Atittudes towards nature and preference for environments with natural elements: An assessment study

Holdninger til naturen og preferanse til miljøer med naturelementer: En vurderingsstudie

Jonas Kristoffer Lassen

UNIVERSITETET FOR MILJØ- OG BIOVITENSKAP

Institutt for Plante og Miljøvitenskap

Masteroppgave i Folkehelsevitenskap 30 stp. 2012

Preface

The idea for this master thesis at The Norwegian University of Life Sciences came into being due to courses attended in 2011. The courses had a series of lectures about the health effects of contact with nature. Other lecturers talked about the ongoing research at the university, where the restorative effects of nature were being explored when adding natural elements into the workplace. I found this highly interesting, and contacted the research group.

The experiment this paper is based upon was led by Phd student Katinka Horgen Evensen at IPM, UMB. I owe her a great deal of thanks, and this thesis would not have existed without her help and guidance. She showed me how to work with the different stages of an experimental study design, from planning and recruitment, to the actual execution of the experiment. I must also thank Ramzi Hassan at ILP, UMB for facilitating the experiment. Ruth Kjærsti Raanaas at IPM, UMB, has also contributed to this thesis and deserves thanks as well. Thank you to all the participants in the study, you were at times hard to find, but I am grateful that each one of you showed up for the experiment.

My wife deserves the largest thanks, without her support I would never have gone back to school in the first place.

August 2012

Jonas Kristoffer Lassen

Abstract

The possible relationship between attitudes towards nature and preference for an office setting with plants was explored in this study. The objectives in the study were to see if a more positive evaluation and preference for having plants in an office setting was related to a positive attitude towards nature.

An experiment was designed to compare the differences in how three office environments were assessed and experienced when including natural elements, inanimate objects and having an empty control environment. The participants in the experiment viewed photographic projections of the three environments before assessing them. After assessing the different environments, attitudes towards nature were measured with the Love and Care for Nature scale (Perkins 2010).

Analyses were performed, and as predicted, the environmental condition with plants was assessed more pleasant than the environmental condition with inanimate objects which in turn was assessed more pleasant than the control condition. This order also applied to the scenario task, where the environment with plants evoked a more positive emotional response than the environment with inanimate objects which evoked a more positive emotional response than the control condition. Participants also preferred to work in the environment that included plants. The relationship between attitudes towards nature and a more positive evaluation and preference for the environment with plants was analyzed in several different ways. There were only indications of a relationship in one of the executed tests. The paper then concludes that there may not be a relationship between attitudes towards nature and a more positive assessment and preference for an office with plants.

Sammendrag

Den mulige sammenhengen mellom holdninger til natur og preferansen for et kontormiljø med planter ble undersøkt i denne studien. Målsetningen til studien var å se om det var en sammenheng mellom en mer positiv evaluering og preferanse for å ha planter i et kontormiljø og en mer positiv holdning til naturen.

Et eksperiment ble utarbeidet for å sammenligne forskjellene mellom hvordan tre kontormiljøer ble evaluert og opplevd når man inkluderte en naturbetingelse, en betingelse med vanlige kontorobjekter og når man hadde en kontrollbetingelse. Deltagere i eksperimentet så på projiseringer av tre miljøer før de ble vurdert. Etter vurderingene av miljøene, ble holdninger til naturen målt ved hjelp av ”Love and Care for Nature” skalaen (Perkins 2010).

Det ble så foretatt analyser av dataene, og som ventet, ble miljøet med plantebetingelsen vurdert som mere trivelig enn miljøet med kontorobjektbetingelsen som ble vurdert som mer trivelig enn kontrollbetingelsen. Denne rekkefølgen gjaldt også scenario oppgaven, hvor miljøet med plantebetingelsen fremkalte en mer positiv emosjonell respons enn miljøet med kontorobjekter, som fremkalte en mer positiv emosjonell respons enn kontrollbetingelsen. Deltagere i studien foretrakk å jobbe i miljøet som inkluderte planter. Sammenhengen mellom holdning til naturen og en mer positiv vurdering og preferanse ble analysert på flere forskjellige måter. Det var kun et funn som insinuerte en sammenheng mellom variablene. Denne studien konkluderer derfor med at det er mulig det ikke er noen sammenheng mellom holdning til naturen og en mer positiv vurdering og preferanse for et kontor som inneholder planter.

Contents

Preface i

Abstract ii

Sammendrag iii

1. Introduction 1

1.2 Theoretical Framework 1

1.2.1 Work and Health 1

1.2.2 Nature and Health 3

1.2.3 Stress Reduction Theory 3

1.2.4 Attention Restoration Theory 4

1.2.5 Cumulative effects of repeated restorative experiences 5

1.2.6 Attitudes towards Nature 5

2. Empirical Methods and Findings 6

2.1 Empirical Findings 6

2.1.1 Benefits of Nature in Various Settings 6

2.1.2 Benefits of Nature in Office Settings 8

2.1.3 Attitudes towards Nature and Health 9

2.2 Objective 10

3. Method 12

3.1 Participants 12

3.2 Recruitment 12

3.3 Design 12

3.4 Photos 12

3.5 Setting 14

3.6 Instruments 15

3.7 Manipulation check 17

3.8 Procedure 18

3.9 Data Analysis 18
4. Results 20
5. Discussion 24
5.1 Methodological issues 26
5.2 Methodological Limitations 27
5.3 Further research and practical implications 29
6. Conclusion 30
References 31

Pictures

Picture A: Office environment with the plant condition. 13
Picture B: Office environment with inanimate object condition 14
Picture C: Control condition 14
Picture D: Illustration of the experiment in the Virtual Reality theater. 15

Figures

Figure 1: This figure shows the Cronbach's alpha coefficient for the pleasantness subscale of the SED and the positive emotion index of BEP. 16
Figure 2: The pleasantness subscale of the Semantic Environmental Description (SED) 20
Figure 3: The positive emotion index from the Basic Emotion Process (BEP) 21

Appendix 1: The Questionnaire

Appendix 2: Written consent form

Appendix 3: Illustrative photos showing the Virtual Reality theater

1. Introduction

According to Norwegian Statistics, an average Norwegian worker spends approximately 7, 5 hours in the workplace each working day (Vaage 2012). This is a large part of the day and makes the workplace an important arena for health promotion. Workplace health is a prioritized setting for health promotion worldwide. The World Health Organization (WHO) works toward the improvement of working conditions around the world (WHO 2011a). Occupational health is highly relevant in offices and office work, where workplaces are characterized not only by demanding standards, but also by large workloads and high demands. A common characteristic of these workplaces is a high level of stress. WHO defines a healthy work environment as "one in which there is not only an absence of harmful conditions but an abundance of health-promoting ones" (WHO 2011b).

While the physical environments can be a threat to health and well-being, physical environments can also be health promoting and may enhance health (Largo-Wight 2011). Health promoting environments are characterized by the absence of harmful factors, and the presence of health promoting factors. Contact with nature outdoors has been shown to give health benefits (de Vries et al. 2003), and to bring natural elements indoors has also been shown to be beneficial to health and well-being (Lohr & Pearson-Mims 2000).

The potential psychological benefits from bringing natural elements into the workplace is the topic of this paper. In a public health perspective, finding additional elements that can promote health and well-being is an important task. This paper seeks to understand the relationships that are present in everyday environments that can affect health.

1.2 Theoretical Framework

1.2.1 Work and Health

The workplace can be a stressful place, where ordinary pressure can exceed people's capacity to deal with it, leading to stress and stress related hazards. Stress is caused by situations perceived as demanding or threatening to well-being, and is primarily a physiological

response to potentially threatening situations. Workplace stress is a response to work demands and pressures that occur when people do not have the knowledge and skills required to resolve the demands (WHO 2011b). Stress related hazards at work include both the work content and the work context. Lack of stimulating tasks, too high workload, lack of participation in decision-making, badly designed shift systems and long work hours are all examples of stress hazards of work contents. The context hazards include job insecurity, conflicting roles in an organization, poor communication and bullying and violence (WHO 2011b). The environments' psychological demands can increase perceived stress (Largo-Wight 2011). Stress also arises in workplaces where demands are high and decision latitude is low, as described in the demand – control model (Karasek & Theorell 1990). The model describes four different types of work experiences, with respectively high and low demands and high and low control latitude. Most negative health reactions at the workplace occur in jobs where there are high demands and low control latitude. These negative reactions include a heightened risk for cardiovascular diseases (Karasek & Theorell 1990). Largo-Wight et al. (2011) claim that office staff compromise 70% of the workforce in the USA, and that office staff typically fall in under the high demand/low control category. Office workers run therefore a higher risk of becoming ill due to workplace stress.

Stress at the workplace is often mentioned together with mental fatigue. The two concepts are not the same, even if they both often are rectified by taking a break from work. While stress involves preparation for an anticipated harmful or threatening event, mental fatigue can also arise from expending resources on projects one likes and enjoys (Kaplan & Kaplan 1995). According to Kaplan & Kaplan (1995), mental fatigue arises when the directed attention has to focus on one task over a period of time. Directed attention must use energy on shutting out competing demands. Shutting out all other demands on attention will eventually lead to mental fatigue.

The physical environment can be a threat to occupational health through psychological influences. There is not always something that can be done with the tasks that need to be done; they need to be done anyways. To be able to promote healthy workplaces and healthy office spaces, one can focus on removing the negative factors such as poor lighting, loud noise and poor indoors working conditions, and focus on environmental conditions with positive health benefits.

Health promotion is the focus on enabling people to take control over the factors determinant to health, to be able to improve one's health (WHO 2012).

1.2.2 Nature and Health

The Biophilia hypothesis suggests that people have an innate tendency to react positively to nature and cannot thrive without natural elements in their surroundings (Wilson 1984).In order to examine the interactions between the physical environment and individuals, and to understand why natural elements can have a positive impact on health and well-being, environmental psychology can provide some answers. Environmental psychology is the study of how people interact with the natural and built environment. There is a traditional separation in environmental psychology between manmade and natural environments. Natural environments encompass all living and nonliving natural things, while the built environments are defined by environments heavily influence by humans.

Nature and natural environments have been shown to create a buffer against stressful life events (van den Berg et al. 2010), and the lack of natural environments can be related to a higher vulnerability to the impacts of stressful life effects (Kaplan & Kaplan 1995). The buffer that natural elements create can be used in office settings to buffer against work-related stress.

