UBC Students' Perceptions of Sustainability as a Function of Faculty and Year

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Executive Summary
We examine how the perception of the importance of sustainability varies amongst faculty and year throughout the student body at the University of British Columbia using the revised New Ecological Paradigm scale (NEP). The revised NEP is a measure of validation of a "pro-ecological" worldview used extensively in the field of environmental education; primarily to measure the differences in behaviour and attitude relative to underlying values and worldviews (2012 Burkshire).
We compare the NEP scores of 278 surveyed students whose faculties (major area of study) were forestry, science, arts, business, and other. In addition to the NEP we use 6 supplemental questions which were provided by our stakeholders to measure perceived campus involvement in sustainability practices and what impact that had on their decisions. We also use the survey to extrapolate if there is a correlation between the number of years on campus and an increased perception of importance of sustainability. We present our data which reflects that there is in fact a relationship between faculty and the perceived importance of sustainability. However there does not appear to be a relationship between the number of years of attendance at UBC and an increase in the perception that sustainability is important.

Research Hypothesis

We posit that the sustainable culture promoted by UBC on campus has direct effects on its students' subjective ratings of the importance of sustainability. Although sustainability can be a construct and defining it can present challenges, within the context of this paper, sustainability is defined as the quality of one's behaviour not having adverse implications on the environment and pertains to the conservation of natural resources (things not man made) which ultimately supports the long- term ecological balance of the Earth. We predict that students who are exposed to UBC's sustainable campus culture for longer durations will show higher subjective ratings on the importance of sustainability than students with less exposure to UBC's sustainable campus culture, as indicated by the number of years that students have attended UBC (as opposed to year standing). We further predict that students belonging to faculties with a curriculum that places greater emphasis on themes of ecology and sustainability, such as the faculty of Forestry, will show higher scores on the New Ecological Paradigm (NEP); whereas students belonging to faculties with a curriculum that places less emphasis on themes of ecology and sustainability, such as the Sauder School of Business, will show lower scores on the NEP. Lastly, because the faculties of Arts and Science are much larger both in size, and in the number of sub-disciplines and specializations they comprise (as compared to Sauder or Forestry), we predict that average NEP scores for students in Arts and Sciences will lie somewhere between the two extremes of NEP scores shown by students in Forestry and Sauder.

Methods

Participants

Participants were 278 male and female undergraduate students from UBC; 317 surveys were initially filled out, but 39 were removed from our sample because of incomplete responses. For our faculty condition, we collected data from students across faculties in the following way: 33 students from the Faculty of Forestry, 45 students from the Sauder School of Business, 95 students from the Faculty of Arts, 53 students from the Faculty of Sciences, and 52 students from other faculties that we lumped together into a category titled 'other'. For our year standing condition, there were 73 First year students, 62 Second year students, 68 Third year students, and 69 Fourth year students.

Conditions

The study included three conditions: students' faculties (Arts, Sciences, Forestry and the Sauder School of Business); year standing (first, second, third, and fourth year); and number of years spent in attendance at UBC (1-7 years). To account for transfer students, both 'year standing' at UBC as well as 'years attending' were included in order to help us determine the actual duration that students had specifically attended UBC, which would enable us to attribute our findings to UBC and its campus culture. Faculties were selected for study on the basis of two criteria: curriculum content and subject matter, and the degree to which each faculty represents a significant percentage of the UBC undergraduate population. To avoid a potential confound, we purposefully avoided surveying participants in the Center for Interactive Research on Sustainability (also known as the CIRS Building) because previous research has shown the CIRS Building to unconsciously influence people to act in more sustainable ways (Wu, DiGiacomo, and Kingstone 2013). To maintain consistency, we surveyed students only on weekdays when students were more likely to be attending class, although the we did not adhere to surveying

within any specific hours of the day in order to increase our chances of acquiring a larger overall population sample size given time constraints.

