Aesthetics and Mood:
Exploring the effect that landscape aesthetics
have on individuals with depressive symptoms

by

Breanna Lea Nelson

A REPORT

submitted in partial fulfillment of the requirements for the degree

MASTER OF LANDSCAPE ARCHITECTURE

Department of Landscape Architecture and Regional & Community Planning
College of Architecture, Planing and Design

KANSAS STATE UNIVERSITY
Manhattan, Kansas

2018

Approved by:

Major Professor
Dr. Tim Keane

Abstract

According to the National Alliance on Mental illness, 18.5% of adults in the U.S. experience mental illness each year. Many recent studies suggest that the natural environment can beneficially impact the mental health of an individual. Research on healing gardens suggests that if an individual with depression has a higher aesthetic preference for a landscape, the individual will see a positive increase in mood and perhaps a decrease in depressive symptoms. An environmental preference study was conducted to understand if an aesthetically preferred landscape has an impact on the mood of an individual. Participants were recruited from two universities and included students and non-students. A total of 120 participants were given the option of online or in-person participation. Prior to viewing landscape images, participants completed the Beck Depression Inventory (BDI) and the Environmental Preference Questionnaire (EPQ). Before and after viewing each image, the participants indicated their mood using a Visual Analog Scale and their aesthetic preference using a Likert-type Scale. This study showed a positive increase in mood, dependent upon aesthetic preference across all participants, however, an overall lower mood for individuals with higher depressional tendencies.

Aesthetics and Mood

Exploring the effect that landscape aesthetics have on individuals with depressive symptoms

Bre Nelson

COPYRIGHT

Department of Landscape Architecture and Regional & Community Planning
College of Architecture, Planing and Design
Kansas State University
Manhattan, Kansas

Committee Members:
Dr. Tim Keane | Department of Landscape Architecture | Chair
Dr. Candice Shoemaker | Department of Horticulture and Natural Resources
Dr. RuthAnn Atchley | Department of Psychology - University of Kansas

Abstract

According to the National Alliance on Mental illness, 18.5% of adults in the U.S. experience mental illness each year. Many recent studies suggest that the natural environment can beneficially impact the mental health of an individual. Research on healing gardens suggests that if an individual with depression has a higher aesthetic preference for a landscape, the individual will see a positive increase in mood and perhaps a decrease in depressive symptoms. An environmental preference study was conducted to understand if an aesthetically preferred landscape has an impact on the mood of an individual. Participants were recruited from two universities and included students and non-students. A total of 120 participants were given the option of online or in-person participation. Prior to viewing landscape images, participants completed the Beck Depression Inventory (BDI) and the Environmental Preference Questionnaire (EPQ). Before and after viewing each image, the participants indicated their mood using a Visual Analog Scale and their aesthetic preference using a Likert-type Scale. This study showed a positive increase in mood, dependent upon aesthetic preference across all participants, however, an overall lower mood for individuals with higher depressional tendencies.

Table of Contents

List of Figures

List of Tables

Appendix C - 1

Appendix C - 2

Acknowledgments

Chapter One

Introduction

Introduction

Dilemma

In our world today, one of the most common mental disorders is depression. Depression affects 6.7% of American adults each year. Depression does not discriminate among age, race, or gender and can occur to anyone at any time of their life. However, only about 35.3% of those with depression will seek treatment because most believe that the disorder is not serious, they can treat it on their own, or even that it is just a weakness rather than a serious disorder ("Depression," 2013).

In the past, local healing places were found in nature, such as springs, sacred groves, or even special rocks and caves. Natural healing places were common in Judaic, Christian, and Islamic religions, which focused on a paradise that is symbolized by a garden. However, the idea of accessing nature for healing purposes became lost, and by the late 20th century, "landscaping was merely for decorative purposes" (Marcus & Barnes, 1999). Overall, the relationship of healing gardens to landscape aesthetics has become less prominent in design today, thus creating the focus for this study.

Goals & Intent

There are two goals of this research, the primary goal is to understand the impact of differing landscape aesthetics on the mental well-being of individuals with varying levels of depressive tendencies. The interest in understanding the connection between the natural environment and healing has been growing in recent research. Many studies have shown positive impact on the mental well-being of those with mental disorders after engaging in the natural environment (McCaffrey, 2007; Milligan & Bingley, 2007; Ulrich, 1984). A secondary goal is to understand if an individual with greater depressional tendencies will have a lower mood than their peers with lesser depressional tendencies.

Research Hypotheses

An individual with depressional tendencies that has a higher aesthetic preference toward a landscape will have a corresponding and more positive mood (Figure 1).

Individuals with higher depressional tendencies will have an overall reported lower mood than those with lesser depressional tendencies.

In the broader context, there is the possibility that if an individual has a positive increase in mood, then they will see a decrease in depressive symptoms. This is something that cannot be tested from this research but instead can provide a step towards an understanding of mental illness and the landscape.

may be a synonym), is everything we see or sense around us," to which will be used specifically as exterior space.

Nature: A term which has been debated and defined in the landscape architecture profession numerous times, however, the most fitting as defined by Bernard Lassus (1998), "places where man has introduced no construction," and thus has no or very minimal human impact.
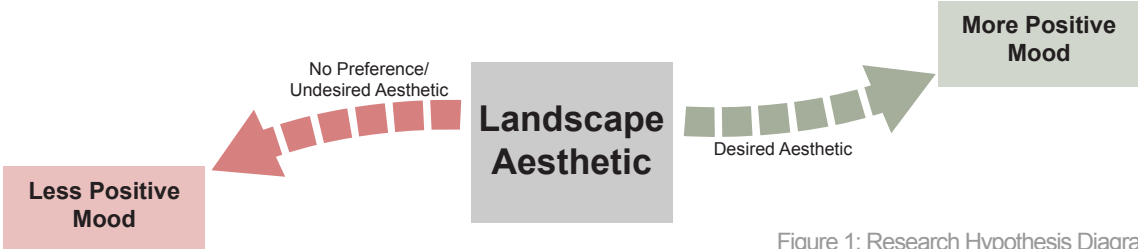
Figure 1: Research Hypothesis Diagram

Concepts & Definitions

There are a few terms necessary to be defined as they will be used in this report.

Garden: This is defined by Marcus and Barnes as encompassing any green outdoor space, however, as it is defined on the Kaplan's Environmental Preference Questionnaire and defined in Horticultural Therapy, the typical definition of "a plot of ground where herbs, fruits, flowers, or vegetables are cultivated."

Landscape: The term landscape comes from the Dutch root "landschap" meaning a representation of scenery. To further define landscape, Garrett Eckbo (2016) states "landscape, like environment (for which it

Methods

This research is to understand how a preference towards a landscape aesthetic will impact mood of an individual. This is done through the projection of a series of landscape images which each participant first declared their preference towards the image and then their anticipated mood in relation to the image. To extend the study, the significance in an individual's change in mood is compared between individuals with greater depressional tendencies and individuals with lesser depressional tendencies.

Review of Literature

Understanding history becomes important when moving towards the future. It is important to know and understand what has been done before and how to grow from that, especially in research. The idea of environmental psychology became popular around the mid-20th century, but can be tracked back to small instances seen throughout history (Spencer, 2009). Environmental Psychology has since rapidly expanded and been documented throughout the literature. The basis of the following literature review is to understand the known impact of the environment on mental health.

Perception of the Natural Environment

James J. Gibson (1979) suggested the term, "affordance"; what the environment has to offer the animal. Affordance, used in this sense, clearly refers to the environment and the animal together. An affordance is measured in way that is relative or unique to the animal, suggesting that an affordance cannot be measured in generalized terms such as an applied equation because it is directly dependent on the animal. In the environment, an affordance is "in a sense objective, real, and physical, unlike values and meanings, which are often supposed to be subjective, phenomenal, and mental" (p. 129). Gibson goes on to state that the reality of this statement is that an affordance is not objective or subjective property and that it cuts across both environment and behavior to understand both the physical and the psychical, the influence on the human mind or psyche (Gibson, 2014).

Gobster, Nassauer, Daniel, and Fry (2007) describe an experiential realm such as the "perceptible realm," the scale at which humans experience the landscape, and within, the interactions provide an aesthetic experience that leads to changes in the landscape affecting humans and landscape interaction. The authors state that the aesthetics-ecology relationship is one that is often misunderstood, but incredibly powerful. Thus, in the perceptible realm, this relationship can be fully understood. Firth (2008) also relays the importance of aesthetics in the experience of place by stating that aesthetics will play a large role in environmental design by helping understand the meaningful relationships of a place and thus, "enhanc[ing] or diminish[ing]" future possibilities.

The way that an individual will perceive and react to the environment becomes an important concept in this study because of its deeply rooted human response. As humans, we subconsciously are drawn to environments that we believe are affording us many benefits, thus creating a higher preference for those landscapes in our minds. However, we understand an environment's affordance to us by our experiences in those landscapes. In such experiences, we are able to understand the perceptible realm and the connection of the environment to aesthetics. Our minds can often process such experiences in a way which the environment is affording us different "healing benefits."

Background of Healing Gardens

Clare Cooper Marcus and Marni Barnes (1999) define healing as referring to a beneficial process that promotes an overall well-being. Healing is then broken down into three specific aspects: relief from physical symptoms or even relief from the overall awareness of symptoms, stress reduction thus, an increase in levels of comfort, and improvement in the overall sense of well-being. Marcus and Barnes define a garden as encompassing any green outdoor space. In relation to a healing garden, the specific type of garden Marcus and Barnes are referring to is designed for use in a heath care setting. To further define a healing garden is to refer to a variety of garden features that will have a consistent tendency to restore a patient, visitor or staff member from stress, as well as provide other positive effects. To qualify as a garden there must be a prominent amount of nature content, in which Marcus and Barnes suggest as green vegetation, flowers or even water. For a garden to achieve the label of healing, it must have therapeutic or beneficial effects on a large majority of users.

Throughout human history, healing gardens were known as local healing places found in nature, such as a healing spring, a sacred grove, or a special rock or cave. In the earliest known hospitals, herbs and prayers were a main focus and thus, infirmaries in monastic communities always had a cloistered garden. The first flowering restorative gardens were in Europe in the middle ages. This was a time when hospitals were for the sick, the insane and the infirm. At this time, hospitals incorporated a courtyard where residents could find different levels of shelter, shade and sun. However, after the evolution of technology

and modern medicine, the attention to the connection of body and spirit became forgotten and each health issue was treated by different specialists for each part of the body. The idea of accessing nature for healing purposes became lost and by the late 20th century, "landscaping" was merely for decorative purposes (p. 1) (Marcus & Barnes, 1999).

Theories of Healing Gardens

Marcus and Barnes (1999) suggest a theory called Stress Reduction Theory in a healing garden. Stress Reduction Theory is broken down into four main stress-coping resources: movement and exercise, social support, control, and natural distraction. Movement and exercise can be summarized by a mild exertion so to not overwhelm the user. Social support relates to personal interactions with other patients as well as staff and visitors. Control alludes to the idea that the garden is a temporary escape. There must be many options to make choices so that the user feels like they are in control. Lastly natural distraction is best done by the use of plants, flowers, water or natural sounds such as birdsong (Marcus & Barnes, 1999).

Horticultural therapy is defined by the American Horticultural Therapy Association (AHTA) as "the engagement of a person in gardening and plant-based activities, facilitated by a trained therapist, to achieve specific therapeutic treatment goals." Horticultural Therapy is assumed to have therapeutic effects by the actions of raking leaves, gardening or other activities in a landscape. In the 19th century, Dr. Benjamin Rush, observed the healing affects of gardening and being in nature with the

mentally ill (American Horticultural Therapy Association, 2017). Horticultural therapy emphasizes the importance of activity and the role of meaningful and enjoyable tasks. When an individual is working in a garden, their activity may seem meaningful and often enjoyable (A. Adevi & Mårtensson, 2013). There are many benefits noted by the Horticultural Therapy Institute: meaningful, purposeful activity, versatility in programming for all developmental areas, restoration and respite from mental stress, and encouragement of human growth that is fundamental and central to each individual (Horticultural Therapy Institute, 2016). However, the key element is the participation in the activity designed to target client goals. The core of Horticultural Therapy can be tied back to Marcus and Barnes (1999) suggestion that the body and spirit should find a connection to the environment as the acts in the garden are once again focusing on that connection. Although Horticultural Therapy focuses on the direct physical interaction between human and nature, the basis of the four dimensions guide this study by providing an understanding to another level of human perception towards the environment.

Another explanation as to why nature has many healing effects is the Biophilia Hypothesis. Suggested by Edward O. Wilson in 1984, Biophilia Hypothesis suggests that humans relate so deeply with the natural world because of a biological need, important to physical and mental health. Wilson (1984) defines biophilia as "the innate tendency to focus on life and life-like processes" (p. 20). The Biophilia Hypothesis proclaims that the human dependence on nature goes beyond simple material and physical sustenance to also involve human desire for

aesthetic, intellectual, cognitive and spiritual meaning and satisfaction. Wilson (1984) explains the intimate connection as a way "to look to the very roots of motivation and understand why, in what circumstances and on which occasions, we cherish and protect life" (p. 21). At the very core of biophilia, is the emotional connection between human beings to other living organisms, these emotions are bound together to create a large part of culture. The "rules" of biophilia suggest that once a human is removed from the natural world, the modern or artificial world cannot accurately compensate for that emotional connection. Biophilia is relevant to human thinking of nature, the landscape, the arts, the creation of myths, and allows for humans to establish environmental ethics (Kellert et al., 1995). Biophilia is also closely related to the idea of Topophilia: originating from the Greek terms topos meaning "place", and philia meaning the "love of." This idea supports the concept of how an individual may get attached to a specific place, creating an emotional bond with person and place (A. Adevi & Mårtensson, 2013).

Lastly, Attention Restoration Theory (ART) was suggested by Stephen and Rachel Kaplan. Simply described by Adevi and Martensson (2013), it is the visual impression from nature that can directly restore the directed attention that is important for every day functioning and well-being. Directed attention is the attention requiring high concentration effort and can produce stress and fatigue. The Kaplans (1998) conclude that recovering from this type of fatigue can be easily done by the "restorative experience." This experience will relieve directed attention and allow for involuntary or effortless attention. The requirements to achieve this restorative experience are:

sense of being away, such as being removed from routine demands on our attention; feeling connected to the larger whole or extent of landscape; evoking fascination, in order to achieve effortless attention; and compatibility for the user, such as adequate path space for a user in a wheelchair (Kaplan, Kaplan, & Ryan, 1998).

Each previously mentioned theory provides another piece of the puzzle to understanding the way that the environment influences the human mind, stemming from our biological need for nature, to a more physical and hands on approach to our relationship with plant material. Theories mentioned provide guidance and insight into why humans are drawn to nature, as well as helping to understand why an "intake" of nature can be so beneficial to mental health.

Research on Healing Effects of Nature

Roger Ulrich completed a study nicknamed as his "window studies" to understand the idea of nature as a healing factor (1984). Participants of this study were patients in a suburban hospital in Pennsylvania recovering from gallbladder surgery and were not in the hospital due to anxiety. Patients were randomly assigned to rooms located on the second and third floors of the three-story hospital, some of the rooms had windows viewing a small area of trees while other windows had view of a brown brick wall. The patients with views of a small wooded area recovered quicker than those with a view of the brick wall. Patients with the natural view also had a significantly shorter hospital stay. Ulrich concluded that the presence of windows to green space and nature-rich scenery reduced delusions and depressing thoughts and feelings that inevitably accompany long stays in intensive care (Ulrich, 1984).

