

Bridging the Gap; Connecting the Office to Nature via a New Program: "Take 10 (Minutes) Outside"

Project Proposal

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Bridging the Gap; Connecting the Office to Nature via a New Program: “Take 10 (Minutes) Outside”

I. Introduction

- A. **Brief summary of the Problem.** Current research is pointing to the increased need for adults to spend quality time in nature. Studies have shown both mental and physical health benefits from time spent outside. Research has also indicated that accuracy (proofreading, for example) is greater after spending time in a natural setting. Much of the current research on this topic involves subjects spending 30 minutes (or significantly more) in a wilderness area. Project Nature Connect (PNC) philosophy also focuses on time spent with nature but allows for a broader definition of nature (to include a potted plant or a fish tank) and a shorter time interval to develop positive results.
- B. **Statement of Research Question as a Hypothesis.** The productivity and personal well-being of office workers increases when they take two 10 minute breaks out-of-doors to connect with nature.
- C. **Objective or purpose of the exploratory aspect of the Doctoral Project.** What would happen if the Natural Systems Thinking Process (NSTP) philosophy were brought into the workplace? Will short segments of time spent out-of-doors, in nature, during the work day have a positive impact on the lives of the employees?
- D. **Brief summary of the project procedures.**

This study will include employed test subjects who work in a traditional office or trade setting in an urban area. Participants work in a variety of professions which include: science, medical, sales, construction, administration and consulting. There will also be a mix of gender and age.

All subjects will sign a participation consent form. Approximately twenty-six participants ranging in age between their mid 20's to mid 50's will be studied. An equal mix of male to female participants is planned. The study will begin with the Warwick-Edinburgh Mental Well-Being Scale (WEMWBS) standardized test documenting the participant's level of mental and physical wellness. Included with the WEMWBS online questionnaire will be a series of questions to the participants to gauge how they define nature and their interaction and feelings about nature prior to the study. This will establish the baseline.

The Nature Systems Thinking Process (NSTP) process is the model around which this experiment has been framed. In basic terms we have been taught to go experience nature, typically through an activity and then write about it when we are done. For this experiment we will be using many of the NSTP elements in a more structured environment (twice a day, ten minutes a time etc.).

In addition to this quantitative study the researcher is interested in qualitative results, particularly about the business environment. The test participants will be made aware that the researcher is also interested in anecdotal information about how the time spent out of doors positively or negative affects performance at work. This could include: attention to detail, concentration, creativity, productivity, memory, focus, inspiration, accuracy, relationship with co-workers, level of stress etc.

An online participatory document (Google doc) will be set up and available to all test subjects throughout the activity. They will use this to record, as frequently as they feel like it, their thoughts about their (hopefully) daily experiences. Participants will be coded for anonymity. Participants will also be encouraged to privately journal about their experiences.

At the end of the 25 day activity the researcher will re-administer the standardized WEMWBS test. The same pre-study short online questionnaire will also be re-administered to the participants to gauge how they now define nature and their interaction and feelings about nature. Before and after results will be statistically compared. The researcher will also conduct a personal interview with each of the test participants. The interview will include topics such as if their feelings about nature changed since the beginning of the study, how would they define nature now, how often they actually went out of doors, whether they enjoyed the activity, did they talk about it to others in their office, did they use or gain inspiration from the group participation, any noted behavior changes at work or other, and anything else they feel germane to the study.

- E. Definition of terms and clarification of concepts
 - a. Ecopsychology
 - b. Well being
 - c. Restoration
 - d. Green exercise
 - e. Forest bathing
 - f. Performance at work
- F. Overview of conceptual framework
 - a. Academic fields addressed
 - i. Ecopsychology
 - ii. Well being
 - iii. Worker productivity
- G. Project Significance
 - a. For ecopsychology
 - b. For business
- H. Main objective
 - a. To rate and assess the level of well being of the participant's before and after 25 days of two individual 10 minute breaks out-of-doors where they reconnect with nature via both the environment and subsequent personal reflection.
 - b. Presentation of data
 - c. Presentation of conclusions as they relate to the project's value to the above identified academic areas, to the individual participants and recommendations for future research.

II. Literature Review

- A. Further development of concepts and definitions identified above
 - a. Well being

- i. Origin of the concept
 - 1. O'Brien and Forest Research
 - ii. Importance of it as a measurement of quality of life
 - iii. Summary of research into well being
 - 1. Work from the University of Essex (Scotland)
 - 2. Nisbit *et al.*
- b. Restorative benefits of nature
 - i. Further development of the concept
 - ii. Summary of research
 - 1. Kaplan's work
 - 2. Louv's work
 - 3. Hartig *et al.* work
 - 4. Maller *et al.* work at Deakin University, Melbourne
 - 5. Cole *et al.*
 - 6. Hine *et al.*
- c. Forest bathing
 - i. Further development of the concept
 - ii. Summary of research
 - 1. Li's work
 - 2. Nilsson *et al.*
 - 3. Park *et al.*
- d. Green exercise
 - i. Further development of the concept
 - ii. Summary of research
 - 1. Barton *et al.* work
 - 2. Bodin
 - 3. Pretty *et al.*
 - 4. Thomson Koon *et al.*
- e. Urban green environment
 - i. Further development of the concept
 - ii. Summary of research
 - 1. Heerwagen's work
 - 2. Jorgenson *et al.*
 - 3. Parry – Jones *et al.*
 - 4. Van den Berg *et al.*
- f. Use of indoor plants to achieve well being
 - i. Further development of the concept
 - ii. Summary of research
 - 1. Smith and Pitt work
 - 2. Hartig *et al.* work
 - 3. Bringslimark *et al.*
 - 4. Ulrich *et al.*

- g. Applied ecopsychology
 - i. Further development of the concept
 - ii. Natural attraction psychology
 - iii. Natural systems thinking process (NSTP)
 - iv. Summary of research
 - 1. Dr. Cohen's work
- h. Performance at work and connection to nature experiences
 - i. Further development of the concept.
 - ii. Summary of research
 - 1. Proofreading improvement – Hartig (1991)
 - 2. Information processing – Kaplan (1995)
 - 3. Attention – Hartig (1991, 2003)
 - 4. Stress reduction (Barton, Hartig)
 - iii. This study does not have the research depth to experimentally analyze this level of data. Instead changes in performance at work will be anecdotally collected from journaling and interviews. Elements tracked include: attention to detail, concentration, creativity, productivity, memory, focus, inspiration, accuracy, relationship with co-workers and level of stress.
 - i. Discussion of amount of time in nature required to have a positive effect
 - i. Bowler *et al.*
 - ii. Hartig *et al.*
 - iii. Kaplan
 - iv. Barton
- B. Studies documenting contradictions in the above described phenomenon
 - a. Further development of the concept.
 - b. Summary of research
 - i. No statistical evidence of nature having any effect of physiological parameters such as stress ([www. Environmentalevidence.org](http://www.Environmentalevidence.org))
 - ii. Bowler *et al.* (2010)
 - iii. Others.
- C. Discussion of the appropriate well being survey to be utilized
 - a. POMS
 - i. McNair *et al.*
 - b. Nature relatedness scale
 - i. Nisbet *et al.*
 - c. Rosenberg Self-Esteem scale
 - i. Rosenberg.
 - d. ZIPERS test
 - i. Zukerman.
 - e. WEMWBS (Warwick-Edinburgh Mental Well-being Scale)
 - i. University of Warwick
- D. Discussion of length of time of survey

- a. 21 days is thought of as a long enough time period to create beneficial habits
 - i. Maltz 1960
 - ii. and others
- E. Summary of literature review

III. Methodology

- A. Introduction and methods of research
- B. Participants
 - a. Rationale of the selection of the sample population
 - i. Working adults with primarily 'office' type jobs
 - ii. Varied age range
 - iii. Mix of genders
- C. Setting
 - a. Their place of employment
 - b. United States based
 - c. Primarily urban environment
 - d. Spring season
- D. Sample size
 - a. Discussion of sample size needed for scientific validity
 - i. Investigation into mixed methods of analysis.
 - ii. Between 25 – 30 participants
 - 1. Not a large enough sample size for strict quantitative analysis.
 - a. T-test
 - b. Other comparative metrics
 - 2. Not too large to make the end of study personal interviews onerous
 - a. 30 minute interviews covering over a dozen interactive questions
- E. Length of time of the study
 - a. 25 work days
- F. The experimental design. This study consists of numerous elements that will come together in the end to result in a comparative analysis of well-being based upon an internationally recognized and validated study model followed by personal interviews supplemented by an online group participation element and finally a personal journal. All of this is illustrated in the Workflow Diagram (Figure 1).
 - a. Participant list. This spreadsheet includes the personal data of each participant which includes: name, group participation alias, age range, city, state, occupation type, role in the organization, setting type, and documentation of completion of the steps in the workflow (signed consent form, survey taken etc). See Appendix A for the form. Please note that the individuals identified on the form have verbally consented to participating in this study. Formal confirmation of their participation will take place after approval of

this research by the PhD committee. Hold their names in confidentiality as an element of the consent form is assurance of confidentiality.