Measures

To measure student perceptions of sustainability, we used the Revised New Ecological Paradigm (R-NEP) scale (Dunlap et al., 2000), which consists of fifteen questions designed to measure individuals' degree of 'environmental concern' and the extent to which they have a leaning toward either a 'pro-ecological worldview' (the belief that we cannot control nature) or a dominant social paradigm (the belief that we can control nature). All questions use the Likert Scale to determine the strength of agreement for each statement. The survey also included six supplemental questions (adapted from questions provided by stakeholders of the study) to provide insight into students' perceptions of the degree to which UBC provides and incorporates sustainability themed curriculum into its course offerings, as well as whether or not UBC adequately promotes sustainability education and sustainability initiatives on campus. The last two supplemental questions asked students more specifically the following: i) between 7 options, what 'sustainable behaviour' (e.g. recycling and proper waste disposal; adopting a vegetarian/vegan diet; walking, biking or taking public transit as opposed to driving; etc.) they perceived as making the biggest difference for sustainability as a student of UBC; and ii) what, if any, sustainability themed events or programs had participants attended in the past year as a result of their connection to UBC. We used three separate one-way Analysis of Variance (ANOVA) tests to analyze whether there was a significant difference between the means of our conditions (faculty, year standing, and years attended) on our measures (NEP and supplemental questions).

Procedure

To gather participants, a convenience sampling method was used. Although the survey was made available online, the majority of respondents came from individuals who were randomly approached by researchers and asked to fill out a brief survey in person using iPads provided by the researchers at various locations around the UBC campus. Locations included: the Forestry Building, the Sauder School of Business, the Irving K. Barber Learning Center (library) and the UBC Student Union Building (the SUB). These locations were selected for data collection because they are known to have a high volume of student traffic from the four faculties that were the focus of our study. The survey consisted of 3 pages, including: i) an initial consent form providing contact information for all experimenters and the supervising instructor of the study; ii) a page that collected participant information: faculty, year standing, and number of years attending UBC; and iii) a page with the survey questions themselves. Data was gathered from March 16th until March 26th at various times throughout the day, but never on the weekends.

<div align="center">

Results

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The means, standard deviations and standard of errors are shown in Table 1, Table 2, and Table 3. Forestry showed a mean score slightly above the averages of the other faculties for the NEP and questions 16 and 18 (Q16 and Q18, Appendix C). Year standing and years attended did not correlate with any of our measures ($r < 0.1$), nor did an ANOVA analysis show any significant difference between the means of those conditions (Table 4, Table 6, and Table 7). The F values for the ANOVA for year standing and years attended are small ($\lesssim 1$) and not significant at $p < .05$ level (Table 6, Table 7).

However, a significant difference was found in the Faculty condition for three of our measures: the NEP, Question 16 and Question 18, with F values for the ANOVA standing at 3.2, 5.3, and 9.9 for each of the measures respectively (Table 5). We therefore conducted a post hoc Tukey test to see which of the faculties differed. The post hoc test indicated a significant difference between the Faculty of Forestry and the Sauder School of Business on their mean NEP scores, with a difference of 0.371 and a p-value of 0.004 (Table 8). The post hoc also indicated a significant difference between Forestry and all the other Faculties (Arts, Science, and Sauder School of Business) on the mean scores for Question 16 and Question 18, with a p-value < .001 and a relatively large difference ~0.4-0.5 and ~0.6-0.9 respectively (Table 8). As a result, our hypothesis is partially supported since forestry scored higher than the other faculties on some, but not all of our measures of sustainability.

Discussion

Forestry scored a significantly higher mean on the NEP compared with Sauder. This suggests that Forestry has a better subjective rating on the importance of sustainability compared to Sauder according to the NEP. Forestry also scored a significantly higher mean score compared to the other faculties on question 16 (Appendix C). This suggests that Forestry perceives UBC as offering more courses that address topics related to sustainability compared to the other faculties, despite the fact that all faculties tested provide sustainability themed courses. Additionally, Forestry scored a significantly higher mean score on question 18 compared with all the other faculties (Appendix C). This suggests that compared to the other faculties tested, students from the faculty of Forestry perceive themselves as more likely to base their course selection on the inclusion of sustainability components. There could be many reasons for the above results, the first being that Forestry students show higher subjective ratings of the importance of sustainability than Sauder students. This is according to the NEP, however, which measures sustainability using a subjective rating scale, and not according to sustainable behaviour. Additionally, Forestry might have scored higher on questions 16 and 18 compared to the other faculties because their program offers more courses with sustainability components. It is worth noting that all the other faculties tested offer at least one course with a sustainability component. Increasing awareness of courses that include a sustainability component might increase the mean scores on question 18 for the other faculties tested. Furthermore, years attended and year standing did not correlate with any of our measures. This might indicate that attending UBC does not increase your subjective rating of the importance of sustainability over time, as measured by the NEP and the supplemental questions. However as mentioned above, the NEP is a subjective rating scale and does not measure sustainable behaviour.