The role of the physical environment has often been overlooked when considering how workplaces can have a positive effect on health and well-being (Gifford 1987). Environmental psychology seeks to understand the complex interactions between man and different environments. In environmental psychology, much of the research test different hypothesis relating to the workplace environment and how the work environment affects health and well-being (Gifford 1987).

1.2.3 Stress Reduction Theory

The innate tendency to react positively to nature is also described and included in the Stress Reduction Theory (SRT) (Ulrich et al. 1991). The SRT claims that contact with nature is psychologically beneficial due to its positive effect of stress-reduction. According to the SRT, stress heightens negative emotions. A natural scene reduces the need for heightened senses and a calming natural scene will provide feelings of interest, pleasantness and well-being.

This will manifest itself in reduced physiological stress markers such as blood pressure and heart rate. The stress-reducing effects of contact with nature come as a result of a shift of feeling towards a more positive emotional state (Ulrich et al. 1991). Environments with nature elements can have a stress reducing effect on people, and the potential beneficial effects can be utilized in stressful office and work related situations. One can assume that nature contact can act as a buffer against stressful experiences, even when the total exposure to nature is limited.

1.2.4 Attention Restoration Theory

In addition to the SRT, a related theory is the Attention Restoration Theory (ART). The ART also tries to explain the positive effects of contact with nature, but focuses on restoration from mental fatigue. Attention Restoration Theory (Kaplan & Kaplan 1995) tells us that being in contact with nature can provide recovery from mental fatigue and explains the benefits of natural elements and their psychological impact. The theory explains that mental fatigue arises due to competing influences on directed attention. Directed attention can be restored through contemplation and reflection that arise in environments where four key components are present: *being away, fascination, extent and compatibility.* Being away is the escape from the competing influences on the directed attention. Natural elements have a particular fascinating quality, yet they do not enthrall the viewer to such an extent that they dominate attention, they have a "soft" fascination. Soft fascination calls forth the involuntary attention, and gives directed attention a chance to recover by opening for contemplation and reflection. The component of extent implies a sense of being in a whole other world. The final component of compatibility implies compatibility between the environmental features, individual needs, and the actions required by the environment (Kaplan & Kaplan 1995). These four components are often found in natural environments and help explain why natural environments are effective restorative environments. Within the framework of ART, Kaplan (1993) also suggests that brief exposures to nature, in so-called micro-restorative experiences, activates involuntary attention thus restoring directed attention. Taking a short break while looking out the office window is a good example of this kind of restorative experience.

1.2.5 Cumulative effects of repeated restorative experiences

To be able to see the relationship between health effects and the relatively short and isolated restorative experiences, Hartig et al. (2011) assumes there are cumulative effects of restorative experiences. While the isolated restorative experiences may have a small immediate effect, it is unlikely that there is a lasting effect on health. The basic assumption that underlies research on restorative environments is the assumption that all restorative experiences over time have a cumulative effect. The strength of the cumulative effect on health is threefold and is determined by the quality of the restorative environments, the dedication towards restoration, and the span of time in which restorative effects can accumulate (Hartig et al. 2011).

Cumulative restorative experiences can help explain the health benefits of natural elements such as plants in people's everyday environments. The constant offer of restorative experiences, where the restorative setting is readily available, may sum up to an increase in factors beneficial to health.

1.2.6 Attitudes towards Nature

The relationship with nature is described in the Biophilia hypothesis as an innate connection to nature and natural settings (Wilson 1984). The ART and SRT both use this connection as an explanation to why nature is beneficial. People have a genetic memory implying that certain types of natural environments are beneficial, and this remnant of evolution still affects how nature is experienced.

There is also another perspective to the question on what causes preference for natural environments over built environments. Preference for nature can be an expression of cultural learning. Culture has influenced how people think about, experience and share beliefs about nature's effect on health. Attitude towards nature may therefore be a product of a person's attitudes, beliefs and values shaped through learning (Hartig et al. 2011). The inclusion of natural elements in rituals, transitions and in decoration are all factors that underline cultural preferences towards nature and plants. People customarily give flowers as gifts, and people feel better when in the presence of plants (Lohr & Pearson-Mims 2000). Attitudes towards nature have also been shown to stem partly from childhood interactions with plants and nature (Lohr & Pearson-Mims 2005).

2. Empirical Methods and Findings

To investigate how the physical environments are perceived and affect people, environmental assessment is a method that can be used. Environmental assessment can also be called a collective judgment of places. It is a practice with origins in environmental psychology, a part of psychology gaining popularity in the 1950's and onwards (Gifford 1987). Environmental assessment is used to study how environments are experienced to be able to improve the design of different environments. Environmental assessment can be as simple as giving someone a blank piece of paper and a pen and asking them to write what they see, but it can often be easier to use a standardized semantic scale (Gifford 1987). These scales vary, and there are many aspects and components of the environment that can be measured.

Several methods are used by researchers to measure how the physical environment affects people. In research on restorative environments both experimental studies and field studies are used. In the experimental studies the participants are often first either exposed to stressful stimuli or given a cognitively demanding task, then exposed to different physical environments before measuring restoration either by stress markers or through cognitive testing. The exposure to the environments can be done with photos, video or on-site in the environments themselves. The field studies will often look for the cumulative experiences and effects for a specific environment over time.

2.1 Empirical Findings

In the following section empirical studies of benefits of nature will be presented. The studies have been conducted in many different settings and use different methods to examine potential benefits of nature.

2.1.1 Benefits of Nature in Various Settings

Contact with nature outdoors is most likely the most potent form for nature contact. People's use of natural spaces and settings have been shown to be beneficial to health and Maller et al. (2006), list several key health benefits that arise when in contact with nature. These are beneficial physiological effects, restorative effects and responses to treatment occurring in natural settings.

Hartig et al. (2003) showed that the participants had decreased physiological stress markers when exposed to nature views and nature walks compared to walks in an urban environment. Participants in this study also had an increase in positive emotion if taking a walk in the nature reserve instead of the urban environment. Attention capacity performance increased in participants in the natural environment condition.

Indoor nature contact is different from outdoors nature contact. The exposure to the natural elements is lessened, and can often be restricted to window view, a picture of natural settings or live potted plants. However, there are studies showing that these types of nature contact can be beneficial to health as well.

Dijkstra et al. (2008) showed photos of a hospital room and the participants were asked to imagine themselves hospitalized with a serious illness. They were told they would remain in the hospital for a couple of weeks receiving treatment. Stress was reported with the Stress Arousal Checklist and the results showed the stress-reducing properties of natural elements in a hospital setting. The presence of plants led to a reduction of perceived stress. The study did not use actual patients in the study, the participants were asked to imagine themselves as hospital patients. The levels of generalization to patients possible from the results are difficult to speculate upon. However, all participants have likely been very ill and one can assume that people can relate to the scenario presented.

Hartig and Staats (2006) used a set of slides to simulate a walk in either urban or natural environments, while collecting data on attitudes towards the different walks. Participants were divided into groups and while some took the walks fatigued, others took the test before fatigue had a chance to set in. The results showed a tendency to prefer nature walks, especially amongst the most fatigued participants. Hartig and Staats (2006) attribute this to nature's restorative potential and the tendency to prefer restorative environments. A study from van den Berg et al. (2003) used video viewing to examine the relation between environmental preference and restoration and stress reduction. Participants were shown a frightening movie to induce stress, and then they were show an environmental video. Tests were conducted before and after all video sessions, to measure differences in mood, preference and concentration. Their analysis showed that affective restoration was a large cause of the preference for natural environments over built environments.

2.1.2 Benefits of Nature in Office Settings

The study and assessment of natural elements in workplaces have been done with varying results. Chang and Chen (2005) found that physical responses associated with stress decreased when shown photos of office environments with natural elements included. Physiologic measurements were taken while viewing six picture combinations of the office. The pictures varied from an office without a window and without natural elements, to an office with a window view of nature, with many potted plants inside. Differences in the measurements were then analyzed. Participants presented with photos of offices without natural elements were more nervous and anxious, and had higher stress values.

Psychological benefits of window views from the workstation have been examined. Kaplan (1993) showed that nature view from the office window is connected with less health ailments and higher job satisfaction. The data in this study was collected from a large group of office workers with the aid of questionnaires. Lohr et al. (1996), conducted a study that added plants to indoors offices without windows. The participants were more productive and less stressed when sitting in the office with plants. The experiment was conducted with attention demanding tasks on the computer, simulating a stressful working environment. Larsen et al. (1998) conducted an experiment to measure the effect of indoor plants on productivity, attitudes towards the workplace and overall mood. The results found in the study showed higher levels of mood and perceived office attractiveness when there were more plants included in the room. However, the results showed an inverse linear relationship between the number of plants in an office and productivity.

Similar experiments with attention demanding tasks include Raanaas et al. (2011). In this experiment participants were led into an office with or without plants and asked to perform a series of computer tests. These tests were designed to test the attention capacity and induce mental fatigue. Attention capacity was tested three times during the experiment and the only difference between the plant and no-plant condition was found between test times one and two. There was no difference between the other test times and conditions. The authors conclude that the lack of significant results indicated that plants had a positive influence on task performance while working, but there was no effect from indoor plants during a break between attention demanding tasks.

Berto (2005) used a test of sustained attention, then showed photographs of different environments before repeating the attention test. Only the participants who viewed the restorative elements improved their test scores. The author attributes this to the theories presented in Kaplan (1993).

A large study including several hundred office workers in the USA, by Dravigne et al. (2008), reported a connection between overall job satisfaction and overall life quality. Office workers with plants in the office also reported felt better about their job. Workers with plants in their office or a window view reported higher quality of life scores.

Another study using a questionnaire sent to many participants at a workplace also found that nature contact at the workplace is beneficial towards health (Largo-Wight et al. 2011). Participants reported a significant, negative association between stress and general health complaints and nature contact at the workplace. The authors point towards the addition of natural elements in the workplace as an important and cost efficient method of health promotion.

2.1.3 Attitudes towards Nature and Health

Attitudes towards nature are an important part of the interactions between nature and people. The attitudes to nature can assist when attempting to shed light on how nature can be beneficial to health. To be able to examine attitudes to nature, the term connectedness to nature has been used. Connectedness to nature is a measure of how emotionally one is connected to the natural world and is an important aspect in the relationship between individuals and nature (Mayer & Frantz 2004). The connection is thought to have both a cognitive and affective aspect, and the current paper will focus on the affective aspect of connectedness to nature.