Ulrich's research gives us a glimpse into the affect of nature on our cognitive behavior and thoughts. We see this in the way that patients are able to recover quicker because their positive perception and mental state after viewing nature (Ulrich, 1984) and even being immersed in nature, as seen in different healing garden theories. The question then becomes: how can the environment impact an individual with a mental disorder such as depression?

Mental Disorders

Understanding mental illness and advancing towards a positive societal outlook on mental illness is important since it is estimated that "nearly half of all Americans will experience a mental disorder at some point in their lives" (Insel, 2013). Scientific director of the Imagination Institute in the Positive Psychology Center at the University of Pennsylvania, Scott Barry Kaufman, states "Every single healthy human being lies somewhere on every psychopathology spectrum" (Kaufman, 2014). Two important occurrences have been introduced in an attempt to understand mental disorders: DSM-5 and BRAIN Initiative (Saltz, 2017).

Diagnostic and Statistical Manual of Mental Disorders, also known as DSM-5, created a list of 157 diagnoses ranging from learning disabilities to mental illnesses. Thomas Insel, director of the National Institute of Mental Health from 2002-2015, stated that there was no set label in defining each disorder and that "Patients with mental disorders deserve better" (National Institute of Mental Health, 2016). This acknowledged the problem with DSM-5 and allowed for the BRAIN Initiative to grow. Brain Research through Advancing Innovative Neurotechnologies (BRAIN) Initiative was announced by President Obama in April of 2013, the study will create a map of the human brain to understand new ways to treat, prevent and cure mental disorders. The BRAIN Initiative allows for what Dr. Saltz (2017) describes as "a clean slate" to produce new vocabulary that will advance society to more informed attitudes towards mental illness (Saltz, 2017).

While mental disorders are often misunderstood and looked down upon, one of the most common but misunderstood mental disorder is depression. Depression effects roughly 6.7% of American adults, however most never report or declare they have it because of misconceptions (Saltz, 2017).

Understanding Depression

According to the National Institute of Mental Health, depression is a mood disorder that affects the way an individual thinks, feels and acts during the day. Depression can also be referred to as "clinical depression" or "depressive disorder." The two most common forms of depression are major depressive disorder (MDD) and persistent depressive disorder. MDD is when an individual has depressive symptoms the majority of their day, nearly every day for at least two weeks. However, persistent depressive disorder is when an individual has depressive symptoms consistently for at least two years. MDD is more likely to interfere with an individual's day to day life, often seen in an individual's ability to work, sleep, eat or enjoy life (National Institute of Mental Health, 2016).

Dr. Saltz (2017) points out that there are many individuals who view the world in a darker way. These individuals, she states, are more melancholic than others. These are individuals which see the negative result of a scenario more than a casual or cheerful individual. However, if such melancholic behavior deepens, becomes a reoccurring sadness and begins to interfere with an individual's quality of life, this becomes clinical depression. When an individual has clinical depression, their experiences range

from suicidal depression, dysthymia, and even dysphoria. Dysthymia, or persistent depressive disorder, is a more moderate form of chronic depression where the individual may have cycles of low and despairing mood but is not completely incapacitated by it. An individual with dysthymia will often still function but they may experience a decrease in productivity or quality of life. Dysthymia can be the most severe form of clinical depression, as an individual can often shut down and be incapable of getting out of bed, getting dressed, or completing simple tasks throughout a normal day. To contrast dysthymia, dysphoria is a set of symptoms which are more of an extreme unease. Dysphoria, in its basic form, is a state of unease, but can be seen in individuals with depression or bipolar disorder (Saltz, 2017).

Statistics and Studies of Depression

Overall, Major Depression Disorder (MDD) affects 6.7% of all adults in the U.S. per year and 10.7% of individuals ages 12 to 17. While depression can occur at any age, the median age for onset is just over 32 years old. A study published by Journal of Behavioral Therapy and Experimental Psychiatry found that those with mild depression and dysphoria were more accurate in assessing their abilities than individuals without depression. Thus, concluding that the moderately depressed do not suffer from an irrational lack of confidence, but rather that those whom are not depressed suffer from irrational overconfidence. Saltz suggests that clinical studies reveal that low to moderate forms of depression (especially when accompanied by an above-average IQ) have gifts such as empathy, insight, and even creativity. While depression can often cause considerable suffering, it can also result in character building. In 2014 a study in NeuroImage: Clinical found that individuals with depression get more activation in the area of the brain called the septal/subgenual cortex. This is the area that is more concerned with guilt and altruistic behavior. Similar results were found in a study done in the Journal of Psychology, where high levels of empathy were more frequently associated to individuals with depression (Saltz, 2017).

The answer for depression can often be medication when the disorder has long term and persisting effects, however, what about those brief moments of time which depression occurs in those diagnosed or undiagnosed? Can a part of the answer be to escape into nature? The idea of studying depressed individuals is visited in several studies as interest has increased.

Effects of Healing Gardens on Individuals with Depression

In a study done by McCaffrey (2009), two types of garden walks and art therapy were used to understand the effects on older adults, classified as 65 years of age or older, with depression. McCaffrey notes that depression in older adults is expected to nearly double by the year 2030, from an approximate 15% in America. The risk of depression is then increased by 25% if the individual also has a serious condition such as diabetes, hypertension, emphysema and even osteoarthritis. The risk of depression in older adults is high due to social isolation such as loss of friends, relatives, and loved ones. McCaffrey used two types of garden walks: walking a garden alone and walking a garden with a guided imagery leader; as well as art therapy to understand the impact of depressional symptoms on older adults. Themes from the "Walk Alone Group" (Group 1) included: enjoyment of walking, something to look forward to, a sense of peace and serenity, and even a new experience of providing a time for reflection. Themes from the "Guided Imagery Group" (Group 2) included: encouragement to leave things in the past and focus on the future, and the ability to share feelings and problems with others helped them realize they were not alone and others were experiencing the

same things. Themes from the "Art Therapy Group" (Group 3) included: the building of relationships, exploration of who they were and who they were becoming over time, and the ability to share experiences was encouraging. Overall, all groups showed benefit in relieving depression and improving mood and overall attitude concerning life. However, there were still many differences among the findings of each group. Groups 2 and 3 had been able to experience group-based activity while, in contrast, Group 1 experienced solitary activity. However, it was still clear that while the "Walk Alone Group" experienced self-reflection, this method was the most cost effective as it did not require a group leader or special training and education. The "Walk Alone Group" showed that simple encouragement of depressed individuals to get out and walk would show benefits (McCaffrey, 2007).

A 2007 study in the United Kingdom was concerned with the extent which increased access to wooded landscape may offer potential benefits to the health and well-being in young adults. The British government's recent agenda to promote the creation of more multi-purpose, multi-benefit wooded areas sparked interest in promoting the improvement in the quality of life and mental well-being. The United Kingdom has seen a significant rise in the mental health issues of young adults over the last 25 years, reporting that one in ten children between the ages of 5 and 16 had a clinically diagnosed mental disorder in 2004. Milligan and Bingley (2007) note that there had been little research done on the effectiveness woodland areas provide to the social inclusion agenda and that there was little exploration on the value of play space in woodland areas being a resource for maintaining the well-being in young

adults. Milligan and Bingley found help from the National Forest and 'Newlands Project,' as well as from the Forestry Commission 'Forest Schools' enterprise. The research explored how young people engaged with woodland areas in order to relieve stress, as well as understanding their perceptions of therapeutic qualities of woodland areas. Milligan and Bingley (2007) examined why an experience in a woodland is viewed as "scary" by young people and why there is a negative perception of the woodlands. The study gathered participants ranging in school setting and education levels as long as they were of ages 16-21 years.

The study found that the size and age of the trees provided a sense of safety, protection and calmness creating a therapeutic atmosphere. The main factor which contributed to the comfort level and how often an adult will visit relies on their childhood experience and the frequency of visits to woodland areas. It was found that woodland areas can become an important resource in order to promote health and well-being in young adults, as well as be used to alleviate stress and anxiety (Milligan & Bingley, 2007).

Summary of Literature

While literature provides a bit of background understanding of the basics: perception of the landscape, healing gardens, and mental disorders; and provides an understanding of different studies relative to depression and the landscape, there are still many gaps in literature pertaining directly to the effect of landscape aesthetics on individuals with mental disorders (Figure 2). After reviewing the literature, it has become apparent that while aesthetics in the landscape and the effect of the landscape on mental disorders are two important things, they remain separate. There are many studies to support the idea that the environment, or even the "sense of environment," such as views to the outdoors, can impact mental health, and often physical health, of an individual. However, the direct connection of the impact that aesthetics or landscape preference has on mental health is still under question. The point of this study is to join the idea of aesthetics and the healing effect of the landscape together to understand the overall impact on individuals with depressive symptoms.

Theory of Affordances
(Gibson, 1979)

"Perceptible Realm"
(Gobster et al, 2007)

Aesthetics creating a meaningful experience
(Firth, 2008)

Biophilia Hypothesis
(Wilson, 1984)

ART
(Kaplan, 1998)

Connection between body and spirit
(Marcus & Barnes, 1999)

Healing garden is a variety of garden features providing positive effects on individuals
(Marcus & Barnes, 1999)

Stress Reduction Theory
(Marcus & Barnes, 1999)

Horicultural Therapy
(American Horticultural Therapy Association, 2017)

"Window Studies"
(Ulrich, 1984)

Woodland Areas
(Milligan & Bingley, 2007)

Garden Walks
(McCaffery, 2007)

Perception of the Natural Environment

Healing Landscapes

Research on Healing Landscapes

Effect of Healing Landscapes on Depression

Depression

Mood disorder that affects the way an individual thinks, feels, and acts.
(National Institute of Mental Health, 2016)

"Ever single healty human being lies somewhere on every psychopathology spectrum" - Barry Kaufman
(Saltz, 2017)

DSM-5 & BRAIN Initiative
(Saltz, 2017)

Power of Different
(Saltz, 2017)

Individuals with Depression process negativity quicker than those without depression
(Saltz, 2017)

Figure 2: Literature Diagram

Chapter Three

Methodology

Methodology

Framework

There are five different instruments used throughout this research (Figure 3): first, a simple demographic survey is used; next, the Beck Depression Inventory (Appendix A) is used to collect a self-ranking of an individual's perceived depressional indicators; followed by the Kaplan's Environmental Preference Questionnaire (Appendix B) to understand an individual's environmental preferences. After the first three surveys are completed, a series of landscape images were then projected. These images fall into four categories ranging from natural to urban scenery. During the projection of each image, individual's completed a Likert Scale, to understand their preference towards the image, and the Visual Analog Scale, to understand an individual's response in relation to mood. These instruments are used to search for a correlation between preferences of a landscape and mood, as well as a correlation between an individual's declaration on the EPQ and rankings of each image category. Lastly, an understanding of the relationship of BDI scores to the change in mood of individuals will be analyzed as well.
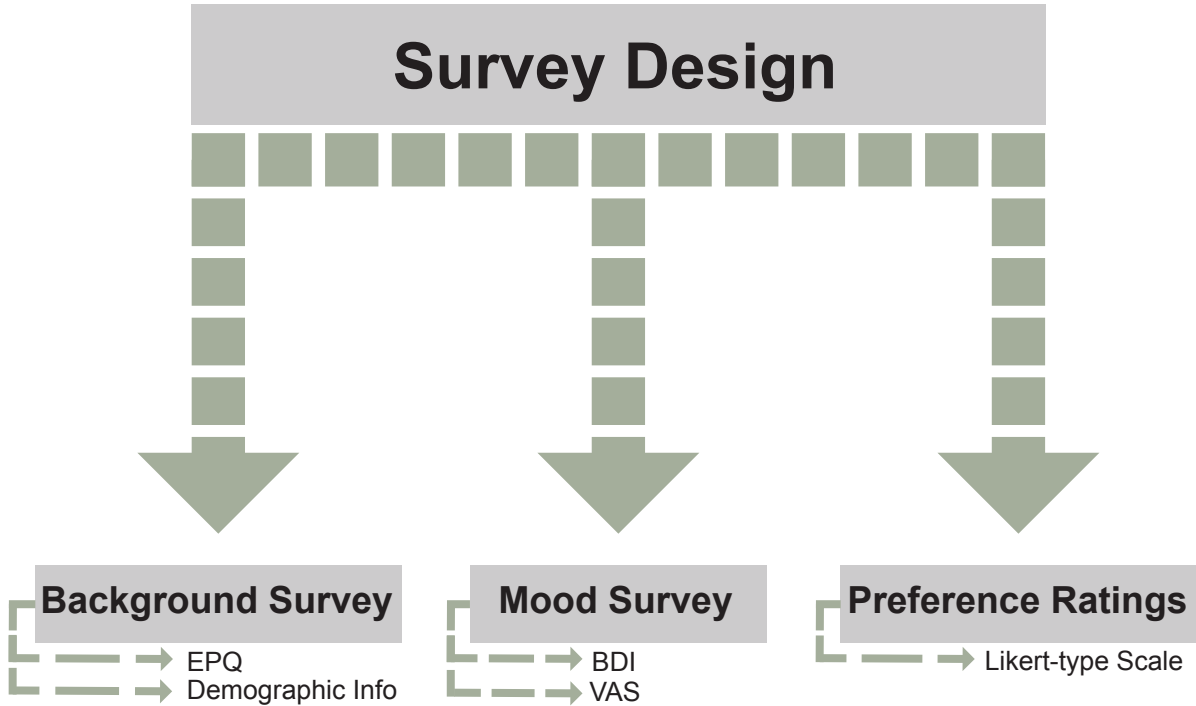
Figure 3: Methodology Diagram

EPQ: Environmental Preference Questionnaire
BDI: Beck Depression Inventory
VAS: Visual Analog Scale

Survey Design

The first survey completed by participants was the Environmental Preference Questionnaire (EPQ). The EPQ was designed by Rachel Kaplan in 1970 to explore the differences in environmental preference of individuals. The focus was placed on a more current outlook rather than an individual's past experiences. The survey measures two classes: choice of activities, and underlying self-esteem; which are categorized into five different sections. There are 65 items with individuals will rank on a 6-point scale; 1 being the worst and 6 being the best (Kaplan, 1977).

There are two scales used to determine mood in this study: The Beck Depression Inventory and the Visual Analog Scale. To understand the mood of the individual on a more permanent scale, the Beck Depression Inventory is used. The Beck Depression Inventory contains 21-items measuring different characteristics of depression which an individual uses to self-report a ranking for each ("Beck Depression Inventory (BDI)," n.d.). The inventory allows the user to rank themselves on a 4-point scale (none, mild, moderate, and severe) to understand the intensity of the individual's depression. The numbers from each item are tallied to produce a score ranging from 0-60. Rankings are as followed 1-10: These ups and downs are considered normal, 11-16: Mild mood disturbance, 17-20: Borderline clinical depression, 21-30: Moderate depression, 31-40: Severe depression, and over 40: Extreme depression.

A temporary measure of mood is determined by use of the Visual Analog Scale. The Visual Analog Scale will help to determine where an individual is feeling in terms of mood before and after projected images of different landscapes. The Visual Analog Scale is an instrument measuring an attitude ranging across many values on an underlying continuum and cannot be directly measured easily. The simplest version of VAS is a straight horizontal line of a defined length; 100mm for this study (Figure 4). Each end indicates the limits of the parameters being measured; left being worst extreme, and right being the best extreme. These are self-reported scales which the individual places a mark on the horizontal line to indicate where on the continuum they feel best represents their current state. This is then measured to determine a number from 0 (worst case) to 100 (best case) to rank mood ("Visual Analogue Scale - Physiopedia," n.d.). The online VAS automatically computed this rating without showing participants their score, while the in-person VAS had to be measured by a ruler.

