

University of British Columbia

Social Ecological Economic Development Studies (SEEDS) Sustainability Program

Student Research Report

Barriers in Research Opportunities for International Students at Post-Secondary Institutions

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Barriers in Research Opportunities for International Students at Post-Secondary Institutions
Pooja Ramachandran, Baldeesh Dhillon, Jenny Li, Sameen Ghaemian, Jayoung Im (Divergent)
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Executive Summary

Our client, the UBC AMS aims to increase accessibility to research opportunities at the UBC campus. To support this endeavour, we conducted an extensive literature review on the perceptions of international and domestic post-secondary students in academic and non-academic contexts. This revealed a knowledge gap on comparative research conducted between the two groups, and specifically within undergraduate academic contexts. To address the knowledge deficit on the topic, we hypothesize that undergraduate international students, relative to undergraduate domestic students, will experience disproportionately negative experiences due to self-efficacy, financial constraints, mental well-being, and sociocultural barriers when pursuing research opportunities. To conduct our study, we administered a survey using the UBC Qualtrics Platform, which was distributed to students enrolled in eight post-secondary institutes in BC. Our analysis indicated that undergraduate international students are not disproportionately impacted by the barrier of social support compared to undergraduate domestic students, thus our hypothesis was not supported. However, further analysis suggests that international students perceived having less social supports compared to domestic students. We recommend that BC post-secondary institutes integrate greater social support in academic contexts, as well as provide instructors with resources and training on fostering inclusion and supporting international students in classes.

Introduction

In 2017, Canada welcomed 245,895 international students who represent 12% of overall enrollment in post-secondary institutes (Government of Canada, 2019). These international students, who are classified as having temporary status in Canada, are increasing in number across post-secondary institutes. They bring unique challenges to the forefront as students and as new residents, which in turn has created interest within academia to study this group. Numerous research has found that international students face several barriers that impair their academic success and degree of integration in the host country (Jenkins & Boyd, 2019; Sherry, Thomas and Chui, 2009; Murzi, Havas & Woods, 2019). Studies sampling international students commonly identified the barriers of low language proficiency, which impacts communication and comprehension; financial problems owing to lack of available financial aids, and employment restrictions related to being on a visa. Moreover, difficulty adapting to new cultural norms in terms of differences in socializing and interacting with others; as well as, reduced social support due to lack of social connectedness were identified as being barriers (Jenkins & Boyd, 2019; Sherry et al., 2009; Murzi et al., 2019).

While these studies successfully identify challenges unique to the community, they have limitations that question their generalizability. Jenkins & Boyd, 2019; Sherry, et al., 2009; Murzi et al., 2019, all had a small sample size, which was geographically limited to the United States. These studies also lacked the responses of domestic students, who provide a useful comparison group. However, Calder, Richter, Mao, Burns, Mogale & Danko (2016) compared international and domestic graduate students' experiences at Canadian universities. Consistent with previous literature, Calder et al (2016) identified financial constraints and social support to be a larger issue for international students than for domestic students.

Although Calder et al's (2016) study focused on domestic and international students, it examined graduate students, who might have different experiences. This highlights the need for a large-scale comparative study on the undergraduate student population in Canada. Further, to our knowledge, there is no literature that questions how the challenges faced by international students affects their ability to partake in research opportunities at post-secondary institutes. Furthermore, the majority of studies regarding international students have focused their analysis on adaptation to host countries societies rather than the institutional barriers within-post secondary schools (Grayson, 2006). The opportunities sought out at the undergraduate level, impact future outcomes, especially for those desiring entry into graduate schools (Yaffe, Bender & Sechrest, 2014). Cognitive barriers, which impact effective performance during cross-cultural transition and social barriers such as behavioural factors (new cultural and social expectations), as well as low socioeconomic status can inhibit students from participating in research (Wu, Garza & Guzman, 2015; Ahmad, Sabat, Trump-Steele & King, 2019). Based on these psychological insights, the purpose of this study is to identify the barriers, particularly with a focus on four major themes: financial constraints, self-efficacy, mental well-being, and social support that impact the ability of undergraduate international students to partake in research opportunities at post-secondary institutions in Canada.