- b. Participation consent form. The participation consent form (Appendix B) covers many elements of this study necessary for its success. It briefly explains the purpose of the study, discusses confidentiality and use of the results, and requests their consent for participation and personal information.
- c. Gaining Consent document. (Appendix C) This stand-alone document contains the 'instructions' on what to do while outside so that the participants fully understand what will be required of them. The NSTP process has been slightly modified for this research. These modifications include a more structured time period and time frame (10 minutes a day, twice a day) and a different report out style. Instead of emailing to the 'group' as is typically done in PNC classes this work will utilize a shared 'Google doc' for insights.
- d. Pre-participation survey and activity
 - i. Summary of survey methods considered (Discussion of survey in Literature Review section)
 - ii. WEMWBS chosen
 - 1. Permission to use survey obtained
 - 2. Survey transferred into a Google form (Figure 2)
 - 3. WEMWBS form modified to include a short written online questionnaire asking about how they define nature and their interactions and feelings about nature prior to (and after) the study.
 - iii. Administer survey to participants
 - 1. Reiterate its use
 - 2. Provide link to the Google form
 - iv. Record completion of survey on spreadsheet (Appendix A)
 - v. Review the NSTP procedure with each participant just prior to the initiation of the study so they understand what they will be doing during the study and with their insights.
- e. The study
 - i. At two ten minute periods throughout the day participants will reflect on nature.
 - 1. Participation is on the honor system.
 - 2. Break periods are chosen by the participant
 - 3. The participant will make every effort to go out-of-doors to the most natural place that they feel drawn to in their individual setting.
 - a. In urban settings this could be a small park or even a tree
 - b. Alternative settings
 - 1. In areas of extreme imperviousness it is possible to be drawn to the clouds, sky or weather
 - 2. In extreme weather participants may be drawn to an indoor plant setting, a fish tank, or

whatever natural setting they feel attracted to at the time.

- c. Participants interaction with nature will be on a personal basis.
 - 4. The participant will 'gain consent' and let nature lead them for ten minutes in their nature setting of choice.
 - 5. The participant will repeat this exercise twice a day.
- ii. Participants are requested to journal daily about their experiences. While they may include anything they want in the journal this research is most interested in mood changes and changes in work routine, productivity, participation, engagement, creativity etc.
- iii. Participants are encouraged to include observations in the Shared Observations Form (Table 1). This is another online shared document in which the participants are anonymously coded to allow for freedom of expression.
- iv. This part of the study will conclude after 25 business days.
- f. Post study survey and study questionnaire
 - i. Study subjects will again take the WEMWBS survey
 - ii. They will also participate in the short written online questionnaire tied to the WEMWBS survey
- g. Post study personal interviews.
 - 1. Participants will be interviewed by the researcher for approximately 30 minutes following the study period.
 - 2. Interviews will be conducted within one month (preferably two weeks) of the conclusion of the study
 - 3. Interviews will be via phone, Skype or in person.
 - 4. Interview questions will follow the same process using the questions posed in Figure 3.
 - a. Dialogue will be free enough to allow for expansion on individual questions as relevant.
 - b. Questions will include asking about how they define nature now and their interactions and feelings about nature after to the study among others (Figure 3)
 - i. The researcher will request use of the participant's personal journal for additional insight.
 - 1. The participant may agree and provide it in its entirety
 - 2. The participant may omit parts they do not want to share
 - 3. The participant may photocopy sections they are comfortable sharing.
 - 4. The participant may want to summarize their journal for the researcher and provide this summary.
 - 5. The participant may determine that the contents of the journal are too private to share.

6. All of these responses are valid and will not take away from the validity of the scientific study.
- h. Analysis and summary of results begins.

IV. Results and analysis

- A. Introduction (includes brief recap of methods of research and goals of study)
- B. Analysis of WEMWBS data
 - a. Report out on participation success
 - b. Qualitative review of data
 - i. Observation of visually observed trends
 - ii. Notice paid to those participants that exhibited extreme changes
 - iii. Notice paid to those participants whose scores did not change
 - c. Quantitative review of data
 - i. T-test
 - ii. Other comparative methods
- C. Qualitative analysis of the shared document
 - a. Level of participation
 - b. Trends
 - i. Level of sharing
 - ii. Depth of sharing
 - iii. Observed 'growth'
- D. Qualitative analysis of personal journals
 - a. Level of participation
 - b. Trends
 - i. Level of sharing
 - ii. Depth of sharing
 - iii. Observed 'growth'
- E. Results of interviews
 - a. Level of participation
 - b. Trends
 - i. Level of sharing
 - ii. Depth of sharing
 - iii. Observed 'growth'
- F. Critique of methods and limitations encountered
 - a. Were the 'Gaining Consent' instructions clear and useful?
 - b. Were there trends in participation?
 - c. Did weather have an influence on participation levels?
 - d. Did the participants natural setting influence effectiveness?
 - i. Did they have a city park to visit or was it a lone tree in an asphalted area or was it indoors with at plant.
 - ii. How often did they go outdoors and was there a difference in responses?

- e. Did the season of the year in which the study was conducted bias the results?
 - i. I expect the answer to this will be maybe but I am only running one experiment.
 - ii. The experiment is one month in duration.

G. Summary

V. Conclusions and Recommendations

A. Introduction

- a. Summary of the goals of the research

B. Conclusions

- a. Setup and conduct of the experiment
 - i. Observations about study group (positive, negative and lessons learned)
 - ii. Observations about setting
 - iii. Observations about the workflow of the experiment
 - iv. Observations about the level of participation of the study subjects
- b. Summary of data
 - i. Quantitative data
 - ii. Qualitative data
- c. Comparison of results from this study to results from other research (identified in the Review of Literature section)
- d. Contribution of this study to the academic areas addressed
 - i. Was the 'Gaining Consent' exercise adequate for the participants on fully experience the NSTP process
 - ii. Was the 10 minute period adequate?
- e. Benefits to study participants

C. Recommendations

- a. Modifications of study methodology for scaling up
 - i. Create an 'app' for computer or smartphone to remind people to take a break and go outside.
 - ii. An onsite training program/manual for employees
- b. Potential creation of blogs or other web-based application of this material
 - i. On PNC and related webpages
 - ii. Something else?
- c. Recommendations for future research

D. Concluding remarks

E. References

F. Appendices

Figures:

Figure 1. Experiment Workflow (pdf of workflow is attached to this document for easier viewing)

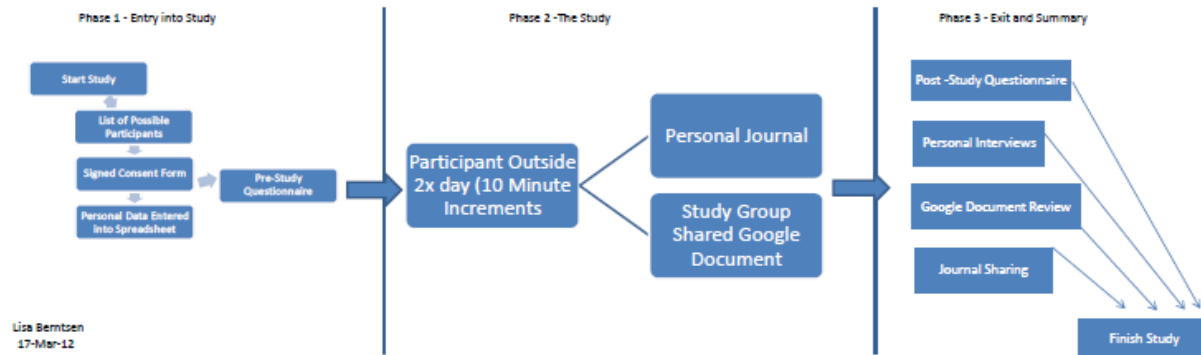


Figure 2. WEBWBS survey

Link to the live form:

https://docs.google.com/a/bgi.edu/spreadsheet/viewform?authkey=CM7fj7gB&authkey=CM7fj7gB&hl=en_US&formkey=dDhkYVZmYWRXbERoQnZHczVwMjNjUnc6MQ#gid=0

Below is a pdf of the questionnaire:

Figure 2. Modified Warwick-Edinburgh Mental Well-being Scale (WEMWBS)

Below are some statements about feelings and thoughts. Please chose the answer that best describes your experience of each question over the last 2 weeks.