Worst Case   Best Case

Figure 4: Visual Analog Scale Sample

A collection of landscape images are projected to participants in order to understand how a person with depressional symptoms feels before or after each image. Each image is projected for 15 seconds in order for the individual to rank aesthetic preference based on a 5-point Likert-type Scale indicating how much they like the image (Figure 5). The scale was developed in 1932 by Rensis Likert. The choices of the scale are fixed in order to measure attitude or opinions and allowing the individual to express the level at which they like or dislike an image ("Likert Scale | Simply Psychology," 2008). For purposes of this study, the individual will express the level at which they prefer the projected image, with 1 being strongly dislike and 5 being like very much.
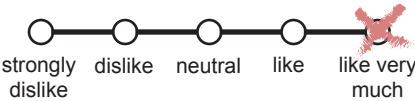
Figure 5: Likert Scale Sample

Procedures

Before getting started with the projection of the images, individuals filled out demographic information such as gender, age, occupation, and if applicable, year in school and college major, and the Kaplan's Environmental Preference Questionnaire (EPQ) (1977) to understand patterns in preferences towards different environmental settings. Next, it is vital to understand how the individual ranked themselves on the depressive scales. Individuals self-reported based upon the Beck Depression Inventory (BDI). Individuals were split into three groups dependent upon their BDI score: 1-10, considered low depressional indicators; 11-17, considered medium depressional indicators; and 18 and up, considered high depressional indicators. The lowest ranking volunteers served as a reference point to help determine whether a change in mood is greater for those with depression. Once all the results were collected, participants who ranked 0 on the BDI were eliminated due to questioned validity of their reports.

Next, individuals rated their mood using the Visual Analog Scale to determine a regular state of mood and determine a ranking from zero (0) to 100. Each landscape image was projected for 15 seconds and the individual was asked to rank each image with use of a Likert-type Scale. After each image was projected, the Visual Analog Scale was used again to understand how the individual was feeling in terms of mood after, or how they perceived they would feel in that setting. Before the official collection of data, three slides were used for practice to represent the range of landscape images projected so the individual was less likely to be surprised by the image content.

A total of 44 images were projected for data collection, this took just under 15 minutes. Participants devoted roughly 30 minutes of their time for the entire process (Figure 6).

The analysis of data was split into two categories: online and in-person data. A total of 86 participants took the online survey. These participants were recruited from two areas: participants from the University of Kansas Psychology Pool (15 students), and through social media and the K-State Today daily online news letter (71 participants). All online collection was combined for the purpose of analyzing a broad range of demographics. However, 6 participants were taken from the analysis due to a zero (0) ranking on the BDI, bringing the total online participation to 80. In-person data was collected from University of Kansas Psychology Pool (10 students) and Kansas State University PSYCH 110 and PSYCH 350 (30 students). For the in-person sessions, the series of landscape images were projected on a large screen while they completed a paper survey by hand. Participants were asked to not look at their previous rankings (preference and mood) in order to fully understand rankings without being based upon the previous reporting. In-person data from both schools were analyzed together due to the similarities in demographics, specifically age and year in school.

To compare the overall change in mood due to the effect of depressional symptoms, participants were separated based upon their BDI score. The division of these groups were based upon an established division by the BDI itself: 1-10, 11-17, and 18+. Scores above 20 were not common in this study and thus grouped together. A one-way analysis of variances (ANOVA) was used to compare average preference and mood rankings for each image category among each BDI group. This provided us with average values as well as significance (p-values on 0.05 level). Preference and mood were compared across categories separately and then again together.

A one-way ANOVA was used to compare age groups to average BDI groups. These age groups were divided evenly and are as follows: 18-25 years of age (44 participants), 26-49 years of age (29 participants), and 50 years and up (31 participants). To follow this, a Post Hoc anlaysis was used to compare the average BDI scores of each age group to one another and determine difference and significance.

Lastly, correlational analysis was conducted between preference rankings and mood ratings throughout the series of image projections to see if there was a direct relationship as well as using the EPQ to understand the relationship between how image categories were ranked.

EPQ: Environmental Preference Questionnaire
BDI: Beck Depression Inventory
VAS: Visual Analog Scale
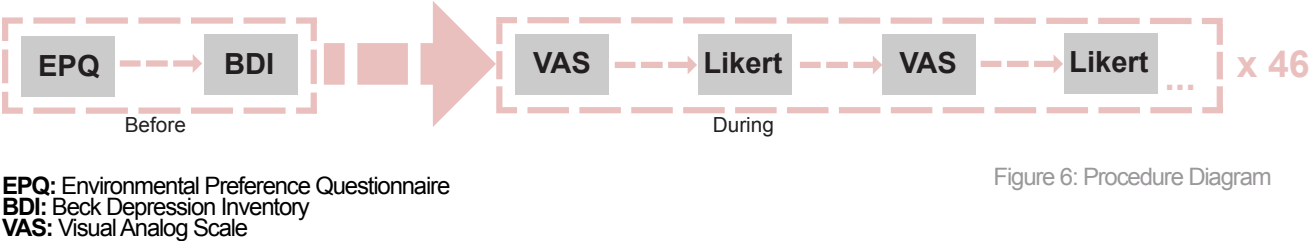
Figure 6: Procedure Diagram

Projected Images

Selection of Images

In order to project a range of landscape aesthetic types to participants, landscape images were selected based upon four categories on a spectrum ranging from urban to natural. The four categories are as follows: urban, formal design, naturalistic design, and natural. The categories were determined to capture a broad understanding of different types of landscapes and each category followed a set of characteristics that set them apart from one another. All selected images were approximately the same size, scale, and presented in landscape orientation. All images were photographed by the author throughout travels.

Urban Images

The selection of the urban images primarily came down to: how much "built environment" is there? The built environment to plant material ratio was at least 2:1, or mostly built environment. Natural elements such as water or plant material can be seen in many of these images, however, it could not be the main focus or dominate the image. The idea was to have similar elements throughout all categories but to have a glimpse into a range of feelings towards the urban environments.

Figure 7: New York City Streetscape (top)
& Venice Waterway (bottom);
These images shows a brief look at how the scene is dominated by built environment such as buildings and hardscape, but has a fair amount of natural elements such as trees and water as well.

Formal Design Images

The images for the formal design category were to show scenes of well-maintained and well-manicured landscapes. These are characteristics such as clean lines or precise planting design in the landscape.

Figure 8: Getty Museum Garden (top)
& Huntington Library Garden (bottom);
The top image shows clean lines in the labyrinth as the hedges are well-manicured and create the impression of being cared for while the bottom image shoes really precise planting arrangements and stone work.

Naturalistic Design Images

The naturalistic design images create scenes that look "messier," or have looser planting designs. This does not necessarily mean these landscapes are not cared for, but rather that they are designed in order to look more natural. Designers often allow their plants to take their own forms instead of consistently pruning or trimming for a specific shape. Naturalistic designs often give the user the feeling of being in a natural setting especially when placed in an urban setting such as Tanner Springs Park in Portland, OR or Central Park in NYC.

Figure 9: Central Park New York City (top)
& Tanner Springs Park (bottom);
These images show loose planting designs that are tucked into the urban setting.

Natural Images

The natural images were selected based upon their contrast with the urban images. As the urban scenes had a higher ratio of built environment to natural environment, the natural images were primarily natural environment. The amount of built landscape had to be very brief in the scene to appear as though there was little human impact. A range of natural landscapes such as prairie lands, wooded areas, and open spaces, were selected to provide for the different preferences participants would have for natural settings.

Figure 10: Drive in Jasper, Arkansas (top)
& Washington Marlatt Memorial Park (bottom);
This image shows a very natural scene with only a small glimpse of human impact.

Chapter Four

Findings

Results

Analysis

Using one-way ANOVA, the mean preference and mean mood from each image category was used to compare BDI group scores: low (1-10), medium (11-17), and high (18+) depressional indicators. Each analysis separated between in-person and online participation.

Online Mood

Overall, there was a significant difference (less than p-value 0.05) in mood among each BDI group throughout each image category. The data shows that overall, participants ranking higher on the BDI declared a lower mood on average than those with lower BDI scores (Figure 11).

A steady trend in mood occurred across each image category with the highest mood rating for the natural images and the lowest mood rating for the urban images (Table 1).

Online Preference

There was, however, no significant difference in preference rankings across BDI groups other than noting a more drastic change in average preference between those in the medium depressional tendencies group. All three groups determined by the BDI had similar rankings of preference toward each image category (Figure 12).

It is important to note the difference in preference ratings from urban settings to natural settings, in which urban images tended to have a preference rating lower than the natural images. Formal and naturalistic images fell around the same range of preference.

Figure 11: Mood among the four image categories for online participants.

	URBAN	FORMAL	NATURALISTIC	NATURAL
Low (45)	74.8044	77.3434	77.9093	78.9152
Mid (14)	66.3857	68.9675	69.2738	70.3766
High (21)	51.8333	54.1385	53.7857	55.2208
Total (80)	67.3013	69.7864	70.0656	71.2011
P-Value	0.000	0.000	0.000	0.000

Table 1: Mood among the four image categories for online participants.
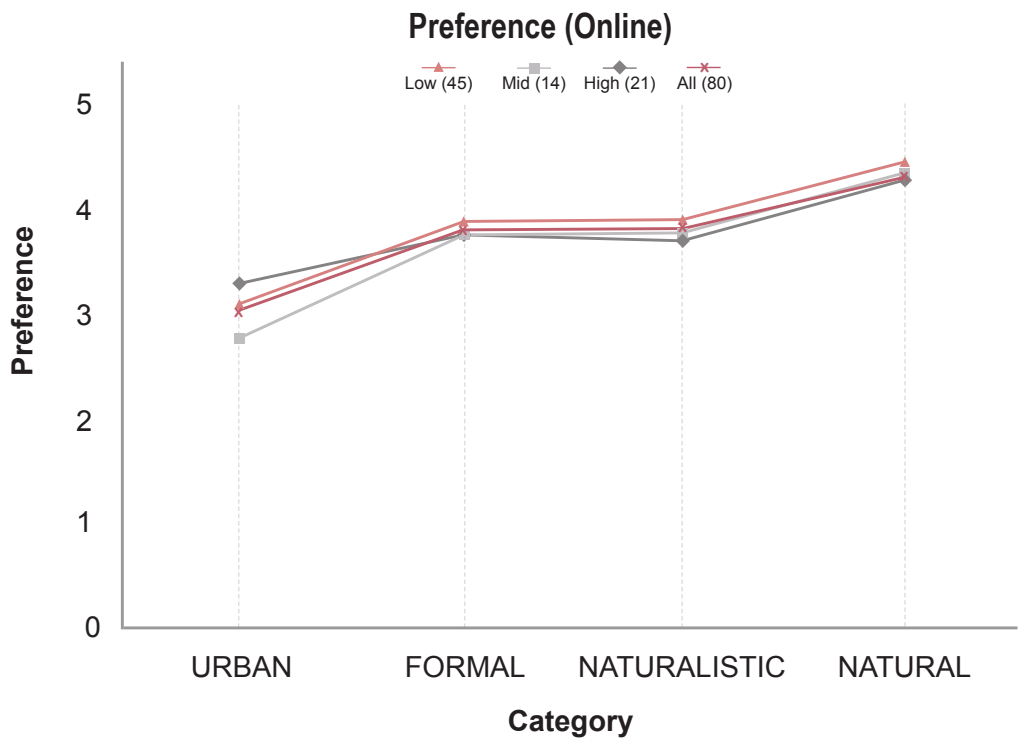
Figure 12: Preference among the four image categories for online participants.

	URBAN	FORMAL	NATURALISTIC	NATURAL
Low (45)	3.1133	3.8525	3.8648	4.4323
Mid (14)	2.7643	3.7532	3.7857	4.3961
High (21)	3.2524	3.7532	3.746	4.329
Total (80)	3.0888	3.8091	3.8198	4.3989
P-Value	0.113	0.728	0.599	0.748

Table 2: Preference among the four image categories for online participants.

Category Preferences - Online

A correlation analysis was used to compare each image category across the different BDI groups: low, medium, and high; in order to show the linear correlation between each category. With correlation, a number closest to 1 represents the linear relationship between two variables. When comparing the four image categories to all of the online participants, there was a strong relationship between the naturalistic images and urban images (r-value closer to 1). There was not, however, a strong relationship between natural and formal preference ratings (Table 3).

Participants in the "low BDI" group had a higher preference towards natural images, however, there was also a relationship between naturalistic and urban images. The smallest relationship for this group shows to be between formal and natural images (Table 4).

A relationship was found between naturalistic and urban images for participants in the "medium BDI" group. However, no close relationship was found between any other image categories, with the smallest relationship between natural and urban images (Table 5).

There is a very small relationship between natural and urban image preferences for the "high BDI" group. Opposed to the other BDI groups, there is a strong relationship in the preference between formal images and urban images (Table 6).

Online Preference: All

	Urban	Formal	Naturalistic	Natural
Urban	x	0.258	0.545	-0.243
Formal	0.258	x	0.236	0.031
Naturalistic	0.545	0.236	x	0.229
Natural	-0.243	0.031	0.299	x

Table 3: Correlation data of image preference of all online participants.

Online Preference: Low BDI

	Urban	Formal	Naturalistic	Natural
Urban	x	0.287	0.620	-0.300
Formal	0.287	x	0.192	0.057
Naturalistic	0.620	0.192	x	0.223
Natural	-0.300	0.057	0.223	x

Table 4: Correlation data of image preference of low BDI online participants.

Online Preference: Medium BDI

	Urban	Formal	Naturalistic	Natural
Urban	x	0.439	0.536	-0.026
Formal	0.439	x	0.280	-0.306
Naturalistic	0.536	0.280	x	0.322
Natural	-0.026	-0.306	0.322	x

Table 5: Correlation data of image preference of medium BDI online participants.

Online Preference: High BDI

	Urban	Formal	Naturalistic	Natural
Urban	x	0.458	0.445	-0.334
Formal	0.458	x	0.200	0.085
Naturalistic	0.445	0.200	x	0.109
Natural	-0.334	0.085	0.109	x

Table 6: Correlation data of image preference of high BDI online participants.

Category Moods - Online

After comparing the mood for all BDI groups, data showed a close relationship for all four categories. The closest relationship, when comparing the mood of all participants across image categories was between the formal and naturalistic images and the smallest relationship between natural and urban images, proving that mood is greatly affected in those two settings regardless of depressional indicators (Table 7).

For participants with low depressional tendencies, there is a very close relationship between mood for naturalistic and formal images, followed by a close relationship between natural and naturalistic images. The smallest relationship was found between the natural and the urban images (Table 8).

There is a very strong relationship between the naturalistic and the formal images, followed by a close relationship between naturalistic and natural images. The smallest relationship was found between natural and urban images for participants in the "medium BDI" group (Table 9).

Again, there is a very strong relationship between naturalistic and formal images for participants in the "high BDI" group. There is a similar relationship between natural and formal images and natural and naturalistic images, both with an r-value of 0.982. The smallest relationship is between urban and natural images (Table 10).

