

4. Research Findings and Discussion

4.1 Introduction

Chapter four exhibits the findings and presents the detailed analysis of the data that was collected during the field work. In this chapter there is also a response to the five hypotheses of the thesis. Inferential statistics were used such Pearson product-moment correlations and ANOVA to test the five-hypothesis outlined following the literature review at both construct and variable level.

The main aim of the research is to help the author understand a simple set of questions: why do we travel so much for business and is it because we have to or because we need to? What if we do not? The researcher is looking into understanding the motivations underlying global business travel: the needs, potential benefits and downsides of, as well as alternatives to modern global business travel. Why global business travel is needed? Is it because corporate culture promotes this lifestyle? Is environmental awareness related to business travel?

4.2 Survey

4.2.1 Survey Basic Demographics

The survey targeted 400 respondents from which 104 completed questionnaires were received. This was a response rate of 26 percent. Low response rates, even under 10%, are not uncommon with web surveys, but future researchers may want to take account of the advice in van Mol (2015) and provide reminders for their potential participants. This would facilitate a larger sample size, as would increasing the number of invitations sent out. The basic demographic information of the respondents was included in the study as area of working, level of employment. Gender and age questions were not included in the study however, the age range of the respondents is between 25 and 60 years old and the gender is 30-40 percent female and 60-70 percent male. In the case study the gender is four out of 15 females, meaning 26 percent female and 74 percent male.

The survey has four blocks. The first one is related to traveling for business and its purpose or goal achievement and business growth, as well as the characteristics in terms of length of time and frequency. There are also two questions related to the usage of ICT or “remote meeting”. The second block has a series of questions related to the environment, sustainability and micro-mobility; which concerns the relationships between environmental awareness and the consequences of the global business travel. This is viewed as individual and as a corporation. The third is related to the corporate culture and corporate social responsibilities; this concerns the relationship between corporate culture and further thoughts on policies related to the global business travel and environment sustainability. The fourth block includes a range of open question which gives deeper knowledge on micro-mobility, contractual travel expectation, , incorporation of the environmental dimension on the corporation, corporate and individual advantages and disadvantages of global business travel, and any other thoughts that may be related to global business travel.

4.2.2 Survey Results

4.2.2.1 Global Business Travel

Respondents answered two questions concerning the amount of global business travel they do in an average year. See Table 1 for each item’s text. One item asks about travel frequency: “on average, how often do you travel for business?”. The other asks about the duration of an average business trip: “how long are each of your business trips, on average?”

The frequency of business trips is described as a percentage of the person’s working time spent engaged in business travel. Table 2 shows the breakdown of respondents based on how often they travel. Of 104 respondents, 26 (25 percent) reported that they travel “less than a few times per year / less than 10 percent of my working time”; 34 (33 percent) reported that they travel “a few times per year / between 10 and 20 percent of my working

time”; 33 (32 percent) reported that they travel “monthly / between 20 and 40 percent of my working time”; and 11 reported that they travel “weekly / more than 40 percent of my working time”.

Table 1: Number of respondents based on percent of working time spent traveling.

Frequency of Travel	Number of Respondents	Percent of Respondents
Less than 10%	26	25%
From 10-20%	34	33%
From 20-40%	33	32%
More than 40%	11	11%

Table 3 shows the duration of an average business trip, ignoring frequency reports. Of 104 respondents, 16 respondents (15 percent) reported average trip length of “one day”; 50 (48 percent) reported average trip length of “two days”; 33 (32 percent) reported average trip length of “from 3-4 days”; and five (5 percent) reported average trip length of “more than 4 days”.

Table 2: Number of respondents based on duration of average business trip.

Average Trip Length	Number of Respondents	Percent of Respondents
One Day	16	15%
Two Days	50	48%
From 3-4 Days	33	32%
More than 4 Days	5	5%

Table 4 combines the two global travel measures to create 16 groups of respondents based on travel frequency as a percentage of work hours (rows) and average trip length in days (columns). As an example, seven respondents (of 104 total respondents) spend less than 10 percent of their working time traveling on day trips. The most common business travel

situation is respondents who spend from 10-20 percent of their work time traveling on trips that are about two days long on average. It is too complex to meaningfully compare 16 groups of people to one another, but the distribution of respondents can be collapsed into four groups (see Table 5). These groupings can be used to do inferential statistics like t-tests, ANOVA, and model-building in the hypothesis-testing sections.

Table 3: Sixteen groups of participants based on frequency of travel and average trip length.

Frequency of Travel	One Day	Two Days	From 3-4 Days	More than 4 Days
Less than 10%	7	10	8	1
From 10-20%	1	20	13	0
From 20-40%	4	17	9	3
More than 40%	4	3	3	1

Table 6 shows the number of respondents based on work travel frequency (rows) and average trip length (columns). With respect to work travel frequency, respondents in the “less frequent” groups (top row) are those who spend 20 percent or less of their total work time doing business travel (e.g., they travel for work no more than a few times per year). Respondents in the “more frequent” groups (bottom row) are those who spend greater than 20 percent of their total work time doing business travel (e.g., they travel for work on a weekly or monthly basis). With respect to average trip length, respondents in the “shorter trips” groups (left column) are those whose work trips are on average one or two days long. Respondents in the “longer trips” groups (right column) are those whose work trips are on average three days or longer.

In terms of distribution of respondents across the four groups in Table 5, 38 of 104 respondents (37 percent) reported shorter and less frequent work travel, 28 (27 percent) reported shorter and more frequent work travel, 22 (21 percent) reported longer and less frequent work travel, and 16 (15 percent) reported longer and more frequent work travel.

Totaling across columns in Table 4 shows that 60 of 104 respondents (58 percent) reported “less frequent” travel (top row) and 44 of 104 respondents (42 percent) reported “more frequent” travel (bottom row). Totaling across rows in Table 4 shows that 66 of 104 respondents (63 percent) reported “shorter trips” (left column) and 38 of 104 respondents (37 percent) reported “longer trips” (right column).

Table 4: Four groups of respondents based on work travel frequency and average trip length.

	Shorter Trips	Longer Trips
Less Frequent	38	22
More Frequent	28	16

In order to use trip frequency and trip length as grouping variables for ANOVA and related inferential hypothesis testing statistical analysis, it is necessary to verify that trip frequency and trip length are not dependent on one another. In other words, respondents with “less frequent” work travel should not be more likely to report shorter trips than respondents with “more frequent” work travel. Of the respondents who reported “less frequent” work travel (Table 5, top row), 63 percent (38 of 60) reported shorter trips and 37 percent (22 of 60) reported longer trips. Respondents who reported “more frequent” work travel showed similar numbers: 64 percent (28 of 44) reported shorter trips and 36 percent (16 of 44) reported longer trips. A Pearson’s Chi-squared test of independence (with Yates’ continuity correction) was not significant, $\chi^2(1) = 3.31e-31, p = 1$. In other words: there is no evidence that trip frequency and trip length are related to or dependent on one another, and it is acceptable to use them as independent variables in inferential statistics.