Several scales have been developed in the attempt to measure connectedness to nature, and the field of research is constantly evolving. The "Love and Care for Nature Scale" (LCN) was designed to provide an expression of people's emotional relationship with nature (Perkins 2010) in contrast to the Connectedness to Nature scale (CN), developed by Mayer and Frantz (2004). The CN scale is often criticized for not focusing enough on the emotional relationship to nature. The Inclusion of Nature in Self (INS) (Wesley Schultz 2001), was developed to

assess to which extent individuals include nature in their cognitive representation of self. The emotional and personal experiences of nature and their effect on different working environments are key components of the current study.

Connectedness to nature has been shown to be correlated with factors relevant to psychological well-being (Cervinka et al. 2012). Reports of higher connectedness to nature corresponded strongly to the psychological factor of meaningfulness, described in the study as the opposite of depression. Vitality was also strongly correlated to connectedness to nature.

Along the same lines the study from Howell et al. (2011) also found strong positive associations between connectedness to nature and the participants' report of psychological well-being in two studies. The authors pointed towards a strong relationship between health and well-being and how connected to nature one was. They reason that the relationship comes in part by the connections between nature contact and a healthy lifestyle. The authors claim that nature contact may improve physical health, which in turn is beneficial to mental health and well-being (Howell et al. 2011). However, the study is performed on university students, and even though the sample in the two studies is quite large, the populations could be too similar to each other, having the same values and ideas towards connectedness to nature. The sample used may not be representative and the findings' external validity may be questioned.

2.2 Objective

The present study will explore how natural elements in the indoor work environment are experienced and if the response to natural elements can be explained by peoples' attitude towards nature.

The objective of the current study is to take research on attitudes towards nature one step further. Research presented earlier in this chapter show a connection between exposure to nature and health and well-being, and that natural settings and natural elements are preferred over built elements. The present study seeks to explore this preference further, and will examine if people's attitude towards nature can explain the responses to nature which may have potential psychological benefits, or if the mechanisms that lead to greater well-being also apply to those without a strong preference for nature.

Assessments of an office setting with living plants will be compared to assessments of the same office with inanimate objects and a control condition in order to find answers to the

following research question: is a positive evaluation and preference for having plants in an office setting related to a positive attitude towards nature?

3. Method

3.1 Participants

The sample in the study consisted of 46 students from the Norwegian University of Life Sciences. The students average age was 22.9 (SD = 3.3). Nine students were male and 37 female. The participants were randomly allocated to one of three experimental sessions. The first session had 19 participants, the second 17, and the third session had 10 participants.

3.2 Recruitment

The students were recruited using several different approaches. For one group, participation in the experiment was a part of a course. Other students were recruited to the study on the university campus, and some were recruited after being presented the study during classes. The students received a lottery ticket as a reward for participating.

The students were told that they would be assessing photos, presented in the Virtual Reality laboratory at the university. This was the only information about the study given to the students beforehand. The nature aspect of the study was not mentioned.

3.3 Design

An experimental study with a crossover design was conducted. The participants were all to assess the same three photographic projections, presented in a different order in each session. The sequence in which the projections were presented was randomized. Due to the crossover design of the study, the study measured the same person's response to the different environments and protects against individual preferences in each group.

3.4 Photos

The photos used in the study depicted a conventional office setting. All photos used were from the same office. The office itself had white walls, a large window on one side, a desk with a PC on it and a chair. Outside the window, parts of a large leafy tree could be seen. The

picture was taken from a vantage point as if one is sitting in front of the desk, with the computer screen in front. The photos were panorama photos, to ease the immersion in the photos.

The photo with the office environment with plants included had two potted pink and white orchids (Phalaenopsis) in the windowsill, one potted green plant (Aglaonema Commutatum) on the desk, and one large potted plant (Schefflera Arboricola) on the floor beside the desk (see picture A).

Picture A: Office environment with the plant condition.

The photo of the office environment with inanimate objects has two lamps in the windowsill, with white lampshades and pink geometric decorations towards the bottom edge. Two green binders sat on the desk and the bookshelf besides the desk had green binders in the top shelf and blue books on the second shelf (see picture B). The different elements were chosen due to similarities with the plants in complexity and color.

Picture B: Office environment with inanimate object condition

The control condition had no additional elements, only the elements common to all three environments (see picture C).

Picture C: Control condition

3.5 Setting

The Virtual Reality (VR) theater was selected to give the students the highest possible degree of immersion in the photos presented. The VR theater resembles a cinema, with a curved screen (7 m (W) x 3 m (H), curving 160 degrees) in front. The seats are close to the screen, so any picture viewed becomes larger than life (see picture D). All seats used during the

experiment had a good view of the screen. The lights were turned off for the experiment, but the light from the screen was sufficient for the participants to be able to write on the questionnaire. Participants were asked not to speak for the duration of the session.

Picture D: Illustration of the experiment in the Virtual Reality theater.

3.6 Instruments

The entire questionnaire with all instruments can be seen in the appendix. All scales are presented under, but only the scales used when analyzing the research question will be presented in detail.

The first task was an open description of the environment. Participants were asked to write the first five adjectives that came to mind when they saw the environments projected. The task was included to get an immediate and personal response to the environment. The open description also ensured that participants paid full attention to the photos.

The instruments used in the questionnaire consisted of several scales used to appraise and evaluate environments.

Following the open description of the environment, perceived pleasantness was measured with a subscale from The Semantic Environmental Description (SED) (Küller 1991). This assessment instrument consists of 36 items and measures eight dimensions of the environment. Participants were asked to mark how well they thought each item matched the

experience of the shown environment using a seven-point Likert scale (1=little: lowest possible, 7=very: highest possible). The eight dimensions are *pleasantness, complexity, unity, enclosedness, potency, social status, affection and originality*. The perceived pleasantness subscale consists of the items: *ugly, stimulating, safe, dull, idyllic, good, nice*, and *brutal* (the score the items *ugly, dull* and *brutal* were reversed for analysis). Internal consistency for this scale was measured with the Cronbach's alpha coefficient. This coefficient indicates whether the items in a scale measure the same underlying construct (Pallant 2007). Values above .70 are considered adequate, but values above .80 are more acceptable. The values show good internal reliability in the different scales. See figure 1 for Cronbach's alpha values on the scales in this study.

	Cronbach's α		
	Plant	Inanimate objects	Control
Pleasantness subscale (SED)	.82	.82	.78
Positive Emotion Index (BEP)	.88	.89	.90

Figure i: This figure shows the Cronbach's alpha coefficient for the pleasantness subscale of the SED and the positive emotion index of BEP.

The next instrument is the Perceived Restorativeness Scale (Hartig et al. 1997). The current study only used the subscale of fascination, with the following items: *This place triggers my curiosity/There is much to explore and discover here/My attention is drawn towards many interesting things/This place is fascinating/ I am interested in what is going on in the office setting.* The scale was rated with the same seven-point Likert scale used in the instrument above

The emotional response to the environment presented was assessed by the Basic Emotional Process scale (Küller 1991). The scale was included to measure emotional response. The scale used a four point scale to measure a total of 12 items representing the basic emotional processes of activation, orientation, evaluation and control. The answers were calculated as a mean over the 12 items and presented as a *positive emotion index*. The scale was introduced with a written scenario with the following instructions: *Picture yourself working in this room.*

How would you feel after one day in this office? Internal reliability test indicated adequate consistency in the scale (see Figure 1).

These scales were repeated three times in the questionnaire, one time for each photographic projection viewed. Following these scales was a simple question on which projected environment you would prefer to work in. Answers were given by crossing out the box next to office 1, office 2, or office 3.

Then followed two questions about how important indoor plants were when working in an office, and how important participants felt a window view was while working in an office. The data from these two questions were not used for further analysis.

The last part of the questionnaire consists of a scale measuring Love and Care for Nature (LCN) (Perkins 2010). LCN measures people's personal emotional relationship with nature and operationalizes the concept of biophilia as love for nature. The same written instructions preceded the scale: *to what extent do you agree with the following statements?* The statements were scored using a seven point Likert scale, with the participants asked to score the items in a range from *strongly disagree* to *strongly agree* (1=strongly disagree: lowest possible, 7=strongly agree: highest possible). Internal validity of this scale is adequate, with Cronbach's $\alpha = .93$.

The "Inclusion of Nature in Self" single item scale (Wesley Schultz 2001) was also included at the end of the questionnaire. The scale consists of seven pairs of circles, with each circle moving closer to each other before overlapping in the final pair. Each circle was marked either "me" or "nature" and the participants were asked to choose which pair of circles best represented their relationship with nature (see appendix). For analysis, each pair of circles was given a score from one to seven, with the first pair of circles given the score of one.

3.7 Manipulation check

A scale designed to measure the participants' immersion in the photographic projections was included as a manipulation check. The scale used was taken from the Igroup Presence Questionnaire (IPQ) (Schubert et al. 2008). Only IPQ items related to immersion in photos were included in this study. The IPQ scale was designed to measure the users' experience of

immersion in the virtual environment. The instructions preceding the scale was *to what extent do you agree with the following statement.* These items were scored using a seven-point Likert scale, with the participants asked to score the items in a range from *little extent* to *large extent* (1=little extent: lowest possible, 7=large extent: highest possible). Internal validity of the scale was adequate with Cronbach's $\alpha = .85$.

3.8 Procedure

The students were placed into three groups and viewed the photos in a different order. The first group viewed the photo with plants first, then the photo with inanimate objects, and finally the empty office. The second group viewed the photo with inanimate objects first, then the empty office, and then the photo with plants. The last group viewed the empty office first, then the photo with plants, and finally the photo with inanimate objects. All three sessions were held on the same day. The weather the participants experienced on the way to the VR-lab was the same during the entire day, windy with some rain. The participants were led into the VR-lab right before commencing the experiment. A short set of instructions were given orally, using the same text each time.

Participants were given information, both orally and in writing, about the consent form they would have to sign prior to the experiment. They were told how long the study would last, that they were answering anonymously and that they could leave at any time. See the appendix for an example of the consent form.

The photos were then presented one at a time, and the presentation of each photo was not stopped until every participant had finished their questionnaire. This took approximately 7 minutes for each photo. At the beginning of each photographic projection, the picture was zoomed in on and panned from side to side. Between photos there was a pause of approximately 2 minutes. After the photos had been assessed, the participants were told to complete the questionnaire. In the questionnaire were written instructions on when to stop and wait for further instructions.