Online Mood: All

	Urban	Formal	Naturalistic	Natural
Urban	x	0.969	0.965	0.934
Formal	0.969	x	0.990	0.974
Naturalistic	0.965	0.990	x	0.979
Natural	0.934	0.974	0.979	x

Table 7: Correlation data of mood of all online participants.

Online Mood: Low BDI

	Urban	Formal	Naturalistic	Natural
Urban	x	0.937	0.915	0.830
Formal	0.937	x	0.974	0.939
Naturalistic	0.915	0.974	x	0.947
Natural	0.830	0.939	0.947	x

Table 8: Correlation data of mood of low BDI online participants.

Online Mood: Medium BDI

	Urban	Formal	Naturalistic	Natural
Urban	x	0.977	0.983	0.974
Formal	0.977	x	0.992	0.970
Naturalistic	0.983	0.992	x	0.987
Natural	0.974	0.970	0.987	x

Table 9: Correlation data of mood of medium BDI online participants.

Online Mood: High BDI

	Urban	Formal	Naturalistic	Natural
Urban	x	0.966	0.967	0.941
Formal	0.966	x	0.994	0.982
Naturalistic	0.967	0.994	x	0.982
Natural	0.941	0.982	0.982	x

Table 10: Correlation data of mood of high BDI online participants.

Online Summary

When comparing the previous mean values from mood and preference analysis there is an overall direct relationship between preference and the impact on mood. There was not a drastic change between the formal and naturalistic images, however, there is a significant difference between urban and natural images (p-value of 0.030 for preference and 0.000 for mood)proving to be significant (Table 11 & Figure 13). As preference increases, so does mood ranging low to high from urban, formal, naturalistic and the highest preference and mood towards natural images in low to medium BDI participants. However, there is a higher mood and preference towards formal images than naturalistic images, yet still not higher than natural images, for individuals in the high BDI group. Thus, we can suggest that individuals with higher depressional tendencies favor settings alluding to a greater sense of control and care, such as formal images indicate (Table 11).

URBAN

	Low	Mid	High	Total
Mood	74.8044	66.3857	51.8333	67.3013
Preference	3.1133	2.7643	3.2524	3.0888

FORMAL

	Low	Mid	High	Total
Mood	77.3434	68.9675	54.1385	69.7864
Preference	3.8525	3.7532	3.7532	3.8091

NATURALISTIC

	Low	Mid	High	Total
Mood	77.9093	69.2738	53.7857	70.0656
Preference	3.8648	3.7857	3.746	3.8198

NATURAL

	Low	Mid	High	Total
Mood	78.9152	70.3766	55.2208	71.2011
Preference	4.4323	4.3961	4.329	4.3989

Table 11: Preference and Mood Relationship.
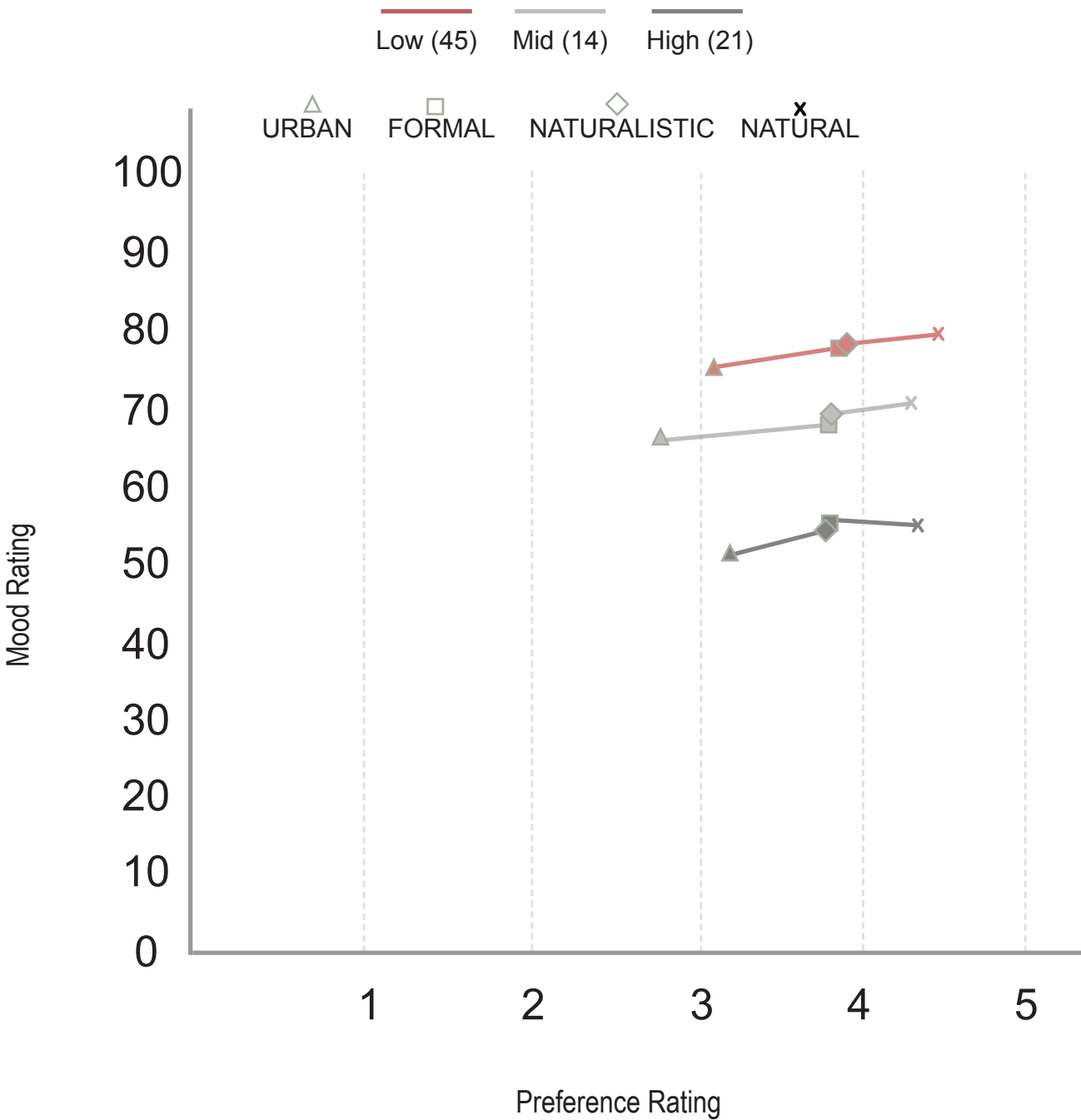
Figure 13: Preference and Mood Relationship.

In-Person Mood

A significant difference in mood ratings for urban images among participants can be noted. However, a shift in mood towards urban and natural images has occurred for in-person participants in the "high BDI" group compared to the "high BDI" group online; in-person participants rated their mood higher in urban settings than in natural settings. Participants in the "low BDI" group had a rather consistent change in mood overall while the participants in the "high BDI" group had a greater change in mood dependent upon each image category (Figure 14). Throughout the urban imagery category, there is a strong significant difference of mood across each BDI category (Table 12).

In-Person Preference

Again, a shift in preference for natural images can be noted as individuals with higher depressional tendencies had a lower preference for natural settings than their online counterparts. A difference in preference for natural images can be seen between those in the "high BDI" group and those in the "low BDI" group (Figure 15). It is important to note that while individuals in the "high BDI" group had a larger and more drastic change in preference across the image categories, the data was from only three participants. No significant difference of preference was found across each BDI category (Table 10).

Figure 14: Mood among the four image categories for in-person participants.

	URBAN	FORMAL	NATURALISTIC	NATURAL
Low (24)	63.1667	67.7727	67.7049	70.9659
Mid (13)	51.2846	59.9231	60.9872	69.3916
High (3)	64.3667	68.1515	60.5833	58.8182
Total (40)	59.3975	56.25	64.9875	69.5432
P-Value	0.015	0.157	0.204	0.407

Table 12: Mood among the four image categories for in-person participants.
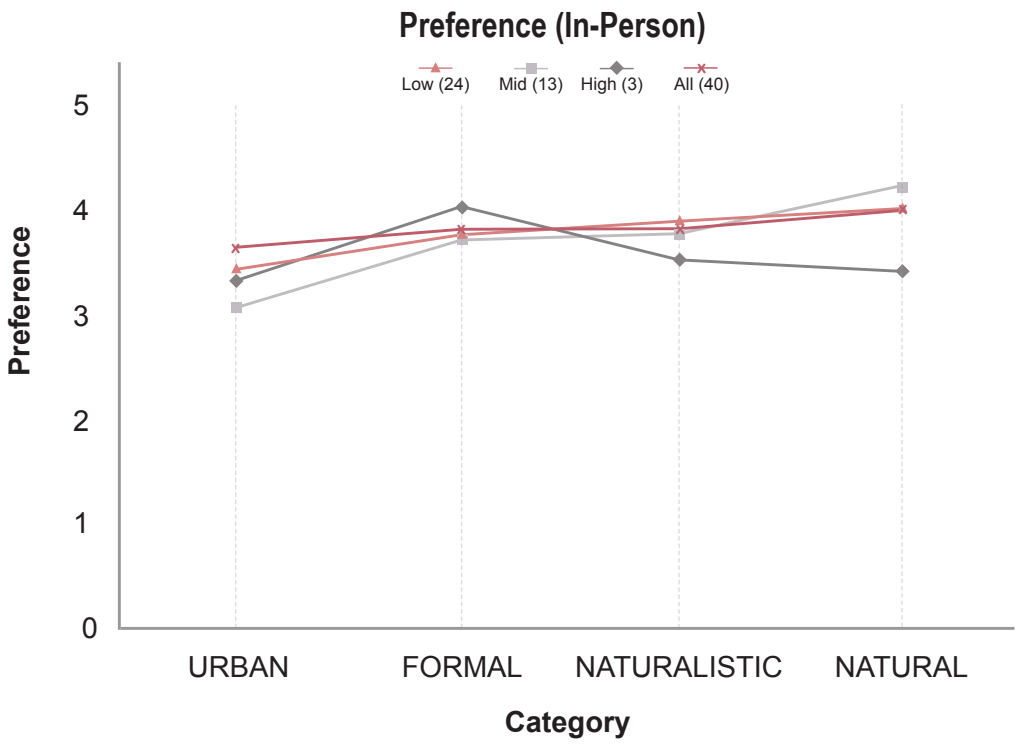
Figure 15: Preference among the four image categories for in-person participants.

	URBAN	FORMAL	NATURALISTIC	NATURAL
Low (24)	3.4875	3.7576	3.809	4.0909
Mid (13)	3.1769	3.7413	3.7372	4.2448
High (3)	3.6333	4.0303	3.5556	3.3636
Total (40)	3.3975	3.7727	3.7667	4.0864
P-Value	0.287	0.515	0.605	0.074

Table 13: Preference among the four image categories for in-person participants.

Category Preferences - In-Person

Preference data is compared for each category across the BDI groups to find correlation. For all BDI groups, the closest relationship is between naturalistic and formal images and the smallest relationship between formal and natural images (Table 14).

There is a close relationship between naturalistic and urban images for individuals in the low BDI group. A very little relationship is found between formal and natural images and a small relationship between natural and naturalistic images as well (Table 15).

For individuals in the medium BDI group, a close relationship is found between formal and naturalistic image, and a small relationship between natural and urban images. Naturalistic and urban images showed to have the smallest relationship (Table 16).

There were many close relationships found between all the categories for individuals in the high BDI group. A very close relationship is found between naturalistic and formal images, followed by a close relationship between formal and urban images. Again, we see a small relationship between urban to natural images. However, it is important to remember there were only three in-person participants in this group and thus only providing a limited amount of data (Table 17).

Lab Preference: All				
	Urban	Formal	Naturalistic	Natural
Urban	x	0.413	0.407	-0.363
Formal	0.413	x	0.568	0.043
Naturalistic	0.407	0.568	x	0.358
Natural	-0.363	0.043	0.358	x

Table 14: Correlation data of image preference of all in-person participants.

Lab Preference: Low BDI				
	Urban	Formal	Naturalistic	Natural
Urban	x	0.440	0.566	-0.390
Formal	0.440	x	0.543	-0.005
Naturalistic	0.566	0.543	x	0.171
Natural	-0.390	-0.005	0.171	x

Table 15: Correlation data of image preference of low BDI in-person participants.

Lab Preference: Medium BDI				
	Urban	Formal	Naturalistic	Natural
Urban	x	0.275	0.089	-0.235
Formal	0.275	x	0.708	0.367
Naturalistic	0.089	0.708	x	0.679
Natural	-0.235	0.376	0.679	x

Table 16: Correlation data of image preference of medium BDI in-person participants.

Lab Preference: High BDI				
	Urban	Formal	Naturalistic	Natural
Urban	x	0.981	0.954	0.397
Formal	0.981	x	0.994	0.569
Naturalistic	0.954	0.994	x	0.655
Natural	0.397	0.569	0.655	x

Table 17: Correlation data of image preference of high BDI in-person participants.

Category Moods - In-Person

Mood across each image category proved to have a close relationship for all BDI groups of lab participants. The smallest relationship between natural and urban images, and the closest relationship between naturalistic and formal images (Table 18).

Participants in the low BDI group had the smallest relationship between natural and formal images. While naturalistic and urban images showed to have the closest relationship (Table 19).

The naturalistic and formal images had the closest relationship while the smallest relationship was found between natural and urban images for participants in the medium BDI group (Table 20).

For participants in the high BDI group, there is very close relationship between their mood for naturalistic and urban images, an r-value of 1, followed by a close relationship between natural and formal images. The smallest relationship is found between natural and naturalistic images, but still an r-value close to one (Table 21).

Lab Mood: All				
	Urban	Formal	Naturalistic	Natural
Urban	x	0.748	0.709	0.399
Formal	0.748	x	0.849	0.457
Naturalistic	0.709	0.849	x	0.734
Natural	0.399	0.457	0.734	x

Table 18: Correlation data of mood for all in-person participants.

Lab Mood: Low BDI				
	Urban	Formal	Naturalistic	Natural
Urban	x	0.774	0.859	0.484
Formal	0.774	x	0.822	0.282
Naturalistic	0.859	0.822	x	0.651
Natural	0.484	0.282	0.651	x

Table 19: Correlation data of mood for low BDI in-person participants.

Lab Mood: Medium BDI				
	Urban	Formal	Naturalistic	Natural
Urban	x	0.590	0.461	0.438
Formal	0.590	x	0.937	0.792
Naturalistic	0.461	0.937	x	0.852
Natural	0.438	0.792	0.852	x

Table 20: Correlation data of mood for medium BDI in-person participants.

Lab Mood: High BDI				
	Urban	Formal	Naturalistic	Natural
Urban	x	0.896	1	0.826
Formal	0.896	x	0.883	0.991
Naturalistic	1	0.883	x	0.810
Natural	0.826	0.991	0.810	x

Table 21: Correlation data of mood for high BDI in-person participants.

In-Person Summary

Overall, there was a direct relationship between preference and the impact on mood for those ranking low or medium on the BDI. There was not a drastic change between the formal and naturalistic images but we found the relationship between urban and natural images to be a p-value of 0.021 for preference and 0.011 for mood, proving to be significant (Table 22 & Figure 16).

However, the "high BDI" group surveyed from in-person participants is more spurious than a larger group. The high BDI group showed a preference for formal design and thus we can suggest that individuals with high depressional tendencies may enjoy the formal designs due to the "control" and care portrayed.