Your username (lisa.berntsen@bgi.edu) will be recorded when you submit this form. Not [lisa.berntsen](#)? [Sign out](#)

I've been feeling optimistic about the future.

- None of the time
- Rarely
- Some of the time
- Often
- All the time

I've been feeling useful.

- None of the time
- Rarely
- Some of the time
- Often
- All the time

I've been feeling relaxed.

- None of the time
- Rarely
- Some of the time
- Often
- All the time

I've been feeling interested in other people.

- None of the time
- Rarely
- Some of the time
- Often
- All the time

I've had energy to spare.

- None of the time
- Rarely
- Some of the time

- Often
- All the time

I've been dealing with problems well.

- None of the time
- Rarely
- Some of the time
- Often
- All the time

I've been thinking clearly.

- None of the time
- Rarely
- Some of the time
- Often
- All the time

I've been feeling good about myself.

- None of the time
- Rarely
- Some of the time
- Often
- All the time

I've been feeling close to other people.

- None of the time
- Rarely
- Some of the time
- Often
- All the time

I've been feeling confident.

- None of the time
- Rarely
- Some of the time
- Often
- All the time

I've been able to make up my own mind about things.

- None of the time
- Rarely
- Some of the time
- Often
- All the time

I've been feeling loved.

- None of the time
- Rarely
- Some of the time
- Often
- All the time

I've been interested in new things.

- None of the time
- Rarely
- Some of the time
- Often
- All the time

I've been feeling cheerful.

- None of the time
- Rarely
- Some of the time
- Often
- All the time

How much time do you spend with nature on a daily basis?

How would you describe nature today? Don't think too deeply about the question, I am looking for a response to your emotional connection.

Figure 3. 'Take 10' Post Interview Questions

1. Have your feelings and/or thoughts about nature changed since beginning this study? In what ways?
2. Do you spend more time in nature than you did (excluding the 20 minutes a day)?
3. Did the weather affect your motivation to go outside? If so, how did you compensate on those days? Did you find an indoor plant or fish tank or skip it altogether?
4. Did you find it easy to connect with nature?
5. Was the gaining consent process helpful to you in this study?
6. Did your mood change after being outside? If yes, for the positive or negative?
7. Did you notice any other emotional changes as a result of being outside?
8. Did you notice any positive or negative changes in your work habits or patterns? When? What?
9. Did you notice any positive or negative changes in your work productivity, creativity, accuracy etc? How?
10. Did the happenings of the day influence your desire to take your nature break?
11. Did the stressfulness of the day have any influence on your ability to connect with nature?
12. Did you like this study? Did your motivation level for it change as it progressed? (i.e. were you skeptical at first and then grew in enthusiasm? Or contrarily, were you enthusiastic at first and then motivation waned?)
13. Is there anything you can think of that would improve the study?
14. Would you consider continuing the 'Take 10 Outside' after the study is complete?
15. Have you talked about this study to others during the past month?
16. Would you consider recommending this activity to others?
17. Can you think of any way to improve this nature experience?
18. Any recommendations you have for a program like this being formally implemented in the workplace?
19. Anything else you want to add?

Tables:

Table 1. Shared Insights

Study Participant Shared Insights Document

Lisa Berntsen - Researcher

(Add new rows below your name code for your insights)

20-Jan-12

Participant	Date	Insight
AA		
BB		
CC		
DD		
EE		
FF		
GG		
HH		
II		
JJ		
KK		
LL		
MM		
NN		
OO		
PP		
QQ		
RR		
SS		
TT		
UU		
VV		
WW		
XX		
YY		
ZZ		

Appendices

Appendix A. Participant Roster (This is a snapshot of the Participant Roster and is 'blurry' to preserve the anonymity of the participants.) Column headers are: Participant name, entry survey, code (AA-ZZ), Diary, online entries, exit survey, interview, permission form, company type, position in company, email address, city, state, gender, age range, typical outside environment.

Take 10 OUT Member List												
Participant Name	Entry Survey	Code (AA-ZZ)	Diary	Online Entries	Exit Survey	Interview	Permission	Company	Position	Email Address	City	State
Cindy Bilyeu								Massage Therapist	owner	cindy.bilyeu	Port Orchard	WA
										david.kozin@bgi.edu		
										gabriel.fertman@bgi.edu		
										morgan.kokenge@bgi.edu		
										andy.marise@bgi.edu		
										kathy.mcmahon@bgi.edu		
										lauren.haire@bgi.edu		
										scott.turner@bgi.edu		
										melissa.buttin@bgi.edu		
										suzanne.pirckney@bgi.edu		
										erik.sachs@bgi.edu		
										greg.lotakis@bgi.edu		
										brandon.madsen@bgi.edu		
										brandon.gough@bgi.edu		
										jonathan.emery@bgi.edu		
										megan.herscher@bgi.edu		
										amy.wheeler@bgi.edu		
										paultaylor.hess@bgi.edu		
										bria.schlottman@bgi.edu		
										scott.wilder@bgi.edu		
										sally.bell@bgi.edu		
										ellen.butchart@bgi.edu		
										nathalie.salles@bgi.edu		
										drbutchart@gmail.com		
										daren.m.salstrom@boeing.com		
										kwetzel@wamail.net		
										jason.christensen@bgi.edu		

Informed Consent and Participation in Research Form

Purpose:

The purpose of this research, titled “Take 10 Outside,” is to explore if quality time spent out-of-doors during a normal work day will have beneficial effects on the participants. This project is being conducted by Lisa Berntsen, who is a graduate student of Akamai University, Institute of Global Education, and Project NatureConnect, as part of the Ph.D. in Eco-Psychology dissertation requirement.

Principal Researcher:

Lisa Berntsen
13339 Shoreline Dr. SE
Olalla, WA 98359
360-265-1336
lisaberntsen@hotmail.com

Procedures:

This study involves three main phases as outlined below:

1. Phase 1 – Entry into the study.
 - a. Each participant will receive a summary of the study outline and research goals (this document).
 - b. Each participant will sign the consent form and agree to participate in the study for approximately one month.
 - c. Each participant will participate in a pre-study questionnaire.
 - d. Each participant will be taught the ‘Gaining Consent’ procedure.
2. Phase 2 – The study
 - a. The study period will be 25 work days in length.
 - b. Each participant commits to take two 10 minute breaks out-of-doors in which they gain consent and contemplate nature.
 - c. Each participant will make an effort to journal about their experiences and any potential emotional and/or behavioral changes as a result of being out-of-doors. Elements to also include are outdoor temperature and weather patterns.
 - d. Each participant has the opportunity (anonymously) to record their feelings or changes in emotion/behavior or any other comment they feel like sharing to the study group on a ‘Google doc’. This document will be used in the dissertation.
3. Phase 3 – Summary and Conclusions
 - a. Each participant will re-take the pre-study questionnaire to note any perceived changes.
 - b. An approximately 30 minute private exit interview will be conducted with each participant by the Principal Researcher. These interviews are anticipated to be held via phone, Skype or in-person.

- c. The Principal Researcher will request copies of the participant's journals if the participant is willing to share this information.

Possible Risks and Safeguards:

Although this study is designed to minimize as much as possible any potential physical, psychological and social risks to you, you agree not to hold the researcher nor PNC liable for any unexpected personal injury. Privacy and anonymity between the participants will be achieved by coding participants in the shared document. In other words, efforts will be made to allow for disclosure of feelings/observations among the participants in the study in a safe anonymous way. For example, Jane Doe will show up on the shared Google Document as Participant AA and John Smith will be Participant BB and so on.

Additionally:

1. My participation shall in no way have any bearing on my student status at Bainbridge Graduate Institute (in case I am student there), or alter or deprive me of any or all services presently received in the institution and setting in which I participate, as well as those provided by the institutions sponsoring and providing oversight for this research project.
2. Although my identity shall be known to the Principal Researcher all identifying information shall be removed at the time of transcription of the interviews in Phase 3 of the study.
3. This informed consent form will be maintained by the Principal Researcher until after the Ph.D. degree is achieved. After that, this documentation will be destroyed.
4. Likewise, the data collected in this study will be preserved for one year after the Ph.D. degree is achieved. After the one year period the data will be retained in aggregate only.
5. Summary notes and observations by the Principal Researcher may be kept indefinitely.
6. There will be no individual feedback regarding my participation, experiences and insights. Only general findings will be presented in a Summary Report of which I am entitled a copy should I request one.
7. None of the personal information I provide associated with my identity will be released to any other party without my explicit written permission.
8. If quotes of my responses are used in the research report for the dissertation, as well as any future publication of these quotations, my identity shall remain anonymous, and at most make use of a fictional name.
9. I have the right to refuse to answer any question asked of me.
10. I have the right to refuse at any time to participate in any part of the study.
11. I also have the right to withdraw from participation at any time, for any reason, without stating my reason.
12. I will receive a copy of this signed consent form for my records.