The lack of knowledge on this topic indicates a promising field for future research and emphasizes the rationale as well as the significance of conducting our study within this field. Hence, our research question is as follows: What are the perceived barriers in the pursuit of research opportunities for international students in British Columbian post-secondary institutions? We hypothesize that undergraduate international students, relative to undergraduate

domestic students, will experience disproportionately negative experiences due to self-efficacy, financial constraints, mental well-being, and sociocultural barriers when pursuing research opportunities.

Methods

Participants

Based on an effect size of 0.5, alpha of 0.05, and power of 0.95, we aimed to obtain a minimum of 105 international and 105 domestic undergraduate students. However, after excluding six responses due to respondents indicating that they are not enrolled in a BC post-secondary institute (see Q12, appendix A), our final data analysis included a total of 131 responses, 33 of which were from international students and 98 were domestic students. Respondents were undergraduate students from eight different BC post-secondary institutions including UBC, SFU, Uvic, KPU, Langara College, Douglas College, and Sprott Shaw College were included in our study. The age range of respondents ranged from 18 to 51 years. The self-reported gender identification of our respondents included 87 females, 40 males, and 4 non-binary, transgender or others.

Conditions

As our study is aimed at comparing group differences, we used a between-subjects design. The two groups are international students and domestic students, which are operationalized using a self-identification question (see Q6 in Appendix A). Thus, the two groups serve as our Independent variable.

Measures

Since our research question is yet to be addressed by scholarly literature and we are conducting preliminary research, we thus designed a survey that was tailored to measure the extent of differences between our groups. Therefore, our dependent variables are self-efficacy, financial constraints, mental well-being and sociocultural barriers. They are conceptually defined as follows: self-efficacy is the belief that one is able to adequately participate in research; mental wellbeing is the perception about one's mental health and social support; financial constraints are one's economic situation, which limits research participation; socio-cultural is the attitudes towards research within one's social networks and culture. Each of these variables were operationalized by using a 5-point Likert scale. All questions used the same set of response options; strongly disagree, disagree, neither agree or disagree, agree, and strongly agree. For the purposes of our survey, this scale was chosen for two reasons. Firstly, these response options are widely used within the social sciences for quantitative studies (Joshi, Kale, Chandel & Pal, 2015; Preston & Colman, 2000). Secondly because it can help determine degrees of agreement to each statement, which is suitable for understanding students' perceptions. Our survey design included three questions (Q1, Q2, Q3, see Appendix A) that assess the inclination of undergraduate students to participate in research opportunities. Although these questions inform the likelihood of research participation, for the purposes of our study, they were not considered to be barriers to research opportunities.

Given that numerous research has found group differences in self efficacy, financial constraints, mental well-being and sociocultural aspects while at university, we wanted to know if these barriers would follow suit when accessing research opportunities. Each dependent variable was gauged using two questions that assess self efficacy (see Q 10-11 in Appendix A), financial constraints (see Q 4-5 in Appendix A), mental well-being (see Q 8-9 in Appendix A)

and sociocultural barriers (see Q 6-7 in Appendix A). To ensure that personal biases did not influence responses, statements pertaining to oneself were asked instead of opinions or attitude orientated questions. If there were negatively disproportionate differences in self-reporting by international students, they could be easily attributed to our psychological insight based on which questions elicited differences. Therefore, it would support our hypothesis. Lastly, since demographic questions have been found to influence responses on surveys, these questions were asked at the end of our survey, to minimize implicit biases (Hughes, Camden & Yangchen, 2016). These questions were a mix of open-ended and yes or no responses.

Procedure

We collected the data for our survey within a three week period, starting March 4, 2021 and ending March 26, 2021 using the UBC Qualtrics platform. Using an online data collection method allowed us to easily distribute our survey on various platforms to aid with our data collection. We used a combination of convenience sampling and snowball sampling, which resulted in us recruiting from our social networks; online forums such as BC universities Facebook, Reddit and Piazza pages; the survey was also distributed to several undergraduate classes at BC institutes, after seeking the instructors' permission. During data collection, we had difficulty facilitating responses from the international student population and from a wide range of post-secondary institutes within BC. Therefore, to encourage participation from these groups, the survey was sent to the Simon Fraser University's student society; University of Victoria's student society; the UBC Alma Mater Society; and the Black Student Union at UBC, for distribution. Analysing our responses alluded to another shortcoming of our survey. Q17 (see appendix A) was a question that had multiple non-responses and inconsistent reporting, which could be deciphered by comparing it with the answers to Q16 (see appendix A). A possible explanation for this pattern of responses is the question phrasing. This question was worded such that it could have been interpreted as a hypothetical question by respondents and thus did not measure what we intended it to.