4.2.2.2 Corporate Culture

In this section, it will be described how to operationalize ideas falling under the general construct of “corporate culture” surrounding traveling for business and about how meetings should be conducted. There are two variables of interest:

- 1) Business growth.
- 2) Meeting culture.

It will be described how each of these variables are operationalized. Later in the chapter, these measures will be used in hypothesis testing.

4.2.2.2.1 Business Growth

The questionnaire posed two questions asking participants about business growth. For each statement, they indicated how strongly they agreed or disagreed by choosing one of seven options on a Likert seven scale ranging from “very strongly disagree” to “very strongly agree”, with “neither agree nor disagree” as the center option. The two statements were:

Q1) “Traveling for business increases business growth”.

Q8) “In my experience, business travel has been essential for achieving the results I have”.

Data collected and coded in this way can be analyzed in multiple methods, two of which will be used in this chapter. One is by assigning a numeric value to each of the options in the Likert seven scale, and then using those numeric values to do calculations and analysis. Here, the researcher has assigned to the central option “neither agree nor disagree” the numeric value of zero. Negative values were assigned to the three “disagree” options and positive values were assigned to the three “agree” options. The intensity with which one agreed or disagreed was coded by absolute value. So, “very strongly agree” was coded as “3”, “strongly agree” as “2”, and “agree” as “1”. Similarly, “very strongly disagree” was coded as “-3”, “strongly disagree” as “-2” and “disagree” as “-1”.

The second method that will be used for analyzing Likert seven scale data is by categorizing each response based on whether the statement was agreed. Values ranging from +1 to +3 (“agree” to “very strongly agree”) were coded as an “agreement” of the statement. Values ranging from -3 to -1 (“very strongly disagree” to “disagree”) were coded as a “non-agreement”. The neutral response “0” (“neither agree nor disagree”) was also coded as a “non-agreement”, as agreement is taken to be an active choice. So, values of -3, -2, -1, and 0 were categorized as “non-agreement” and values of +1, +2, and +3 were categorized as “agreement”.

The number of respondents who agreed, versus the ones that did not agree with, each statement about business growth is displayed in Table 6. If Question 1 and Question 8 measure the same underlying variable (e.g., Business Growth), then it can be expected for them to be dependent on one another. In other words, those who agreed with Question 1 should be significantly more likely to also agree with Question 8. Of 104 respondents, 74 agreed with Question 1, “traveling for business increases business growth” (Table 6, top row). When it comes to their responses about Question 8, 62 of those 74 (84 percent) also agreed with Question 8, “in my experience, business travel has been essential for achieving the results I have”. Of the 30 respondents who did not agree with Question 1, only 18, or 60 percent, agreed with Question 8. A Pearson’s Chi-squared test of independence (with Yates’ continuity correction) was statistically significant, $\chi^2(1) = 5.5283, p = 0.01871$. Analyzing the data as numeric continuous data, showed the same pattern: a significant positive correlation between responses to the two questions (see Figure 3), Pearson’s product-moment correlation $R = 0.416, 95\% CI = 0.243 - 0.564, t(102) = 4.624, p = 0.00001$.

Table 5: Number of respondents based on agreement of business growth questions.

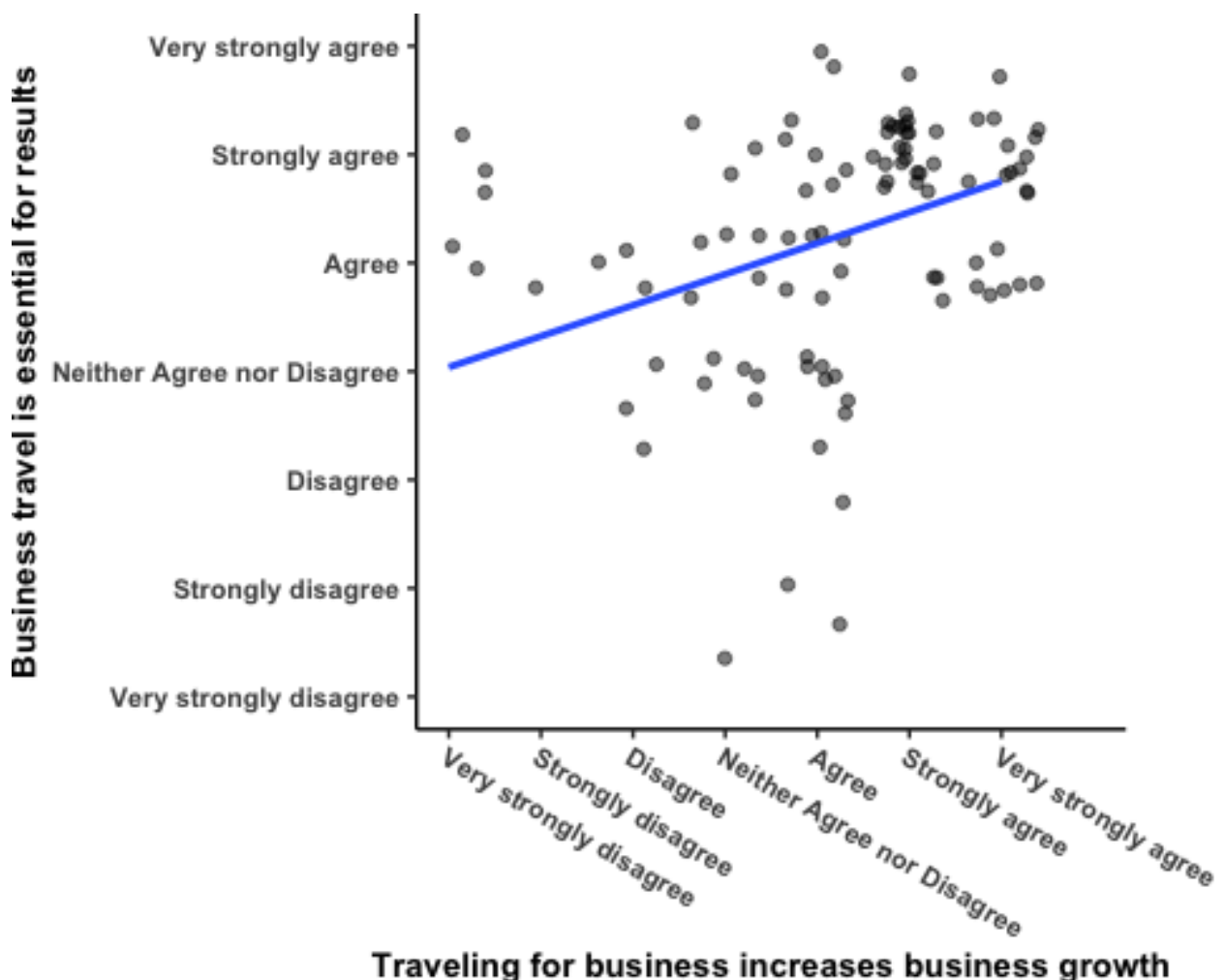
Q1 Response ^a	Q8 Agreement ^b	Q8 Non-Agreement ^b
Agreement	62	12

^a “Traveling for business increases business growth.”

