

Optimizing AMS Pocket Lounges: The Effects of Nature Sounds on Perceived Stress

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**Optimizing AMS Pocket Lounges:
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‘Green Out’
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EXECUTIVE SUMMARY

Our goal is to contribute to the AMS by optimizing the university Pocket Lounges in order to reduce students' perceived stress levels. Previous studies indicate that nature has psychologically restorative effects and, based on that assumption, we hypothesized that exposure to nature sounds will also have a psychologically restorative effect. In the experimental condition, 31 students were exposed to nature sounds (birds, wind, running water) emitted by a small portable speaker. In the control condition, 28 students were exposed to the normal sounds and settings of the pocket lounge. We administered the Perceived Stress Scale (PSS) in one of seven Pocket Lounges to 59 UBC students. Our research aimed to determine whether exposure to nature sounds decreases students' perceived stress levels. Our results, however, did not indicate any variance in perceived stress among the two groups. We believe this is due to various factors involved in the manner in which we collected our data (time of day, volume of nature sounds, time of semester, duration of time spent in the lounge, etc.). Further studies should be done to assess the effectiveness of nature sounds for reduction of perceived stress.

INTRODUCTION

Throughout the course of their academic experience, university students are subjected to a consistent and substantial amount of pressure. Many sources contribute to a student's level of perceived stress – academic obligations, a heavy course-load, and financial strains are just a few examples. Stress and its underlying biological processes can elicit a series of negative consequences. According to research on the effects of stress on medical students, the demanding nature of medical school can have adverse effects on various aspects of students' functioning (including academic performance, physical and psychological health, and general well-being) (Mosley et al., 1994). Consequently, it is imperative that a university provide a multitude of environments that decrease students' perceived stress levels. Perceived stress is the "extent to which situations in one's life are appraised as stressful" (Cohen, 1983). However, in order to create environments at UBC that decrease students' perceived stress, it is crucial to identify specific strategies to improve existing facilities. There is a substantial amount of research that identifies the benefits of exposure to nature pertaining to cognitive functioning. A study conducted by Berman, Jonides, and Kaplan (2008) indicates that even brief interactions with nature can significantly increase cognitive control. The research also indicates that exposure to nature may play a role in psychological restoration. By applying the knowledge gained from findings in previous research, we investigated how the AMS Pocket Lounges could be optimized to help reduce students' perceived stress levels through the addition of nature sounds. Our research question asks whether nature sounds can elicit the psychologically restorative effect of reducing (perceived) stress in students. We hypothesize that the presence of nature sounds in the AMS pocket lounges will lead to lower perceived stress among university students.

METHODS AND MATERIALS

Participants:

Fifty-nine (27 male, 19 female, 13 unknown, 1 other; mean age = 20.27) University of British Columbia students participated in this study. All participants gave verbal informed consent before completing Sheldon Cohen's (1983) Perceived Stress Scale (PSS).

Many of the students who were using the pocket lounge were engaged in the following activities: eating lunch, on their computers, doing homework, hanging out with friends and some were listening to music.

Conditions:

The experiment consists of two conditions. In the control condition, 28 students were exposed to the normal sounds and settings of the Pocket Lounge. In the experimental condition, 31 students were exposed to nature sounds (birds chirping, wind, running water) emitted by a small portable speaker.

Measures:

In this experiment we used the Perceived Stress Scale (PSS), created by Sheldon Cohen in 1983. The PSS is the most widely used psychological instrument for measuring the perception of stress. It measures the degree to which situations in someone's life are appraised as stressful. The items of the scale have been designed to discover how unpredictable, uncontrollable, and overloaded respondents find their lives to be. The items are phrased and worded in a manner easy enough for junior high school students to comprehend. Items are both positively and negatively worded and question general nature as opposed to context specific situations, hence the inventory is applicable to our population. The PSS is a 10 item inventory that asks participants to grade their answers to each question on a scale from 0 (Never) to 4 (Very Often).

Procedure:

The experiment took place in a pocket lounge in the Student Union Building (SUB) at the University of British Columbia. Data collection took place during the peak hours of 12:30 pm - 3:30 pm in order to maximize participant population. Students that were situated in the AMS pocket lounge for a minimum time of 20 minutes were targeted as participants and were exposed to either the experimental or control condition. In the experimental condition, 31 students were exposed to nature sounds emitted by a Philips Fidelio SBD7500 portable speaker in medium/loud volume. Our nature sounds included birds chirping, a gust of wind, and a waterfall - sounds that are easily found in a park away from the city (the youtube video used is found in the APPENDIX B). Once the individuals successfully completed a 20 minute exposure to nature sounds, they were asked for oral consent to participate in the study; upon approval they were asked to fill out a PSS survey. In the control condition 28 students were exposed to the normal sounds and setting of the pocket lounge. Once the individuals successfully completed a 20 minute exposure to the pocket lounge, they were asked for oral consent to participate in the study; upon approval, they were asked to fill out the PSS survey. Once the surveys were completed by the participants, the results were compiled and analyzed by using a one way ANOVA. It is crucial that targeted participants were not wearing headphones or earphones during the experiment as it could inhibit the effects of nature sounds. Experimenters also ensured that the piano located inside the pocket lounge was not being played during data collection in order to avoid noise overlap with music. In order to account for the possible sound interference of the piano, the researchers wrote a note on the piano stating “ the piano is off use.”