URBAN

	Low	Mid	High	Total
Mood	63.1667	51.2846	64.3667	59.395
Preference	3.4875	3.1769	3.6333	3.3975

FORMAL

	Low	Mid	High	Total
Mood	67.7727	59.9231	68.1515	56.25
Preference	3.7576	3.7413	4.0303	3.7727

NATURALISTIC

	Low	Mid	High	Total
Mood	67.7049	60.9872	60.5833	64.9875
Preference	3.809	3.7372	3.5556	3.7667

NATURAL

	Low	Mid	High	Total
Mood	70.9659	69.3916	58.8182	69.5432
Preference	4.0909	4.2448	3.3636	4.0864

Table 22: Preference and Mood Relationship.
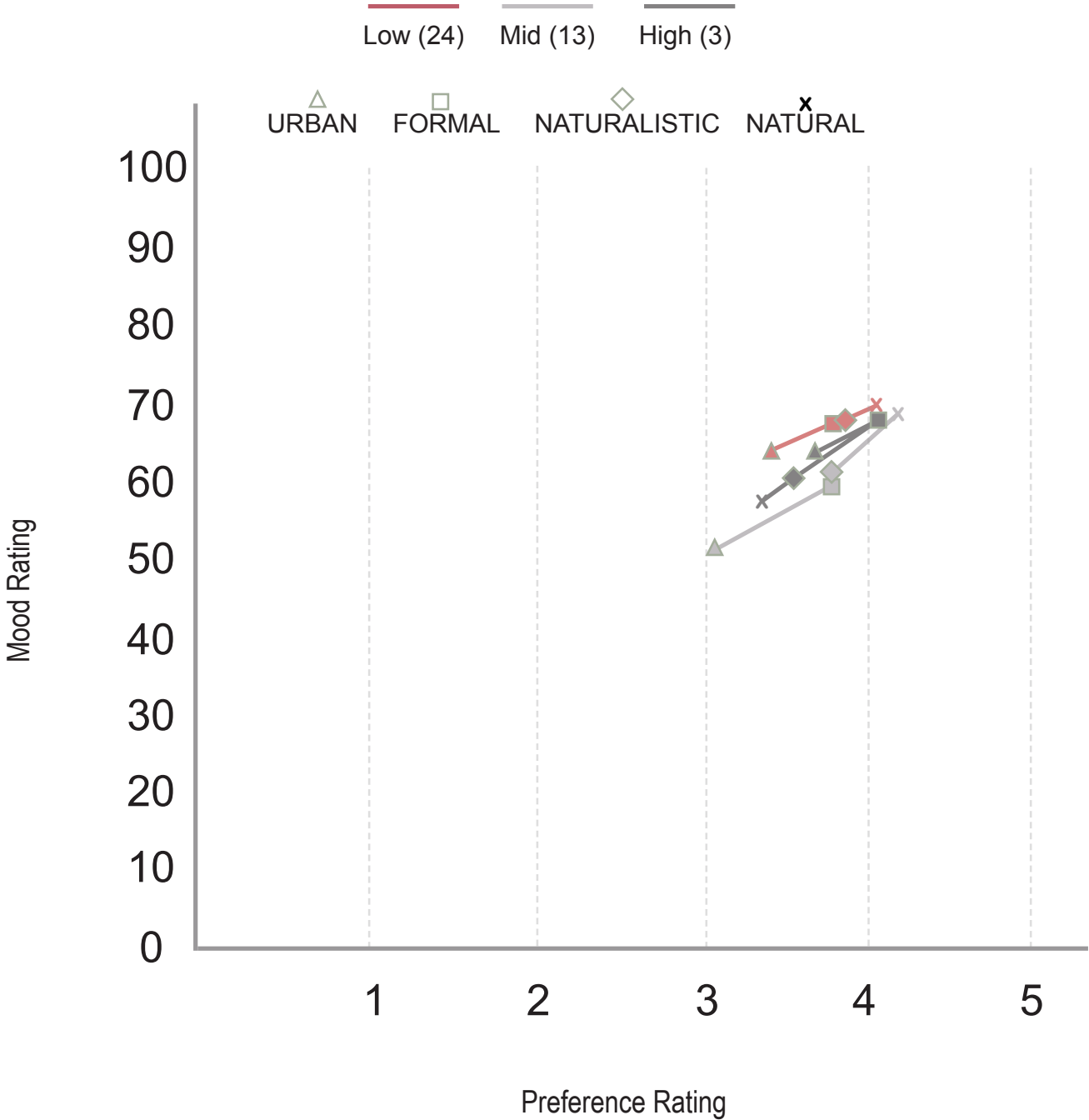
Figure 16: Preference and Mood Relationship.

Environmental Preference Questionnaire

The EPQ, developed by Rachel Kaplan in 1970, was designed to explore environmental preferences; in this study, it is used as background information to compare across BDI scores. EPQ information was analyzed across BDI scores for online and in-person data, separately. As there were 65 items on the EPQ which were analyzed, only significant data is considered (*View appendix x for full analysis*).

Online EPQ

4 of the 65 items from the EPQ showed to be significant across BDI scores (Table 23, Table 24, & Table 25).

There is a contrast in settings that participants preferred: most participants had a strong preference against a "deserted street of a large city at night" and a strong preference towards "a city park" (Table 23). This idea was consistent with preference and mood ratings found with the image categories. There was a lower preference for urban settings and a higher preference towards natural settings. A preference towards both open spaces and gardening were consistent among the online participants as well (Table 24 & Table 25). Both preferences fall into a more natural category as opposed to urban settings.

The deserted street of a large city at night

	Mean	P-Value
Low (45)	2.42	
Mid (14)	2.29	
High (21)	3.43	
Total (80)	2.66	0.033

A city park

	Mean	P-Value
Low (45)	4.58	
Mid (14)	4.57	
High (21)	3.81	
Total (80)	4.38	0.039

Table 23: EPQ: Preference for each of the following moods or settings...

Open spaces

	Mean	P-Value
Low (45)	5.16	
Mid (14)	5.21	
High (21)	4.24	
Total (80)	4.93	0.003

Table 24: EPQ: Things I like...

Gardening

	Mean	P-Value
Low (45)	4.40	
Mid (14)	4.43	
High (21)	3.29	
Total (80)	4.11	0.022

Table 25: EPQ: How much satisfaction you get from each of the following...

In-Person EPQ

4 of the 65 items from the EPQ showed to be significant across BDI scores (Table 26, Table 27, & Table 28). All significant items were highly preferred among lab participants with the exception of the "high BDI" group, who preferred formal settings and even a slightly higher preference for urban settings over natural settings. This can be seen in the preference towards three of the four significant items: a high preference for "low BDI" and "medium BDI" groups towards woodland areas, beachcombing and gardening, while the "high BDI" group did not prefer those items. Fellowship, however, can be neither urban or natural as it is mostly dependent upon the company in the setting (Table 27).

A totally woodland area

	Mean	P-Value
Low (24)	4.79	
Mid (13)	4.69	
High (3)	2.67	
Total (40)	4.60	0.017

Table 26: EPQ: Preference for each of the following moods or settings...

Beachcombing

	Mean	P-Value
Low (24)	4.92	
Mid (13)	4.77	
High (3)	2.67	
Total (40)	4.70	0.009

Fellowship

	Mean	P-Value
Low (24)	4.96	
Mid (13)	3.85	
High (3)	5.33	
Total (40)	4.63	0.036

Table 27: EPQ: Things I like...

Gardening

	Mean	P-Value
Low (24)	4.10	
Mid (13)	3.73	
High (3)	2.00	
Total (40)	3.80	0.044

Table 28: EPQ: How much satisfaction you get from each of the following...

Age Distribution

All of the participants were compared together to understand the age distribution across BDI scores. The average BDI score for 70 participants ages 18-25 was 12.73, a rating described as "mild mood disturbance;" the average BDI score for 24 participants ages 26-49 was 7.63, "ups and downs considered normal;" and lastly, the average BDI score for 25 participants ages 50 and up was 9.92, "ups and downs considered normal," (Table 26).

These scores were then compared to find the significant difference between them. The most significantly different BDI score across the age groups was the 18-25 participants and the 26-49 participants (Table 27).

Age	Participants	Average BDI
18-25	70	12.73
26-49	24	7.63
50+	25	9.92
All	119	11.11

Table 29: Age distribution compared to average BDI score.

	18-25	26-49	50+	
18-25	x	5.104	2.809	Mean Difference
		0.026	0.308	Significance
26-49	-5.104	x	-2.295	Mean Difference
	0.026		0.591	Significance
50+	-2.809	2.295	x	Mean Difference
	0.308	0.591		Significance

Table 30: Age distribution significance across BDI score.

Age Distribution - Online

The in-person participants were removed, elimination over half of the participants in the 18-25 age range. this was done to compare methods, however, all in-person participants fell into the 18-25 age range. The average BDI score for 31 participants of the ages 18-25, was 16.42 or between "mild mood disturbance" and "boarderline clinical depression." The remaining participants have the same averages as previously mentioned. This is because no participants from the lab study were of the ages 26 or up, and thus were not removed (Table 28).

Again, there is a strong significant difference between participants 18-25 years of age and 26-49 years of age. A significant difference at the 0.05 level is between participants 18-25 years of age and the 50 and up age group (Table 29).

Age	Participants	Average BDI
18-25	31	16.42
26-49	24	7.63
50+	25	9.92
All	80	11.75

Table 31: Age distribution compared to average BDI score.

	18-25	26-49	50+	
18-25	x	8.794	6.499	Mean Difference
		0.001	0.018	Significance
26-49	-9.794	x	-2.295	Mean Difference
	0.001		0.623	Significance
50+	-6.499	2.295	x	Mean Difference
	0.018	0.623		Significance

Table 32: Age distribution significance across BDI score.

Chapter Five

Conclusions

Overall Understandings & Summary

Do the findings support the study?

This study showed that all individuals saw a positive change in mood towards a landscape of their preference, supporting the first hypothesis: *an individual with depressional tendencies that has a higher aesthetic preference toward a landscape will have a corresponding and more positive mood.* Overall, we did see a larger or more drastic change in mood for the "high BDI" group from the in-person study compared to the other two groups. We can conclude that individuals with depressional tendencies should spend time in landscape settings which they find aesthetically pleasing, as well as any individual for mental wellness. This ties back to the literature, and Roger Ulrich's "window study," as well. Ulrich showed a link between wellness, both mental and physical, and views to nature. Ulrich suggested that the impact on mental and physical wellness was supported by the individual's mood. This study aims to extend Ulrich's work and understand the impact of aesthetic preference. The research showed that when an individual had an aesthetic preference toward a landscape, their mood increased, which can result in improvement in wellness. Data also supported the second hypothesis: *individuals with higher depressional tendencies will have an overall reported lower mood than those with lesser depressional tendencies.* While data shows a more drastic change in mood for the "high BDI" group of in-person data, this is only three cases and was not consistent with the online data, which showed an overall lower mood than those with lesser depressional tendencies.

What did I learn?

There are several things I have learned from this project, the first was the many differences found between in-person data and online data, such as shifts in mood and BDI scores.

We saw a larger number of higher BDI scores through the online survey results. This could be due to many things such as levels of comfort in anonymity. Individuals do not need to make a physical appearance therefore, they may have felt more comfortable being honest with declaring their depressional indicators. While in-person participants sat in an unfamiliar location in close proximity to one another. These individuals could have fear that another participant or the researcher in the room could have viewed their BDI answers. This could have easily intimidated participants and caused them to be dishonest.

As stated previously, online participants filled out the survey in a comfortable and familiar location, thus their changes in mood were more consistent and slight than the in-person participants. In-person participants had more drastic changes in mood, which could have also been due to the participants ability to ask questions and receive further explanation.

Limitations

Due to time constrictions and regulations, the sampled volunteers do not declare whether they have or do not have clinical depression. Nor were they selected based upon whether they have depression. This can result with a smaller number of students having notable depressional indicators out of the whole sampled volunteers. The main issue with any landscape preference study is that there are always certain factors in the image to which humans are directly drawn. For example, because of the primal instinctive draw to water, ratings for an image with a water feature could rank above the same image without a water feature. This would skew the results because it is not purely the scenery of the landscape that the individual enjoyed, but instead one piece in the image that instinctively drew them in. Lastly, answers to any of the surveys could be skewed from the individual recording what they think is the "right answer" for the study, instead of what they currently feel.

Reflection

What could have been improved?

Overall, time constraints seemed to become a significant limitation, resulting with an unreasonable goal number of participants. The original set of participants were strictly from the University of Kansas Psychology Pool, however, we found that these younger students were typically waiting until closer to the end of the semester to begin participating in studies for credit. As pressure towards deadlines increased, the decision was made to allow students the option of participating via online survey. With this new option, we were able to expand to allow participants from the public through K-State Today and social media. The number of volunteers increased when Professor Stuart Miller allowed his two psychology classes extra credit if they participated, which helped greatly.
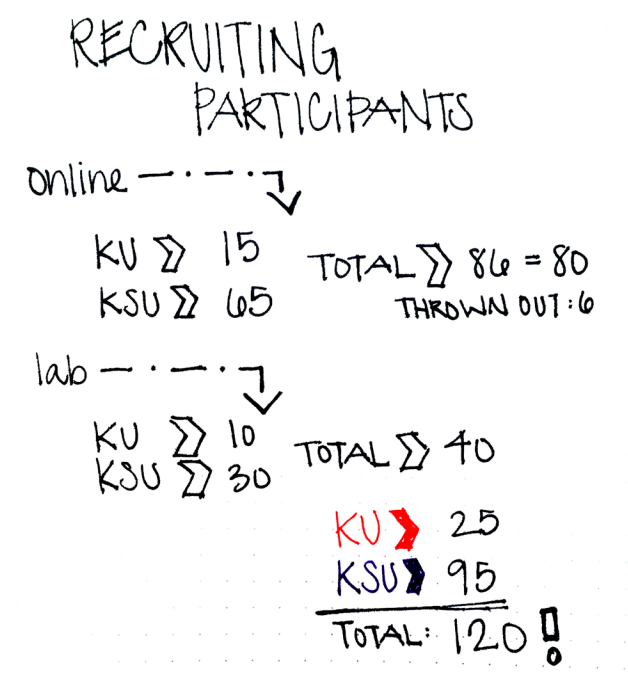
Figure 17: Recruiting Process

What was done well?

I believe that adaptation became a strength throughout the progression of this project. There were many factors beyond control that significantly impacted the timespan and flow of the research, however, as each problem arose, adapting and finding the best solution was necessary.

The overall project became a learning process as we got closer to actually conducting research. There were many unanswered questions that changed the flow of the research and revisions often had to be made. There were a few in-lab surveys that had to be thrown out at the beginning of the process after learning the right and wrong way to proceed. Again, a huge strength was learning to adapt and continue progressing.

What could have affected results?

For a greater understanding of the impacts of landscape preferences on mental health, a wider demographic would be more desirable for the in-lab procedures. However, the sample participants were roughly all the same age. This could greatly impact results by not seeing such a large range in the findings. Secondly, for compliance with IRB regulations, participants were not allowed to directly declare whether they had clinical depression. Recruitment could also not suggest an individual must have clinical depression as well. Thus, a small fraction of participants would fall under a higher ranking on the Beck Depression Inventory (BDI), creating a smaller sample group to collect data from.

The online survey could have been beneficial as far as the BDI is concerned because participants could have felt more comfortable honestly answering questions about their feelings when at home or a comfortable location. While participants taking the survey in-lab could have felt more shy or unsafe about answering honestly to many of the questions of the BDI.