^b “In my experience, business travel has been essential for achieving the results I have.”

Therefore, there is evidence that responses to these two items are dependent on one another. Additionally, it is acceptable to combine the responses to create an overall measure of the variable “business growth”. For each respondent, “business growth” was calculated by taking the average of the responses from Questions 1 and 8. The values ranged from a minimum of -2.50 to a maximum of +3.00; the median was 1.50 (between “agree” and “strongly agree”); the arithmetic mean was 1.12 (“agree”); the standard deviation was 1.22. The variable “business growth” will be used in inferential statistics later on in this chapter.

Figure 1: Responses to business growth questions.



4.2.2.2.2 Meeting culture

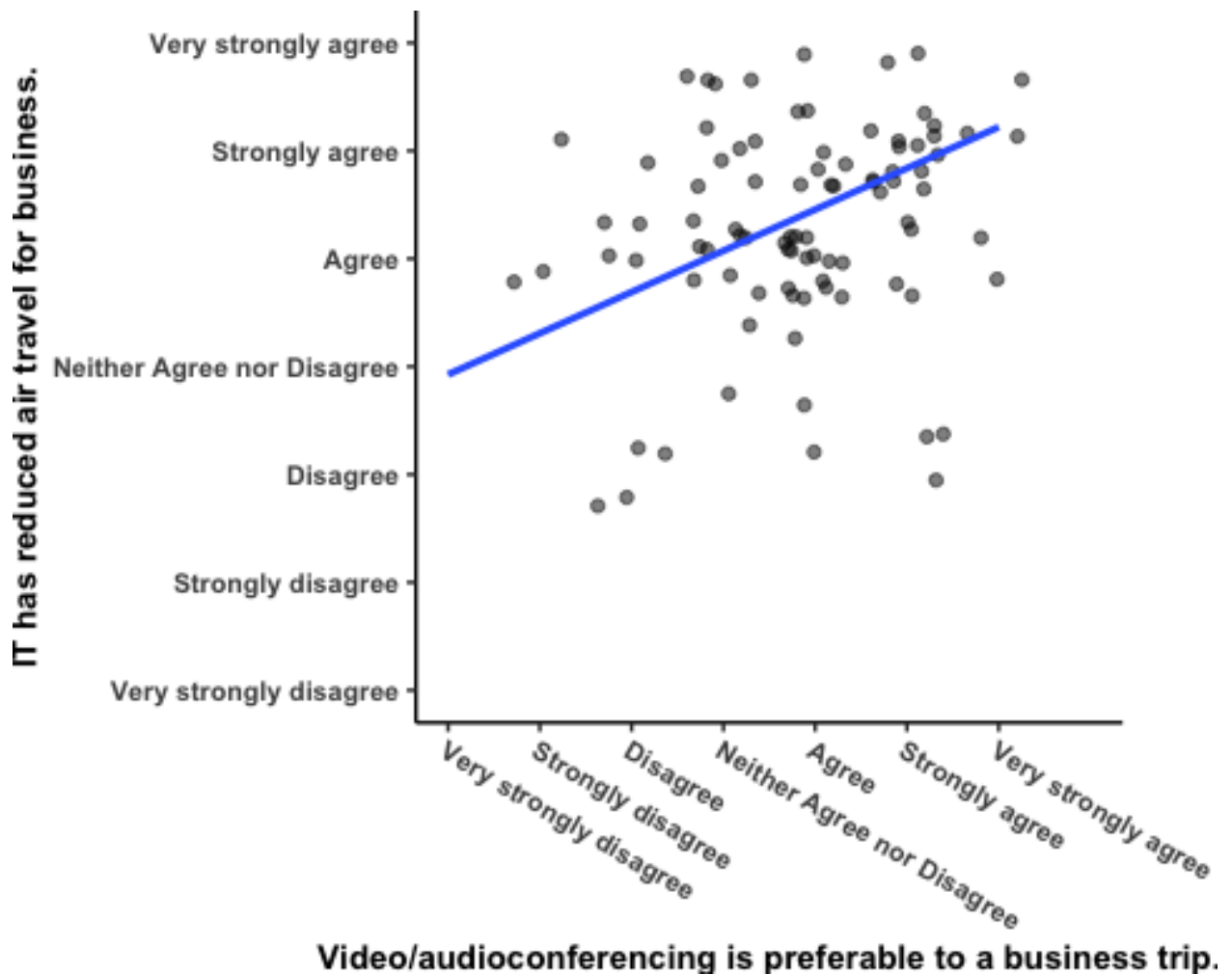
Respondents answered two questions about the role of ICT in meetings and business. Those from corporations with a pro-business-travel meeting culture would rate their agreement with these comments as lower than those from corporations without such a meeting culture. The statements were:

Q6) “Video/audioconferencing is preferable to a business trip.”

Q7) “Information technology (IT) has reduced the use of air travel for business purposes.”

There was a significant positive correlation between responses to the two questions (see Figure 4), Pearson’s product-moment correlation $R = 0.51$, 95% CI = 0.282 - 0.592, $t(102) = 5.1003$, $p = 0.000002$. Data for these questions were not analyzed categorically, because very few participants failed to agree with Question 7. They were mostly all likely to agree that IT had reduced the need for air travel, and a handful were neutral or disagreed.

Figure 2: Responses to questions about remote meetings.



The relationship between the Question 6 and Question 7 does not show a clear colinear effect. However, the strength of agreement or disagreement does appear to show some relationship. As a result, the researcher decided to analyze the data about “remote meetings” in two ways: once as a composite measure that takes the mean of the questions (“remote meeting”: min = -3.00, max = 3.00, mean = 1.14, standard deviation = 1.12). Then for a second time just using Question 6, which has a number of non-agreements as well (“prefer videoconference”: min = -3.00, max = 3.00, mean = 0.874, standard deviation = 1.426).

The variable “remote meeting” will be used in inferential statistics later on in this chapter, and so will “prefer videoconference”.