There were some unforeseen difficulties within our survey that became evident when testing began. During the initial design phase of our study and survey, we planned to focus our study on students at the undergraduate level, but due to our use of a convenience sampling method, we did not anticipate that such a significant number of graduate and doctoral students, as well as UBC staff, would make us such a significant percentage of our respondents; therefore, we did not provide space within our survey to accommodate and include these individuals. Since we did not control for age or level of degree (bachelors, masters, or doctoral) a confounding variable was created. Although this created some confusion for some of our participants, our input field for number of years in attendance at UBC still made such individuals relevant to the study. The placement and order of questions within our survey may have influenced certain responses due to priming effects. For example, asking participants questions regarding their

faculty before the survey may have acted as a primer in terms of how they perceive and answer the questions, as well as potentially created some confusion in whether the use of the word "institution" within the survey was referencing their faculty, or UBC at large.

The use of the NEP may have affected our results, specifically for Forestry students. Many Forestry students recognized and were familiar with the NEP, as it is part of a mandatory Forestry class taken by Forestry students in their second year: CONS 200 Foundations of Conservation. This familiarity with the NEP may have affected how they responded to the questions, although it is important to note that Forestry scored higher on the NEP only compared with Sauder, and not with the the other faculties tested; if familiarity with the NEP shown by Forestry students did indeed create a significant bias in how they answered their questions, then a similar effect should have been seen across all faculties. Additionally, the two questions that Forestry students performed better on overall were not from the NEP, but rather, from the added supplementary questions in relations to sustainability and the institution of UBC (Q16, Q18, Appendix C).

Due to a lack of resources including time, and the need for a high number of participants, our survey was taken at various locations around UBC. This lack of control in the testing environment likely influenced our results. For example, as demonstrated in previous research, the environment itself in which an individual is tested can influence his or her perceptions and behavior within a sustainability context. Wu, DiGiacomo, and Kingstone (2013) demonstrated that being in a building that has relevance to sustainability leads individuals to both feeling and behaving in a more environmentally conscious manner. The results of this study provided support specifically to UBC's CIRS Building, showing that just being in the building leads to increased pro-environmental behaviour (Wu et al., 2013). Due to this known effect, we did not collect data in the CIRS Building, but it is important to note that other buildings on campus may have influenced participant responses in a similar way, such as the "Forestry" building.

Participants were tested throughout the week at different times and locations, and therefore, different days of the week, times and places, may have influenced how participants responded to the survey. A known effect, noted by Li, Johnson and Zaval (2011), shows that current weather and temperature conditions on any given particular day can significantly affect individuals' perceptions and beliefs pertaining to global warming. Thus, with these potential confounds in mind, future studies controlling for gender, age, nationality, weather conditions and daily temperature, day of the week, time of day, location and built environment, would all help in establishing a causal relationship.

Due to the restrictions of time and resources, there were several limitations to our study, each of which should be consulted for future studies. Although we chose to limit the focus of our study to four faculties (Arts, Sciences, Forestry and Sauder/Business), we feel that including additional faculties in the future would be beneficial. In particular, we believe it would have been valuable to include the Faculty of Engineering because of their focus on overcoming challenges and obstacles using scientific and technological means. This mode of thinking and disciplinary approach may influence engineering student to perceive humans as being capable of solving the worlds problems, including climate change, through scientific and technological advancement, which could potentially make them more inclined to seeing the world though the "normal social paradigm" lens. In order to collect data we had to ask participants to voluntarily take the survey, which may have created a sample bias in that that results are from those who were already willing to take the survey. Therefore, the results may not be representative of UBC and the specific faculties.

In summary, although several flaws and limitations were present, our study provides a strong foundation from which to conduct further research. We believe it is important to show that UBC is fulfilling its sustainability initiatives through its students, and this can be exemplified through studies such as this, thus allowing us to strengthen as a sustainable community by finding spaces to improve as well as identify aspects working.