Results

Data cleaning

Since our survey included two questions intended to measure each barrier, with the exception of interest, which included three questions, the responses gauging each factor were tallied to simplify analysis. Upon simplifying the data set, the total score for responses ranged from a minimum of 2 and a maximum of 10 for all barriers with exception of interest, which ranged from 3 to 15.

Analysis

To analyze our responses, we utilized an independent t-test, specifically the Welch's t-test as it does not assume the variance of the two groups to be equal (Delacre, Lakens & Leys, 2017). Table 1 (see below or Appendix B) shows the significant group differences that emerged when each factor was analyzed. As shown, none of the examined barriers elicited group differences, however, interest, which was accounted for as a factor, showed a group difference $t(129) = 2.904, p = .005$. For international $M = 11.121, SD: 2.395$; for Domestic: $M = 9.724, s = 2.376$ (Table 1 & 2, Figure 1, see Appendix B). Of the questions gauging interest (see Q1, Q2, Q3 of appendix A), two of the three questions showed significant group differences. For Q1 $p = .01$ (see table 6, appendix B), for Q3 $p = .008$ (see table 10 appendix B). Upon further analysis of the barrier of mental wellbeing, international students scored significantly lower on Q9 (see

appendix A), which gauged social support Mean International = 3.364, $SD = 1.220$ Domestic Mean = 4.214 $SD = .922$ (Figure 6 see below or Appendix C), (Table 4, Table 5 see Appendix B).

Table 1:
Independent Samples T-Test

	t	df	p	Cohen's d
Interest	2.094	54.745	.005*	0.586
Financial Constraints	1.470	58.36	.147	-0.291
Socio-cultural	-1.652	63.838	.104	-0.319
Mental Wellbeing	-1.762	49.992	.084	-0.365
Self-Efficacy	-0.085	68.437	.933	-0.016

* $p < .05$, significant

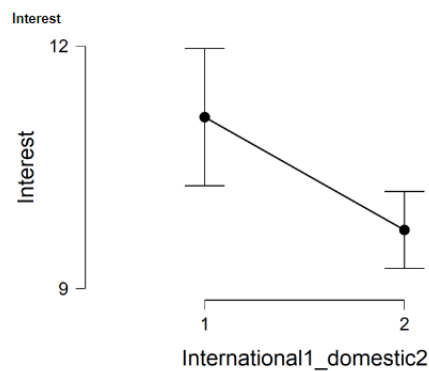


Figure 1: Interest (Based on responses to Q1,Q2,Q3)

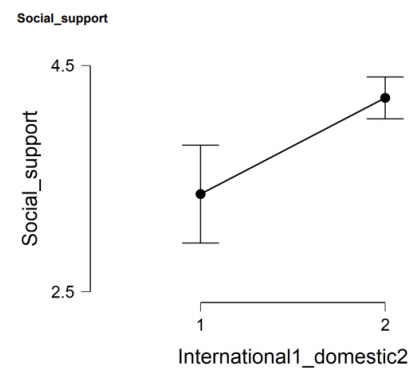


Figure 6: (Based on response to Q9)

Bonferroni Correction

The Bonferroni type adjustment was utilized to correct for multiple comparisons. With an adjusted p value of .010, all barriers were not shown to be significant (Table 3, see Appendix B), except for the factor of interest in pursuing research opportunities, where $p = .005 < .010$. Given that none of our dependent variables showed a significant group difference, our hypothesis is rejected.

Discussion

Our survey results revealed no major differences in perceived access to research opportunities between domestic and international students in the process of investigating our initial hypothesis. One of our findings was consistent with established literature that suggests international students perceive less social support in their city of residence (Sherry et al., 2009). Regarding our research question, our findings could be explained by one of three things. First, despite previous literature on the barriers faced by international students, differences in the perceived barriers to research opportunities between international and domestic students may be truly non-existent.

Second, there may be other barriers where group differences emerge, which were not considered in our research. Third, there may be significant shortcomings to our study, which hinder any significant results.