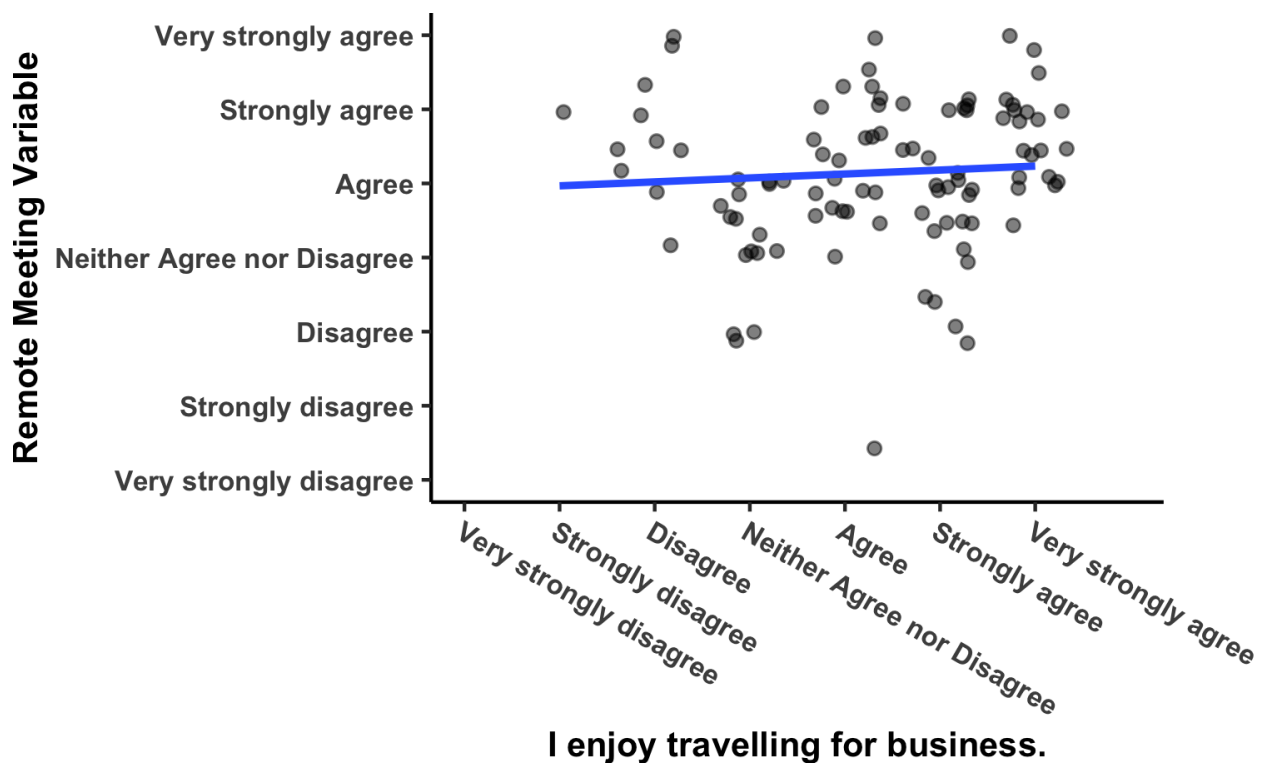
As an attempt to measure “meeting culture” separately from technology related questions, respondents were asked how much they agreed with the following statement:

Q2) “I enjoy travelling for business.”

The researcher reasoned that respondents from corporations with a meeting culture that emphasizes meeting face-to-face would report greater enjoyment of business travelling. For one, they were hired by the corporation, so they are likely to embody the culture to begin with.

Second, being in a pro-business-travel meeting culture would ultimately make one more likely to believe they enjoy business travel, as has been argued previously (Bentley, Bloomfield, Davidai and Ferguson, 2016; Mueller, 2010). The researcher compared the responses to this question against the variable “remote meeting”, and found that they were not significantly correlated (see Figure 5), Pearson’s product-moment correlation $R = 0.062$, 95% $CI = -0.133 - 0.253$, $t(102) = 0.626$, $p = 0.533$. This suggests that enjoyment of business travel and preference for videoconferencing are two separate constructs. Therefore, they will be analyzed separately later on in this chapter.

Figure 3: Responses to questions about meeting culture.



“Meeting culture” did prove to be difficult or at least quite complex to measure. So to reiterate, where it was indicated inferential statistics, “meeting culture” will be represented by three different variables: “remote meeting” (mean of Question 6 and Question 7), “prefer videoconferencing” (Question 6 alone), and “like travel” (Question 2 alone). “Like travel” will not be combined with “remote meeting” or “videoconferencing” – as it was not collapsed to create a variable “meeting culture”, because there is no evidence that such a construct exists in the collected data.

4.2.2.3 Environmental Awareness

The last of the three big constructs is “environmental awareness”. Awareness includes “knowledge” about the issue, as well as a “willingness” to do something about it. So, the variables under “environmental awareness” are: “knowledge about climate science” and “social responsibility”. Social responsibility will be measured at the corporate level and at the individual level.

4.2.2.3.1 Knowledge about Climate Science

One specific component of environmental awareness is being informed about climate science. Respondents to the questionnaire rated how much they agreed with each of three statements, on a scale of -3 (“very strongly do not understand”) to +3 (“very strongly understand”), with a 0-point at “neither understand nor do not understand”. The three statements were:

Q9) “I understand the greenhouse effect, its causes, and its consequences.”

Q10) “I understand the greenhouse gas emissions caused by an aircraft.”

Q11) “I understand the consequences of the global warming.”

For each of the three statements, the percentage of respondents who agreed the statement (“understand”, “strongly understand”, “very strongly understand”) was over 95 percent. So, the researcher proceeded to analyze this data as scale of intensity. This was instead of agreeing as continuous numerical data and not as an agreed/did not agree binary data.

Table 7 displays the correlation matrix for the three “climate science knowledge” questions. The three questions were highly positively correlated with one another, with Pearson R values ranging from 0.75 to 0.89. Since they are so strongly correlated, they are combined into one overall variable called “climate science knowledge” by averaging them together. Scores on this measure ranged from -0.333 to + 3.00, with a mean of 1.88, and a standard deviation of 0.876.

Table 6: Correlation matrix for questions about climate science knowledge.

	Greenhouse Effect	Aircraft Emissions	Global Warming
Greenhouse Effect	1.00	0.89	0.75
Aircraft Emissions	0.89	1.00	0.75
Global Warming	0.75	0.75	1.00

4.2.2.3.2 Social Responsibility

In order to claim “environmental awareness”, one needs to go above merely understanding the issues of climate science (Ham, Mrčela and Horvat, 2016). There also must be a willingness to act on climate science, as a corporation and as an individual. In business, that tends to be financial remuneration to the global citizenry in some form of green tax or financial offsetting of carbon footprint.

Respondents indicated how much they agreed with three statements about social responsibility toward the environment on a scale of -3 (“very strongly disagree”) to +3 (“very strongly agree”). The statements were:

Q17) “I am willing to pay more, as a corporation, when purchasing pollution products and services, through “green taxes”.”

Q16) “I am willing to pay more, as an individual, when purchasing pollution products and services, through “green taxes”.”

Q18) “I am willing to pay (as an individual) a fee to NGOs such as “myClimate”, when purchasing pollution products and services – business related – through off-setting carbon footprint compensation.”

Table 8 displays the correlation matrix for the three social responsibility questions. The three questions were positively correlated with one another, with Pearson *R* values ranging from 0.58 to 0.65. Since these responses are correlated, they were combined into one

overall variable identified as “social responsibility”, by averaging them together. Scores on this measure ranged from -0.333 to + 3.00, with a mean of 1.88, and a standard deviation of 0.876.

Table 7: Correlation matrix for questions about social responsibility toward the environment

	Corporate Tax	Individual Tax	Individual Off-Setting
Corporate Tax	1.00	0.65	0.58
Individual Tax	0.65	1.00	0.62
Individual Off-Setting	0.58	0.62	1.00

4.2.3 Survey Data Reliability

The questionnaire was tested for validity and reliability using Qualtrics test survey tool. Saunders et al. (2012) affirmed that the use of pilot testing, effectively serves to determine the accuracy and appropriateness of the research design and instruments. Thus, pilot testing is crucial in detecting ambiguous, redundant, and irrelevant questions which would not be fit for eliciting the kind of information required to achieve the study objectives.