Recommendations

We recommend that UBC replicate our study with a more detailed survey in which additional traits such as age, gender, ethnicity, etc. can be measured. UBC should also consider further research into all faculties and their corresponding specialties for both undergrad and graduate students. It would also be valuable to survey additional graduate and doctoral students as well as staff because they make up a considerable portion of the UBC population. Additionally, we recommend that the study be replicated with a larger sample in order to compare scores by year within each faculty. This would allow for the comparison of years attended at UBC and the various measures within each faculty. Future studies should also incorporate a design to measure the long term sustainability effects that UBC's campus culture has on students. This information could potentially be gathered by surveying alumni students and/or students studying abroad at UBC before, after, and during their UBC experience. We further recommend that UBC look into why sustainable themes are valued more in the class selection process by certain individuals and not others, even though ecologically themed courses are available to everyone. Our analysis of the data also indicated that attending UBC does not improve your subjective rating of the importance of ecological sustainability over time, as measured by the NEP and supplemental questions. Further research in this area could explore whether perceptions of the importance of sustainability is a fixed opinion that is formulated at a younger age, or by other contributing environmental factors. Further research could also measure sustainability through behaviour which is discussed below.

For future research, we further recommend that UBC, and the greater enviro-psych research community at large, consider creating a new type of survey to be delivered in conjunction with the NEP. This survey would measure individuals' subjective ratings of the importance of a variety specific "sustainable behaviours" spread across several sustainability themed domains in terms of each behavior's degree of "sustainability value" (e.g. recycling and proper waste disposal, adopting a vegetarian/vegan diet, choosing a 'green' mode of transportation, etc.). In other words, the degree to which a specific behaviour makes a positive contribution to achieving desired sustainability outcomes.

We reason that measuring individuals' subjective ratings of the importance of specific behaviors is important because it is the adoption of the most sustainable behaviours on the part of each individual that is required to create a more fully sustainable University campus as a whole, and society at large. To expand on this, we acknowledge the merits of the NEP and the attempts it makes to measure the degree of 'environmental concern' that individuals carry, and the extent to which people hold a 'pro-ecological worldview' based on their broad-scale "bigger picture" perceptions of the global crisis, which are drawn from and informed by multiple influences including: an individual's family and social peer group, the news and other media outlets, possible contact and experience with climate change education in various forms (i.e. formalized education, documentary films, books, the internet, etc.) and other personal experiences. However, although the NEP enables us to assess more broad-scale perceptions of larger

sustainability issues in a more global context, it does not address or assess the amount of "sustainability value" that they attach to specific "sustainable behaviours", and thus, misses the important work of evaluating how aware people are of their own personal impacts to the environment based on their decisions and actions, as well as how important each behaviour is in helping us move toward achieving a genuinely sustainable culture and society.

In the end, it is the degree to which individuals make well informed sustainable choices and adopt sustainable behaviours that will determine whether or not much needed sustainable outcomes become a reality, and allow a society to flourish in the long-term. Therefore, it is our hope that this form of survey would help UBC and other universities begin to assess which behaviours that their students see as carrying more "sustainable weight", allowing them to decipher which areas they need to "target" on campus, as well as to what extent they need to pour energy, funding and resources into raising awareness and further educating the student body about the degree of impact their behaviours are having on the environment.

Given that previous studies have shown that behavioural modification in the direction of sustainable outcomes is largely driven by a combination of both sustainability education and the convenience of readily available infrastructure that promotes and efficiently facilitates sustainable behaviours, our hope is that such an approach would help expedite the rate of behavioural change in the student body in the direction of greater sustainable outcomes. Further, such a survey could also be used to provide participants with direct feedback on their "level of sustainability" by giving them a "sustainability rating" based on their individual answers to the questions in each sustainability domain, creating an opportunity to provide further education about the very real environmental impacts of their behaviours (e.g. the amount of energy consumption and resources involved in meat production and consumption, the amount of carbon emissions a person accounts for by purchasing a return flight to Mexico for a vacation, etc.), as well as providing links to further online educational resources such as the most significant and current, up-to-date environmental and climate-change reports (like the International Panel on Climate-Change, or well researched and critically acclaimed environmental documentaries). Better still, a unique, informative, dynamic and engaging website could be created to engage the student body in learning more about the impacts of their own behaviors in various categories of sustainability (i.e. water & energy conservation, impacts based on dietary preferences, impacts from transportation choices, etc.) based on how they answered each of the questions. This endeavor could be realised in a multi-disciplinary collaboration between the UBC faculties of Computer Science (responsible for the coding aspects of the project), Environmental Psychology Students and the SEEDS program, and other relevant faculties that could add value. The website could be maintained and updated regularly by UBC, and metrics re-tuned annually to reflect the most current, up-to-date research, and could potentially become a powerful system or model, and robust tool for measuring not only sustainable perceptions, but also the number of times that an individual actually engages in either more sustainable behaviors, or less desirable unsustainable behaviors, as compared to the average. Such information and direct feedback could help increase students' level of personal awareness in a sustainability context, and nudge students to both adopt new sustainable behaviors using the power of social norms, which have shown to be highly effective catalysts for increasing sustainability oriented behavioral changes leading to greater positive sustainable outcomes.