As discussed in the methods section of this paper, during data collection, we faced a few challenges which also pose as limitations of our study. Due to time constraints, we were unable to reach our targeted sample size of 105 domestic and 105 international students. This limited sample size resulted in unbalanced groups, which limited our data analysis. Thus, it is possible our data analysis left undetected, due to type II error, possible group differences. In terms of the impacts of the Covid-19 pandemic on the barriers of mental wellbeing and financial constraints, it is possible that pandemic related restrictions influenced both groups in a similar way, which might explain the lack of group differences (Aucejo, French, Araya & Zafar, 2020; Kecojevic, Basch, Sullivan & Davi, 2020). With respect to our survey design, the survey only included two questions to examine each of the barriers. Therefore, it is possible that other aspects of these barriers were left unaccounted for.

To address some of the limitations of this paper, future studies should use a larger sample size and more equal representation from other BC institutes (100 of the 131 respondents were UBC students), as this would help address any of the type II errors that are due to sampling characters. In terms of the survey administered, future studies should incorporate a greater number of questions per barrier. This would allow for future studies to explore each barrier in more depth; thus, investigating any additional aspects or nuanced themes that might subsequently emerge. Additionally, it would be beneficial to explore additional barriers which were not explored in our study. Studies to follow, should also consider exploring this research in a longitudinal capacity. This would allow for changes in characteristics associated with barriers such as the development of confidence in research skills to be accounted for (Harsh, Maltese, & Tai, 2011).

Although the findings of this paper do not support our hypothesis, our research topic highlights the importance of examining perceived barriers in the pursuit of research opportunities. Any research contributing to this area of study has implications for fostering diversity in educational institutes and enriching knowledge about the importance of diversity (Denson & Chang, 2009). Examining this area of research would allow for a more multifaceted approach, which would also provide greater opportunities to study unexplored areas in academia.

Recommendations for UBC Client

As our findings suggest that international students have lower social supports, our recommendations are formulated on addressing this specific barrier. We find that many of the programs that aim to provide social supports to international students are facilitated in a non-academic context (primarily through social events) rather than in classes. For this reason, we recommend the integration of social supports through academic activities in addition to non-academic activities such as programs that connect international students with peer mentors, within their major. Further, as previous research has found that students from diverse backgrounds report difficulty navigating developmental opportunities in undergraduate research labs due to a lack of mentorship, we advise post-secondary institutions to formulate programs that foster social relationships between international students and other lab members. Furthermore, we recommend that post-secondary institutes provide resources for instructors to connect students facing challenges related to social supports with appropriate agencies (Ahmad et al., 2016).

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Appendix A

Qualtrics Survey

Q1. I am aware of the research opportunities (i.e. research assistants, lab technicians, etc) at my post secondary institution within my specialization

- Strongly disagree
- Disagree
- Neither agree or disagree
- Agree
- Strongly agree

Q2. I desire to be a part of research opportunities (i.e. research assistants, lab technicians, etc) offered at my school

- Strongly disagree
- Disagree
- Neither agree or disagree
- Agree
- Strongly agree

Q3.

I spend a lot of time looking for research opportunities (i.e. research assistants, lab technicians, etc)

- Strongly disagree
- Disagree
- Neither agree or disagree
- Agree
- Strongly agree

Q4. Financial constraints prevent me from obtaining unpaid research positions (i.e. research assistants, lab technicians, etc)

- Strongly disagree
- Disagree
- Neither agree or disagree
- Agree
- Strongly agree

Q5. Paid research positions (i.e. research assistants, lab technicians, etc) would provide me with enough income to support my financial needs

- Strongly disagree
- Disagree
- Neither agree or disagree
- Agree
- Strongly agree

Q6. Research is highly valued in my culture

- Strongly disagree
- Disagree
- Neither agree or disagree
- Agree
- Strongly agree

Q7. It is socially desirable in my culture to work a research job (i.e. research assistants, lab technicians, etc)

- Strongly disagree
- Disagree
- Neither agree or disagree
- Agree
- Strongly agree

Q8. My mental wellbeing influences my ability to obtain research positions (i.e. research assistants, lab technicians, etc)

- Strongly disagree
- Disagree
- Neither agree or disagree
- Agree
- Strongly agree

Q9. I have reliable social supports (eg. friends, family) in British Columbia

- Strongly disagree
- Disagree
- Neither agree or disagree
- Agree
- Strongly agree

Q10. I am confident in my abilities to be competent in research positions (i.e. research assistants, lab technicians, etc)

- Strongly disagree
- Disagree
- Neither agree or disagree
- Agree
- Strongly agree

Q11.