Broader Applications

The relationship between landscape aesthetics and the healing aspects of nature is a delicate one that is often misunderstood. This report breaks down the role that landscape aesthetics play currently and should play in the future of healing landscapes. It is important to consider both aspects when designing a landscape, even when the two aspects seemingly come from different ends of the spectrum; art and creativity, and science and health respectively.

Where should future studies go?

While there are many different directions that this research could take the discipline of landscape architecture, my main goal is to increase the understanding of the need for multidisciplinary work and research. This idea has been increasingly valued but still today we often forget that we are a world and not just an island, we learn and grow together. Through working with a clinical psychologist and a horticulturist that specializes in horticultural therapy, my thoughts and process was often redirected by their knowledge and expertise, an experience for which I will continue to be grateful.

My hope is that my research opens the door towards more clinical trials with greater expertise. I would like to see future research expand to focus on individuals that have been diagnosed with clinical depression to understand if the natural environment can directly reduce depressional symptoms in a broad sense, then expanding to understand if a preference towards a certain landscape aesthetic will have an impact as well. Lastly, the simplest hope for further research: to expand the ability of having participants physically experiencing each landscape instead of only viewing an image.

References

Sources

A. Adevi, A., & Mårtensson, F. (2013). Stress rehabilitation through garden therapy: The garden as a place in the recovery from stress. Urban Forestry & Urban Greening, 12, 230–237. https://doi.org/10.1016/j.ufug.2013.01.007

American Horticultural Therapy Association. (2017). History of Horticultural Therapy. Retrieved December 7, 2017, from http://www.ahta.org/history-of-horticultural-therapy

Depression. (2013, October 26). Retrieved November 3, 2017, from http://www.mentalhealthamerica.net/conditions/depression

Eckbo, G. (2016). Is landscape architecture? In Is landscape...? Routledge.

Firth, D. (2008). The Role of Aesthetic Considerations in a Narrative Based Approach to Nature Conservation. Ethics & the Environment, 13(2), 77–100.

Gibson, J. J. (2014). The Ecological Approach to Visual Perception: Classic Edition. Psychology Press.

Gobster, P. H., Nassauer, J. I., Daniel, T. C., & Fry, G. (2007). The shared landscape: what does aesthetics have to do with ecology? Landscape Ecology, 22(7), 959–972. https://doi.org/10.1007/s10980-007-9110-x

Horticultural Therapy Institute. (2016). Questions About Horticultural Therapy. Retrieved April 28, 2018, from http://www.htinstitute.org/questions-about-horticultural-therapy/

Insel, T. (2013). NIMH » Transforming Diagnosis. Retrieved September 25, 2017, from https://www.nimh.nih.gov/about/directors/thomas-insel/blog/2013/transforming-diagnosis.shtml

Kaplan, R., Kaplan, S., & Ryan, R. (1998). With People in Mind: Design And Management Of Everyday Nature (4th ed. edition). Washington, D.C: Island Press.

Kaufman, S. B. (2014, September 15). The Real Link Between the Psychopathology Spectrum and the Creativity Spectrum - Scientific American Blog Network. Retrieved April 26, 2018, from https://blogs.scientificamerican.com/beautiful-minds/the-real-link-between-psychopathology-and-creativity/

Kellert, S. R., Wilson, E. O., McVay, S., Katcher, A., McCarthy, C., Wilkins, G., … Lawrence, E. (1995). The Biophilia Hypothesis (Reissue edition). Washington, DC: Shearwater.

Lassus, B. (1998). The Obligation of Intervention. In Theory in Landscape Architecture. University of Pennsylvania Press.

Marcus, C. C., & Barnes, M. (1999). Healing Gardens: Therapeutic Benefits and Design Recommendations. John Wiley & Sons.

McCaffrey, R. (2007). The effect of healing gardens and art therapy on older adults with mild to moderate depression. Holistic Nursing Practice, 21(2), 79–84. https://doi.org/10.1097/01.HNP.0000262022.80044.06

Milligan, C., & Bingley, A. (2007). Restorative places or scary spaces? The impact of woodland on the mental well-being of young adults. Health & Place, 13(4), 799–811. https://doi.org/10.1016/j.healthplace.2007.01.005

National Institute of Mental Health. (2016). NIMH » Depression Basics. Retrieved September 25, 2017, from https://www.nimh.nih.gov/health/publications/depression/index.shtml

Saltz, D. G. (2017). The Power of Different: The Link Between Disorder and Genius. New York: Flatiron Books.

Spencer, C. (2009). The roots and branches of environmental psychology | The Psychologist. Retrieved March 22, 2018, from https://thepsychologist.bps.org.uk/volume-22/edition-2/roots-and-branches-environmental-psychology

Ulrich, R. S. (1984). View through a Window May Influence Recovery from Surgery. Science, 224(4647), 420–421.

Glossary

Terms and Definitions

Aesthetics

As defined by Gombrich and Winner, aesthetics is a set of principles concerned with the nature and appreciation of beauty, especially in art (Graham, 2005).

Affordance

A term created by James J. Gibson meaning, what the environment has to offer the animal (Gibson, 2014).

Attention Restoration Theory

A type of restorative experience suggested by Stephen and Rachel Kaplan in which nature can help with restoring mental fatigue (Kaplan et al., 1998).

Biophilia Hypothesis

The idea that humans value nature due to physical, intellectual and emotional benefits (A. Adevi & Mårtensson, 2013).

Depression

A mood disorder that affects the way an individual thinks, feels and acts during the day (National Institute of Mental Health, 2016).

Garden

A plot of ground where herbs, fruits, flowers, or vegetables are cultivated (Webster Dictionary, 2018).

Healing Garden

In reference to a variety of garden features that will have a consistent tendency to restore a patient, visitor or staff member from stress, as well as provide other positive effects (Marcus, 1999).

Horticultural Therapy

The act of raking leaves, gardening or other activities in a landscape which are assumed to have remedial effects such as a decrease in mental fatigue (A. Adevi & Mårtensson, 2013).

Landscape

Derived from the Dutch "landschap," originally referring to a picture representing a natural inland scenery (Oxford English Dictionary, 2018).
Further defined by Garrett Eckbo as "landscape, like environment (for which it may be a synonym), is everything we see or sense around us," to which will be used specifically as exterior space (Eckbo, 2016).

Nature

Bernard Lassus suggests to be places where man has introduced no construction (Lassus, 2016).
Thus has no or very minimal human impact. (Operational Definition). .

Perceptible Realm

The experiential realm in which humans experience the landscape. Within this realm, the interactions provide aesthetic experience leading to changes that affect humans and the landscape (Gobster et al., 2007).

Perception

An ordinary awareness of sensible objects (Russell, 1926).
Isaac Aaronson defines perception as a process of a living organism that enables it to solve the problems set for it by its environment. It is a process of adjustment to the advantages and disadvantages, values and disvalues of the situation in which the organism fulfills its career (Aaronson, 1914).

Stress Reduction Theory

Theory created by Clare Cooper Marcus and Marni Barnes, suggesting that four main resources in a healing garden will help with the reduction of stress (Marcus, 1999).

Appendix A

Beck Depression Inventory

BDI-II

Date: _____

Name: _____ Marital Status: _____ Age: _____ Sex: _____

Occupation: _____ Education: _____

Instructions: This questionnaire consists of 21 groups of statements. Please read each group of statements carefully, and then pick out the **one statement** in each group that best describes the way you have been feeling during the **past two weeks, including today.** Circle the number beside the statement you have picked. If several statements in the group seem to apply equally well, circle the highest number for that group. Be sure that you do not choose more than one statement for any group, including Item 16 (Changes in Sleeping Pattern) or Item 18 (Changes in Appetite).

1. Sadness
- 0 I do not feel sad.
- 1 I feel sad much of the time.
- 2 I am sad all the time.
- 3 I am so sad or unhappy that I can't stand it.

2. Pessimism
- 0 I am not discouraged about my future.
- 1 I feel more discouraged about my future than I used to be.
- 2 I do not expect things to work out for me.
- 3 I feel my future is hopeless and will only get worse.

3. Past Failure
- 0 I do not feel like a failure.
- 1 I have failed more than I should have.
- 2 As I look back, I see a lot of failures.
- 3 I feel I am a total failure as a person.

4. Loss of Pleasure
- 0 I get as much pleasure as I ever did from the things I enjoy.
- 1 I don't enjoy things as much as I used to.
- 2 I get very little pleasure from the things I used to enjoy.
- 3 I can't get any pleasure from the things I used to enjoy.

5. Guilty Feelings
- 0 I don't feel particularly guilty.
- 1 I feel guilty over many things I have done or should have done.
- 2 I feel quite guilty most of the time.
- 3 I feel guilty all of the time.

6. Punishment Feelings
- 0 I don't feel I am being punished.
- 1 I feel I may be punished.
- 2 I expect to be punished.
- 3 I feel I am being punished.

7. Self-Dislike
- 0 I feel the same about myself as ever.
- 1 I have lost confidence in myself.
- 2 I am disappointed in myself.
- 3 I dislike myself.

8. Self-Criticalness
- 0 I don't criticize or blame myself more than usual.
- 1 I am more critical of myself than I used to be.
- 2 I criticize myself for all of my faults.
- 3 I blame myself for everything bad that happens.

9. Suicidal Thoughts or Wishes
- 0 I don't have any thoughts of killing myself.
- 1 I have thoughts of killing myself, but I would not carry them out.
- 2 I would like to kill myself.
- 3 I would kill myself if I had the chance.

10. Crying
- 0 I don't cry anymore than I used to.
- 1 I cry more than I used to.
- 2 I cry over every little thing.
- 3 I feel like crying, but I can't.

_____ Subtotal Page 1

Continued on Back

60

11. Agitation
- 0 I am no more restless or wound up than usual.
- 1 I feel more restless or wound up than usual.
- 2 I am so restless or agitated that it's hard to stay still.
- 3 I am so restless or agitated that I have to keep moving or doing something.

12. Loss of Interest
- 0 I have not lost interest in other people or activities.
- 1 I am less interested in other people or things than before.
- 2 I have lost most of my interest in other people or things.
- 3 It's hard to get interested in anything.

13. Indecisiveness
- 0 I make decisions about as well as ever.
- 1 I find it more difficult to make decisions than usual.
- 2 I have much greater difficulty in making decisions than I used to.
- 3 I have trouble making any decisions.

14. Worthlessness
- 0 I do not feel I am worthless.
- 1 I don't consider myself as worthwhile and useful as I used to.
- 2 I feel more worthless as compared to other people.
- 3 I feel utterly worthless.

15. Loss of Energy
- 0 I have as much energy as ever.
- 1 I have less energy than I used to have.
- 2 I don't have enough energy to do very much.
- 3 I don't have enough energy to do anything.

16. Changes in Sleeping Pattern
- 0 I have not experienced any change in my sleeping pattern.
- 1a I sleep somewhat more than usual.
- 1b I sleep somewhat less than usual.
- 2a I sleep a lot more than usual.
- 2b I sleep a lot less than usual.
- 3a I sleep most of the day.
- 3b I wake up 1–2 hours early and can't get back to sleep.

17. Irritability
- 0 I am no more irritable than usual.
- 1 I am more irritable than usual.
- 2 I am much more irritable than usual.
- 3 I am irritable all the time.

18. Changes in Appetite
- 0 I have not experienced any change in my appetite.
- 1a My appetite is somewhat less than usual.
- 1b My appetite is somewhat greater than usual.
- 2a My appetite is much less than before.
- 2b My appetite is much greater than usual.
- 3a I have no appetite at all.
- 3b I crave food all the time.

19. Concentration Difficulty
- 0 I can concentrate as well as ever.
- 1 I can't concentrate as well as usual.
- 2 It's hard to keep my mind on anything for very long.
- 3 I find I can't concentrate on anything.

20. Tiredness or Fatigue
- 0 I am no more tired or fatigued than usual.
- 1 I get more tired or fatigued more easily than usual.
- 2 I am too tired or fatigued to do a lot of the things I used to do.
- 3 I am too tired or fatigued to do most of the things I used to do.

21. Loss of Interest in Sex
- 0 I have not noticed any recent change in my interest in sex.
- 1 I am less interested in sex than I used to be.
- 2 I am much less interested in sex now.
- 3 I have lost interest in sex completely.

_____ Subtotal Page 2

_____ Subtotal Page 1

_____ Total Score

61

Appendix B

Environmental Preference Questionnaire

Appendix D: EPQ

Please indicate your preference for each of the following moods or settings, using a scale
where: 1 = strongly dislike … 6 = like very much

1 2 3 4 5 6   A totally woodland area

1 2 3 4 5 6   The deserted street of a large city at night

1 2 3 4 5 6   A wide open grassland area

1 2 3 4 5 6   A front lawn in a suburban area

1 2 3 4 5 6   Mall or shopping center

1 2 3 4 5 6   A farmland region

1 2 3 4 5 6   A city park

1 2 3 4 5 6   A new housing development

1 2 3 4 5 6   A quiet residential street

1 2 3 4 5 6   A clearing or opening in the woods

1 2 3 4 5 6   The bustle and excitement of a large city

1 2 3 4 5 6   A grassland area with scattered trees

1 2 3 4 5 6   A walk through a woodsy area or along a deserted beach

1 2 3 4 5 6   Some place far away from civilization

If you were guaranteed a comfortable income regardless, how much would you like to spend
your life in each of these, using a scale where: 1 = not very … 6 = a great deal

1 2 3 4 5 6   City

1 2 3 4 5 6   Suburbs

1 2 3 4 5 6   Small town or village

1 2 3 4 5 6   Rural countryside or backwoods area

Things I like, using a scale where: 1 = strongly dislike … 6 = like very much

1 2 3 4 5 6   Setting sun

1 2 3 4 5 6   Skyscrapers

1 2 3 4 5 6   Clouds

1 2 3 4 5 6   Beachcombing

1 2 3 4 5 6   Celebrating

1 2 3 4 5 6   Wilderness

1 2 3 4 5 6   Fellowship

1 2 3 4 5 6   Wildflowers

1 2 3 4 5 6   Caves

1 2 3 4 5 6   A walk through the woods

1 2 3 4 5 6   Construction sites

1 2 3 4 5 6   Open spaces

1 2 3 4 5 6   Bright city lights

1 2 3 4 5 6   Plazas

1 2 3 4 5 6   A walk through a grassland

1 2 3 4 5 6   Windy days

1 2 3 4 5 6   Collecting acorns or dried flowers

1 2 3 4 5 6   Lakes, rivers

1 2 3 4 5 6   Waterfalls

Please indicate how much satisfaction you get from each of the following, using a scale where:
1 = none or almost none … 6 = great deal

1 2 3 4 5 6   Bargaining, buying selling

1 2 3 4 5 6   Cities

1 2 3 4 5 6   Conversation, all kinds

1 2 3 4 5 6   Food

1 2 3 4 5 6   Gardening

1 2 3 4 5 6   Nature, enjoyment of

1 2 3 4 5 6   Odors, perfumes, etc.

1 2 3 4 5 6   Ownership of property

1 2 3 4 5 6   Parties

1 2 3 4 5 6   People

1 2 3 4 5 6   Physical exercise

1 2 3 4 5 6   Religion

1 2 3 4 5 6   Outdoor recreation, fishing, canoeing, hunting, etc.