Consent of Principal Researcher:

I have explained the above procedures and conditions of this study, provided an opportunity for the research participant to ask questions, and have attempted to provide satisfactory answers to all questions that have been asked in the course of this explanation.

Principal Researcher Signature Principal Researcher Name Date

Consent of the Participant:

If you are ready to provide your consent, read the statement below, then sign, and print your name and date on the line below. If you are doing this electronically please email me back your consent and the response to the below questions.

I have read the above information, have had an opportunity to ask questions about any and all aspects of this study, and give my voluntary consent to participate.

Participant Signature Participant Name Date

The type of company you work for (consulting, manufacturing, retail, medical etc):

Position:

Your City/State:

Best email address for you:

Describe the typical environment outside your office (trees, paved, impervious surfaces, green space etc):

Age range (20-30, 31-40, 41-50, 51-60 etc):

Anything else I should know such as physical handicap that might prevent full participation?

Appendix C. Gaining Consent Instructions

KEEP THESE PAGES: *Now what am I supposed to do when I go outside?*

The Natural Systems Thinking Process (NSTP) is the model around which this experiment has been framed. In basic terms we have been taught to go experience nature, typically through an activity and then write about it when we are done. For this experiment we will be using many of the NSTP elements in a more structured environment (twice a day, ten minutes a time etc.).

There are eight steps to the Natural Systems Thinking Process that allow it to succeed. If you can follow them on each of your out-of-doors trips, to the best of your ability, it will greatly enhance this work and hopefully your experience. I have summarized them here:

1. Go outside.
2. Go to the most natural area that is convenient for you, the more natural the better, and do the activity there.
3. Make sure the area you have chosen feels 'right'. It is ok to move to a different area that you find yourself more attracted to.
4. After it feels 'right' both for you and your natural environment, and you have 'gained consent'. Now sense what nature means to you, your community, your world or anything else that you feel strongly about. What thoughts and feeling emerge after spending time observing and sensing nature and the environment?
5. When finished, journal, in your personal journal, what you think and feel during and after the activity. Please identify any changes to you back in at work with regards to attention to details, clarity, concentration, feelings of well being, increased collaboration, creativity etc.
6. In the online collaborative journal please share some of what you have written in your personal journal. Since we will be doing this activity twice a day for 25 days I am not expecting you to journal or collaborate after every event. More, however, is better.
7. If someone posts something in the online collaborative journal that is meaningful to you please validate their activity experience with a comment.
8. If you feel comfortable, please share your experiences with friends and associates describing what value you found in the activity and how you feel about it.

We will go over this process more fully in person, Skype email or via phone just prior to the initiation of the study to clarify any last details and make sure you understand the NSTP process.

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For reference, the above information is a summary of how we 'gain consent' as we have been taught by Dr. Cohen. The specific process, as he describes it, is below:

The instructions below written in red and the explanations written in black.

1) Nature enables things to build balanced relationships through natural attraction energies. **Notice how you feel right now, then go to something in nature that you like, that you appreciate.** A park, backyard, aquarium, even a pet or potted plant will do. Their attractiveness or appreciation is a tangible sensory connection. It invites, welcomes and consciously, feelingly connects you to them. The more natural and

attractive a natural area or thing is, the more worthwhile the results of this activity. A goldfish or a flower may be better than a wilderness area if it is more attractive to you.

2. **Appreciate the natural area and thank it for being there for you.** Thank it for safely activating a good feeling in you through this attraction connection.

3. Recognize that as part of the Earth community, justifiably, this natural area or thing desires and has a right to exist, build beneficial relationships and grow, just as you do. **Decide that you are going to respect its integrity** by asking for its permission to visit it.

4. Because we are usually socialized to think in nature-conquering ways, silently, aloud or in writing, **respectfully ask this natural area for its consent for you be there and do this activity there.** It will not give you permission to visit if you are going to injure, destroy or defame it, or if it will not be safe for you. Remember, *in nature, negative relationships are not attractive*; **promise this area that you will treat it honorably.**

5. **Sense the area in silence and respect.** Be aware of negative signals from stress, discouragement or danger from it, such as thorns, bees, poison ivy, ticks, cliff faces or unpleasant memories, thoughts or feelings. If they appear, thank them for their "safety" message to help you find ways to obtain good feeling and rewards *safely*.

A. After a bit, notice if **the area still feels attractive, or has become more attractive.** If either, it has consented to your visit through a multitude of your natural senses. Proceed to 6.

B. If this part of the natural area no longer feels attractive, or is replaced by another attraction, thank it for its guidance and simply select another natural part of the area that feels attractive to you. Then repeat the gaining permission process. When this occurs, you have multisensory permission to visit it. In that moment, many additional natural senses are connecting and consenting.

6. As soon as you feel in touch with a natural area, genuinely thank it for giving its consent for you being there.

7. **Now:** Compare how you feel about being in this mutually supportive moment with how you felt when you first started doing this activity. Has any change occurred because you gained this natural area's consent and thanked it for consenting? Does the area feel better or friendlier to you? Do you find it more attractive, ethical or rewarding now than before you received its consent and thanked it? Do you feel better about yourself, more supported by the life community? Do you feel less stressed?

Write down what occurred and if you obtained good feelings or rewards from doing this activity in your journal, what they were and whether you trust them. Share this information with people close to you or others who are doing the activity.

Annotated Bibliography:

The annotated following references listed below may not be absolutely the ones that will form the foundation of the pro and con arguments. Instead they are those that will likely be used with a high degree of certainty. This list may shift as the literature review commences.

BOOKS and ARTICLES:

Andrew, S., Matthew, T., & Michael, P. (2011). Healthy, productive workplaces: towards a case for interior plantscaping. *Facilities*, 29(5), 209-223.

This paper investigated office users' perceptions of their working environment in relation to the addition of plants. Significant differences were found between the experimental and control groups for the work environment contributing to pressure, health concerns, morale and preference for plants. There were also perceived improvements in productivity, pressure, privacy and comfort although these were non-significant. Sickness absence reduced substantially in the area with plants and increased slightly in the control area.

Barton J, Hine R and Pretty J. (2009). The health benefits of walking in greenspaces of high natural and heritage value. *Journal of Integrative Environmental Sciences* 6(4) 1-18

Lifestyles are increasingly characterized by sedentary behavior, obesity problems, stress, mental ill-health and disconnection from nature. However, contact with nature has been shown to improve psychological health by reducing stress, enhancing mood and replenishing mental fatigue. In addition to providing a range of environmental services, greenspaces provide opportunities and incentives for 'green exercise' such as walking, cycling or horse riding. Visitor numbers indicate that many people already benefit from spending time in greenspaces, but little is known about the immediate impact of an acute exposure on their health and wellbeing. This study focuses on evaluating changes in self-esteem and mood after walking in four different National Trust sites of natural and heritage value in the East of England. The standardized measures of both self-esteem and mood were administered immediately pre- and post-activity. Self-esteem scores for visitors leaving the sites were significantly higher than those just arriving and overall mood also significantly improved. Feelings of anger, depression, tension and confusion all significantly reduced and vigor increased. Thus, the environment plays an important role in facilitating physical activities and helping to address sedentary behaviors. Walking, in particular, can serve many purposes including exercise, recreation, travel, companionship, relaxation and restoration. However, walking in greenspaces may offer a more sustainable option, as the primary reward is enhanced emotional wellbeing through both exposure to nature and participation in exercise.

Barton, J., & Pretty, J. (2010). What is the Best Dose of Nature and Green Exercise for Improving Mental Health? A Multi-Study Analysis. *Environ. Sci. Technol.* 44. 3947-3955.

Green exercise is activity in the presence of nature. Evidence shows it leads to positive short and long-term health outcomes. This multi-study analysis assessed the best regime of dose(s) of acute exposure

to green exercise required to improve self-esteem and mood (indicators of mental health). The research used meta-analysis methodology to analyse ten UK studies involving 1252 participants. Dose responses for both intensity and duration showed large benefits from short engagements in green exercise, and then diminishing but still positive returns. Every green environment improved both self-esteem and mood; the presence of water generated greater effects. Both men and women had similar improvements in self-esteem after green exercise, though men showed a difference for mood. Age groups: for self-esteem, the greatest change was in the youngest, with diminishing effects with age; for mood, the least change was in the young and old.

Barton, J. (ND) The benefits of green exercise. www.hphpcentral.com/article/the-benefits-of-green-exercise accessed Jan 22, 2012

This short blog discusses further benefits of going outside to get exercise. Their research indicates that the first five minutes of green exercise has the biggest impact on improving self-esteem and mood. Longer time periods do not necessarily equate to significantly greater rewards.

