especially when comparing students to the general population. The daily diary was catered towards undergraduate university students. As such, it is hard to generalize results, but also to determine the effectiveness of such a study outside of the present population. Future research might seek activate spirituality among different populations to test the robustness of the results.

The findings relating people's spirituality and nature connectedness could be followed up in several ways. One way is through focused sampling of specific religious or spiritual populations. In particular, a follow up study of religious connections to nature could be conducted to further understand the moderating role of religiosity. Certain Buddhist traditions have a strong connection to nature. It would be interesting to probe

Buddhists' connection to nature. Conversely, the Christian tradition is quite varied in the representation of and connection to nature. A sampling of these different perspectives could help understand why some groups oppose environmental protection while others encourage it.

Conclusion

The present study sought to improve the state of the natural environment by increasing individuals' sense of spirituality. This was moderately achieved, where religious individuals felt a greater sense of spirituality after reflecting and subsequently felt more connected to nature. This has several implications outside of the laboratory. As mentioned previously, connection to nature is associated with pro-environmental attitudes and behaviours (Nisbet, Zelenski, & Murphy, 2009). Although not detected within the current study, the inference is possible that the activation of spirituality may lead to greater overall environmental friendliness (i.e., nature connectedness, environmental attitudes and behaviours). Religious or spiritual groups seeking to engage their members in nature protection activities might choose guided spiritual reflections each day. Furthermore, individuals who may be restricted in their ability to access nature may seek spiritual experiences or recall spiritual experiences to maintain a sense of connection to nature. This adds to an expanding area of literature examining alternate means of influencing environmental friendliness. The earth could benefit from individuals being more spiritual.

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Appendix A

SPIRITUAL EXPERIENCE INDEX

Source: Spiritual Experience Index (Genia, 1997)

Instruction: Below are statements with which you may agree or disagree. Please read each statement carefully and indicate your level of agreement.

Response Scale:

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree

Items:

Spiritual Support Subscale

(1) I often feel strongly related to a power greater than myself.
(2) My faith gives my life meaning and purpose.
(3) My faith is a way of life.
(4) I often think about issues concerning my faith.
(5) My faith is an important part of my individual identity.
(6) My relationship to God is experienced as unconditional love.
(7) My faith helps me to confront tragedy and suffering.
(8) I gain spiritual strength by trusting in a higher power.
(9) My faith is often a deeply emotional experience.
(10) I make a conscious effort to live in accordance with my spiritual values.
(11) My faith enables me to experience forgiveness when I act against my moral conscience.
(12) Sharing my faith with others is important for my spiritual growth.
(13) My faith guides my whole approach to life.

Spiritual Openness Subscale

(1) I believe that there is only one true faith. *
(2) Ideas from faiths different from my own may increase my understanding of spiritual truth.
(3) One should not marry someone of a different faith. *
(4) I believe that the world is basically good.
(5) Learning about different faiths is an important part of my spiritual development.
(6) I feel a strong spiritual bond with all of humankind.
(7) I never challenge the teachings of my faith. *
(8) My spiritual beliefs change as I encounter new ideas and experiences.
(9) Persons of different faiths share a common spiritual bond.
(10) I believe that the world is basically evil. *

* Items are reverse scored

Appendix B

NATURE RELATEDNESS

Source: Nature Relatedness Scale (NR; Nisbet, Zelenski, & Murphy, 2009)

Instruction: Below are statements with which you may agree or disagree. Please read each statement carefully and indicate your level of agreement.

Response Scale:

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree

Items:

(1) My connection to nature and the environment is a part of my spirituality
(2) My relationship to nature is an important part of who I am
(3) I feel very connected to all living things and the earth
(4) I am not separate from nature, but a part of nature
(5) I always think about how my actions affect the environment
(6) I am very aware of environmental issues
(7) I think a lot about the suffering of animals
(8) Even in the middle of the city, I notice nature around me
(9) My feelings about nature do not affect how I live my life
(10) Humans have the right to use natural resources any way we want
(11) Conservation is unnecessary because nature is strong enough to recover from any human impact
(12) Animals, birds and plants have fewer rights than humans
(13) Some species are just meant to die out or become extinct
(14) Nothing I do will change problems in other places on the planet
(15) The state of nonhuman species is an indicator of the future for humans
(16) The thought of being deep in the woods, away from civilization, is frightening
(17) My ideal vacation spot would be a remote, wilderness area
(18) I enjoy being outdoors, even in unpleasant weather
(19) I don’t often go out in nature
(20) I enjoy digging in the earth and getting dirt on my hands
(21) I take notice of wildlife wherever I am

Appendix C

NEW ECOLOGICAL PARADIGM

Source: New Ecological Paradigm (NEP; Dunlap, Van Liere, Mertig, & Jones, 2000)

Instruction: Listed below are statements about the relationship between humans and the environment. For each one, please indicate your level of agreement.