3.9 Data Analysis

One-way repeated measures ANOVA were used to test the differences for the subscale of Pleasantness score and for the Emotion Index. Regression analyses were used to see the

impact from LCN on the Pleasantness score, here coded as the difference between scores in the plant condition and the inanimate object condition. Additional analysis used the difference in scores between the plant and control conditions. Other regression analysis were performed with the difference in the Emotion index between the plant and inanimate object conditions and the plant and control conditions, and the LCN.

Independent samples t-test was performed to see if there was any difference in LCN and whether one preferred the environmental condition with plants compared to the inanimate object condition. An independent t-test was also performed to see if there was any difference in the LCN and whether one preferred the environmental condition with plants compared to preference for the control condition. A final independent samples t-test was performed to see if there was any difference in the LCN and whether one preferred the plant environment or one of the other environments. Standard statistical tests were used to check that the statistical assumptions were met. Data was analyzed using SPSS version 19.

4. Results

Only the results relevant to the hypothesis and to further analysis are reported here.

The mean score on the pleasantness subscale of the SED for the environmental condition with plants was 4.48 (SD=1.12) (see figure 2). The mean score on the environmental condition with inanimate objects was 3.29 (SD=1.02) and the mean score on the control condition was 2.77 (SD=1.12).

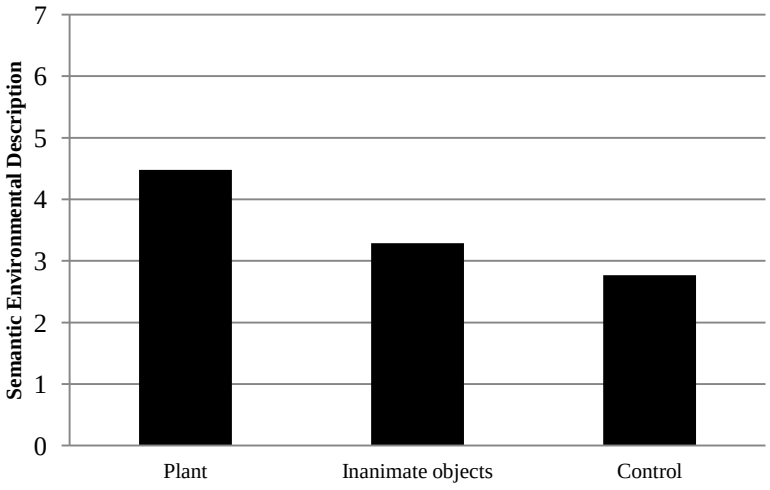

Figure ii: The pleasantness subscale of the Semantic Environmental Description (SED)

A one way repeated measures ANOVA showed a significant difference between the pleasantness scores from the SED on the different environmental conditions, Wilks' Lambda = .33, F (2, 44) = 45.7, p = .00, multivariate partial eta squared = .68 (a large effect size). Pairwise comparisons of this variable show a significant difference between the three conditions: between plant and inanimate objects condition, p = .00, between plant and control conditions, p = .00, and between the inanimate objects and control condition p = .04. The results are adjusted for multiple comparisons using the Bonferroni adjustment.

The Basic Emotional Process (BEP) is reported by an emotion index (see figure 3). The mean score on the environmental condition with plants was 2.73 (SD=.42), the score on the environmental condition with inanimate objects was 2.39 (SD=.47) and the score on the control condition was 2.13 (SD=.51).

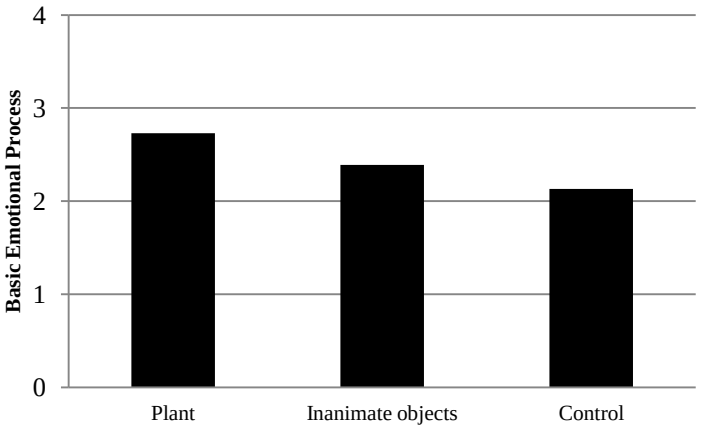

Figure iii: The positive emotion index from the Basic Emotion Process (BEP)

A one way repeated measures ANOVA on the Emotion Index showed a significant statistical difference between the conditions, Wilks' Lambda .41, F (2, 44) = 32, p = .00, multivariate partial eta squared = .59 (a large effect size). Pairwise comparisons of this variable show a significant difference between the three conditions: between plant and inanimate objects condition, p = .00, between plant and control conditions, p = .00, and between the inanimate objects and control condition p = .00. The results are adjusted for multiple comparisons using the Bonferroni adjustment.

On the question of which environment the participants preferred, 71.1% preferred the environment with plants, 22.2% preferred the environment with inanimate objects, and 6.7% preferred the environment with the control condition.

The mean score on the immersion in the environments (IPQ) scale was 3.74 (SD = 1.20).

The mean score on the Love and Care for nature scale was 5.54 (SD = 1.08). The mean score on the INS scale was 4.72 (SD = 1.15). A correlation analysis of the relationship between the two variables INS and LCN showed a positive and large correlation between the variables, r = .72, n = 46, p = .00 (Cohen suggests (Cohen 1988) that the strength of the correlation is large when r = .50 to r = 1.0).

The main research question was investigated in several different ways.
Regression analyses were conducted to test whether attitudes towards nature could explain preference for the office environment with plants.

First, the difference in the Pleasantness score between the plant and inanimate object condition was used as the dependent variable and the score on the LCN scale as the independent variable. Statistical assumptions for doing this test are met. The analysis showed that LCN score explained 4% of the variance of the difference in the Pleasantness score (*R Square* = .04) (*F* (1, 44) = 1.94) (*p* = .17*)*. LCN could not predict the difference in the pleasantness score between the plant and the inanimate object conditions (*B* = .24, *SE* = .17, *p* = .17).

A separate regression analysis was performed, this time with the difference in the Pleasantness score between the plant and control condition as the dependent variable and the LCN score as the independent variable. The analysis showed that the LCN score explained 2% of the variance of the difference in the Pleasantness score (*R Square* = .02) (*F* (1, 44) = 1.03) (*p* = .32). LCN could not predict the difference in pleasantness score between the plant and control conditions (*B* = .17, *SE* = .17, *p* = .32).

The regression analysis with the difference in the Emotion Index scores between the plant and inanimate object condition as the dependent variable and the LCN score as the independent variable was also carried out. The analysis showed that the LCN score explained 10% of the variance of the difference in the Emotion Index score (*R Square* = .10) (*F* (1, 44) = 4.94) (*p* = .03). LCN had a significant relationship with the difference in the Emotion Index score between the plant and inanimate object conditions (*B* = 0.12, *SE* = .05, *p* = .03).

A final regression analysis was carried out with the difference in the Emotion Index scores between the plant and control condition as the dependent variable and the LCN score as the independent variable. The analysis showed that the LCN explained 4% of the variance in the difference in the Emotion Index score (*R Square* = .04) (*F* (1, 44) = 1.70) (*p* = .20). LCN could not predict the difference in the Emotion Index score between the plant and the control conditions (*B* = .10, *SE* = .07, *p* = .20).

To examine whether there was a difference in the score on the LCN scale if the participant preferred the nature environment or one of the other environments, independent-samples t-test were carried out.

The first independent-samples t-test was executed to compare the LCN scores for those who preferred the environmental condition with plants and those who preferred the environment with inanimate objects. There was no significant difference in the score for those who preferred the plant environment (M = 5.69, SD = 1.13) and those who preferred the environment with inanimate objects (M = 5.17, SD = .88); t (40) = 1.33, p = .19 (two-tailed).

Another independent-samples t-test compared the LCN scores for those who preferred the environmental condition with plants and those who preferred the control condition. There was no significant difference in the score for those who preferred the plant environment (M = 5.69, SD = 1.13) and those who preferred the control condition (M = 4.84, SD = .88); t (33) = 1.26, p = .22 (two-tailed).

A final independent-samples t-test was carried out, to examine the difference in LCN score for the group who preferred the environment with plants with those who preferred one of the other environments. The preferred environment score was coded into two answers instead of the original three. The preference for the environment with plants was kept as one variable, while the preference for the environment with inanimate objects and the control condition was merged into another variable. There was no significant difference in the score on the LCN scale for those who preferred the plant environment (M = 5.69, SD = 1.13) and those who preferred one of the other two environments (M = 5.22, SD = 0.92); t (44) = 1.36, p = .18 (two-tailed).

5. Discussion

The current study examined the effect indoor plants had on the experience of an office environment and if the effect was related to attitudes towards nature. Participants in the study were asked to assess photos of three office environments; one environment with plants, one with inanimate objects and a control condition. We expected the environment with plants to be more positively assessed and experienced than the environment with inanimate objects which in turn was thought to be more positively assessed and experienced than the control condition. Preference for the different environments was expected to follow the same pattern. These preferences were thought to be explained by a more positive attitude to nature. The study used a virtual reality theater to give a high degree of immersion in the photographic projections. Photographic projections were used to show several environments in the same session and then compare the results from the different conditions.

As expected the environment with plants was perceived as more pleasant than the environment with inanimate objects and the environment with inanimate objects was perceived as more pleasant than the control condition. The environment with plants was also experienced emotionally as more positive than the environment with inanimate objects which in turn was more positively experienced than the control condition in the scenario task. In the scenario task participants were asked to imagine themselves to have worked in the office for a full working day before answering the questions. A majority of the participants preferred the environment with plants when asked to decide which environment they would prefer to work in.

The experiment showed a relationship between attitudes for nature and a positive emotional response to the environmental condition with plants compared to the environment with inanimate objects. However, attitudes towards nature did not show a relationship between the difference between the environmental condition with plants and the control condition. The reason for using the difference in emotional response as a variable was to be able to examine the differences in the assessments of the environments. There were no significant relationships between perceived pleasantness and attitudes towards nature. Attitudes towards nature were measured with several different methods, and they all showed the same preference towards the environmental condition with plants. This means the data showed no clear relationship between attitudes towards nature and the preference for the environmental

condition with plants. There was a relationship when testing it one way, but the find was supported when testing other ways.