Bodin, M., & Hartig, T. (2003) Does the outdoor environment matter for psychological restoration gained through running? *Psychology of Sport and Exercise*, 4, 141-153.

Outdoor environments might amplify or hinder psychological benefits of exercise. Using types of outdoor environment commonly available for exercise, the moderating effect of environment on attentional and emotional restoration was assessed during a run. A field experiment with environment (park, urban), occasion (first run, second run), and time (pre-run, post-run) was conducted. Runners provided self-reports of emotions and behavioral measures of attention before and after each of two 1-hour runs in each of the two environments. The routes differed in amount of greenery, proximity to water, and presence of traffic, buildings, and other people. We also obtained background measures of stress and evaluations of the running environments. Running reduced anxiety/depression and anger but had inconsistent effects on attention. The runners preferred the park over the urban environment and perceived it as more psychologically restorative. The study provides a point of departure for further research on potential moderating effects of commonly accessible outdoor environments on the psychological benefits of exercise.

Bowler, D., Buyung-ali, L., Knight, T., & Pullin, A.S. 2010. The importance of nature for health: is there a specific benefit of contact with green space? *CEE review 08-003 (SR 40)*.

Environmental Evidence: www.environmentalevidence.org/SR40.html is a two page summary of the study. The authors investigated 23 studies on the topic to discern if the purported results actually did indeed support the hypotheses. The unusual nature of this study is that they performed a meta-analysis on a subset of the data to yield a quantitative summary. Their results supported evidence that nature exposure has a positive effect on self-reported emotions and mood, no evidence of effect on physiological parameters and inconsistent results concerning tranquility, attention and energy. The

actual study provides greater depth on all of these issues. (This article contains many arguments against why connection to nature does not work.)

Bringslimark, T., Hartig, T., & Patil, G. G. (2007). Psychological benefits of indoor plants in workplaces: Putting experimental results into context. *HortScience*, **42**, 581-587.

Laboratory experiments and quasi-experimental field studies have documented beneficial effects of indoor plants on outcomes such as psychophysiological stress, task performance, and symptoms of ill health. Such studies have taken an interest in the value of indoor plants in work settings, but they typically have not considered how the effects of plants might compare with effects of other workplace characteristics. The present study makes an initial attempt to situate the potential benefits of indoor plants in a broader workplace context. They studied several often-studied workplace factors with perceived stress, sick leave, and productivity. Other variables included gender, age, physical workplace factors (e.g., noise, temperature, lighting, air quality), and psychosocial workplace factors (demands, control, social support). After controlling for these variables, the number of indoor plants proximal to a worker's desk had small but statistically reliable associations with sick leave and productivity. Although small, such associations can have substantial practical significance given aggregation over the large number of office workers over time.

Bringslimark, T., Hartig, T., & Patil, G. G. (2009). The psychological benefits of indoor plants: A critical review of the experimental literature. *Journal of Environmental Psychology*, **29**, 422-433.

People have been bringing plants into residential and other indoor settings for centuries, but little is known about their psychological effects. They reviewed the experimental literature on the psychological benefits of indoor plants with a focus on benefits gained through passive interactions with indoor plants rather than on the effects of guided interactions with plants in horticultural therapy or the indirect effect of indoor plants as air purifiers or humidifiers. The reviewed experiments addressed a variety of outcomes, including emotional states, pain perception, creativity, task-performance, and indices of autonomic arousal. Some findings recur, such as enhanced pain management with plants present, but in general the results appear to be quite mixed. Sources of this heterogeneity include diversity in experimental manipulations, settings, samples, exposure durations, and measures.

Bringslimark, T., Hartig, T., & Patil, G. G. (2011). Adaptation to windowlessness: Do office workers compensate for a lack of visual access to the outdoors? *Environment & Behavior*, **43**, 469-487.

If office workers lack a view to natural features outdoors, do they compensate by bringing plants and pictures of nature indoors? The authors used cross-sectional survey data from 385 Norwegian office workers to investigate whether such compensation occurs. The authors found that workers without windows had roughly five times greater odds of having brought plants into their workspaces than workers with windows, independent of age, gender, type of office, job demands, control over work, and

personalization. Windowless workers also had three times greater odds of having brought pictures of nature into their workspaces. The authors consider implications of the findings for environmental design that offers contact with nature to people who spend much of their time indoors.

Cimprich, B. (1992). Attentional fatigue following breast cancer surgery, *Research in Nursing and Health*, 15, 199-207. (.)

Attentional fatigue usually follows intense use of mental effort and is manifested as a decreased capacity to concentrate, that is, to direct attention. The purpose of this study was to examine the capacity to direct attention in persons with cancer during the initial phase of illness. The study stated that 20 minutes out of doors three times a week has a positive effect.

Cimprich, B. (1993). Development of an intervention to restore attention in cancer patients. *Cancer Nursing*, 16, 83-92.

This paper studied interventions to maintain or restore attentional capacity during demanding phases of illness to help promote effective functioning in people with cancer. This study tested the effects of an experimental intervention aimed at maintaining or restoring attentional capacity in 32 women during the 3 months after surgery for localized (Stage I or II) breast cancer. The intervention was designed to minimize or prevent attentional fatigue through regular participation in activities that engage fascination and have other restorative properties. The study stated that 20 minutes out of doors three times a week has a positive effect.

Cole, D. N., & Hall, T. E. (2010). Experiencing the Restorative Components of Wilderness Environments: Does Congestion Interfere and Does Length of Exposure Matter?. *Environment & Behavior*, 42(6), 806-823. doi:10.1177/0013916509347248

Wilderness should provide opportunities for stress reduction and restoration of mental fatigue. Visitors, surveyed as they exited wilderness trailheads, were asked for self-assessments of stress reduction and mental rejuvenation and the extent to which they experienced various restorative components of the environment—attributes deemed by attention restorative theory to be conducive to restoration. Day and overnight hikers on both very high use and moderate use trails were studied. Most respondents reported substantial stress reduction and mental rejuvenation and most experienced the environment in ways considered conducive to restoration. At the moderate to high use levels psychological restoration did not vary significantly with level of congestion, suggesting that concern about restorative experiences is not a valid rationale for limiting use on wilderness trails. Day trips reduced stress and allowed for mental rejuvenation to the same degree that overnight trips did. This paper will be used as an example of the more typical studies with length of time out of doors.

Hartig, T., (1996) Toward Understanding the Restorative Environment as a Health Resource. Institute for Housing and Urban Research, Uppsala University

This paper talks about the 'restorative environment'. Much of the concept's appeal has to do with how it helps us to relate health to experiences in natural environments. This paper illustrates the current status of research on restorative environments and where research can go next. He also provides some comprehensive definitions of restoration and theories as to how restoration environments function.

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

This study compared psychophysiological stress recovery and directed attention restoration in natural and urban field settings using physical, emotional and attention studies in 112 young adults. Study settings included a viewless room, walking in an urban setting and walking in a nature preserve. Results indicated that attention went up after a walk in the nature preserve and down after the urban walk. Anger decreased in nature and increased in the urban setting. A number of well being tests (Overall Happiness Scale, ZIPERS) were used in this investigation. Accuracy was assessed using the Necker Cube task. Results indicated that performance increase slightly in the natural environment and suffered in the urban environment. Overall this study is very rich in data and results and will form a substantive part of the background information for this research study.

Hartig, T., Mang, M., & Evans, G.W. (1991) Restorative effects of natural environment experience. *Environment and Behavior* 23, 3-26

The utility of different theoretical models of restorative experience was explored in a quasi-experimental field study and a true experiment. The former included wilderness backpacking and nonwilderness vacation conditions, as well as a control condition in which participants continued with their daily routines. The latter had urban environment, natural environment, and passive relaxation conditions. Multimethod assessments of restoration consisted of self-reports of affective states, cognitive performance, and, in the latter study, physiological measures. Convergent self-report and performance results obtained in both studies offer evidence of greater restorative effects arising from experiences in nature. Implications for theory, methodology, and design were discussed. This study is referenced in *Nature Principle*.

Heerwagen, J., (2009). Biophilia, health, and well-being. In: Campbell, Lindsay; Wiesen, Anne, eds. Restorative commons: creating health and well-being through urban landscapes. Gen. Tech Rep. NRS-P-39. U.S. Department of Agriculture, Forest Service, Northern Research Station: 38-57. Accessed from <http://nrs.fs.fed.us/pubs/5132> on Jan, 22, 2012

One of 18 articles inspired by the [Meristem](#) 2007 Forum, "Restorative Commons for Community Health." The articles include interviews, case studies, thought pieces, and interdisciplinary theoretical works that explore the relationship between human health and the urban environment. This volume is a joint endeavor of [Meristem](#) and the U.S. Forest Service Northern Research Station as they work to strengthen networks of researchers and practitioners to develop new solutions to persistent and emergent challenges to human health, well-being, and potential within the urban environment.