The questionnaire was pre-tested via www.qualtrics.com for validity, reliability and to check if the questions were understood. The test sample was done with 10 people carefully selected. These people were asked if they could understand clearly all the questions and if there was anything that needed improving to avoid any ambiguity. In addition to the question content, testing was also carried out on the display and accessibility of the questionnaire. Further feedback was sought on the deadline provided for the completion of the survey. The test was conducted in both German and English to make sure that it any misunderstanding could be avoided. They were asked to highlight any unclear question and to provide an overall feedback which was used to improve the final survey as well as the language as the

survey was done in German and English languages. The feedback received was implemented as improvement.

4.3 Test five specific hypotheses about Global Business Travel

In this part of the chapter, the researcher will use the variables operationalized in the previous section to investigate relationships between the three constructs of: global business travel, environmental awareness, and corporate culture. Firstly, a revision from the previous findings, to show which variables fall under each construct is needed. Use Table 1 to follow which questions make up each variable. Table 9 displays the five hypotheses.

The researcher operationalized the construct of “global business travel” into two orthogonal variables: 1) the frequency of the travel, and 2) the length of the average trip. This choice was made based on the fact that the two were uncorrelated, and so there would be separate predictions for the two variables. In some cases, they may interact with one another.

The researcher operationalized the construct of “corporate culture” in several ways. One of the variables that emerged from the survey question analysis was “business growth”. This is defined as the mean score of two questions about the importance of business travel and its relation to business growth. The second set of variables constitute the attempt to measure the level of meeting culture within a corporation. As a result, the researcher had one variable focused on how much the respondent likes travel, (“likes travel”), and another variable identified as “remote meeting”. The averages of these two questions are taken as data on the role of ICT in meetings. The third variable is a subset of this, focusing on just the one question about preferences, identified as “prefer videoconference”. Resultantly, four variables emerged from the operationalization of corporate culture to attempt to approximate the construct: 1) business growth; 2) likes travel; 3) remote meeting; 4) prefer videoconference.

Subsequently the construct of environmental awareness was operationalized under two variables: 1) climate science knowledge and 2) social responsibility. In some areas (e.g., Ha(2)), it will be focused on corporate social responsibility; and in others (e.g., Ha(3)), it will be focused on “individual social responsibility”.

Table 8: The five specific hypotheses and their operationalization.

Ha(1)	There is a significant positive relationship between global business travel and business growth.
Ha(2)	As environmental awareness (from the corporate) increases, business travel decreases.
Ha(3)	As environmental awareness (from the individual) increases, business travel decreases.
Ha(4)	Corporate culture is the predominant reason business travel is undertaken as frequently as it is.
Ha(5)	As corporate social responsibilities policies linked to environmental awareness (from the corporate) increases, business travel decreases.

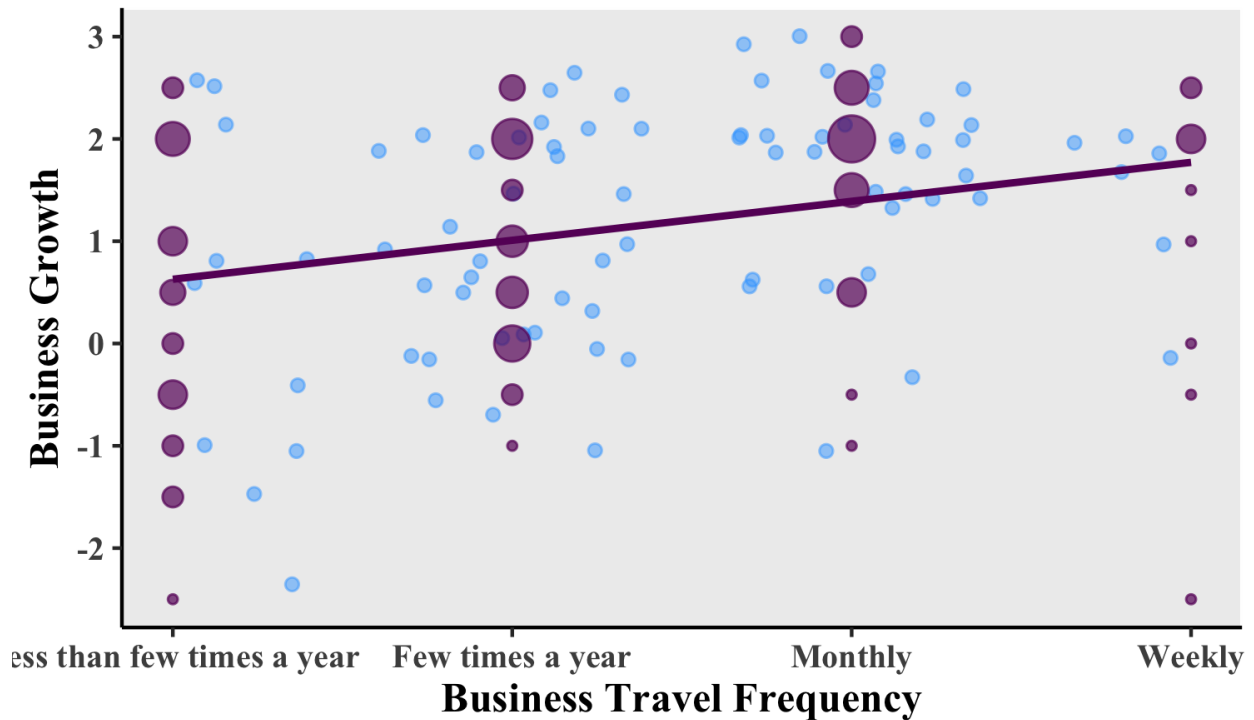
4.3.1 Hypothesis 1: there is a significant positive relationship between global business travel and business growth.

The first hypothesis focuses on a part of corporate culture identified as business growth, and on global business travel practices. The researcher predicted that the frequency of global business travel will be correlate positively with higher ratings on the business growth variable.

Figure 6 is a scatterplot showing one blue point for each of the respondents, based on which of the four options they chose for travel frequency and their judgment of how important travel is to their business growth. There is random jitter added to the graph, so that each point is visible. The purple dots show the average number of people at each possible response by their size. The purple line shows the general linear relation between the two

variables. Analysis of this supports hypothesis 1, as there is a significant and positive correlation. Pearson's product-moment correlation $R = 0.299$, 95% $CI = 0.113 - 0.465$, $t(102) = 3.164$, $p = 0.002053$.