The assessments of the environment and positive preferences for the environmental condition with plants strengthened the assumption that the environments were experienced differently due to the inclusion of plants or inanimate objects in the environments. This is in line with the general assumptions made in the research question.

Other experiments with the same experimental approach also show how natural elements have positive effects on tension and anxiety, two common stress markers, as well as physiological reactions (Chang & Chen 2005). They have also compared the results from exposing the participants to the same environment, but changing some of the key elements before assessing and measuring physiological signs. This emotional response to nature and environments with plants is also reported in other studies, even though the methods are different and not directly comparable. The preference for nature is attributed to nature's restorative potential in the studies. The studies point towards a relation between perceived attractiveness and stress reduction (Dijkstra et al. 2008; van den Berg et al. 2003) and towards perceived attractiveness and an increase in mood (Larsen et al. 1998; Ulrich et al. 1991).

These preferences are in line with the stress reduction theory (Ulrich et al. 1991), where it is argued that restorative environments lessen feelings of stress and anxiety, and thus contributing to perceived well-being. Plants in a room will increase the perceived attractiveness and stress-reducing effects, and due to the connection between attractiveness and stress-reduction, be preferred over other environments. This mechanism can explain why the plant condition was rated more positively on both scales in the current study. This in turn is reinforced by the general assumption presented by Hartig et al. (2011), where the authors state that environmental preference can be an indication of conditions relevant to well-being.

The research question assumes a strong relationship between preference and responses to nature and attitudes towards nature. Of the seven analyses performed, only one of them showed the assumed relationship. The simplest test was the independent-samples t-test that tested whether preference for the environmental condition with plants was related to attitudes towards nature. This t-test did not show any relationship between the variables. On the simple question on which environment one would prefer to work in, most participants would want to work in the office with plants. Explanations to why the preference towards one environment is so clearly marked can vary, although some explanations are more likely than others.

The cultural response to nature and natural elements is also a factor to consider in this study. Wilson states in his article "Biophilia and the conservation ethic" (Kellert & Wilson 1993), that "many emotional responses are woven into a large part of culture." In the present study, one could argue that a large part of the emotional responses and environmental assessments are due to subconscious cultural conditions, rather than conscious and deliberate answers in a questionnaire. This can explain why the data in the current study all show that environment with the plant condition is the preferred environment, while there is only one inconsistent relationship with the love and care for nature scale. The plant condition is preferred due to cultural responses to natural elements, while the same cultural responses do not manifest in the Love and Care for nature scale. It is possible that positive attitudes towards nature do not have a relationship with preference for office settings with natural elements. People can have positive attitudes towards nature but this does not have to signify that they prefer an office full of plants. We can assume that people with positive attitudes towards nature visit nature when they feel the need. At the same time, most participants chose the office with plants when asked which environment they would prefer to work in.

5.1 Methodological issues

The emotional experience of the environments is part of the key to understanding the current study. The Love and Care for nature scale is designed to measure the emotional relationship with nature (Perkins 2010), and was therefore thought to be a good measure for the study. At the same time, comparing LCN to the positive preference and emotional response seemed a valid procedure in this study. The assumption was made that the measure of emotional relationship with nature should have a correlation with a preference for natural environments and positive emotions. The assumption seemed correct in one of the tests. The LCN was chosen to measure the specific affective response to nature. LCN correlated with the INS, so the assumption could be made that the LCN scale had high construct validity, or measured the wanted emotional relationship with nature.

The scale used to measure attitude towards nature could explain the results. The LCN scale is not originally Norwegian, it is translated from English. Some important nuances could have been lost in the translation, even though steps were taken to insure that the Norwegian and English versions meant the same, the wording was emotional, with some phrases possibly

being experienced as pompous and foreign. Additionally, none of the phrases used in the scale were negatively worded and the scale could easily have been responded to in an automatic manner.

At the same time, there could be other mechanisms that could explain the data. One could argue that the love and care for nature scale does not measure the right factor when searching for answers to why the plant condition is preferred. All of the assessed environments also have a large window in them, with a large leafy tree outside. This gives a continuous green element to each projection, independent of the other conditions. The current study assumes that the window does not affect the data to a high enough degree, as the data shows significant differences between the environments.

There is no difference in LCN between those who prefer the office setting and those who prefer one of the other settings. One way of looking at it is that plants in the office are not considered to be important enough when relating to nature. There does not have to be a relationship between the factors, people with high love for nature presumably seek out nature experiences in other places.

The mean score on the Love and Care for nature scale was high. In other words the participants in the study all felt a high degree of positive attitudes towards nature. There is however no difference in the preference for the environment with natural elements between those with a more positive attitude towards nature. The participants might not believe or think that there is a need for plants in the workplace.

5.2 Methodological Limitations

In the current study all participants were recruited from the university campus at the Norwegian University of Life Science. Many of the participants were from the same classes and were therefore likely to have many of the same interests. This could create a selection bias, even though steps were taken to counter this type of bias (Shadish et al. 2002). The argument can be made that the participants were too similar in their views on natural elements at the workplace, even if statistical testing showed acceptable results. The use of university students can also be questioned as the study shows photographic projections of an office space. It is not certain all participants can realistically immerse themselves in this type of

projection and scenario, due to uncertainties to whether the participants have experienced this type of workplace.

Scenario tasks are used in experimental studies concerning the effect of contact with nature (Herzog et al. 1997; Herzog et al. 2011; Staats et al. 2003). They are used as a means to collect data from large groups of people, in a cost and time efficient manner. By using scenario tasks researchers assume that participants can project themselves into common situations and imagine their reactions. As long as the scenario is a common enough setting, there should not be a threat to the external validity of the study (Herzog et al. 2011). However, scenario tasks can be an unknown factor in the study, as participants can give different meanings to even the most common situations. The same study by Herzog et al. (2011) also speculates upon the validity of using photos or other simulated environments. They argue that literature on the issue, including (Wilson et al. 1995), show that photos provide a valid data regarding evaluative responses. By using photos the researchers can have some control over what is actually experienced.

The study could also have included more participants to counter low statistical power. More participants would increase the power of the study and could prevent a false result when testing the null-hypothesis (Shadish et al. 2002).

There could be other factors that explain the results, which the study does not incorporate. The experimental study was designed to remove many of the potentially confounding factors, but there is no guarantee that all competing factors were taken into account. The design has taken sensory stimuli into account, the VR theater was the same in all three sessions, with the same visual and audio impulses. Without these precautions, wind and weather can affect the results. All sessions were held on the same day. The social factor could not be controlled, and the interactions within the group could have affected the results.

The experiment design itself could have threatened internal validity of the study. When answering the same questions three times, one can argue that the repetition of the assessments in the questionnaire affected the answers in subsequent rounds. The questions become familiar and one interprets the same questions in a different manner each time. These threats were included in the process of designing the experiment, by having the three groups view the environments in a different order each time.

The threats to external validity in this case include several issues around generalization. Can the data in this study be applied to other populations and will other populations answer in the same way? If all threats to external validity were unfounded, the results from the current study would apply to any random population (Shadish et al. 2002).

The limitations of the Love and Care for nature scale has already been discussed, and many of the questions raised around the Love and Care for Nature scale can also be raised when evaluating the other scales. Especially language and context issues can be discussed concerning all the scales. Special care has to be exercised under translation to ensure similar meaning. On a similar note, there exist other scales that measure parts of the same environmental features as the current study does.

5.3 Further research and practical implications

The results from this study can be used to advocate the use of more natural elements in workplaces. With workplaces being places where a lot of time is spent during the day, it can be beneficial to improve these environments. This and other studies show that the working environment has an impact on working conditions, and that the inclusion of natural elements can be a cost effective method to improve these conditions. In Norway the winter is long and grey and an increased amount of natural elements in the workplace can have an effect on public health. The results in this study show that the indoor environment can influence well-being and that preference for the environment with natural elements can be related to factors beneficial to well-being.

Further studies on the same topic are highly recommended. The study should then include a larger population, encompassing groups of people with greater varieties in backgrounds and interests. Larger groups will also provide stronger statistical validity as described earlier.

Other studies can also use the same experimental methods but with live plants instead of showing photographic projections of environments. One could argue that the only way to properly examine the effect of an environment is by experiencing it, with sight, sound and smell. This can also be said of the scenario assignment, that the only way to properly measure restoration from mental fatigue is by using participants who are in fact fatigued.

6. Conclusion

This study has shown that an environment with natural elements is assessed as more pleasant and evokes a more positive emotional response than the same environment without natural elements. The same assessment also applies to the environment with inanimate objects compared to the control condition. With this in mind, natural elements can be used deliberately to affect the working conditions and workplace health.

The current study found indications of a relation between positive emotional response and attitudes towards nature. This single positive result was inconsistent as long as none of the other analysis shows the same relationship. The answer to the main research question may be that there is not a strong relationship between attitudes toward nature and the preference for plants in an office setting. The discussion has pointed out that there could be other factors influencing this study. The LCN can be at fault and not measure the wanted attitude towards nature. There might exist other relationships between well-being and nature that the scales and assessment instruments used in this study were unable to measure.

This paper has pointed towards some possibilities to why an indoor environment with plants was assessed more favorably. While some of the answer may lie in nature's potential for restoration and the innate preference for nature, other parts can be attributed to a cultural tendency to prefer plants and natural elements.

References

Berto, R. (2005). Exposure to restorative environments helps restore attentional capacity. *Journal of Environmental Psychology*, 25 (3): 249-259.

Cervinka, R., Röderer, K. & Hefler, E. (2012). Are nature lovers happy? On various indicators of well-being and connectedness with nature. *Journal of Health Psychology*, 17 (3): 379-388.

Chang, C.-Y. & Chen, P.-K. (2005). Human Response to Window Views and Indoor Plants in the Workplace. *Hortscience*, 40 (5): 1354-1359.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Hillsdale, N. J.: Laurence Erlbaum. XXI, 567 s. pp.

de Vries, S., Verheij, R. A., Groenewegen, P. P. & Spreeuwenberg, P. (2003). Natural environments -- healthy environments? An exploratory analysis of the relationship between greenspace and health. *Environment and Planning A*, 35 (10): 1717-1731.