Hine R, Pretty J., & Barton J. (2009). Research Project: Social, Psychological and Cultural Benefits of Large Natural Habitat & Wilderness Experience: A review of current literature. Report for the Wilderness Foundation by University of Essex

This report studies numerous papers about psychology and the wilderness experience. An emergent body of evidence demonstrates the health and well-being benefits experienced by individuals after spending time in the natural environment, and this link between nature and health is becoming more recognized in current literature. Health benefits seen as a result of contact with nature include reduced stress levels, improved mood, enhanced psychological wellbeing and improved attention and concentration. Natural places facilitate stress recovery, encourage exercise participation, stimulate development in children and provide opportunities for personal development and sense of purpose in adults. Contact with nature also enables social contact (and so builds social capital) and the creation of memories of place. This compilation will be useful to this current study, especially in the background section.

Hine, R, Wood, C, Barton, J., & Pretty, J. (2011). The Mental health and wellbeing effects of a walking and outdoor activity based therapy project. A Report for Discovery Quest and Julian Housing by University of Essex.

This study takes a comprehensive look at the effect of mental well being of 30 participants as they participated in regular walks in Scotland. Study subjects took a number of assessment tests including the WEMWBS study. Positive changes in all three wellbeing measures were observed with a statistically significant improvement, using the samples t-test, in participant wellbeing, self-esteem and total mood. Informational interviews were also conducted after the study period. This study also assessed other health factors such as BMI, smoking/drinking and eating habits. This study has many good elements in it that will be extremely useful to this current investigation.

Jorgenson, A. Gobster, P., (2010). Shades of green: Measuring the ecology of urban green space in the context of human health and well-being. *Nature and Culture*. 5(3): 338-363.
<http://nrs.fs.fed.us/pubs/37180> accessed January 22, 2012

In this paper they review and analyze the recent research literature on urban green space and human health and well-being, with an emphasis on studies that attempt to measure biodiversity and other green space concepts relevant to urban ecological restoration. They looked at the literature to identify typologies of urban green space and human health and well-being measures. This article is only available online at the above link.

Kaplan, S. (1995). The Restorative Benefits of Nature: Toward an Integrative Framework. *Journal of Environmental Psychology*, **15**, 169-182.

This study, while slightly old, provides valuable background and data into the origin of nature related restorative experiences. This study begins to tie Attention Restoration Theory to recovery from fatigue and then ties this to natural environments. This study references a great quote by Olmsted (1865) about natural scenery that might fit in with this work. Much of this paper is theoretical but still useful for introductory sections of this current investigation.

Kaplan, R and Kaplan, S. (1989). *The Experience of Nature: A Psychological Perspective*. Cambridge University Press, Cambridge.

In this volume concerning the natural environment, people, and the relationship between them, Rachel and Stephen Kaplan offer the first research-based analysis of the vital psychological role that nature plays in our lives. Over a period of twenty years, the authors have sought to understand how people perceive nature and what types of natural environments they prefer, what psychological benefits they seem to derive from wilderness experiences, and why backyard gardens are especially important to some people. The book examines the satisfactions and advantages that various natural settings bring to us. While many readers may have little doubt that the natural environment makes a difference to them, they may be surprised to discover the pervasiveness of its impact on people of diverse ages and cultural heritages. Beyond the awe-inspiring mountains and waterfalls, many comparatively simple natural settings foster tranquility and well-being. The book explores questions such as: Is the effect of nature on people as powerful as it intuitively seems to be? What makes natural settings so compelling? How do settings restore bodily health? Are some natural patterns more effective than others? Are there ways to design, manage, and interpret natural environments so as to enhance their beneficial influences? A wide audience will find this analysis of our natural environment compelling and insightful. Really need to get this book but it is out of print.

Li, Q., Morimoto, K., Nakadai, A., et al, (2007) Forest Bathing Enhances Human Natural Killer Activity and Expression of Anti-Cancer Proteins, *International Journal of Immunopathology and Pharmacology* 20 3-8

In order to explore the effect of forest bathing on human immune function, we investigated natural killer (NK) activity. The subjects experienced a three-day/two-night trip in three different forest fields. On the first day, subjects walked for two hours in the afternoon in a forest field; and on the second day, they walked for two hours in the morning and afternoon, respectively, in two different forest fields. Blood was sampled on the second and third days, and NK activity were measured. Similar measurements were made before the trip on a normal working day as the control. Almost all of the subjects (11/12) showed higher NK activity after the trip (about 50 percent increased) compared with before. There are significant differences both before and after the trip and between days 1 and 2 in NK activity. These findings indicate that a forest bathing trip can increase NK activity, and that this effect at least partially mediated by increasing the number of NK cells and by the induction of intracellular anti-cancer proteins.

Li Q, Morimoto K, Kobayashi M, Inagaki H, Katsumata M, Hirata Y, Hirata K, Suzuki H, Li YJ, Wakayama Y, et al. (2008) Visiting a forest, but not a city, increases human natural killer activity and expression of anti-cancer proteins. *Int J Immunopathol Pharmacol*. Jan-Mar; 21(1):117-27.

This is a follow on study on forest bathing and the enhancement of human NK activity. In the present study, they investigated how long the increased NK activity lasts and compared the effect of a forest bathing trip on NK activity with a trip to places in a city without forests. The increased NK activity lasted for more than 7 days after the trip. In contrast, a city tourist visit did not increase NK activity nor the expression of selected intracellular anti-cancer proteins. Phytoncides, such as alpha-pinene and beta-

pinene were detected in forest air, but almost not in city air. Phytoncides released from trees and decreased stress hormone may partially contribute to the increased NK activity.

Louv, R. (2011). *The Nature Principle: Human Restoration and the End of Nature-Deficit Disorder*. Chapel Hill, NC, Algonquin Books of Chapel Hill. ISBN 978-1-56512-581-0.

Our society, says Louv, has developed such an outsized faith in technology that we have yet to fully realize or even adequately study how human capacities are enhanced through the power of nature. Supported by groundbreaking research, anecdotal evidence, and compelling personal stories, Louv shows us how tapping into the restorative powers of the natural world can boost mental acuity and creativity; promote health and wellness; build smarter and more sustainable businesses, communities, and economies; and ultimately strengthen human bonds. This book was heavily used in the research for this study. Many of the final papers that appear in this annotated bibliography were noted in Louv's book(s).

Maller, C, Townsend, M, Brown, P., & St. Leger, L, 2002 *Healthy Parks Healthy People*. Deakin University and Parks Victoria. ISBN 0-9581971-3-X

Research is beginning to document that humans may be dependent on nature for psychological, emotional, and spiritual needs that are difficult to satisfy by other means. Findings so far demonstrate that access to nature plays a vital role in human health, wellbeing, and development that has not been fully recognized. This review is an examination of a broad cross-section of published literature that relates to the potential and actual health benefits of contact with nature, particularly but not only, in a park context. In terms of health, parks and other natural environments have been viewed almost exclusively as venues for leisure and sport. Yet recent research shows that 'green nature', such as parks, can reduce crime, foster psychological wellbeing, reduce stress, boost immunity, enhance productivity, and promote healing. Evidence in the literature shows that among other benefits viewing nature is positive for health in terms of recovering from stress, improving concentration and productivity, and improving psychological state, particularly of people in confined circumstances such as prisons and hospitals. Furthermore, wilderness and related studies clearly demonstrate that being in a natural environment affects people positively, particularly in terms of mental health. There are also multiple benefits from brief encounters with nature, or experiencing nature on a smaller scale, such as in urban parks.

Mayer, F.S., Frantz, C.M., Bruehlman-Senecal, E., Dolliver, K. (2008). Why Is Nature Beneficial?: The Role of Connectedness to Nature. *Environment And Behavior* 41, 5, 607-643 ISSN: 00139165 DOI: 10.1177/0013916508319745

Three studies examine the effects of exposure to nature on positive affect and ability to reflect on a life problem. Participants spent 15 min walking in a natural setting (Studies 1, 2, & 3), an urban setting (Study 1), or watching videos of natural and urban settings (Studies 2 & 3). In all three studies, exposure to nature increased connectedness to nature, attentional capacity, positive emotions, and ability to reflect on a life problem; these effects are more dramatic for actual nature than for virtual nature. Mediation analyses indicate that the positive effects of exposure to nature are partially mediated by

increases in connectedness to nature and are not mediated by increases in attentional capacity. The discussion focuses on the mechanisms that underlie the exposure to nature/well-being effects.