RESULTS

The PSS is scored out of a total of 40, with each of the 10 questions being scored from 0 to 4. Four of the 10 questions (4,5,7, and 8) are positively stated items, and therefore the scores are reversed in order to maintain consistency (e.g., 0 = 4, and 1 = 3). After reversing the 4 questions, a simple summing across all 10 gives you the participant's score for the PSS. After having scored all of our data, a one way t-test was then run in order to analyze the data that we had collected. As indicated by Table 1 in the appendix, recorded stress levels for our experimental condition did not show a noticeable difference in comparison to our control. We obtained a P value of 0.58 from our results, suggesting that our results are not statistically significant. Means of 18.161 and 18.893 with standard deviations of 4.458 and 5.679 were reported for the experimental and control respectively. Hence, our experiment has displayed roughly a 4% decrease in PSS score with the implementation of the nature sounds. A difference likely negligible due to confounding factors such as differing times of participation, and proximity to the speaker. It is worth noting that the normal population means for participants of ages 18 to 29 is 14.2 with a standard deviation of 6.2. This means our participants were, on average, two thirds of a standard deviation above the population normal perceived stress level.

Limitations

A criticism of our study that should be considered is our usage of self-reported stress measurement. Rather than measuring stress directly (i.e. measuring physiological markers of stress such as serum cortisol levels or blood pressure), we opted to measure self-reported *perceived* stress levels. By assessing perceived stress, the experiment may have measured how people *believed* their body felt rather than how it *actually* felt. To mitigate this in future studies, researchers should administer physiological measures of stress such as the measurement of cortisol levels. Other flaws of our research include the fact that some participants were listening to music utilizing earphones, thus not being exposed to the experimental conditions and challenging affecting the integrity of our results. Volume levels could have also influenced the effects of nature sounds on stress reduction. Due to the fact that our experiment was conducted during peak hours in the Student Union Building, the maximum volume of the relatively small portable speakers could have potentially been too low to reach all of the desired participants. Contrastingly, participants that sat too close to the speaker could have been exposed to excessively loud volumes, affecting their concentration, social interactions and overall well-being. On a related note, playing music during peak hours in

the pocket lounge could have created a cacophony causing overstimulation and higher stress levels than if the base setting was silent.

DISCUSSION

The results do not indicate any difference among the two groups. That is, the perceived stress levels of students did not change after our intervention. However, this does not *necessarily* indicate that our hypothesis should be rejected. Rather, we ascribe the lack of statistical significance to flaws in our study design. Namely, our study lacks construct validity. We measured whether nature sounds can reduce *perceived* stress in students, and not whether this intervention reduces *actual* stress. Although the validity and reliability of the PSS has been accepted worldwide (Nordin & Nordin, 2013; Siqueira Reis, Ferreira Hino & Romelio Rodriguez Anez, 2010), this was perhaps not the best choice for our purposes. The usage of the PSS as a self-report measure can provide insight into the effects of environment on perceived stress (and this approach is certainly enticing due to the high face validity of the PSS), but perhaps a more direct approach (i.e. one not influenced by subjective individual interpretation) could be more useful. By measuring, for example, physiological markers of stress (such as serum cortisol levels, blood pressure, or heart rate), we may be able to determine the effects of the environmental manipulation (in our case, nature sounds) on stress in a more objective way.

Another possible source of error in our study is the potentially distracting influence of other stimuli. We conducted our study during peak hours in the pocket lounge which could have created a cacophony causing overstimulation and higher stress levels than if the base setting was silent. Furthermore, some participants were listening to music via earphones, potentially being influenced by their own music or worse, not being exposed to the experimental conditions at all. This could threaten the integrity of our results. Another factor to consider is inconsistency in volume for different participants. The maximum volume of the small portable speakers could have not been loud enough to reach all of the desired participants. On the other hand, those participants who sat too close to the speaker could have been exposed to excessively loud volumes, affecting their concentration, social interactions, and overall well-being.