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Appendix A

Table 1. Descriptive Statistics for Faculty and Measures.

Descriptives Faculty

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Mean NEP Score	Arts	95	3.64	.447	.046	3.55	3.73	2	5
	Science	53	3.61	.452	.062	3.48	3.73	3	5
	Forestry	33	3.83	.431	.075	3.68	3.98	3	5
	Sauder	45	3.46	.436	.065	3.33	3.59	2	4
	Other	52	3.61	.495	.069	3.47	3.75	2	5
	Total	278	3.62	.461	.028	3.57	3.67	2	5
Q16[a]	Arts	95	2.26	.587	.060	2.14	2.38	1	3
	Science	53	2.26	.560	.077	2.11	2.42	1	3
	Forestry	33	2.76	.435	.076	2.60	2.91	2	3
	Sauder	45	2.31	.557	.083	2.14	2.48	1	3
	Other	52	2.38	.599	.083	2.22	2.55	1	3
	Total	278	2.35	.581	.035	2.28	2.42	1	3
Q17[b]	Arts	95	2.03	.515	.053	1.93	2.14	1	3
	Science	53	2.08	.549	.075	1.92	2.23	1	3
	Forestry	33	2.12	.485	.084	1.95	2.29	1	3
	Sauder	45	2.13	.588	.088	1.96	2.31	1	3
	Other	52	2.02	.464	.064	1.89	2.15	1	3
	Total	278	2.06	.520	.031	2.00	2.13	1	3
Q18[c]	Arts	95	2.07	.688	.071	1.93	2.21	1	3
	Science	53	1.85	.632	.087	1.67	2.02	1	3
	Forestry	33	2.73	.517	.090	2.54	2.91	1	3
	Sauder	45	1.96	.673	.100	1.75	2.16	1	3
	Other	52	1.98	.754	.105	1.77	2.19	1	3
	Total	278	2.07	.712	.043	1.99	2.16	1	3
Q19[d]	Arts	95	1.58	.645	.066	1.45	1.71	1	3
	Science	52	1.60	.664	.092	1.41	1.78	1	3
	Forestry	33	1.97	.770	.134	1.70	2.24	1	3
	Sauder	45	1.69	.733	.109	1.47	1.91	1	3
	Other	52	1.75	.711	.099	1.55	1.95	1	3
	Total	277	1.68	.698	.042	1.60	1.76	1	3

Table 2. Descriptive Statistics For Year Standing and Measures.

Descriptives Year Standing

	Year Standing	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound	95% Confidence Interval for Mean Upper Bound	Minimum	Maximum
Mean NEP Score	1	73	3.57	.477	.056	3.45	3.68	2	5
	2	62	3.61	.409	.052	3.51	3.72	3	5
	3	68	3.64	.461	.056	3.52	3.75	2	5
	4	68	3.63	.470	.057	3.52	3.75	2	5
	Total	271	3.61	.455	.028	3.56	3.66	2	5
Q16	1	73	2.33	.528	.062	2.21	2.45	1	3
	2	62	2.26	.626	.079	2.10	2.42	1	3
	3	68	2.46	.558	.068	2.32	2.59	1	3
	4	68	2.38	.599	.073	2.24	2.53	1	3
	Total	271	2.36	.578	.035	2.29	2.43	1	3
Q17	1	73	2.16	.500	.059	2.05	2.28	1	3
	2	62	2.03	.511	.065	1.90	2.16	1	3
	3	68	2.03	.517	.063	1.90	2.15	1	3
	4	68	2.01	.560	.068	1.88	2.15	1	3
	Total	271	2.06	.523	.032	2.00	2.13	1	3
Q18	1	73	2.07	.653	.076	1.92	2.22	1	3
	2	62	1.97	.701	.089	1.79	2.15	1	3
	3	68	1.97	.712	.086	1.80	2.14	1	3
	4	68	2.19	.758	.092	2.01	2.37	1	3
	Total	271	2.05	.708	.043	1.97	2.14	1	3
Q19	1	73	1.70	.681	.080	1.54	1.86	1	3
	2	62	1.69	.781	.099	1.50	1.89	1	3
	3	67	1.70	.628	.077	1.55	1.85	1	3
	4	68	1.57	.676	.082	1.41	1.74	1	3
	Total	270	1.67	.690	.042	1.58	1.75	1	3

Table 3. Descriptive Statistics For Years Attended UBC and Measures.