McNair, D.M., Lorr, M., & Droppleman, L.F., (1992) Revised Manual for the Profile of Mood States. San Diego, CA, Education and Industrial Testing Service.

The POMS assessment provides a rapid, economical method of assessing transient, fluctuating active mood states. It is an ideal instrument for measuring and monitoring treatment change in clinical, medical, and addiction counseling centers. It is also well-suited to clinical drug trials because its sensitivity to change allows you to accurately document the effects of drugs on mood state. The test looks at real time psychological issues such as tension-anxiety, anger- hostility etc. These are clearly bigger issues than this study will take on. No further research into this study method.

Morfeld, M., Petersen, C., Krüger-Bödeker, A., von Mackensen, S., & Bullinger, M. (2007) The assessment of mood at workplace - psychometric analyses of the revised Profile of Mood States (POMS) questionnaire *Psychosoc Med.*; 4: Doc06 accessed at <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2736534/> on January 23.2012

With the Profile of Mood States (POMS), a German version of an international instrument for the assessment of mood is available. The paper introduces a new short version containing 24 items and four scales. With the tested version of the POMS, a short instrument with good psychometric properties has been presented which can be assessed in healthy as well as in health-impaired persons. This is just one example of the many well-being models considered for this study.

Nilsson, K., Sangster, M., Gallis, C., Hartig, T., De Vries, S., Seeland, K., & Schipperijn, J. (Eds.) (2011), *Forests, trees, and human health*. Dordrecht: Springer. ISBN 978-90-481-9805-4

The link between modern lifestyles and increasing levels of chronic heart disease, obesity, stress and poor mental health is a concern across the world. The cost of dealing with these conditions places a large burden on national public health budgets so that policymakers are increasingly looking at prevention as a cost-effective alternative to medical treatment. Attention is turning towards interactions between the environment and lifestyles. This book explores the relationships between health, natural environments in general, and forests. Need to borrow this book from the library for this study.

NHS Health Scotland, University of Warwick and University of Edinburgh (2006) The Warwick-Edinburgh Mental Well-being Scale (WEMWBS) <http://www.healthscotland.com/documents/1467.aspx> accessed Jan, 5 2012

WEMWBS was developed for use as a population-based measure of mental wellbeing. It is designed to monitor the mental wellbeing of groups of people over time, and before and after interventions or programs. Changes over time can be assessed by examining differences in the mean scores. This newly developed scale for assessing positive mental health (mental well-being). A 14 positively worded item scale with five response categories. It covers most aspects of positive mental health (positive thoughts and feelings) currently in the literature, including both hedonic and eudaimonic perspectives. WEMWBS is now included in the core module of the annual Scottish Health Survey (from 2008) and is also being

widely used throughout the UK and beyond. This scale has also been used in other Project Nature Connect studies.

Nisbet, E., Zelenski, J., & Murphy, S., (2009). The Nature Relatedness Scale: Linking Individuals' Connection with Nature to Environmental Concern and Behavior. *Environment and Behavior* Vol 41, No, 5, 715-740

Disconnection from the natural world may be contributing to our planet's destruction. The authors propose a new construct, Nature Relatedness (NR), and a scale that assesses the affective, cognitive, and experiential aspects of individuals' connection to nature. In their studies, NR correlated with environmental scales, behavior, and frequency of time in nature. The potential of NR as a useful method for investigating human-nature relationships and the processes underlying environmental concern and behaviors was discussed. This survey method will not be used in this study. No further research into it will be performed.

Nisbet, E. K., & Zelenski, J. M. (2011). Underestimating nearby nature: Affective forecasting errors obscure the happy path to sustainability. *Psychological Science*, 22(9), 1101-1106.

Modern lifestyles disconnect people from nature, and this may have adverse consequences for the well-being of both humans and the environment. In their experiments, they found that although outdoor walks in nearby nature made participants much happier than indoor walks did, participants made affective forecasting errors, such that they systematically underestimated nature's hedonic benefit. The pleasant moods experienced on outdoor nature walks facilitated a subjective sense of connection with nature, a construct strongly linked with concern for the environment and environmentally sustainable behavior. To the extent that affective forecasts determine choices, their findings suggest that people fail to maximize their time in nearby nature and thus miss opportunities to increase their happiness and relatedness to nature.

Nisbet, E. K., Zelenski, J. M., & Murphy, S. A. (2011). Happiness is in our nature: Exploring nature relatedness as a contributor to subjective well-being. *Journal of Happiness Studies*, 12, 303-322, doi: 10.1007/s10902-010-9197-7

This paper continues to explore the connection of happiness, nature and well-being. This paper uses business people as their study group. They explore the influence of environmental education on nature relatedness, well-being and changes in vitality. It also discusses interventions for improving psychological health and promotion of positive environmental behavior.

O'Brien, L. (2009) Well-being, forestry and ecosystem services: A discussion paper. Forest Research. Surrey UK.
<http://www.forestry.gov.uk/website/forestresearch.nsf/ByUnique/INFD-5Z5ALT>
accessed January 22, 2012.

Well-being has become increasingly important in government policy in the last decade. Ecosystem services have also become a significant focus for government following the Millennium Ecosystem Assessment (MEA). This document focuses on the implications for forestry and the Forestry

Commission, with the aim of proposing priority areas for future research. The objective of this paper is to stimulate discussion and help focus the well-being research agenda. It also has some clear definitions of well-being and other key terms.

Park, B.J., Tsunetsugu, Y., Kasetani, T. Kagawa, T., & Miyazaki, Y. (2010) The Physiological Effects of Shinrin-yoku (Taking in the Forest Atmosphere or Forst Bathing) :Evidence from Field Experiments in Twenty-four Forests across Japan, *Environmental Health and Preventative Medicine*, 15, No 1, 18-26.

This paper reviews previous research on the physiological effects of *Shinrin-yoku* (taking in the forest atmosphere or forest bathing), and presents new results from field experiments conducted in 24 forests across Japan. The term *Shinrin-yoku* was coined by the Japanese Ministry of Agriculture, Forestry, and Fisheries in 1982, and can be defined as making contact with and taking in the atmosphere of the forest. In this experiment, subjects walked in and viewed a forest or city area. On the first day, six subjects were sent to a forest area, and the others to a city area. On the second day, each group was sent to the other area as a cross-check. Salivary cortisol, blood pressure, pulse rate, and heart rate variability were used as indices. The results show that forest environments promote lower concentrations of cortisol, lower pulse rate, lower blood pressure, greater parasympathetic nerve activity, and lower sympathetic nerve activity than do city environments. These results will contribute to the development of a research field dedicated to forest medicine, which may be used as a strategy for preventive medicine.

Parry-Jones, W.I. (1990) Natural landscape, psychological well-being and mental health
Landscape Research Volume: 15, Issue: 2, Publisher: Routledge, Pages: 7-11

The design, development, conservation and maintenance of urban and rural public open spaces presents an increasingly difficult challenge, in terms of decisions about their most effective use. If the psychological and mental health-related aspects of the properties of the natural landscape are to be taken into consideration, there is a need for more reliable, scientifically based, information, which is readily available. This paper provides a brief multi-disciplinary review of research and theory.

Peacock, J., Hine, R., & Pretty, J. (2007) The mental health benefits of green exercise activities and green care. Mind week Report Feb 2007. Centre for Environment and Society, Department of Biological Sciences, University of Essex, Wivenhoe Park, Colchester C04 3SQ.

More research into green exercise and other types of green interactions (gardening for example). This study found that as little as 15 minutes had a measurable benefit. Many graphs and charts comparing well being characteristics to indoor and outdoor walks.

Pretty J. (2006). Physical activity in modern society: is there also an environmental benefit?
Environmental Conservation 33 (2), 87-88

Higgins (2005) has shown that increased human physical activity in the USA could lead to both improvements in physical health and reductions in oil consumption by motor vehicles, thereby also reducing carbon emissions. It is an intriguing idea and, as the health costs of obesity are so high, the potential health and environmental savings could be vast. These questions deserve wider attention, as

all the trends suggest that consumption of both fossil fuels and food calories (combined with more sedentary lifestyles) will continue to rise in the coming years.

Pretty, J., Griffin, M., Sellens, M., & Pretty, C. (2003) Green Exercise: Complementary Roles of Nature, Exercise and Diet in Physical and Emotional Well-Being and Implications for Public Health Policy. CES Occasional Paper 2003-1. University of Essex

The primary role played by diet and physical activity in emotional and physical well-being is complemented by secondary roles played by connections to nature and social communities. An innate connectedness to nature is the core principle in the 'biophilia hypothesis', which suggests that closeness to nature increases well-being as well as the likelihood of understanding of and care for nature, and its rediscovery can lead to transformations in people and nature. It also suggests that disconnections are harmful – both to individuals and to societies and cultures at large. There is a well-established literature that shows that the physical and social features of the environment affect behavior, interpersonal relationships and actual mental states, as well as shape relations with nature. People seem to prefer natural environments to other settings, and the benefits go beyond just enjoyment. A growing number of researchers from many disciplines are now showing that contacts with the natural world can benefit mental and physical health.