I think that I am qualified for research positions (i.e. research assistants, lab technicians, etc)

- Strongly disagree
- Disagree
- Neither agree or disagree
- Agree
- Strongly agree

Q12. Are you currently enrolled as an undergraduate student at a BC post-secondary institution?

- Yes
- No

Q13. Which post-secondary institution do you attend?

Q14. What year of study are you in?

Q15. Are you currently doing a research project with a supervisor?

- Yes
- No

Q16. Are you an international student?

- Yes
- No

Q17. If you are an international student, do you feel at a disadvantage to receiving research opportunities (i.e. research assistants, lab technicians, etc) in comparison to domestic students?

- Yes
- No
- I am not an international student

Q18. What is your age in years?

Q19. What gender do you identify with?

- Male
- Female
- Non-binary
- Transgender
- Other

Appendix B

Independent Samples T-Test & Descriptives (Tables)

Table 1:

Independent Samples T-Test for Factor and dependent variables

	t	df	p	Cohen's d
Interest	2.094	54.745	.005*	0.586
Financial Constraints	1.47	58.360	.147	-0.291
Socio-cultural	-1.652	63.838	.104	-0.319
Mental Wellbeing	-1.762	49.992	.084	-0.365
Self-Efficacy	-.085	68.437	.933	-0.016

* p<.05, significant

Table 2:

Descriptives for Factors and dependent variables

	Group	N	Mean	SD	SE
Interest	1	33	11.121	2.395	0.417
	2	98	9.724	2.376	0.240
Financial	1	33	6.788	1.364	0.237
	2	98	6.378	1.454	0.147
Sociocultural	1	33	6.606	1.456	0.254
	2	98	7.112	1.704	0.172
Mental-WB	1	33	7.000	1.479	0.257
	2	98	7.510	1.310	0.132
Self-efficacy	1	33	7.606	1.456	0.254
	2	98	7.633	1.824	0.184

Table 3:
Bonferroni Correction for factor and dependent variables

Interest	.005<.01**
Financial Constraints	.147>.01
Socio-cultural	.104>.01
Mental Wellbeing	.084>.01
Self-Efficacy	.933>.01

** p<.01, significant

Table 4:
Independent Samples T-Test for Q9

	t	df	p	Cohen's d
Social Support	-3.668	44.949	< .001*	-0.787

Table 5:
Descriptives for Q9

	Group	N	Mean	SD	SE
Social Support	1	33	3.364	1.220	0.212
	2	98	4.214	0.922	0.093

Table 6:
Independent Samples T-Test for Q1

	t	df	p	Cohen's d
Awareness of research opportunities	2.669	63.608	.010*	0.516

Table 7:
Descriptives for Q1

	Group	N	Mean	SD	SE
Awareness of research opportunities	1	33	3.697	0.951	0.166
	2	98	3.163	1.109	0.112

Table 8:
Independent Samples T-Test for Q2

	t	df	p	Cohen's d
Desire to participate	1.047	65.308	.299	0.201

Table 9:
Descriptives for Q2

	Group	N	Mean	SD	SE
Desire to participate	1	33	4.121	0.960	0.167
	2	98	3.908	1.150	0.116

Table 10:
Independent Samples T-test for Q3

	t	df	p	Cohen's d
Spent time looking	2.766	56.569	.008*	0.553

Table 11:
Descriptives for Q3

	Group	N	Mean	SD	SE
Spent time looking	1	33	3.303	1.159	0.202
	2	98	2.653	1.194	0.121

Appendix C Figures

Figure 1: Interest (Based on responses to Q1, Q2, Q3)

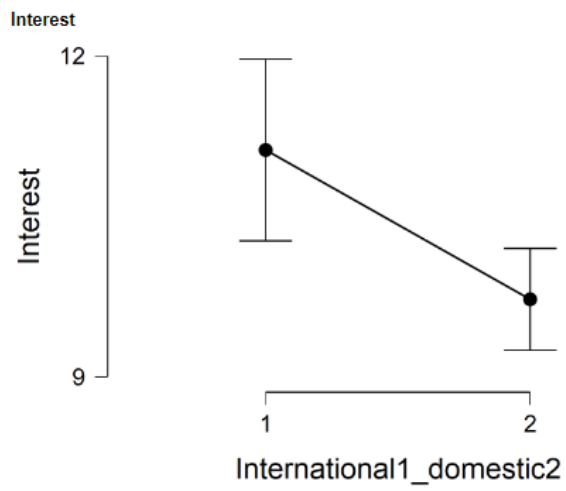


Figure 2: Self-efficacy (Based on responses to Q10 and Q11)