1 2 3 4 5 6   Routine activities

1 2 3 4 5 6   Self adornment

1 2 3 4 5 6   Solitude

1 2 3 4 5 6   Sports-watching

When you have been stressed or under pressure, to what degree would each of the following
help make you feel better? 1 = not at all … 6 = a great deal

1 2 3 4 5 6   Going to the movies

1 2 3 4 5 6   Going for a walk in the city, or a residential neighborhood

1 2 3 4 5 6   Going for a walk on the grassland, in the woods, or in some other natural setting

1 2 3 4 5 6   Being with friends

1 2 3 4 5 6   Looking for some excitement

1 2 3 4 5 6   Eating

1 2 3 4 5 6   Sleeping

1 2 3 4 5 6   Going for a ride in the country

1 2 3 4 5 6   Going for a ride in an urban or industrial area

1 2 3 4 5 6   Just sitting around

1 2 3 4 5 6   Watching TV

Appendix C-1

Preference for each of the following moods or settings... Online

A totally woodland area

	Mean	P-Value
Low (45)	4.89	
Mid (14)	4.79	
High (21)	4.95	
Total (80)	4.89	0.907

The deserted street of a large city at night

	Mean	P-Value
Low (45)	2.42	
Mid (14)	2.29	
High (21)	3.43	
Total (80)	2.66	0.033

The wide open grassland area

	Mean	P-Value
Low (45)	4.71	
Mid (14)	4.86	
High (21)	4.24	
Total (80)	4.61	0.267

A front lawn in a suburban area

	Mean	P-Value
Low (45)	3.71	
Mid (14)	4.00	
High (21)	3.52	
Total (80)	3.71	0.547

Mall or shopping center

	Mean	P-Value
Low (45)	2.40	
Mid (14)	2.17	
High (21)	2.57	
Total (80)	2.50	0.737

A farland region

	Mean	P-Value
Low (45)	4.44	
Mid (14)	4.71	
High (21)	3.86	
Total (80)	4.34	0.095

A city park

	Mean	P-Value
Low (45)	4.58	
Mid (14)	4.57	
High (21)	3.81	
Total (80)	4.38	0.039

A new housing development

	Mean	P-Value
Low (45)	3.20	
Mid (14)	2.86	
High (21)	3.19	
Total (80)	3.14	0.701

A quiet residential street

	Mean	P-Value
Low (45)	4.20	
Mid (14)	3.86	
High (21)	3.81	
Total (80)	4.04	0.438

A clearing or orpening in the woods

	Mean	P-Value
Low (45)	4.98	
Mid (14)	5.14	
High (21)	5.24	
Total (80)	5.08	0.629

The bustle and excitement of a large city

	Mean	P-Value
Low (45)	2.96	
Mid (14)	3.00	
High (21)	2.90	
Total (80)	2.95	0.986

A grassland area with scattered trees

	Mean	P-Value
Low (45)	4.91	
Mid (14)	4.57	
High (21)	4.48	
Total (80)	4.74	0.308

A walk through a woodsy area or along a deserted beach

	Mean	P-Value
Low (45)	5.40	
Mid (14)	4.86	
High (21)	5.48	
Total (80)	5.33	0.108

Some place far away from civilization

	Mean	P-Value
Low (45)	4.71	
Mid (14)	4.79	
High (21)	4.95	
Total (80)	4.79	0.737

Table 33: EPQ Ratings Section One for Online Participants

How much would you like to spend your life in each of these... Online

City

	Mean	P-Value
Low (45)	3.04	
Mid (14)	2.64	
High (21)	3.33	
Total (80)	3.05	0.499

Small town or village

	Mean	P-Value
Low (45)	4.29	
Mid (14)	4.07	
High (21)	3.90	
Total (80)	4.15	0.555

Fellowship

	Mean	P-Value
Low (45)	4.47	
Mid (14)	4.43	
High (21)	4.33	
Total (80)	4.43	0.942

Open spaces

	Mean	P-Value
Low (45)	5.16	
Mid (14)	5.21	
High (21)	4.24	
Total (80)	4.93	0.003

Windy days

	Mean	P-Value
Low (45)	2.84	
Mid (14)	2.79	
High (21)	2.76	
Total (80)	2.81	0.972

Suburbs

	Mean	P-Value
Low (45)	3.42	
Mid (14)	3.57	
High (21)	4.19	
Total (80)	3.65	0.164

Rural countryside or backwoods area

	Mean	P-Value
Low (45)	4.13	
Mid (14)	4.36	
High (21)	4.1	
Total (80)	4.16	0.894

Wildflowers

	Mean	P-Value
Low (45)	5.29	
Mid (14)	5.36	
High (21)	4.90	
Total (80)	5.20	0.368

Bright city lights

	Mean	P-Value
Low (45)	3.02	
Mid (14)	3.07	
High (21)	3.19	
Total (80)	3.08	0.93

Collecting acorns or dried flowers

	Mean	P-Value
Low (45)	3.60	
Mid (14)	3.71	
High (21)	3.05	
Total (80)	3.48	0.322

Table 34: EPQ Ratings Section Two for Online Participants

Caves

	Mean	P-Value
Low (45)	3.76	
Mid (14)	3.79	
High (21)	3.76	
Total (80)	3.76	0.998

Plazas

	Mean	P-Value
Low (45)	3.73	
Mid (14)	3.57	
High (21)	3.81	
Total (80)	3.73	0.896

Lakes, rivers

	Mean	P-Value
Low (45)	5.44	
Mid (14)	5.50	
High (21)	5.29	
Total (80)	5.41	0.691

Things I like... Online

Setting sun

	Mean	P-Value
Low (45)	5.51	
Mid (14)	5.50	
High (21)	5.38	
Total (80)	5.48	0.862

Clouds

	Mean	P-Value
Low (45)	4.87	
Mid (14)	5.29	
High (21)	5.14	
Total (80)	5.01	0.388

Construction sites

	Mean	P-Value
Low (45)	2.09	
Mid (14)	1.64	
High (21)	1.95	
Total (80)	1.98	0.469

A walk through a grassland

	Mean	P-Value
Low (45)	4.96	
Mid (14)	4.93	
High (21)	4.43	
Total (80)	4.81	0.192

Waterfalls

	Mean	P-Value
Low (45)	5.49	
Mid (14)	5.57	
High (21)	5.62	
Total (80)	5.54	0.765

Skyscrapers

	Mean	P-Value
Low (45)	3.04	
Mid (14)	2.64	
High (21)	3.10	
Total (80)	2.99	0.632

Beachcombing

	Mean	P-Value
Low (45)	4.64	
Mid (14)	4.21	
High (21)	4.48	
Total (80)	4.53	0.533

A walk through the woods

	Mean	P-Value
Low (45)	5.24	
Mid (14)	4.93	
High (21)	4.9	
Total (80)	5.10	0.465

Celebrating

	Mean	P-Value
Low (45)	4.42	
Mid (14)	4.29	
High (21)	4.62	
Total (80)	4.45	0.717

Wilderness

	Mean	P-Value
Low (45)	4.48	
Mid (14)	5.21	
High (21)	5.05	
Total (80)	4.96	0.474

Table 35: EPQ Ratings Section Three for Online Participants

How much satisfaction you get from each of the following... Online

Bargaining, buying selling

	Mean	P-Value
Low (45)	3.40	
Mid (14)	3.07	
High (21)	3.24	
Total (80)	3.30	0.741

Gardening

	Mean	P-Value
Low (45)	4.40	
Mid (14)	4.43	
High (21)	3.29	
Total (80)	4.11	0.022

Parties

	Mean	P-Value
Low (45)	3.56	
Mid (14)	3.43	
High (21)	3.62	
Total (80)	3.55	0.932

Outdoor recreation, fishing, canoeing, hunting, etc.

	Mean	P-Value
Low (45)	4.62	
Mid (14)	4.43	
High (21)	4.90	
Total (80)	4.66	0.572

Sports-watching

	Mean	P-Value
Low (45)	3.40	
Mid (14)	2.79	
High (21)	3.05	
Total (80)	3.20	0.475

Cities

	Mean	P-Value
Low (45)	3.24	
Mid (14)	3.00	
High (21)	3.38	
Total (80)	3.24	0.758

Nature, enjoyment of

	Mean	P-Value
Low (45)	5.42	
Mid (14)	5.14	
High (21)	5.05	
Total (80)	5.28	0.324

People

	Mean	P-Value
Low (45)	4.49	
Mid (14)	3.64	
High (21)	4.00	
Total (80)	4.21	0.096

Routine activities

	Mean	P-Value
Low (45)	3.96	
Mid (14)	4.07	
High (21)	4.84	
Total (80)	4.11	0.209

Conversation, all kinds

	Mean	P-Value
Low (45)	4.49	
Mid (14)	3.79	
High (21)	4.29	
Total (80)	4.31	0.224

Odors, perfumes, etc.

	Mean	P-Value
Low (45)	3.38	
Mid (14)	3.64	
High (21)	3.62	
Total (80)	3.49	0.683

Physical exercise

	Mean	P-Value
Low (45)	4.60	
Mid (14)	4.36	
High (21)	4.57	
Total (80)	4.55	0.821

Self adornment

	Mean	P-Value
Low (45)	2.98	
Mid (14)	3.14	
High (21)	3.19	
Total (80)	3.06	0.794

Food

	Mean	P-Value
Low (45)	5.04	
Mid (14)	4.86	
High (21)	5.14	
Total (80)	5.04	0.7

Ownership of property

	Mean	P-Value
Low (45)	4.42	
Mid (14)	4.79	
High (21)	4.33	
Total (80)	4.46	0.559

Religion

	Mean	P-Value
Low (45)	3.78	
Mid (14)	3.14	
High (21)	3.10	
Total (80)	3.49	0.36

Solitude

	Mean	P-Value
Low (45)	4.24	
Mid (14)	4.14	
High (21)	4.52	
Total (80)	4.30	0.606

Table 36: EPQ Ratings Section Four for Online Participants

What degree would each of the following make you feel better... Online

Going to the movies

	Mean	P-Value
Low (45)	3.29	
Mid (14)	3.57	
High (21)	3.81	
Total (80)	3.48	0.421

Looking for some excitement

	Mean	P-Value
Low (45)	3.58	
Mid (14)	2.86	
High (21)	3.90	
Total (80)	3.54	0.136

Going for a ride in an urban or industrial area

	Mean	P-Value
Low (45)	2.38	
Mid (14)	2.64	
High (21)	3.14	
Total (80)	2.63	0.141

Going for a walk in the city, or residential neighborhood

	Mean	P-Value
Low (45)	3.71	
Mid (14)	3.50	
High (21)	4.10	
Total (80)	3.78	0.428

Eating

	Mean	P-Value
Low (45)	3.89	
Mid (14)	4.14	
High (21)	4.52	
Total (80)	4.1	0.231

Just sitting around

	Mean	P-Value
Low (45)	2.80	
Mid (14)	3.00	
High (21)	3.48	
Total (80)	3.01	0.190

Going for a walk on the grassland, in the woods or in some other natural setting

	Mean	P-Value
Low (45)	5.02	
Mid (14)	5.00	
High (21)	5.10	
Total (80)	5.04	0.965

Sleeping

	Mean	P-Value
Low (45)	4.13	
Mid (14)	4.79	
High (21)	4.81	
Total (80)	4.43	0.149

Watching TV

	Mean	P-Value
Low (45)	3.24	
Mid (14)	3.21	
High (21)	3.62	
Total (80)	3.34	0.624

Being with friends

	Mean	P-Value
Low (45)	3.58	
Mid (14)	2.86	
High (21)	3.90	
Total (80)	3.54	0.090

Going for a ride in the country

	Mean	P-Value
Low (45)	4.49	
Mid (14)	4.57	
High (21)	4.81	
Total (80)	4.59	0.679

Table 37: EPQ Ratings Section Five for Online Participants

Appendix C-2

Preference for each of the following moods or settings... In-Person

A totally woodland area

	Mean	P-Value
Low (24)	4.79	
Mid (13)	4.69	
High (3)	2.67	
Total (40)	4.60	0.017

Mall or shopping center

	Mean	P-Value
Low (24)	4.29	
Mid (13)	3.85	
High (3)	3.33	
Total (40)	4.08	0.442

A quiet residential street

	Mean	P-Value
Low (24)	4.72	
Mid (13)	5.28	
High (3)	4.67	
Total (40)	4.28	0.857

A walk through a woodsy area or along a deserted beach

	Mean	P-Value
Low (24)	5.21	
Mid (13)	5.00	
High (3)	4.00	
Total (40)	5.05	0.271

The deserted street of a large city at night

	Mean	P-Value
Low (24)	3.21	
Mid (13)	3.62	
High (3)	2.67	
Total (40)	3.30	0.653

A farland region

	Mean	P-Value
Low (24)	4.46	
Mid (13)	4.31	
High (3)	3.33	
Total (40)	4.33	0.406

A clearing or orpening in the woods

	Mean	P-Value
Low (24)	4.63	
Mid (13)	4.54	
High (3)	3.00	
Total (40)	4.48	0.233

Some place far away from civilization

	Mean	P-Value
Low (24)	3.75	
Mid (13)	4.00	
High (3)	2.33	
Total (40)	3.73	0.300

The wide open grassland area

	Mean	P-Value
Low (24)	4.50	
Mid (13)	4.46	
High (3)	3.00	
Total (40)	4.38	0.114

A city park

	Mean	P-Value
Low (24)	4.85	
Mid (13)	4.82	
High (3)	4.77	
Total (40)	4.62	0.133

The bustle and excitement of a large city

	Mean	P-Value
Low (24)	3.67	
Mid (13)	4.00	
High (3)	3.63	
Total (40)	4.42	0.876

A front lawn in a suburban area

	Mean	P-Value
Low (24)	3.54	
Mid (13)	2.92	
High (3)	3.33	
Total (40)	3.33	0.339

A new housing development

	Mean	P-Value
Low (24)	4.06	
Mid (13)	4.42	
High (3)	6.54	
Total (40)	3.95	0.93

A grassland area with scattered trees

	Mean	P-Value
Low (24)	4.42	
Mid (13)	4.38	
High (3)	4.00	
Total (40)	4.38	0.839

Table 38: EPQ Ratings Section One for In-Person Participants

How much would you like to spend your life in each of these... In-Person

City	Mean	P-Value
Low (24)	3.96	
Mid (13)	3.77	
High (3)	4.67	
Total (40)	3.95	0.707

Small town or village	Mean	P-Value
Low (24)	3.50	
Mid (13)	3.46	
High (3)	3.33	
Total (40)	3.48	0.985

Suburbs	Mean	P-Value
Low (24)	4.58	
Mid (13)	4.08	
High (3)	4.00	
Total (40)	4.38	0.446

Rural countryside or backwoods area	Mean	P-Value
Low (24)	3.54	
Mid (13)	3.46	
High (3)	2.00	
Total (40)	3.40	0.335

Fellowship	Mean	P-Value
Low (24)	4.96	
Mid (13)	3.85	
High (3)	5.33	
Total (40)	4.63	0.036

Open spaces	Mean	P-Value
Low (21)	4.52	
Mid (11)	4.55	
High (3)	4.00	
Total (35)	4.49	0.710

Windy days	Mean	P-Value
Low (21)	2.86	
Mid (11)	2.82	
High (3)	1.67	
Total (35)	2.74	0.422

Wildflowers	Mean	P-Value
Low (21)	5.38	
Mid (11)	4.64	
High (3)	4.33	
Total (35)	5.06	0.119

Bright city lights	Mean	P-Value
Low (21)	4.29	
Mid (11)	4.36	
High (3)	4.33	
Total (35)	4.31	0.990