Descriptives Years Attended UBC

Years Attended UBC		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Mean NEP Score	1	90	3.57	.453	.048	3.48	3.67	2	5
	2	71	3.61	.454	.054	3.51	3.72	3	5
	3	47	3.68	.470	.068	3.54	3.82	2	5
	4	48	3.65	.518	.075	3.50	3.80	2	5
	5	15	3.61	.378	.098	3.40	3.82	3	4
	6+	6	3.67	.456	.186	3.19	4.15	3	4
	Total	277	3.62	.462	.028	3.57	3.67	2	5
Q16	1	90	2.32	.537	.057	2.21	2.43	1	3
	2	71	2.28	.637	.076	2.13	2.43	1	3
	3	47	2.38	.573	.084	2.21	2.55	1	3
	4	48	2.44	.580	.084	2.27	2.61	1	3
	5	15	2.47	.516	.133	2.18	2.75	2	3
	6+	6	2.50	.837	.342	1.62	3.38	1	3
	Total	277	2.35	.582	.035	2.29	2.42	1	3
Q17	1	90	2.14	.487	.051	2.04	2.25	1	3
	2	71	2.07	.593	.070	1.93	2.21	1	3
	3	47	2.02	.489	.071	1.88	2.16	1	3
	4	48	2.00	.546	.079	1.84	2.16	1	3
	5	15	1.93	.458	.118	1.68	2.19	1	3
	6+	6	2.00	.000	.000	2.00	2.00	2	2
	Total	277	2.06	.521	.031	2.00	2.13	1	3
Q18	1	90	2.01	.695	.073	1.87	2.16	1	3
	2	71	2.17	.654	.078	2.01	2.32	1	3
	3	47	1.89	.729	.106	1.68	2.11	1	3
	4	48	2.10	.751	.108	1.89	2.32	1	3
	5	15	2.27	.884	.228	1.78	2.76	1	3
	6+	6	2.50	.548	.224	1.93	3.07	2	3
	Total	277	2.07	.714	.043	1.99	2.16	1	3
Q19	1	90	1.71	.707	.075	1.56	1.86	1	3
	2	71	1.69	.729	.086	1.52	1.86	1	3
	3	47	1.68	.663	.097	1.49	1.88	1	3
	4	47	1.77	.698	.102	1.56	1.97	1	3

⊞ **Table 4.** Pearson's Correlation Coefficients for Year Standing, Years Attended And Measures.

Correlations

		Year Standing	Years Attended	Mean NEP Score	Q16	Q17	Q18	Q19
Year Standing	Pearson Correlation	1	.743**	.056	.068	-.101	.056	-.060
	Sig. (2-tailed)		.000	.355	.263	.098	.356	.327
	N	271	270	271	271	271	271	270
Years Attended	Pearson Correlation	.743**	1	.063	.096	-.118	.072	-.068
	Sig. (2-tailed)	.000		.297	.111	.050	.233	.258
	N	270	277	277	277	277	277	276
Mean NEP Score	Pearson Correlation	.056	.063	1	.055	-.179**	.270**	.128*
	Sig. (2-tailed)	.355	.297		.362	.003	.000	.033
	N	271	277	278	278	278	278	277
Q16	Pearson Correlation	.068	.096	.055	1	.295**	.279**	.263**
	Sig. (2-tailed)	.263	.111	.362		.000	.000	.000
	N	271	277	278	278	278	278	277
Q17	Pearson Correlation	-.101	-.118	-.179**	.295**	1	.046	.147*
	Sig. (2-tailed)	.098	.050	.003	.000		.446	.014
	N	271	277	278	278	278	278	277
Q18	Pearson Correlation	.056	.072	.270**	.279**	.046	1	.374**
	Sig. (2-tailed)	.356	.233	.000	.000	.446		.000
	N	271	277	278	278	278	278	277
Q19	Pearson Correlation	-.060	-.068	.128*	.263**	.147*	.374**	1
	Sig. (2-tailed)	.327	.258	.033	.000	.014	.000	
	N	270	276	277	277	277	277	277

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Note. No sig. correlation between our conditions (year standing, years attended) and measures. Some weak correlation between measures.