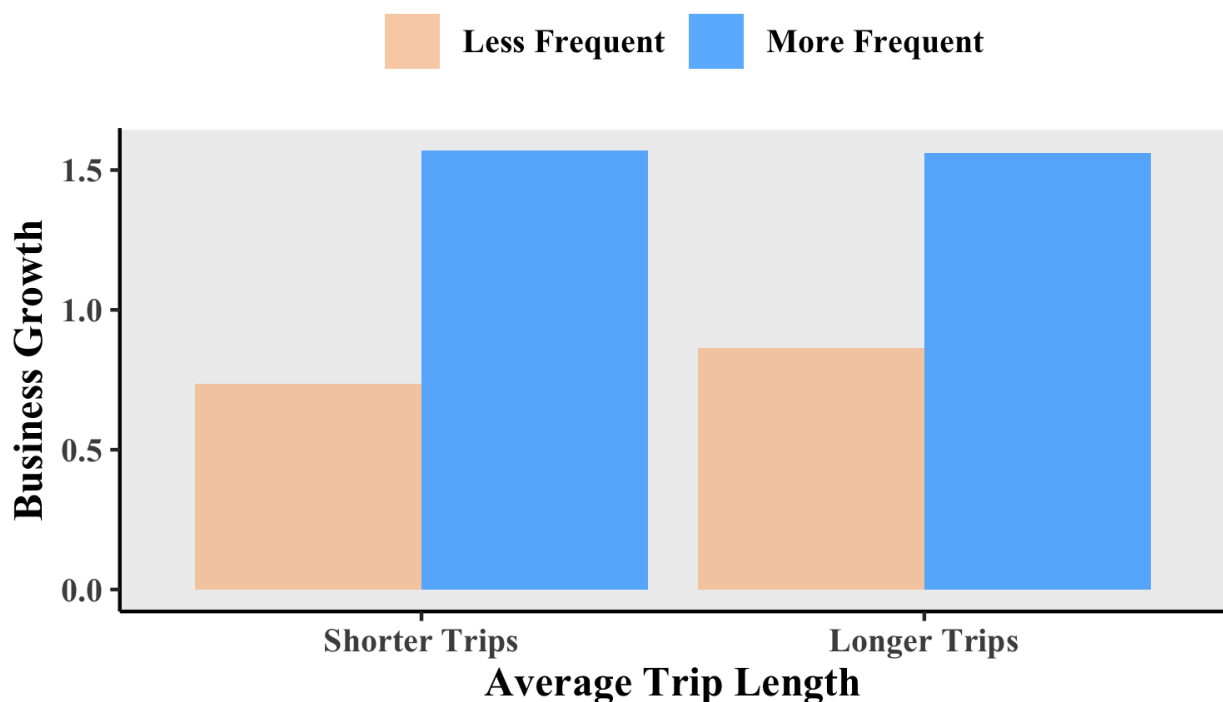
Figure 4: Relationship between business growth travel frequency.



The data was also analyzed by category, see Figure 7. After having categorized respondents as those who travel more frequently (blue bars; travel monthly or more frequent) versus those who travel less frequently (orange bars; travel zero to a few times per year). If global business travel is undertaken partly because respondents believe it contributes to business growth, the researcher would expect global travel frequency to be related to business growth. However, it would not necessarily be expected that to be a dependent variable so, to predict an average trip length. That is, those who travel more frequently do so because they believe it is integral for their business growth and that trip length should not be related. A 2 (trip length: shorter, longer) x 2 (travel frequency: less frequent, more frequent) between-subjects ANOVA was conducted to see whether “business growth” varied across

the groups. The researcher found a significant difference for travel frequency: indeed, those who travel more frequently did rate travel as more important to their business growth, $F(1, 100) = 11.31, p = 0.0011$. There was no significant difference in business growth based on average trip length, $F(1, 100) = 0.08, p = 0.77$. There was no significant interaction between the two variables business growth based on average trip length. However, business growth was significantly different between less and more frequent travelers, regardless of trip length, $F(1, 100) = 0.08, p = 0.78$.

Figure 5: Average business growth scores based on travel frequency (color) and average trip length (horizontal axis).



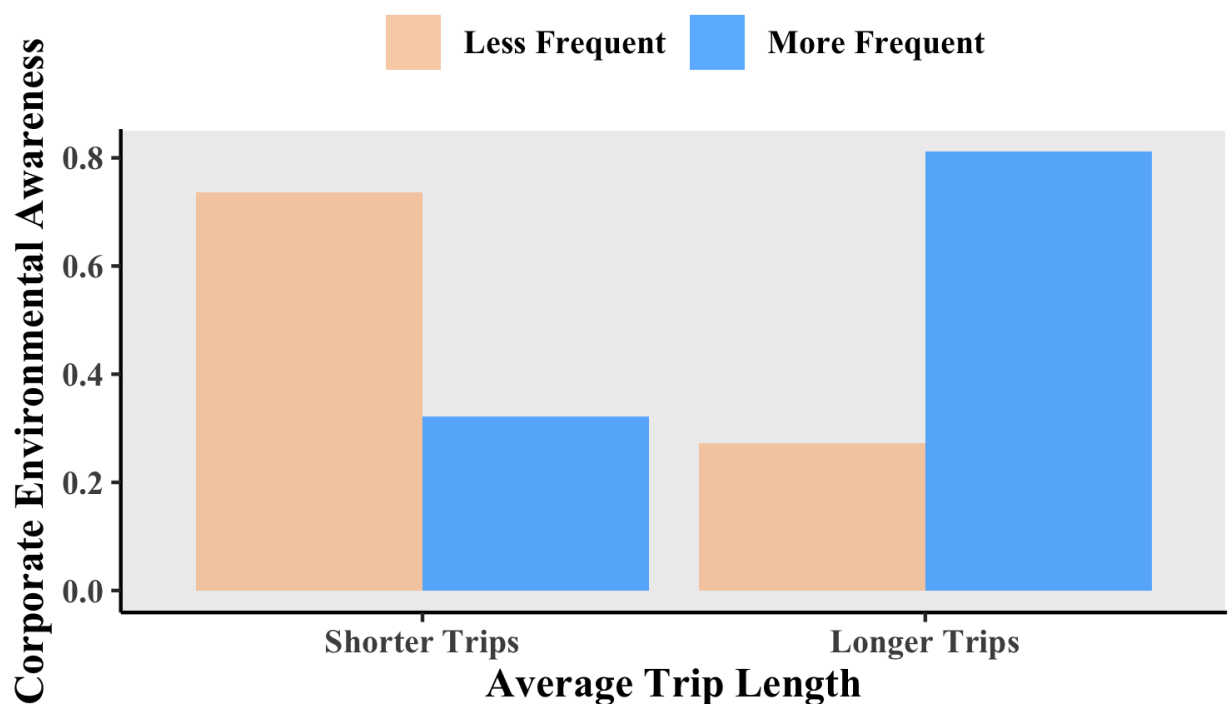
4.3.2 Hypothesis 2: As environmental awareness (from the corporate) increases, business travel decreases.

“Environmental awareness” was split into three variables: “knowledge about climate science”, “corporate social responsibility”, and “individual social responsibility”. This section

focuses on “corporate social responsibility”, or to expand: “willingness to pay green taxes at the corporate level”.

If an increase in “environmental awareness (from the corporate)” is related to decreased “business travel”, then the researcher theorizes that people who take more frequent business trips, would be less willing to pay green taxes at the corporate level. However, a significant difference was not found between more and less frequent travelers, $F(1, 100) = 0.041, p = 0.840$. Therefore, the null hypothesis for $H_a(2)$ cannot be rejected ~~but~~ ~~accepted~~. No effect was found upon trip length, $F(1, 100) = 0.33, p = 0.86$, nor any interaction between the two business travel variables, $F(1, 100) = 1.96, p = 0.165$.