Collecting acorns or dried flowers	Mean	P-Value
Low (21)	3.38	
Mid (11)	2.64	
High (3)	1.67	
Total (35)	3.00	0.095

A walk through the woods	Mean	P-Value
Low (21)	4.90	
Mid (11)	4.36	
High (3)	2.67	
Total (35)	4.54	0.320

Plazas	Mean	P-Value
Low (21)	4.67	
Mid (11)	4.45	
High (3)	4.33	
Total (35)	4.57	0.844

Lakes, rivers	Mean	P-Value
Low (21)	5.52	
Mid (11)	5.45	
High (3)	5.00	
Total (35)	5.46	0.597

Construction sites	Mean	P-Value
Low (21)	2.14	
Mid (11)	2.00	
High (3)	1.67	
Total (35)	2.06	0.060

A walk through a grassland	Mean	P-Value
Low (21)	4.67	
Mid (11)	4.91	
High (3)	3.33	
Total (35)	4.63	0.067

Waterfalls	Mean	P-Value
Low (21)	5.67	
Mid (11)	5.82	
High (3)	5.33	
Total (35)	5.69	0.371

Caves	Mean	P-Value
Low (21)	4.00	
Mid (11)	4.27	
High (3)	2.67	
Total (35)	3.97	0.320

Table 39: EPQ Ratings Section Two for In-Person Participants

Things I like... In-Person

Setting sun	Mean	P-Value
Low (24)	5.75	
Mid (13)	5.62	
High (3)	5.00	
Total (40)	5.65	0.102

Clouds	Mean	P-Value
Low (24)	5.08	
Mid (13)	4.85	
High (3)	4.67	
Total (40)	4.98	0.733

Skyscrapers	Mean	P-Value
Low (24)	4.21	
Mid (13)	3.38	
High (3)	3.33	
Total (40)	3.88	0.158

Beachcombing	Mean	P-Value
Low (24)	4.92	
Mid (13)	4.77	
High (3)	2.67	
Total (40)	4.70	0.009

Celebrating	Mean	P-Value
Low (24)	5.29	
Mid (13)	5.15	
High (3)	4.67	
Total (40)	5.20	0.487

Wilderness	Mean	P-Value
Low (24)	4.83	
Mid (13)	5.08	
High (3)	3.00	
Total (40)	4.77	0.084

Table 40: EPQ Ratings Section Three for In-Person Participants

How much satisfaction you get from each of the following... In-Person

Bargaining, buying selling

	Mean	P-Value
Low (21)	3.67	
Mid (11)	4.00	
High (3)	4.67	
Total (35)	3.86	0.482

Gardening

	Mean	P-Value
Low (21)	4.10	
Mid (11)	3.73	
High (3)	2.00	
Total (35)	3.80	0.044

Parties

	Mean	P-Value
Low (21)	4.48	
Mid (11)	4.27	
High (3)	2.67	
Total (35)	4.26	0.126

Outdoor recreation, fishing, canoeing, hunting, etc.

	Mean	P-Value
Low (21)	4.52	
Mid (11)	4.27	
High (3)	3.00	
Total (35)	4.31	0.370

Sports-watching

	Mean	P-Value
Low (21)	3.71	
Mid (11)	3.73	
High (3)	4.67	
Total (35)	3.80	0.735

Cities

	Mean	P-Value
Low (21)	4.33	
Mid (11)	4.55	
High (3)	4.33	
Total (35)	4.40	0.889

Nature, enjoyment of

	Mean	P-Value
Low (21)	5.38	
Mid (11)	4.91	
High (3)	4.67	
Total (35)	5.17	0.355

People

	Mean	P-Value
Low (21)	4.95	
Mid (11)	5.18	
High (3)	4.67	
Total (35)	5.00	0.669

Routine activities

	Mean	P-Value
Low (21)	4.62	
Mid (11)	3.40	
High (3)	4.00	
Total (35)	4.21	0.060

Conversation, all kinds

	Mean	P-Value
Low (21)	5.05	
Mid (11)	4.91	
High (3)	4.33	
Total (35)	4.94	0.618

Odors, perfumes, etc.

	Mean	P-Value
Low (21)	4.05	
Mid (11)	4.27	
High (3)	4.00	
Total (35)	4.11	0.871

Physical exercise

	Mean	P-Value
Low (21)	5.10	
Mid (11)	4.00	
High (3)	4.33	
Total (35)	4.69	0.114

Self adornment

	Mean	P-Value
Low (21)	4.38	
Mid (11)	4.36	
High (3)	3.33	
Total (35)	4.29	0.242

Food

	Mean	P-Value
Low (21)	5.33	
Mid (11)	5.36	
High (3)	6.00	
Total (35)	5.40	0.450

Ownership of property

	Mean	P-Value
Low (21)	3.81	
Mid (11)	4.27	
High (3)	3.33	
Total (35)	3.91	0.551

Religion

	Mean	P-Value
Low (21)	4.05	
Mid (11)	4.09	
High (3)	5.33	
Total (35)	4.17	0.520

Solitude

	Mean	P-Value
Low (21)	3.76	
Mid (11)	3.91	
High (3)	4.00	
Total (35)	3.83	0.926

Table 41: EPQ Ratings Section Four for In-Person Participants

What degree would each of the following make you feel better... In-Person

Going to the movies

	Mean	P-Value
Low (24)	3.58	
Mid (13)	4.31	
High (3)	4.00	
Total (40)	3.85	0.421

Going for a walk in the city, or residential neighborhood

	Mean	P-Value
Low (24)	4.17	
Mid (13)	4.38	
High (3)	5.00	
Total (40)	4.30	0.428

Going for a walk on the grassland, in the woods or in some other natural setting

	Mean	P-Value
Low (24)	4.83	
Mid (13)	4.92	
High (3)	4.67	
Total (40)	4.85	0.965

Being with friends

	Mean	P-Value
Low (24)	5.04	
Mid (13)	4.85	
High (3)	5.00	
Total (40)	4.98	0.090

Looking for some excitement

	Mean	P-Value
Low (24)	4.58	
Mid (13)	4.08	
High (3)	5.00	
Total (40)	4.45	0.136

Eating

	Mean	P-Value
Low (24)	4.42	
Mid (13)	4.77	
High (3)	3.33	
Total (40)	4.45	0.231

Sleeping

	Mean	P-Value
Low (24)	4.63	
Mid (13)	5.00	
High (3)	5.33	
Total (40)	4.80	0.149

Going for a ride in the country

	Mean	P-Value
Low (24)	4.54	
Mid (13)	4.62	
High (3)	5.00	
Total (40)	4.60	0.679

Going for a ride in an urban or industrial area

	Mean	P-Value
Low (24)	3.46	
Mid (13)	3.38	
High (3)	3.67	
Total (40)	3.45	0.141

Just sitting around

	Mean	P-Value
Low (24)	3.08	
Mid (13)	3.08	
High (3)	3.33	
Total (40)	3.10	0.190

Watching TV

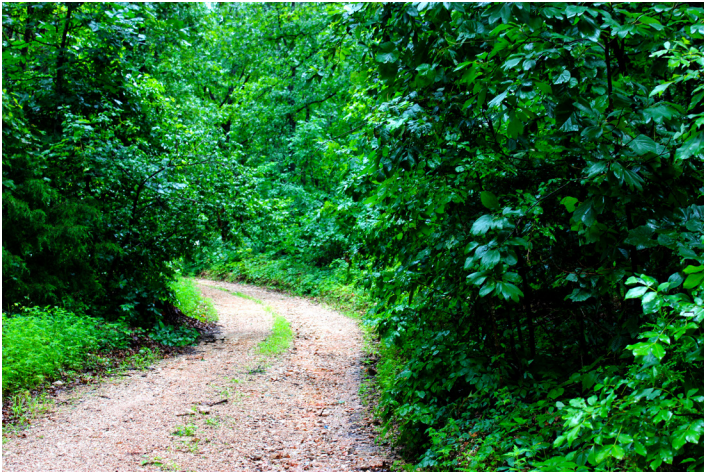|	Mean	P-Value
Low (24)	3.54	
Mid (13)	3.38	
High (3)	2.67	
Total (40)	3.43	0.624

Table 42: EPQ Ratings Section Five for In-Person Participants

Appendix D

Projected Images

Practice Images

Practice Image 1: Natural | Japser, AR

Practice Image 2: Formal | 911 Memorial, New York City, NY

Practice Image 3: Urban | Piazza in Venice, Italy

Figure 18: Practice Images in Order

Images for Data Collection

Image 1: Naturalistic | Gated Community in Irvine, CA
Average preference ranking: 4.35833

Image 2: Formal | Getty Museum Garden in Los Angeles, CA
Average preference ranking: 3.95

Image 3: Urban | Post Office Square in Boston, MA
Average preference ranking: 2.85

Image 4: Urban | Streetscape New York City, NY
Average preference ranking: 2.84

Image 5: Formal | MoMA Sculpture Garden in New York City, NY
Average preference ranking: 3.51

Image 6: Naturalistic | Tanner Springs Park in Portland, OR
Average preference ranking: 2.74

Figure 19: Projected Images in Order

Image 7: Urban | Lovejoy Fountain in Portland, OR
Average preference ranking: 2.64

Image 8: Natural | Top of the World in Manhattan, KS
Average preference ranking: 4.18

Image 13: Urban | Waterway in Venice, Italy
Average preference ranking: 4.01

Image 14: Naturalistic | SOKA University in Aliso Viejo, CA
Average preference ranking: 4.05

Image 9: Urban | Getty Museum in Los Angeles, CA
Average preference ranking: 3.15

Image 10: Urban | Piazza in Assisi, Italy
Average preference ranking: 3.57

Image 15: Natural | Buffalo River in Jasper, AR
Average preference ranking: 4.62

Image 16: Urban | SOKA University in Aliso Viejo, CA
Average preference ranking: 3.43

Image 11: Natural | Washington Marlatt Park in Manhattan, KS
Average preference ranking: 4.20

Image 12: Naturalistic | Highline in New York City, NY
Average preference ranking: 3.90

Image 17: Formal | Great Park in Irvine, CA
Average preference ranking: 3.57

Image 18: Formal | Cathedral Garden in Assisi, Italy
Average preference ranking: 3.79

Image 19: Naturalistic | Getty Museum in Los Angeles, CA
Average preference ranking: 4.04

Image 20: Natural | Breckenridge, CO
Average preference ranking: 4.26

Image 25: Natural | Washington Marlatt Park in Manhattan, KS
Average preference ranking: 3.95

Image 26: Naturalistic | Huntington Garden in San Marino, CA
Average preference ranking: 4.45

Image 21: Formal | Getty Museum in Los Angeles, CA
Average preference ranking: 3.92

Image 22: Formal | Gated Community in Irvine, CA
Average preference ranking: 3.77

Image 27: Natural | Central Park in New York City, NY
Average preference ranking: 4.24

Image 28: Urban | Streetscape in Barcelona, Spain
Average preference ranking: 2.88

Image 23: Formal | Maltese Garden
Average preference ranking: 3.56

Image 24: Formal | Huntington Garden in San Marino, CA
Average preference ranking: 4.07

Image 29: Urban | Streetscape in Orvieto, Italy
Average preference ranking: 3.22

Image 30: Formal | Terry Schrunk Plaza in Portland, OR
Average preference ranking: 3.53

Image 31: Natural | Washington Marlatt Park in Manhattan, KS
Average preference ranking: 4.30

Image 32: Naturalistic | Garden in Capri, Italy
Average preference ranking: 4.04

Image 37: Formal | Huntington Garden in San Marino, CA
Average preference ranking: 3.85

Image 38: Naturalistic | Courtyard in Portland, OR
Average preference ranking: 3.25

Image 33: Natural | Clearing in Copper, CO
Average preference ranking: 4.50

Image 34: Naturalistic | Central Park in New York City, NY
Average preference ranking: 3.99

Image 39: Naturalistic | Cathedral Garden in Barcelona, Spain
Average preference ranking: 3.70

Image 40: Natural | Trail in Capri, Italy
Average preference ranking: 4.10

Image 35: Natural | Overlook in Jasper, AR
Average preference ranking: 4.36

Image 36: Formal | Villa Caserta in Caserta, Italy
Average preference ranking: 3.91

Image 41: Urban | Piazza Navona in Rome, Italy
Average preference ranking: 3.31

Image 42: Naturalistic | Courtyard in Portland, OR
Average preference ranking: 3.22

Image 43: Natural | Trail in Breckenridge, CO
Average preference ranking: 4.48

Image 44: Naturalistic | Huntington Garden in San Marino, CA
Average preference ranking: 3.85

APPROVAL OF PROTOCOL

February 14, 2018

Ruth Atchley
785 864-9821
ratchley@ku.edu

Dear Ruth Atchley:

On 2/14/2018, the IRB reviewed the following submission:

Type of Review:	Initial Study
Title of Study:	Effect of Landscape Aesthetics on Mood
Investigator:	Ruth Atchley
IRB ID:	STUDY00141992
Funding:	None
Grant ID:	None
Documents Reviewed:	• Correct BDI for our study, • corrected submission form, • Debriefing form.docx, • revised consent form

The IRB approved the study from 2/14/2018 to 2/13/2019.

1. Before 2/13/2019 submit a Continuing Review request and required attachments to request continuing approval or closure.
2. Any significant change to the protocol requires a modification approval prior to altering the project.
3. Notify HRPP about any new investigators not named in original application. Note that new investigators must take the online tutorial at https://rgs.drupal.ku.edu/human_subjects_compliance_training.
4. Any injury to a subject because of the research procedure must be reported immediately.
5. When signed consent documents are required, the primary investigator must retain the signed consent documents for at least three years past completion of the research activity.

If continuing review approval is not granted before the expiration date of 2/13/2019 approval of this protocol expires on that date.

Please note university data security and handling requirements for your project:
https://documents.ku.edu/policies/IT/DataClassificationandHandlingProceduresGuide.htm

You must use the final, watermarked version of the consent form, available under the "Documents" tab in eCompliance.

Sincerely,

Jocelyn Isley, MS, CIP
IRB Administrator, KU Lawrence Campus

TO: Dr. Timothy Keane   Proposal Number: 9126
        Landscape Architecture/Regional and Community Planning
        2007 Seaton Hall

FROM: Rick Scheidt, Chair
        Committee on Research Involving Human Subjects

DATE: 02/27/2018

RE: Proposal Entitled, "Effect of Landscape Aesthetics on Mood"

The Committee on Research Involving Human Subjects / Institutional Review Board (IRB) for Kansas State University has reviewed the proposal identified above and has determined that it is EXEMPT from further IRB review. This exemption applies only to the proposal - as written – and currently on file with the IRB. Any change potentially affecting human subjects must be approved by the IRB prior to implementation and may disqualify the proposal from exemption.

Based upon information provided to the IRB, this activity is exempt under the criteria set forth in the Federal Policy for the Protection of Human Subjects, **45 CFR §46.101, paragraph b, category: 2, subsection: ii.**

Certain research is exempt from the requirements of HHS/OHRP regulations. A determination that research is exempt does not imply that investigators have no ethical responsibilities to subjects in such research; it means only that the regulatory requirements related to IRB review, informed consent, and assurance of compliance do not apply to the research.

Any unanticipated problems involving risk to subjects or to others must be reported immediately to the Chair of the Committee on Research Involving Human Subjects, the University Research Compliance Office, and if the subjects are KSU students, to the Director of the Student Health Center.