Table 5. ANOVA for Faculty and Measures.

ANOVA for Faculty

		Sum of Squares	df	Mean Square	F	Sig.
Mean NEP Score	Between Groups	2.661	4	.665	**3.230***	**.013**
	Within Groups	56.224	273	.206		
	Total	58.884	277			
Q16	Between Groups	6.718	4	1.679	**5.286***	**.000**
	Within Groups	86.736	273	.318		
	Total	93.453	277			
Q17	Between Groups	.535	4	.134	.492	.742
	Within Groups	74.299	273	.272		
	Total	74.835	277			
Q18	Between Groups	17.847	4	4.462	**9.926***	**.000**
	Within Groups	122.714	273	.450		
	Total	140.561	277			
Q19	Between Groups	4.363	4	1.091	2.281	.061[a]
	Within Groups	130.041	272	.478		
	Total	134.404	276			

*. Indicates a significant difference between the means of the Faculties.

a. *Note.* Almost significant. Post hoc Tukey analysis revealed a small effect between Forestry and Arts at $p < .057$

Table 6. ANOVA for Year Standing.

ANOVA Year Standing

Year Standing		Sum of Squares	df	Mean Square	F	Sig.
Mean NEP Score	Between Groups	.218	3	.073	.348	.790
	Within Groups	55.579	267	.208		
	Total	55.796	270			
Q16	Between Groups	1.373	3	.458	1.375	.251
	Within Groups	88.907	267	.333		
	Total	90.280	270			
Q17	Between Groups	1.044	3	.348	1.275	.283
	Within Groups	72.889	267	.273		
	Total	73.934	270			
Q18	Between Groups	2.228	3	.743	1.490	.218
	Within Groups	133.049	267	.498		
	Total	135.277	270			
Q19	Between Groups	.791	3	.264	.551	.648
	Within Groups	127.209	266	.478		
	Total	128.000	269			

Table 7. ANOVA for Years Attended UBC

ANOVA Years Attended UBC

Years Attended UBC		Sum of Squares	df	Mean Square	F	Sig.
Mean NEP Score	Between Groups	.437	5	.087	.406	.845
	Within Groups	58.445	271	.216		
	Total	58.882	276			
Q16	Between Groups	1.155	5	.231	.679	.640
	Within Groups	92.174	271	.340		
	Total	93.329	276			
Q17	Between Groups	1.148	5	.230	.845	.519
	Within Groups	73.682	271	.272		
	Total	74.830	276			
Q18	Between Groups	4.215	5	.843	1.675	.141
	Within Groups	136.341	271	.503		
	Total	140.556	276			
Q19	Between Groups	3.198	5	.640	1.321	.255
	Within Groups	130.744	270	.484		
	Total	133.942	275			

Table 8. Post Hoc Tukey Test for Forestry and Significant Measures.

Post Hoc Test – Multiple Comparisons

Tukey HSD

Dependent Variable	(A) Faculty	(B) Faculty	Mean Difference (A-B)	Std. Error	Sig.
Average NEP Score	Forestry	Arts	.190	.082	.233
		Science	.223	.092	.176
		Sauder	**.371***	**.104**	**.004**
		Other	.215	.092	.209
Q16[a]	Forestry	**Arts**	**.494***	**.114**	**.000**
		Science	**.493***	**.125**	**.001**
		Sauder	**.446***	**.129**	**.006**
		Other	.373*	.125	.026
Q18[b]	Forestry	**Arts**	**.654***	**.135**	**.000**
		Science	**.878***	**.149**	**.000**
		Sauder	**.772***	**.154**	**.000**
		Other	.747*	.149	.000

*. The mean difference is significant at the 0.05 levels.

a.16. Indicate the extent to which your institution offers courses, which address topics related to sustainability.

b.18. To what extent would the inclusion of sustainability components and/or themes influence the courses you select?

Note. Table only shows data for forestry, as it is the only faculty that differed from the other faculties.

NEP out of 5-point Likert. Q16 and Q18 out of 3-point Likert.

Appendix B

Issues/Points of Concern

We encountered a few issues in hosting our survey online. We were asked to create our survey in SurveyMonkey by the stakeholders, however when we finished that we were informed that it would be hosted on Fluidsurvey instead. Due to the limitations of the FluidSurveys free account this was not possible for us to do (there was a limit of 10 questions). The stakeholders, therefore recreated our survey on Fluidsurvey. It took roughly 10 days from when we created our survey on surveymonkey to when we could start our data collection. Additionally, the person who recreated the survey on Fluidsurvey did not encode for the counterbalanced questions. As a result, the counterbalanced questions had to be manually changed post data collection.