Dijkstra, K., Pieterse, M. E. & Pruyn, A. (2008). Stress-reducing effects of indoor plants in the built healthcare environment: The mediating role of perceived attractiveness. *Preventive Medicine*, 47 (3): 279-283.

Dravigne, A., Waliczek, T. M., Lineberger, R. D. & Zajicek, J. M. (2008). The Effect of Live Plants and Window Views of Green Spaces on Employee Perceptions of Job Satisfaction. *Hortscience*, 43 (1): 183-187.

Gifford, R. (1987). *Environmental psychology: principles and practice*. Boston, Mass.: Allyn & Bacon. vii, 472 s. pp.

Hartig, T., Korpela, K., Evans, G. W. & Garling, T. (1997). A measure of restorative quality in environments. *Scandinavian Housing & Planning Research*, 14 (4): 175-194.

Hartig, T., Evans, G. W., Jamner, L. D., Davis, D. S. & Gärling, T. (2003). Tracking restoration in natural and urban field settings. *Journal of Environmental Psychology*, 23 (2): 109-123.

Hartig, T. & Staats, H. (2006). The need for psychological restoration as a determinant of environmental preferences. *Journal of Environmental Psychology*, 26 (3): 215-226.

Hartig, T., Berg, A. E., Hagerhall, C. M., Tomalak, M., Bauer, N., Hansmann, R., Ojala, A., Syngollitou, E., Carrus, G., Herzele, A., et al. (2011). Health Benefits of Nature Experience: Psychological, Social and Cultural Processes. In Nilsson, K., Sangster,

M., Gallis, C., Hartig, T., Vries, S., Seeland, K. & Schipperijn, J. (eds), *Forests, Trees and Human Health*. pp. 127-168: Springer Netherlands.

Herzog, T. R., Black, A. M., Fountaine, K. A. & Knotts, D. J. (1997). REFLECTION AND ATTENTIONAL RECOVERY AS DISTINCTIVE BENEFITS OF RESTORATIVE ENVIRONMENTS. *Journal of Environmental Psychology*, 17 (2): 165-170.

Herzog, T. R., Hayes, L. J., Applin, R. C. & Weatherly, A. M. (2011). Compatibility: An Experimental Demonstration. *Environment and Behavior*, 43 (1): 90-105.

Howell, A. J., Dopko, R. L., Passmore, H.-A. & Buro, K. (2011). Nature connectedness: Associations with well-being and mindfulness. *Personality and Individual Differences*, 51 (2): 166-171.

Kaplan, R. (1993). The role of nature in the context of the workplace. *Landscape and Urban Planning*, 26 (1–4): 193-201.

Kaplan, R. & Kaplan, S. (1995). *The experience of nature: a psychological perspective*. Ann Arbor, Mich.: Ulrich's Bookstore. XII, 340 s. pp.

Karasek, R. & Theorell, T. (1990). *Healthy work: stress, productivity, and the reconstruction of working life*. [New York]: Basic Books. XV, 381 s. pp.

Kellert, S. R. & Wilson, E. O. (1993). *The Biophilia hypothesis*. Washington, D.C.: Island Press. 484 s. pp.

Küller, R. (1991). Environmental Assessment from a Neuropsychological Perspective. In Evans, T. & Gärling, T. (eds) *Environment, Cognition and Action. An integrative approach*. New York: Oxford University Press.

Largo-Wight, E. (2011). Cultivating healthy places and communities: evidenced-based nature contact recommendations. *International Journal of Environmental Health Research*, 21 (1): 41-61.

Largo-Wight, E., Chen, W. W., Dodd, V. & Weiler, R. (2011). Healthy workplaces: the effects of nature contact at work on employee stress and health. *Public Health Rep*, 126 Suppl 1: 124-30.

Larsen, L., Adams, J., Deal, B., Kweon, B. S. & Tyler, E. (1998). Plants in the Workplace. *Environment and Behavior*, 30 (3): 261-281.

Lohr, V. I., Pearson-Mims, C. H. & Goodwin, G. K. (1996). Interior Plants May Improve Worker Productivity and Reduce Stress in a Windowless Environment. *J. Environ. Hort.*, 14(2): 97-100.

Lohr, V. I. & Pearson-Mims, C. H. (2000). Physical Discomfort May Be Reduced in the Presence of Interior Plants. *HortTechnology*, 10 (1): 53-58.

Lohr, V. I. & Pearson-Mims, C. H. (2005). Children's Active and Passive Interactions with Plants Influence Their Attitudes and Actions toward Trees and Gardening as Adults. *HortTechnology*, 15 (3): 472-476.

Maller, C., Townsend, M., Pryor, A., Brown, P. & St Leger, L. (2006). Healthy nature healthy people: 'contact with nature' as an upstream health promotion intervention for populations. *Health Promot Int*, 21 (1): 45-54.

Mayer, F. S. & Frantz, C. M. (2004). The connectedness to nature scale: A measure of individuals' feeling in community with nature. *Journal of Environmental Psychology*, 24 (4): 503-515.

Pallant, J. (2007). *SPSS survival manual: a step by step guide to data analysing using SPSS for Windows*. Maidenhead: McGraw-Hill ; Open University Press. XV, 335 s. pp.

Perkins, H. E. (2010). Measuring love and care for nature. *Journal of Environmental Psychology*, 30 (4): 455-463.

Raanaas, R. K., Evensen, K. H., Rich, D., Sjostrom, G. & Patil, C. (2011). Benefits of indoor plants on attention capacity in an office setting. *Journal of Environmental Psychology*, 31 (1): 99-105.

Schubert, T., Friedmann, F. & Regenbrecht, H. (2008). *igroup presence questionnaire (IPQ) overview*. Available at: http://www.igroup.org/pq/ipq/index.php (accessed: 16.05.2012).

Shadish, W. R., Cook, T. D. & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. Boston: Houghton Mifflin. XXI, 623 s. pp.

Staats, H., Kieviet, A. & Hartig, T. (2003). Where to recover from attentional fatigue: An expectancy-value analysis of environmental preference. *Journal of Environmental Psychology*, 23 (2): 147-157.

Ulrich, R. S., Simons, R. F., Losito, B. D., Fiorito, E., Miles, M. A. & Zelson, M. (1991). Stress recovery during exposure to natural and urban environments. *Journal of Environmental Psychology*, 11 (3): 201-230.

Vaage, O. F. (2012). Tidene skifter, tidsbruk 1971-2010: Statistisk Sentrabyrå.

van den Berg, A. E., Koole, S. L. & van der Wulp, N. Y. (2003). Environmental preference and restoration: (How) are they related? *Journal of Environmental Psychology*, 23 (2): 135-146.

van den Berg, A. E., Maas, J., Verheij, R. A. & Groenewegen, P. P. (2010). Green space as a buffer between stressful life events and health. *Social Science & Medicine*, 70 (8): 1203-1210.

Wesley Schultz, P. (2001). The structure of environmental concern: Concern for self, other people, and the biosphere. *Journal of Environmental Psychology*, 21 (4): 327-339.

WHO. (2011a). *Occupational Health*. Available at: http://www.who.int/occupational_health/en/ (accessed: 27.09.2011).

WHO. (2011b). *Stress at the workplace*. Available at: http://www.who.int/occupational_health/topics/stressatwp/en/index.html (accessed: 26.09.2011).

WHO. (2012). *Health Promotion*. Available at: http://www.who.int/topics/health_promotion/en/ (accessed: 02.08.2012).

Wilson, E. O. (1984). *Biophilia. The Human Bond with Other Species*: Harvard University Press.

Wilson, M. I., Robertson, L. D., Daly, M. & Walton, S. A. (1995). Effects of visual cues on assessment of water quality. *Journal of Environmental Psychology*, 15 (1): 53-63.

Appendix 1 : The questionnaire

Beskrivelse og bedømming av bilder

Gruppe:

Bilde 1

Miljøbeskrivelse

Tenk deg at kontoret du ser avbildet foran deg er din arbeidsplass.

Beskriv miljøet med fem adjektiv:

Instruksjon

Et miljø kan bedømmes på mange måter. En kan for eksempel synes det er mer eller mindre vakkert, stort eller lite, eller mer eller mindre stygt.

Dette skjema inneholder en rekke skalaer der du skal vurdere hvordan du opplever miljøet du ser på bildene som blir presentert for deg. Her er eksempel på en skala:

FARGERIKT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

Ovenfor skalaen står hvilken kvalitet ved miljøet skalaen måler (FARGERIKT).

Marker med ett kryss i en rute for hvor godt du synes det stemmer med opplevelsen av miljøet.

MODERNE

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

VARIERT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

STYGT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

EIENDOMMELIG

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

VERDIFULLT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

MASKULINT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

STIMULERENDE

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

LUKKET

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

FUNKSJONELT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

VELHOLDT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

VANLIG

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

TRYGT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

STILRENT

litt □ □ □ □ □ □ □ svært

KJEDELIG

litt □ □ □ □ □ □ □ svært

SKJØRT

litt □ □ □ □ □ □ □ svært

DEMPET

litt □ □ □ □ □ □ □ svært

TIDLØST

litt □ □ □ □ □ □ □ svært

ÅPENT

litt □ □ □ □ □ □ □ svært

IDYLLISK

litt □ □ □ □ □ □ □ svært

OVERRASKENDE

litt □ □ □ □ □ □ □ svært

ENKELT

litt □ □ □ □ □ □ □ svært

GAMMELDAGS

litt □ □ □ □ □ □ □ svært

GJENNOMFØRT

litt □ □ □ □ □ □ □ svært

LIVLIG

litt □ □ □ □ □ □ □ svært

GODT

litt □ □ □ □ □ □ □ svært

AVGRENSET

litt □ □ □ □ □ □ □ svært

KRAFTFULLT

litt □ □ □ □ □ □ □ svært

NYTT

litt □ □ □ □ □ □ □ svært

PÅKOSTET

litt □ □ □ □ □ □ □ svært

SAMMENSATT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

TRIVELIG

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

FEMININT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

HELHETLIG

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

BRUTALT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

SPESIELT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

LUFTIG

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

Det følgende sier noe om hva du synes om kontormiljøet som *helhet*:

Marker med ett kryss i hvilken grad påstanden stemmer.