Figure 6: Average environmental awareness (from the corporate) based on travel frequency (color) and average trip length (horizontal axis).

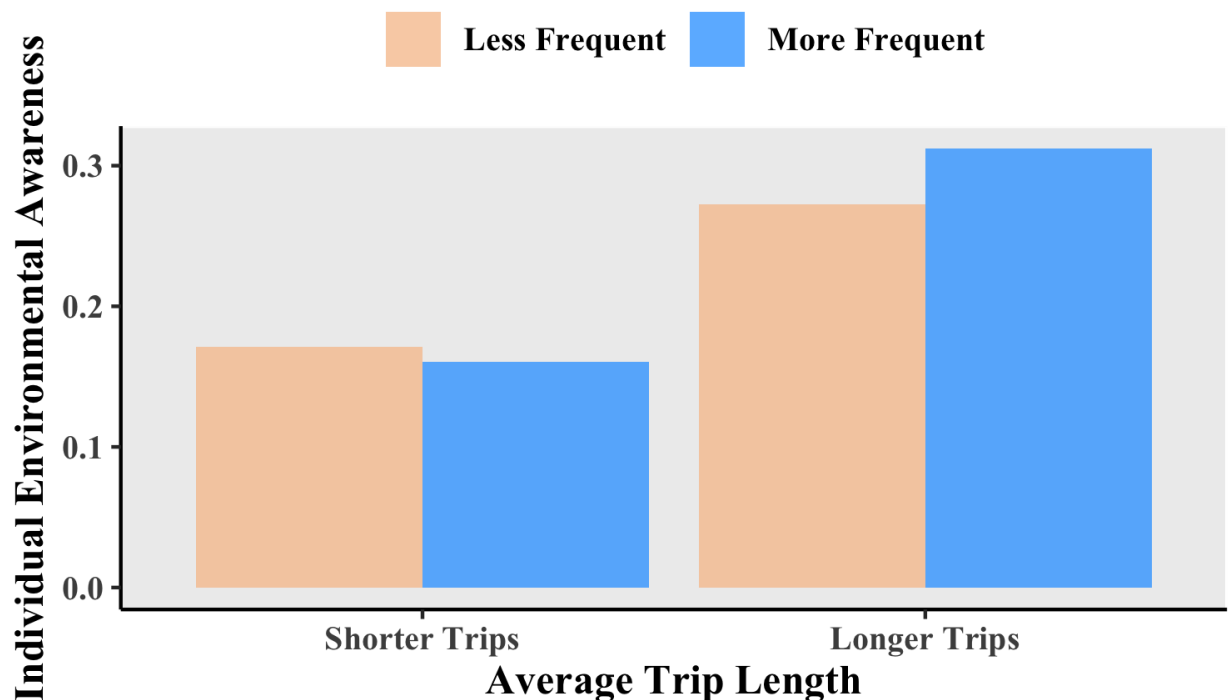


4.3.3 Hypothesis 3: As environmental awareness (from the individual) increases, business travel decreases.

This section will focus on “individual environmental awareness”, as well as “willingness to pay green taxes or NGO offsets at the individual level”.

If increase in “environmental awareness (from the individual)” is related to decreased business travel, then the researcher predicts that those who take more frequent business trips would be less willing to pay green taxes at the individual level. The analysis did not find a significant difference between more and less frequent travelers, $F(1, 100) = 0.001, p = 0.979$. Therefore, the null hypothesis for $H_a(3)$ cannot be rejected ~~but accepted~~. The analysis did not find an effect on trip length, $F(1, 100) = 0.18, p = 0.68$, nor any interaction between the two business travel variables, $F(1, 100) = 0.01, p = 0.93$.

Figure 7: Average environmental awareness (from the individual) based on travel frequency (color) and average trip length (horizontal axis).



4.3.4 Hypothesis 4: corporate culture is the predominant reason business travel is undertaken as frequently as it is.

Corporate culture was operationalized with four different variables: “business growth” (as covered in Hypothesis 1), “like travel” (Question 2 alone), “remote meeting” (mean of Question 6 and Question 7) and “prefer videoconferencing” (Question 6 alone). If corporate culture is a predominant decider in business travel decisions, it would be expected that higher “like travel” values would correlate with those who do more frequent travel. Similarly, it would suggest that there would be lower “remote meeting” and “prefer videoconferencing” values for more frequent travelers.

Figure 10 shows “like travel” variables for those who take shorter trips (left) versus longer trips (right), less frequently (in orange) or more frequently (in blue). Firstly, the research highlighted that compared to those who travel less frequently for business, the more frequent travelers indeed rated that they like travel more, $F(1, 100) = 15.50, p = 0.0002$. Secondly, that those who take longer trips (average of orange and blue bars on the left) reported liking travel more than those who take shorter trips (average of the orange and blue bars on the right), $F(1, 100) = 3.29, p = 0.073$. There was not seen to be a significant interaction between the two variables; therefore the difference between the bars on the left, is not significantly bigger than the difference between the two bars on the right, even though it appears as though that might be the case, $F(1, 100) = 1.54, p = 0.217$.

Figure 8: Average “like travel” score based on travel frequency (color) and average trip length (horizontal axis).