Response Scale:

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree

Items:

(1) We are approaching the limit of the number of people the earth can support
(2) Humans have the right to modify the natural environment to suit their needs
(3) When humans interfere with nature it often produces disastrous consequences
(4) Human ingenuity will insure that we do NOT make the earth unlivable
(5) Humans are severely abusing the environment
(6) The earth has plenty of natural resources if we just learn how to develop them
(7) Plants and animals have as much right as humans to exist
(8) The balance of nature is strong enough to cope with the impacts of modern industrial nations
(9) Despite our special abilities humans are still subject to the laws of nature
(10) The so-called "ecological crisis" facing humankind has been greatly exaggerated
(11) The earth is like a spaceship with very limited room and resources
(12) Humans were meant to rule over the rest of nature
(13) The balance of nature is very delicate and easily upset
(14) Humans will eventually learn enough about how nature works to be able to control it
(15) If things continue on their present course, we will soon experience a major ecological catastrophe

Appendix D

DAILY ENVIRONMENTAL BEHAVIOUR QUESTIONNAIRE

Source: Elliott S. Lee and Frederick M.E. Grouzet (2012)

Instructions: The following questions are to gain a complete picture of your life as you live it. They are for the purpose of understanding your daily behaviours. The following questions will ask you about your day, from the time you woke up to now.

How many hours did you sleep?

- o Less than 3h
- o 3h-5h
- o +/- 6h
- o +/- 7h
- o +/- 8h
- o +/- 9h
- o More than 9h

Did you leave the water running while brushing your teeth?

- o Less than usual
- o Somewhat less than usual
- o Usual
- o Somewhat more than usual
- o More than usual
- o Didn't shower today

How long was your shower?

- o Yes
- o No
- o Didn't brush teeth today

How did you get to school/work? (select as many as apply to you)

- □ Bike
- □ Bus
- □ Car
- □ Walk/Run
- □ Skateboard
- □ Other

At school, what did you take notes on? (select as many as apply to you)

- □ Computer
- □ Tablet
- □ Single side of paper
- □ Both sides of paper
- □ Recycled paper
- □ Notebook
- □ Other

How did you read online readings, articles, etc.? (Select as many as apply to you)

- □ Read them on a computer
- □ Read them on a tablet
- □ Print them single-sided
- □ Print them double-sided
- □ Other

How did you satisfy your thirst today? (Select as many as apply)

- □ Buy a bottle of water?
- □ Buy juice?
- □ Buy soda/pop?
- □ Buy an alcoholic beverage?
- □ Buy coffee/tea in your own mug?
- □ Buy coffee/tea in a disposable cup?
- □ Bring your own bottle?
- □ Find a water fountain?
- □ Other

Did you smoke today?

- o Yes
- o No
- o Don't smoke

How often did you use your cell phone?

- o Never
- o Not very often
- o Sometimes
- o Somewhat often
- o Always
- o No, don't own a cell phone

How long did you spend playing video games today?

- o Didn't play video games today
- o Less than an hour
- o 1-2 hours
- o 2-3 hours
- o 3-4 hours
- o More than 4 hours
- o Don't play video games

Did you leave electronics on when not using them?

- o Never
- o Not very often
- o Sometimes
- o Fairly often
- o Always

Where did you eat breakfast?

- o At a sit-down restaurant
- o At a fast food restaurant
- o At the school cafeteria
- o At home
- o Didn't eat breakfast

Where did you eat lunch?

- o At a sit-down restaurant
- o At a fast food restaurant
- o At the school cafeteria
- o At home
- o Didn't eat lunch

Where did you eat dinner?

- o At a sit-down restaurant
- o At a fast food restaurant
- o At the school cafeteria
- o At home
- o Didn't eat dinner

What did you eat for breakfast? (select as many as apply)

- □ Dairy
- □ Meat
- □ Fish
- □ Eggs
- □ Tofu
- □ Bread
- □ Pasta or rice
- □ Vegetables
- □ Fruit
- □ Salad
- □ Other

What did you eat for lunch? (select as many as apply)

- □ Dairy
- □ Meat
- □ Fish
- □ Eggs
- □ Tofu
- □ Bread
- □ Pasta or rice
- □ Vegetables
- □ Fruit
- □ Salad
- □ Other

What did you eat for dinner? (select as many as apply)

- □ Dairy
- □ Meat
- □ Fish
- □ Eggs
- □ Tofu
- □ Bread
- □ Pasta or rice
- □ Vegetables
- □ Fruit
- □ Salad
- □ Other

Did your breakfast come in disposable packaging?

- o Yes
- o No
- o Didn't come in packaging

Did your lunch come in disposable packaging?

- o Yes
- o No
- o Didn't come in packaging

Did your dinner come in disposable packaging?

- o Yes
- o No
- o Didn't come in packaging