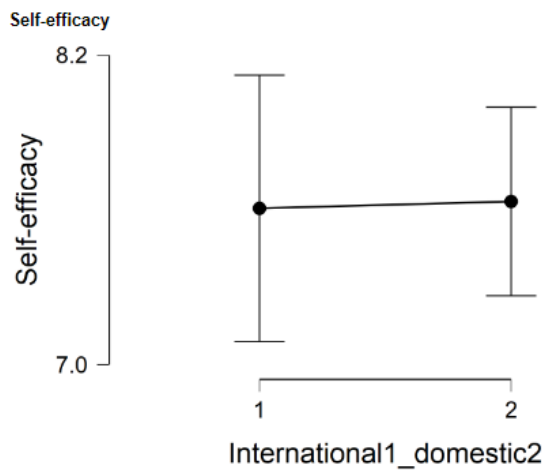


Figure 3: Financial (Based on responses to Q4 and Q5)

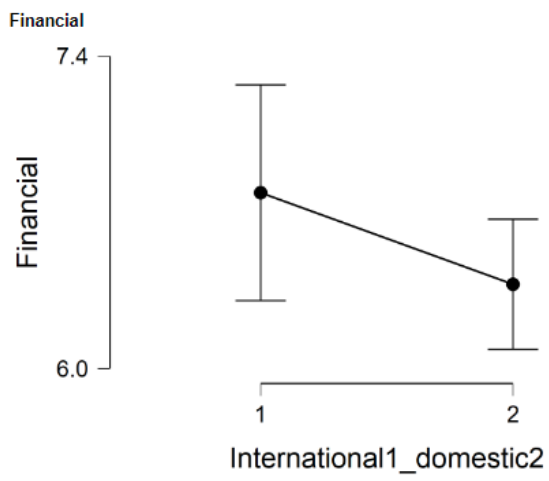


Figure 4: Sociocultural (Based on responses to Q6 and Q7)

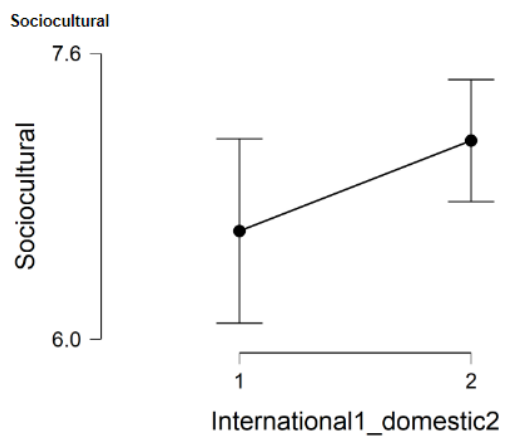


Figure 5: MentalWB (Based on responses Q8 and Q9)

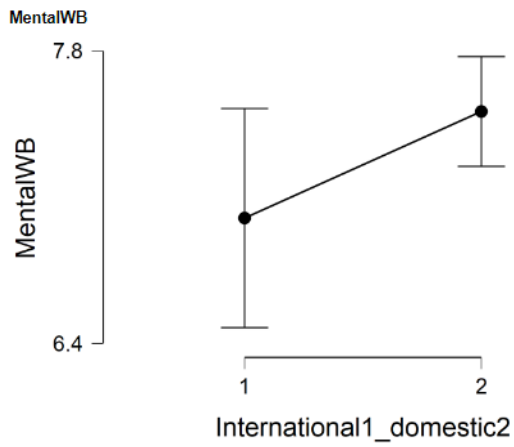


Figure 6: Social Support (Based on response to Q9)