Pretty J, Peacock J, Sellens M., & Griffin M. (2005). The Mental and Physical Health Outcomes of Green Exercise. *International Journal of Environmental Health Research* 15(5), 319-337

Both physical activity and exposure to nature are known separately to have positive effects on physical and mental health. They investigated whether there is a synergistic benefit in adopting physical activities whilst being directly exposed to nature ('green exercise') while indoors on a treadmill. Five groups of 20 subjects were exposed to a sequence of 30 scenes projected on a wall whilst exercising on a treadmill. Both rural and urban pleasant scenes produced a significantly greater positive effect on self-esteem than the exercise-only control. This shows the synergistic effect of green exercise in both rural and urban environments. By contrast, both rural and urban unpleasant scenes reduced the positive effects of exercise on self-esteem. This article will be interesting to include as it states that positive benefit can be obtained inside by just looking at pretty images.

Rosenberg, M. (1965). *Society and the Adolescent Self-Image*. Princeton, New Jersey: Princeton University Press.

The *Rosenberg Self-Esteem Scale*, identified as *About Me* in the site-specific questionnaire battery, is a well-known measure of self-esteem. Each of the 10 items is rated on a 4-point scale ranging from 1 = *strongly agree* to 4 = *strongly disagree*. A self-esteem score is calculated after reversing the positively worded items. This was just one more potential survey methodology considered for this research.

Selhub, E. & Logan, A.C. (2012). *Your Brain On Nature: The Science of Nature's Influence on Your Health, Happiness and Vitality*. John Wiley.

This book is to be available for purchase in May of 2012. Reviews of this book in www.davidsuzuki.org/blogs/docs-talk/2011/11/your-brain-on-nature blog indicate that they expose and summarize much information from scientific literature linking nature and healthy brains. One sentence in the review was particularly noteworthy, "Spending just 20 minutes in vegetation-rich nature has been shown to improve vitality." This, and other studies will be relevant to this research as the daily nature exposure in this work is also 20 minutes.

Smith, A., & Pitt, M. (2009). Sustainable workplaces: improving staff health and well-being using plants. *Journal Of Corporate Real Estate*, 11(1), 52-63.
doi:10.1108/14630010910940552

The article focuses on a study which identified and demonstrated the impact of having plants in offices on employees' health and well-being. The study conducted a literature review in order to identify the relevance of indoor plants in office environments. The benefits of the plants were analyzed based on their ability to physically improve air quality and remove pollutants, and its influence on enhancing the well being of employees through psychological benefits. Study authors argues that indoor plants should become an integral part of corporate real estate strategies because they have that potential to prevent sick building syndrome.

Thomson Koon, J. Boddy, K., Stein, K., Whear, R., Barton, J., & Depledge, M.H. (2011). Does Participating in Physical Activity in Outdoor Natural Environments Have a Greater Effect on Physical and Mental Well-being than Physical Activity Indoors? A Systematic Review. *Environmental Science and Technology* DOI: 10.1021/es102947t

The objective of this paper was to compare the effects on mental and physical wellbeing, health related quality of life and long-term adherence to physical activity, of participation in physical activity in natural environments compared with physical activity indoors. They conducted a systematic review of data sources to reach their conclusions. Most trials (n = 9) showed some improvement in mental wellbeing on one or other of the outcome measures. Compared with exercising indoors, exercising in natural environments was associated with greater feelings of revitalization and positive engagement, decreases in tension, confusion, anger, and depression, and increased energy. However, the results suggested that feelings of calmness may be decreased following outdoor exercise. Participants reported greater enjoyment and satisfaction with outdoor activity and declared a greater intent to repeat the activity at a later date. The hypothesis that there are added beneficial effects to be gained from performing physical activity outdoors in natural environments is very appealing and has generated considerable interest. This review has shown some promising effects on self-reported mental wellbeing immediately following exercise in nature which are not seen following the same exercise indoors. However, the interpretation and extrapolation of these findings is hampered by the poor methodological quality of the available evidence and the heterogeneity of outcome measures employed. The review demonstrates the paucity of high quality evidence on which to base recommendations and reveals an undoubted need for further research in this area.

Van den Berg, A. E., Hartig, T., & Staats, H. (2007). Preference for nature in urbanized societies: Stress, restoration, and the pursuit of sustainability. *Journal of Social Issues*, 63, 79-96.

Cities and other dense settlement areas may offer some environmental, economic, and social advantages, but it can impose psychological demands that people find excessive. These demands of urban life have stimulated a desire for contact with nature through suburban residence, leading to planning and transportation practices that have profound implications for the pursuit of sustainability. Some might dismiss people's desire for contact with nature as the result of an anti-urban bias in conjunction with a romantic view of nature. However, research in environmental psychology suggests that people's desire for contact with nature serves an important adaptive function, namely, psychological restoration. They discuss research on four issues: how people tend to believe that nature is restorative; how restoration needs and beliefs shape environmental preferences; how well people actually achieve restoration in urban and natural environments; and how contact with nature can promote health.

Ulrich, R. S. (1979) Visual landscapes and psychological well being. *Landscape Research*, 4, 17-23 I CANT SEEM TO GET AN ABSTRACT OR ANYTHING OFF THE WEB

Ulrich, R. S. (2003). The Impact of Flowers and Plants on Workplace Productivity. Texas A&M.

Researchers at Texas A&M University recruited 101 participants to take part in SAF's Impact of Flowers & Plants on Workplace Productivity Study. During the four-month scientific study, participants took part in emotional, creativity and attentional demand protocols, in conditions that were carefully controlled, yet were similar to those in many office workplaces. Subjects were asked to take a series of tests in one of three environmental office conditions, selected at random: with fresh flowers and plants; with abstract sculpture; or with no greenery or sculpture at all. Throughout each session, subjects self-rated their moods four times, executed two creativity tasks and completed one attentional demand test. Researchers measured the number of ideas participants generated, their ideas' originality and flexibility, and other responses, using data extracted from the tests, which included Torrance Tests of the Creative Thinking and Profile of Mood States. "Productivity, in the form of innovation and creative problem solving, can mean the difference between mild and great success."

- Problem-solving skills, idea generation and creative performance improve substantially in workplace environments that include flowers and plants.
- Specifically, both men and women who work in environments with flowers and plants demonstrate more innovative thinking as compared to environments with sculpture or no decorative objects.
- Men who participated in the study generated 30 percent more ideas when working in environments with flowers and plants than ones without.
- While men generate a greater abundance of ideas, the research shows that women generate more creative, flexible solutions to problems in workplace environments with flowers and plants.

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

Stress recovery during exposure to natural and urban environments was studied by first exposing study participants to a scary movie. The researchers then showed urban and natural scenes and tested the restorative nature of the scenes with measures of heart rate etc. Findings indicated that viewing nature scenes led to positive changes.

Zukerman, M. (1977). Development of a situation-specific trait-state test from the prediction and measurement of affective responses. *Journal of Consulting and Clinical Psychology*, 45, 513-523. (Zipers emotional test).

This is just another one of the potentially useful well-being tests considered for this study. This one is commonly called the ZIPERS emotional test. It was not included in this research.

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- Buzzell, Linda. <https://groups.google.com/group/ecotherapy-association/topics?pli=1> This is Linda’s current blog site that contains up to date information on ecotherapy covering a wide variety of topics some of which will likely be useful to this research. Her current website: <http://www.ecotherapyheals.com/> will also be consulted regularly. Linda’s previous work as Linda Buzzell-Saltzman is found here: <http://www.santabarbaratherapy.org/therapists/therapist.html?tid=395> and may include historical information germane to this work.
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WEBSITES:

- <http://www.davidsuzuki.org>
- <http://www.childrenandnature.org/blog/author/rich/>
- <http://www.greenexercise.org/index.html>
- <http://www.forestry.gov.uk/website/forestresearch.nsf/ByUnique/INFD-5Z5ALT>

This website is a dynamic research site out of the UK that covers many topics on wellbeing, forestry and ecosystem services. Accessed Jan 22, 2012.

- <http://www.hphpcentral.com/article/the-benefits-of-green-exercise>

This website focuses on the green exercise research program at the University of Essex (UK) They have started to quantify some of these health benefits. The research has involved a range of different types of nature therapies, contexts, activities, clients, motivations and needs, but all have shown positive health and wellbeing benefits. They show that the first 5 minutes of green exercise has the biggest impact on improving self-esteem and mood.