CLIENT RECOMMENDATIONS

Part of the mandate of the Alma Mater Society is to “improve students’ social and personal lives” (Alma Mater Society, 2015, Mission Statement), which presumably involves reducing stress. The AMS Pocket Lounges serve as recreational/relaxation amenities for students at the University of British Columbia (UBC). Although our results are not ideal, the lack of statistical significance does not necessarily mean that such a significance does not exist. Further studies should be conducted to assess the effectiveness of this relatively inexpensive intervention. These further studies should take care to reliably measure the *actual* stress experienced by survey respondents (using, for example, physiological measures) and not merely their perception of it. In addition, using a variety of different nature sounds (e.g., birds chirping, rain falling, waterfalls) would be a useful tool to assess more specifically what helps to reduce stress. Furthermore, future studies

should be administered over a much longer period of time in order to account for various factors (such as time of day, time of semester, season, etc.) Additionally, it would be interesting to see whether this intervention (or others like it) has a different effect on people depending on their race, gender, age, or any other relevant dimension. It would also be interesting to note whether this intervention can be harmful (perhaps some people find nature sounds distracting) and further studies should take this into account. Ultimately, however, we believe that the effects of this this inexpensive and relatively non-invasive intervention could be researched throughout the pocket lounges with little to no risk, and with potentially psychologically restorative benefits.

APPENDIX A

In our original proposal, we had hoped to measure the differences between the effects of an active stimulus (such as colouring pages) compared to a passive stimulus (such as nature sounds). When we first began our experiment, we decided to start with the colouring pages, and we laid out 5-6 pages on each table with pencils as well as pop-up tents that instructed students to colour them. Unfortunately, throughout the course of several attempts, we quickly noticed that no one was engaging in the activity. In our first attempt, no one took part in the activity, so we decided to add ‘actors’ for the next attempt (members of the team themselves started colouring in order to see whether this would encourage any ‘pocket loungers’ to partake in our study). Unfortunately, this approach did not yield any participants either. After discussing the issue with our clients, we decided to simplify our study and limit the intervention to nature sounds only (with the additional arm of the study being the control group).



APPENDIX B:

Sum

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Control	28	18.8929	5.67868	1.07317	16.6909	21.0948	8.00	31.00
Condition	31	18.1613	4.45793	.80067	16.5261	19.7965	11.00	28.00
Total	59	18.5085	5.04248	.65648	17.1944	19.8226	8.00	31.00

Table 1 - PSS Scores of Participants

APPENDIX C:

This is the actual youtube sound clip we used in our experiment:
Youtube: <https://youtu.be/PwSHOI7DwWM>

APPENDIX D: Images of Pocket lounge



APPENDIX D:

Perceived Stress Scale

The questions in this scale ask you about your feelings and thoughts **during the last month**. In each case, you will be asked to indicate by circling *how often* you felt or thought a certain way.

Name _____ Date _____

Age _____ Gender (Circle): **M** **F** Other _____

0 = Never 1 = Almost Never 2 = Sometimes 3 = Fairly Often 4 = Very Often

- 1. In the last month, how often have you been upset because of something that happened unexpectedly? 0 1 2 3 4
- 2. In the last month, how often have you felt that you were unable to control the important things in your life? 0 1 2 3 4
- 3. In the last month, how often have you felt nervous and "stressed"? 0 1 2 3 4
- 4. In the last month, how often have you felt confident about your ability to handle your personal problems? 0 1 2 3 4
- 5. In the last month, how often have you felt that things were going your way?..... 0 1 2 3 4
- 6. In the last month, how often have you found that you could not cope with all the things that you had to do? 0 1 2 3 4
- 7. In the last month, how often have you been able to control irritations in your life? 0 1 2 3 4
- 8. In the last month, how often have you felt that you were on top of things?.. 0 1 2 3 4
- 9. In the last month, how often have you been angered because of things that were outside of your control?..... 0 1 2 3 4
- 10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them? 0 1 2 3 4

Please feel free to use the *Perceived Stress Scale* for your research.

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References

The PSS Scale is reprinted with permission of the American Sociological Association, from Cohen, S., Kamarck, T., and Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, 24, 385-396.
Cohen, S. and Williamson, G. Perceived Stress in a Probability Sample of the United States. Spacapan, S. and Oskamp, S. (Eds.) *The Social Psychology of Health*. Newbury Park, CA: Sage, 1988.

REFERENCES

Berman, M. G., Jonides, J., & Kaplan, S. (2008). The cognitive benefits of interacting with nature. *Psychological science*, *19*(12), 1207-1212.

COHEN, S., KAMARCK, T., & MERMELSTEIN, R. (1983) A global measure of perceived stress. *Journal of Health and Social Behavior*, *24*, 385-396. DOI:10.2307/2136404.

Mosley Jr, T. H., Perrin, S. G., Neral, S. M., Dubbert, P. M., Grothues, C. A., & Pinto, B. M. (1994). Stress, coping, and well-being among third-year medical students. *Academic Medicine*, *69*(9), 765-7.

Nordin, M., & Nordin, S. (2013). Psychometric evaluation and normative data of the Swedish version of the 10-item perceived stress scale. *Scandinavian Journal Of Psychology*, *54*(6), 502-507. <http://dx.doi.org/10.1111/sjop.12071>

Siqueira Reis, R., Ferreira Hino, A., & Romelio Rodriguez Anez, C. (2010). Perceived Stress Scale: Reliability and Validity Study in Brazil. *Journal Of Health Psychology*, *15*(1), 107-114. <http://dx.doi.org/10.1177/1359105309346343>