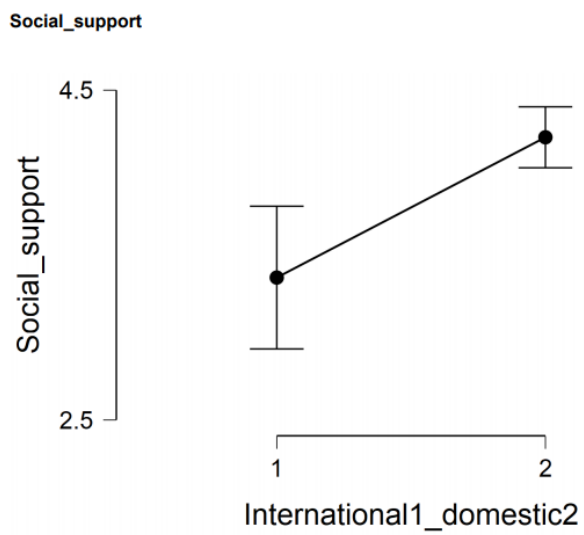


Figure 7: Awareness of Research Opportunities (Based on response to Q1)

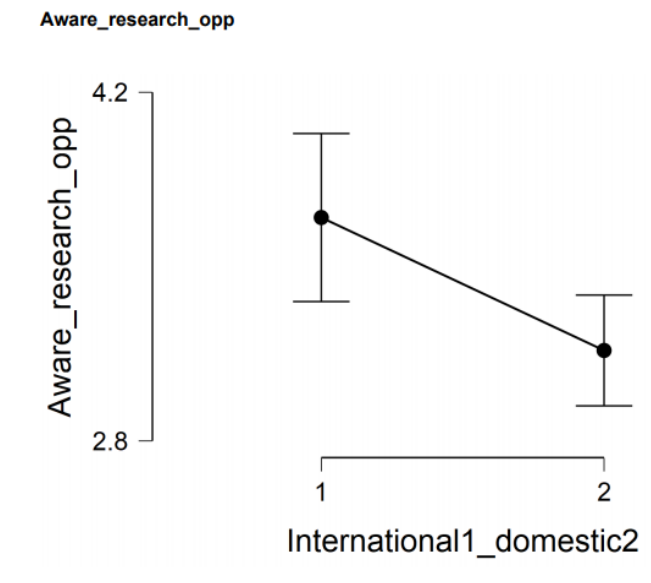


Figure 8: Desire to Participate (Based on response to Q2)

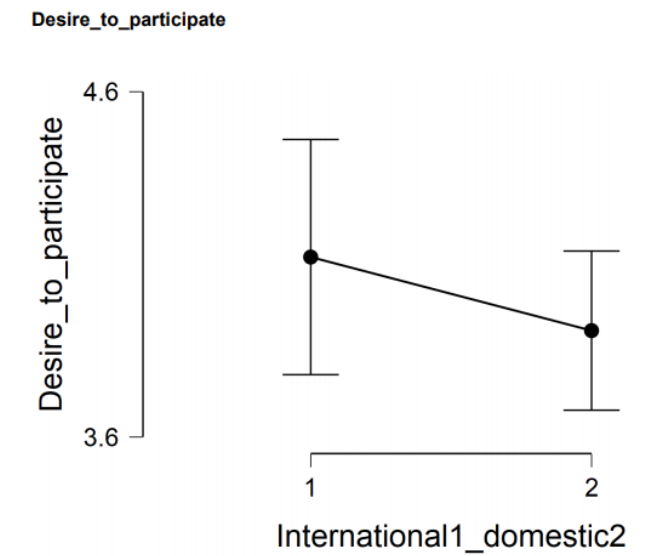
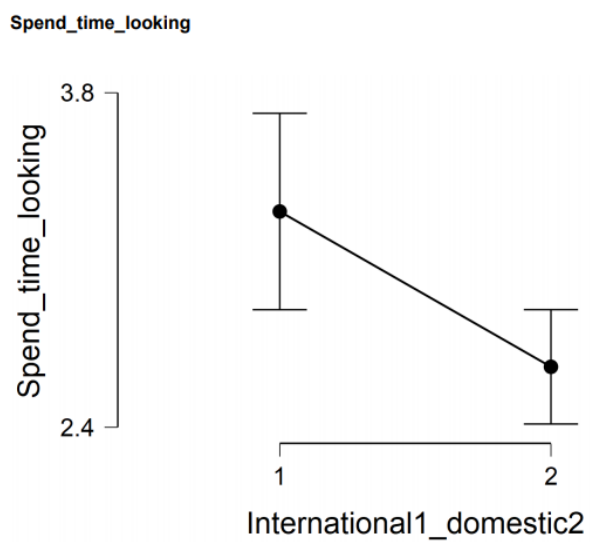


Figure 9: Spent Time Looking (Based on response to Q3)



Appendix D

Contribution of Members for the Entire Project

Contributions of Team Members For Proposal:

Brainstorming Phase: Pooja, Baldeesh, Jenny, Sameen contributed equally. Jayoung was not part of our group during this time, but was assigned to our group, she attended two meetings or so (one was upon request to attend class).