We chose not to include questions 20 and 21 in our data analyses as it became too confusing with the worded responses. We did not know how to encode the worded responses in a way that was usable for the various statistical tests. Specifically, how to encode for the "other, please specify below area" of the questions.

Appendix C

Survey Consent Form

Welcome to our study. We are running a survey on Campus Sustainability as our group project for the PSYC 321-Environmental Psychology course. The survey will take about 10 minutes to complete. You will answer a series of questions on Campus Sustainability in the survey.

Your participation in this survey is entirely voluntary and anonymous. You can refuse to participate or withdraw from the survey at any time. Your identity will be kept strictly confidential. All documents will be identified only by code number and stored securely. You will not be identified by name in any reports of this study. Data in this survey will only be accessed by the students, the course instructor, and the teaching assistant. Results of this study will be used to write a research report. There are no risks associated with participating in this survey.

If you have any questions about the study, please contact us below. (list every student on this project)

Name: Christina Anda   Email: ▮▮▮▮▮▮▮▮   Phone: ▮▮▮▮▮

Name: Jay Dubeta   Email: ▮▮▮▮▮▮   Phone: ▮▮▮▮▮

Name: Elizabeth Eakin   Email: ▮▮▮▮▮▮▮   Phone: ▮▮▮▮-
▮▮

Name: Erik Elvenaes   Email: ▮▮▮▮▮▮   Phone: ▮▮▮▮▮

Name: Isaiah Smith   Email: ▮▮▮▮▮   Phone: ▮▮▮▮▮

You can also contact the course instructor, Dr. Jiaying Zhao, assistant professor in the Department of Psychology and the Institute for Resources, Environment and Sustainability at UBC. Dr. Zhao can be reached at at 604-827-2203, or environmentalpsychology321@gmail.com.

If you consent to participate in this study, please proceed to the next page.

Appendix D

Survey Questions

Listed below are the questions asked of each participant:

Please select your faculty (choices: Faculty of Arts, Faculty of Science, Faculty of Forestry, Sauder School of Business, Other [please specify in the area below])

Please specify your year standing according to the SSC. (choices: First Year, Second Year, Third Year, Fourth Year)

Please specify the number of years you have attended UBC. (choices: 1, 2, 3, 4, 5, 6, 7 or more)

Revised NEP
On a scale from 1 (strongly disagree) to 5 (strongly agree), please indicate how much you agree or disagree with the following statements:

1	2	3	4	5
Strongly Disagree				Strongly Agree

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

Supplemental Questions
16. The balance of nature is very delicate and easily upset. (Also on Likert Scale)

17. Humans will eventually learn enough about how nature works to be able to control it. (Also on Likert Scale)

18. If things continue on their present course, we will soon experience a major ecological catastrophe. Also on Likert Scale)

19. Indicate the extent to which your institution offers courses which address topics related to sustainability. (1 Not at all, 2 Somewhat, 3 Significantly.)

20. Indicate the extent to which sustainability is a focus woven into traditional disciplinary education in. (1 Not at all, 2 Somewhat, 3 Significantly.)

21.To what extent would the inclusion of sustainability components and/or themes influence the courses you select? (1 Not at all, 2 Somewhat, 3 Significantly.)

22. To what extent did the university's commitment or reputation in sustainability influence you attending UBC? (1 Not at all, 2 Somewhat, 3 Significantly.)

23. Of the options below, which is the best way for you to engage in sustainability education and action on campus?
- (Adopting a vegan/vegetarian diet and raising awareness of the environmental impacts of meat consumption,
- Using sustainable travel (e.g. taking public transit or other rideshare, biking, walking, etc.)
- Disposing of waste properly (i.e. using appropriate bins for recycling, composting, etc.)
- Actively participating in sustainability projects (e.g. joining a club, research study, or activist group with a sustainability focus)
- Taking courses in sustainability education to better understand the complex problems associated with sustainability issues, and then implementing change.
- Actively reducing water and energy consumption (e.g. taking shorter showers, using a reusable water bottle, turning off the lights, unplugging electronic devices, etc.)
- Other (please specify in the area below).

24. Have you attended sustainability initiatives, events or programs at UBC?(If yes, please specify the event.)