Dette stedet tiltaler meg

liten grad ☐ ☐ ☐ ☐ ☐ ☐ ☐ stor grad

Dette stedet vekker min nysgjerrighet

liten grad ☐ ☐ ☐ ☐ ☐ ☐ ☐ stor grad

Det er mye å utforske og oppdage her

liten grad ☐ ☐ ☐ ☐ ☐ ☐ ☐ stor grad

Min oppmerksomhet blir ledet mot mange interessante ting

liten grad ☐ ☐ ☐ ☐ ☐ ☐ ☐ stor grad

Dette stedet er fascinerende

liten grad ☐ ☐ ☐ ☐ ☐ ☐ ☐ stor grad

Jeg er interessert i hva som skjer i kontormiljøet

liten grad ☐ ☐ ☐ ☐ ☐ ☐ ☐ stor grad

Se for deg at du sitter i dette rommet og arbeider.

Hvordan ville du kjenne deg etter en dag ved denne arbeidsplassen?

Marker svarene dine med ett kryss per linje.

☐ svært sliten	☐ ganske sliten	☐ ganske uthvilt	☐ svært uthvilt
☐ svært trygg	☐ ganske trygg	☐ ganske engstelig	☐ svært engstelig
☐ svært uinteressert	☐ ganske uinteressert	☐ ganske interessert	☐ svært interessert
☐ svært selvsikker	☐ ganske selvsikker	☐ ganske ubesluttsom	☐ svært ubesluttsom
☐ svært pigg	☐ ganske pigg	☐ ganske døsig	☐ svært døsig
☐ svært sint	☐ ganske sint	☐ ganske vennlig	☐ svært vennlig
☐ svært effektiv	☐ ganske effektiv	☐ ganske uforetaksom	☐ svært uforetaksom
☐ svært avhengig	☐ ganske avhengig	☐ ganske selvstendig	☐ svært selvstendig
☐ svært søvnig	☐ ganske søvnig	☐ ganske våken	☐ svært våken
☐ svært glad	☐ ganske glad	☐ ganske trist	☐ svært trist
☐ svært likegyldig	☐ ganske likegyldig	☐ ganske engasjert	☐ svært engasjert
☐ svært sterk	☐ ganske sterk	☐ ganske svak	☐ svært svak

Vennligst vent

Bilde 2

Miljøbeskrivelse

Tenk deg at kontoret du ser avbildet foran deg er din arbeidsplass.

Beskriv miljøet med fem adjektiv:

Instruksjon

Et miljø kan bedømmes på mange måter. En kan for eksempel synes det er mer eller mindre vakkert, stort eller lite, eller mer eller mindre stygt.

Dette skjema inneholder en rekke skalaer der du skal vurdere hvordan du opplever miljøet du ser på bildene som blir presentert for deg. Her er eksempel på en skala:

FARGERIKT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

Ovenfor skalaen står hvilken kvalitet ved miljøet skalaen måler (FARGERIKT).

Marker med ett kryss i en rute for hvor godt du synes det stemmer med opplevelsen av miljøet.

MODERNE

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

VARIERT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

STYGT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

EIENDOMMELIG

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

VERDIFULLT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

MASKULINT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

STIMULERENDE

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

LUKKET

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

FUNKSJONELT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

VELHOLDT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

VANLIG

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

TRYGT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

STILRENT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

KJEDELIG

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

SKJØRT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

DEMPET

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

TIDLØST

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

ÅPENT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

IDYLLISK

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

OVERRASKENDE

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

ENKELT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

GAMMELDAGS

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

GJENNOMFØRT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

LIVLIG

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

GODT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

AVGRENSET

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

KRAFTFULLT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

NYTT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

PÅKOSTET

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

SAMMENSATT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

TRIVELIG

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

FEMININT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

HELHETLIG

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

BRUTALT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

SPESIELT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

LUFTIG

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

Det følgende sier noe om hva du synes om kontormiljøet som *helhet*:

Marker med ett kryss i hvilken grad påstanden stemmer.

Dette stedet tiltaler meg

liten grad ☐ ☐ ☐ ☐ ☐ ☐ ☐ stor grad

Dette stedet vekker min nysgjerrighet

liten grad ☐ ☐ ☐ ☐ ☐ ☐ ☐ stor grad

Det er mye å utforske og oppdage her

liten grad ☐ ☐ ☐ ☐ ☐ ☐ ☐ stor grad

Min oppmerksomhet blir ledet mot mange interessante ting

liten grad ☐ ☐ ☐ ☐ ☐ ☐ ☐ stor grad

Dette stedet er fascinerende

liten grad ☐ ☐ ☐ ☐ ☐ ☐ ☐ stor grad

Jeg er interessert i hva som skjer i kontormiljøet

liten grad ☐ ☐ ☐ ☐ ☐ ☐ ☐ stor grad

Se for deg at du sitter i dette rommet og arbeider.

Hvordan ville du kjenne deg etter en dag ved denne arbeidsplassen?

Marker svarene dine med ett kryss per linje.

☐ svært sliten	☐ ganske sliten	☐ ganske uthvilt	☐ svært uthvilt
☐ svært trygg	☐ ganske trygg	☐ ganske engstelig	☐ svært engstelig
☐ svært uinteressert	☐ ganske uinteressert	☐ ganske interessert	☐ svært interessert
☐ svært selvsikker	☐ ganske selvsikker	☐ ganske ubesluttsom	☐ svært ubesluttsom
☐ svært pigg	☐ ganske pigg	☐ ganske døsig	☐ svært døsig
☐ svært sint	☐ ganske sint	☐ ganske vennlig	☐ svært vennlig
☐ svært effektiv	☐ ganske effektiv	☐ ganske uforetaksom	☐ svært uforetaksom
☐ svært avhengig	☐ ganske avhengig	☐ ganske selvstendig	☐ svært selvstendig
☐ svært søvnig	☐ ganske søvnig	☐ ganske våken	☐ svært våken
☐ svært glad	☐ ganske glad	☐ ganske trist	☐ svært trist
☐ svært likegyldig	☐ ganske likegyldig	☐ ganske engasjert	☐ svært engasjert
☐ svært sterk	☐ ganske sterk	☐ ganske svak	☐ svært svak

Vennligst vent

Bilde 3

Miljøbeskrivelse

Tenk deg at kontoret du ser avbildet foran deg er din arbeidsplass.

Beskriv miljøet med fem adjektiv:

Instruksjon

Et miljø kan bedømmes på mange måter. En kan for eksempel synes det er mer eller mindre vakkert, stort eller lite, eller mer eller mindre stygt.

Dette skjema inneholder en rekke skalaer der du skal vurdere hvordan du opplever miljøet du ser på bildene som blir presentert for deg. Her er eksempel på en skala:

FARGERIKT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

Ovenfor skalaen står hvilken kvalitet ved miljøet skalaen måler (FARGERIKT).

Marker med ett kryss i en rute for hvor godt du synes det stemmer med opplevelsen av miljøet.

MODERNE

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

VARIERT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

STYGT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

EIENDOMMELIG

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

VERDIFULLT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

MASKULINT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

STIMULERENDE

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

LUKKET

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

FUNKSJONELT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

VELHOLDT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

VANLIG

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

TRYGT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

STILRENT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

KJEDELIG

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

SKJØRT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

DEMPET

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

TIDLØST

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

ÅPENT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

IDYLLISK

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

OVERRASKENDE

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

ENKELT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

GAMMELDAGS

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

GJENNOMFØRT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

LIVLIG

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

GODT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

AVGRENSET

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

KRAFTFULLT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

NYTT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

PÅKOSTET

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

SAMMENSATT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

TRIVELIG

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

FEMININT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

HELHETLIG

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

BRUTALT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

SPESIELT

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

LUFTIG

litt ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært

Det følgende sier noe om hva du synes om kontormiljøet som *helhet*:

Marker med ett kryss i hvilken grad påstanden stemmer.

Dette stedet tiltaler meg

liten grad ☐ ☐ ☐ ☐ ☐ ☐ ☐ stor grad

Dette stedet vekker min nysgjerrighet

liten grad ☐ ☐ ☐ ☐ ☐ ☐ ☐ stor grad

Det er mye å utforske og oppdage her

liten grad ☐ ☐ ☐ ☐ ☐ ☐ ☐ stor grad

Min oppmerksomhet blir ledet mot mange interessante ting

liten grad ☐ ☐ ☐ ☐ ☐ ☐ ☐ stor grad

Dette stedet er fascinerende

liten grad ☐ ☐ ☐ ☐ ☐ ☐ ☐ stor grad

Jeg er interessert i hva som skjer i kontormiljøet

liten grad ☐ ☐ ☐ ☐ ☐ ☐ ☐ stor grad

Se for deg at du sitter i dette rommet og arbeider.

Hvordan ville du kjenne deg etter en dag ved denne arbeidsplassen?

Marker svarene dine med ett kryss per linje.

☐ svært sliten	☐ ganske sliten	☐ ganske uthvilt	☐ svært uthvilt
☐ svært trygg	☐ ganske trygg	☐ ganske engstelig	☐ svært engstelig
☐ svært uinteressert	☐ ganske uinteressert	☐ ganske interessert	☐ svært interessert
☐ svært selvsikker	☐ ganske selvsikker	☐ ganske ubesluttsom	☐ svært ubesluttsom
☐ svært pigg	☐ ganske pigg	☐ ganske døsig	☐ svært døsig
☐ svært sint	☐ ganske sint	☐ ganske vennlig	☐ svært vennlig
☐ svært effektiv	☐ ganske effektiv	☐ ganske uforetaksom	☐ svært uforetaksom
☐ svært avhengig	☐ ganske avhengig	☐ ganske selvstendig	☐ svært selvstendig
☐ svært søvnig	☐ ganske søvnig	☐ ganske våken	☐ svært våken
☐ svært glad	☐ ganske glad	☐ ganske trist	☐ svært trist
☐ svært likegyldig	☐ ganske likegyldig	☐ ganske engasjert	☐ svært engasjert
☐ svært sterk	☐ ganske sterk	☐ ganske svak	☐ svært svak

Vennligst vent

I hvilket av kontorinteriørene ville du foretrukket å arbeide i?

☐ Kontor 1 ☐ Kontor 2 ☐ Kontor 3

I hvilken grad er du enig i følgende utsagn?