Gathering Literature phase: Pooja, Baldeesh, Jenny and Sameen contributed by finding a minimum of 2 sources and summarizing them in a shared document. Jayoung did not summarize any sources, but she did copy down a few links to literature articles.

Completion of proposal: All members contributed equally with the exception of Jayoung, who did not complete her part on time, and after asking her to share what she had done before the deadline she did not have anything that could be used in the proposal. Her part was subsequently done by all other group members

Data collection process

Preparing the survey for publishing: Baldeesh and Pooja

Creating/publishing to Qualtrics: Baldeesh

Posting on online forums/groups: Primarily Pooja and Baldeesh; and to some extent Jayoung, Jenny and Sameen posted to social media/friends

Writing up email template for requesting survey distribution: Pooja

Emails to profs requesting survey for distribution: All members contributed equally

Reaching out to other institutes: Pooja and Baldeesh

Communication with Client: Pooja and Jenny

Communication with teaching team: Primarily Baldeesh, sometimes Pooja, Jenny and Sameen

Proposal check in meeting:

Preparing for check-in meeting: Baldeesh and Pooja

Progress Check-In Meeting: Pooja, Baldeesh and Jenny were present

Presentation

Presentation preparation (slides): Pooja, Baldeesh, Jenny and Sameen. Jayoung did not contribute.

Presentation day of: Pooja, Baldeesh, Jenny, Sameen and Jayoung

Proposal check in meeting:

Prepare for meeting: Pooja, Baldeesh, Jenny and Sameen

Attending meeting: Pooja, Baldeesh, Jenny, Sameen and Jayoung

Attending Meetings:

During class breakout rooms: Pooja, Baldeesh, Jenny, Sameen attended equally, Jayoung was rarely present for in-class meetings.

Meeting with teaching team outside of class regarding project: Primarily Baldeeh, Pooja and Jenny, sometimes Sameen

Attending meetings outside of class: When it was planned ahead of time, everyone came.

Meetings to work on stuff last minute/emergency: primarily Pooja, Baldeesh, Jenny

Contributions of Team Members For Final Report:

Pooja Ramachandran: Introduction, Methods (Measures, Procedure) Results, Discussion, Appendices, References

Jenny Li: Methods(Measures, Procedure)Results, Appendices

Baldeesh Dhillon: Executive Summary, Introduction, Methods (Participants, Conditions) Recommendations for Client, Discussion, Appendices, References

Sameen Ghaemian: Introduction, Discussion, Appendices

Jayoung: Psychological Insight (subsequently corrected by Baldeesh)

Jayoung's contribution to project: Summary (for more info, please refer to the document emailed to Dr Zhao and Kyle)

- Absences + Communications: Throughout the term we had limited communication with her, due to being absent for many of the in class discussions.
- Meeting deadlines: She never met the deadline set by the group to complete their assigned sections.
- Quality of work: When contributions were made, they were incorrect information and did not reflect understanding of the project. This resulted in other members of the group having to redo her assigned parts. Further, when she did contribute by making small edits to the documents, they were detrimental to our work because she ended up either making them grammatically incorrect, or cutting out key pieces of information. Due to this, we had to revert the doc version, and create a separate document so that such future problems could be limited. We would like to add that, having to transfer everything to a new document along with the extensive comments we had made for ourselves on to a new doc was time consuming and tedious.

Jayoung was largely absent from all classes and communication following the proposal assignment, and the group had assumed that she would be dropping the class. Jayoung did not attend class or meetings until the last two weeks of the semester. It was only at this point that Jayoung shared her personal circumstances which included her mother passing away, and a plethora of midterms for her absence during the majority of the term. We empathize with Jayoung and shared that we are concerned for her mental health, offering her resources, and we reached out to the teaching team through Early Alert due to our concern for her. Following this, we attempted to support Jayoung and involved her in the project (by letting her contribute to

psychological insight for the report), despite her absence during the majority of the semester. We asked Jayoung to reach out for support either to us or the teaching team if she did not understand what was required of her.