Jeg opplevde at jeg var i kontormiljøet som ble vist

liten grad ☐ ☐ ☐ ☐ ☐ ☐ ☐ stor grad

Jeg opplevde det som om kontormiljøet omsluttet meg

liten grad ☐ ☐ ☐ ☐ ☐ ☐ ☐ stor grad

Jeg følte at jeg bare så på bilder

liten grad ☐ ☐ ☐ ☐ ☐ ☐ ☐ stor grad

Jeg følte meg ikke tilstede i kontormiljøet

liten grad ☐ ☐ ☐ ☐ ☐ ☐ ☐ stor grad

Jeg følte meg tilstede i kontormiljøet

liten grad ☐ ☐ ☐ ☐ ☐ ☐ ☐ stor grad

Hvor oppmerksom var du på det virkelige miljøet rundt deg (lyder, temperatur, andre mennesker o.s.v.)

liten grad ☐ ☐ ☐ ☐ ☐ ☐ ☐ stor grad

Jeg la ikke merke til det virkelige miljøet rundt meg

liten grad ☐ ☐ ☐ ☐ ☐ ☐ ☐ stor grad

Jeg var fortsatt oppmerksom på det virkelige miljøet rundt meg

liten grad ☐ ☐ ☐ ☐ ☐ ☐ ☐ stor grad

Jeg ble fullstendig ”dratt inn” i miljøet som ble vist

liten grad ☐ ☐ ☐ ☐ ☐ ☐ ☐ stor grad

I hvilken grad du er enig i følgende utsagn:

Det er viktig for meg å ha planter rundt meg når jeg sitter inne og arbeider

svært uenig ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært enig

Det er viktig for meg å kunne se ut til naturen gjennom vinduet

svært uenig ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært enig

Jeg får ofte en følelse av ærefrykt og undring når jeg er ute i urørt natur

svært uenig ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært enig

Når jeg tilbringer tid i urørt natur, føler jeg ofte at hverdagsbekymringene mine blir mindre i møte med naturens underverk

svært uenig ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært enig

Jeg føler meg tilfreds og nesten som hjemme når jeg er i urørt natur

svært uenig ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært enig

Jeg kjenner meg ofte følelsesmessig nær naturen

svært uenig ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært enig

Når jeg er i naturen, kjenner jeg meg følelsesmessig nær naturen

svært uenig ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært enig

Når jeg er tett på naturen, føler jeg meg virkelig i ett med naturen

svært uenig ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært enig

Jeg føler glede bare ved å være i naturen

svært uenig ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært enig

Jeg har en personlig opplevelse av å være forbundet med resten av naturen

svært uenig ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært enig

Jeg føler en dyp kjærlighet til naturen

svært uenig ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært enig

Jeg føler at nærhet til naturen er viktig for mitt velvære

svært uenig ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært enig

Jeg føler meg åndelig knyttet til resten av naturen

svært uenig ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært enig

Det å beskytte naturen for naturens egen skyld er viktig for meg

svært uenig ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært enig

Jeg må ha så mye natur rundt meg som mulig

svært uenig ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært enig

Jeg føler ofte en sterk omsorg for naturen

svært uenig ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært enig

Jeg liker å lære om naturen

svært uenig ☐ ☐ ☐ ☐ ☐ ☐ ☐ svært enig

Til slutt ber vi deg sette en sirkel rundt bildet som best beskriver ditt forhold til naturen. Hvor sterkt forbundet er du med naturen?

Alder:

Kjønn:

Studieretning/fag:

Årstrinn:

Takk for at du tok deg tid til å delta i undersøkelsen!

Appendix 2: Written consent form

Katinka Evensen, PhD student

IPM, UMB, 64 96 56 57

katinka.evensen@umb.no

Samtykkeerklæring

Jeg samtykker i å delta i øvelsen som omhandler beskrivelse og bedømming av bilder på storskjerm i Virtual Reality laboratoriet på UMB.

Jeg er klar over at øvelsen er anonym og varer en drøy halvtime, samt at deltakelsen er frivillig og at jeg har rett til å trekke meg når som helst i undersøkelsen.

…….. ……

Sted og dato Navn

Appendix 3: Illustrative photos showing the Virtual Reality theater

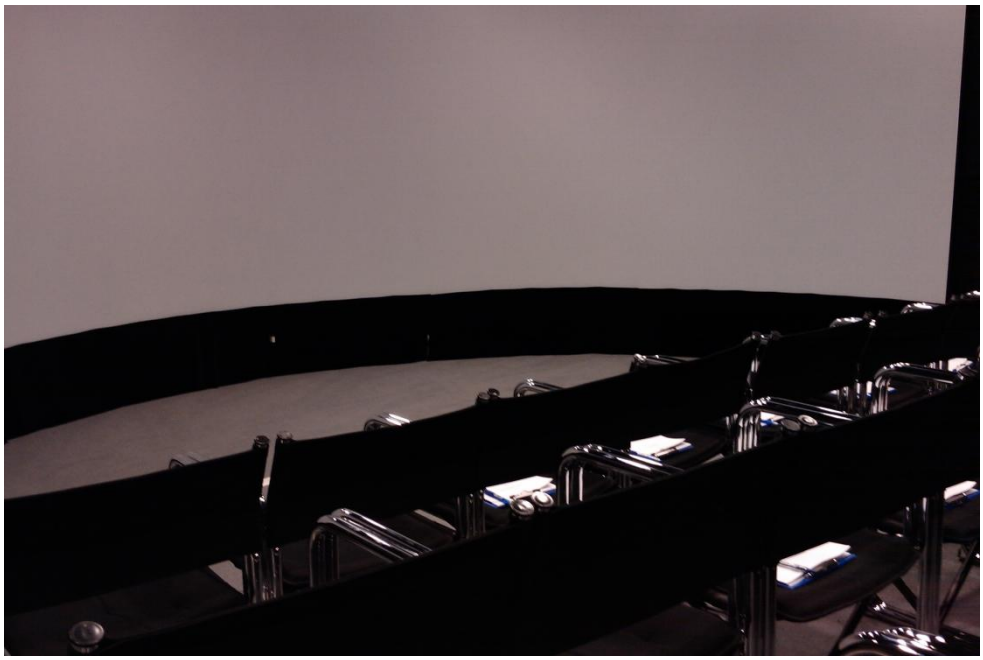

Photo 1: The view of the large curved screen from the back row

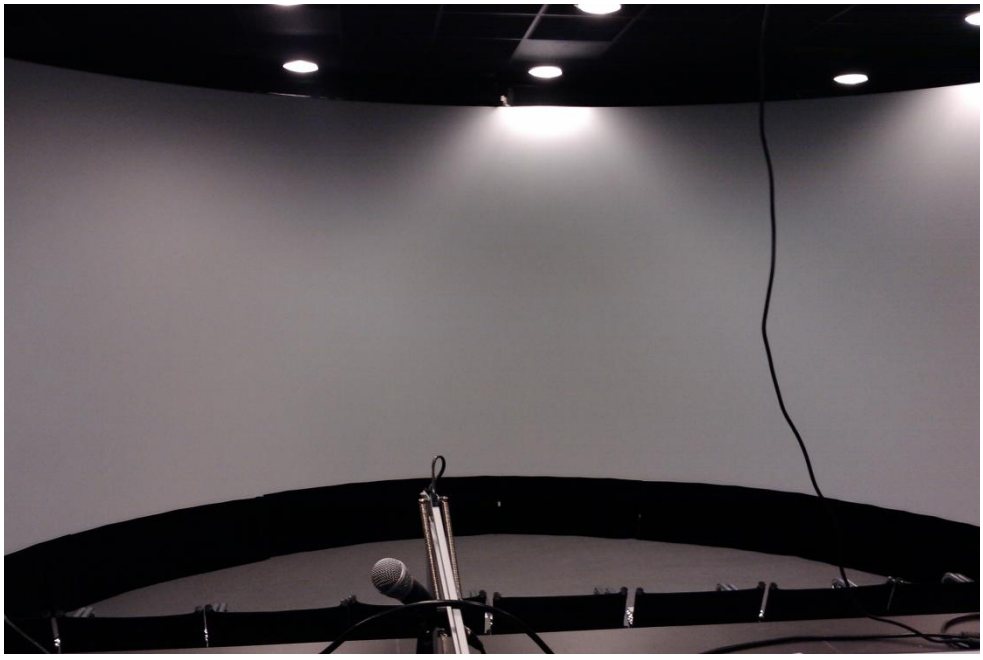

Photo 2: The large curved screen

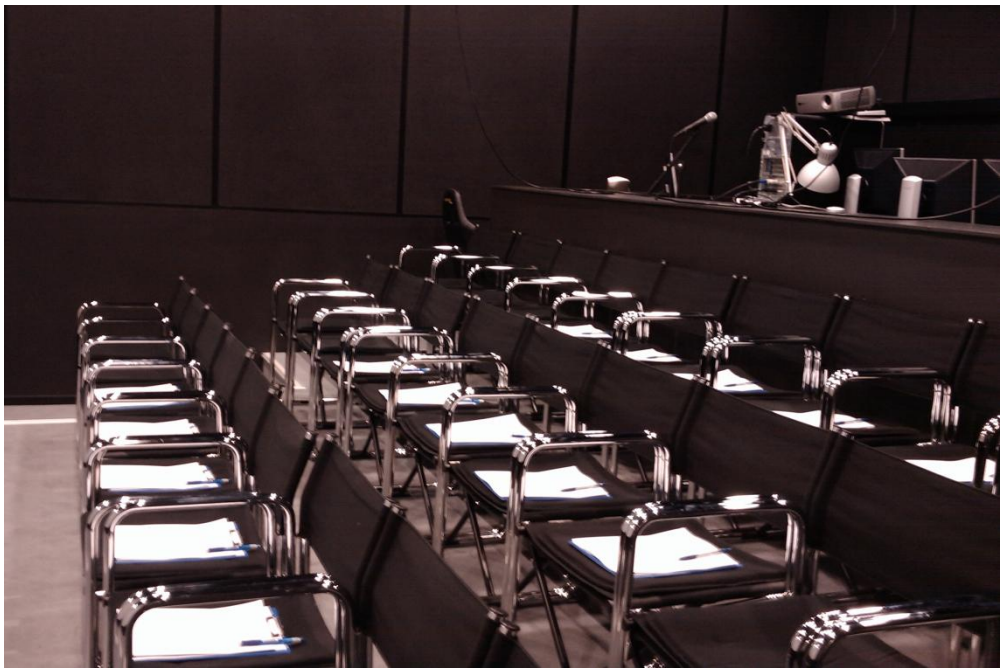

Photo 3: The seating arrangements

Photo 4: Viewing and assessing the control condition