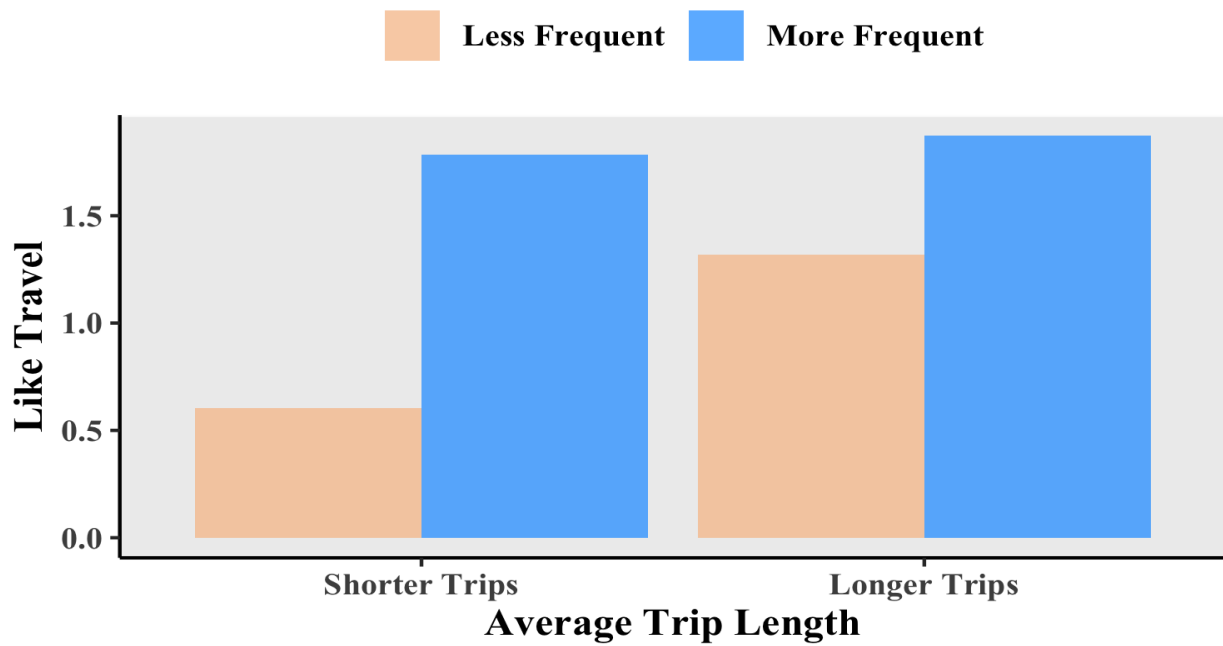
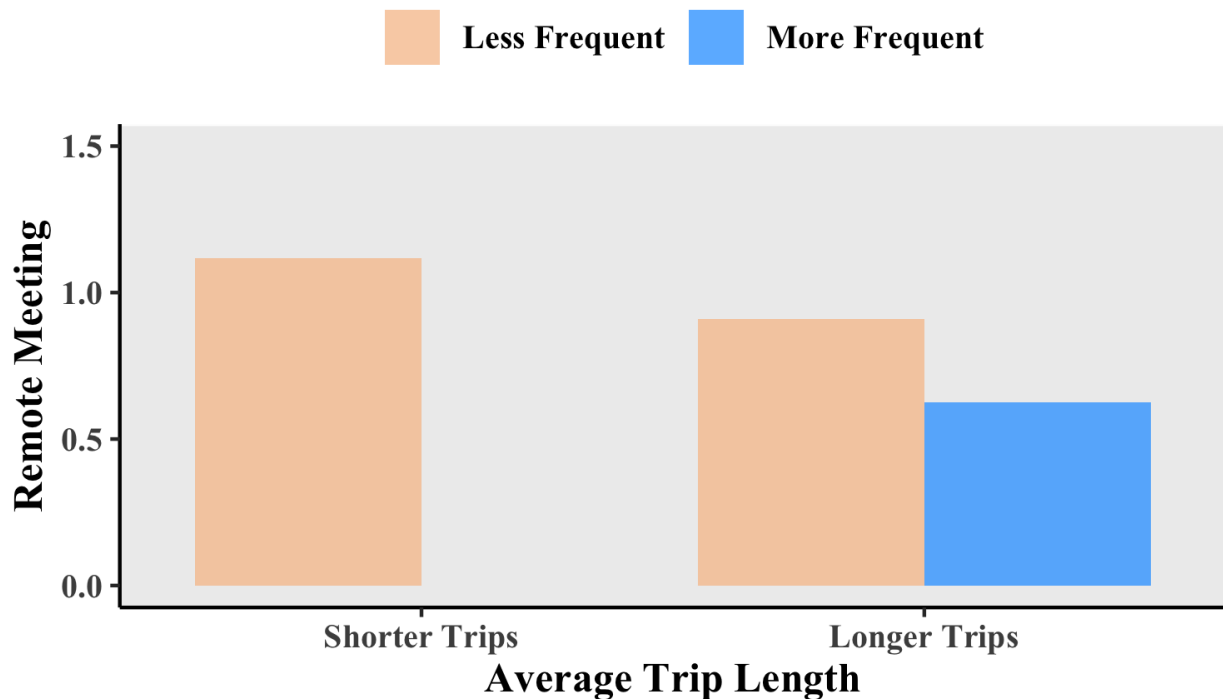


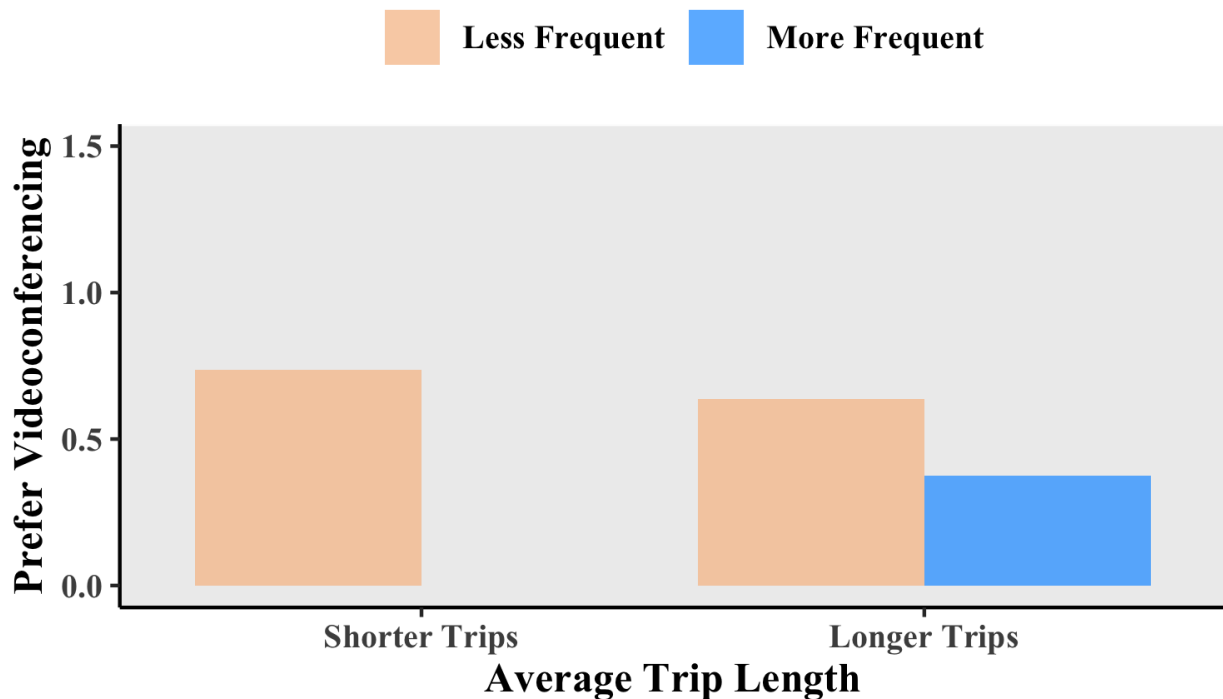
Figure 11 illustrates “remote meeting” variables for those who take shorter trips (left) versus longer trips (right), less frequently (in orange) or more frequently (in blue). In this analysis, the researcher did not uncover any difference based on trip frequency, $F(1, 100) = 1.21, p = 0.27$. However, the researcher found that those who take shorter trips scored higher than those who take longer trips, $F(1, 100) = 6.39, p = 0.01$. In other words, taking shorter trips is associated with increased remote meeting culture and inversely, and taking longer trips is associated with less remote meeting culture. The analysis did not discover a significant interaction between the two variables, though it was marginally significant, $F(1, 100) = 4.04, p = 0.066$.

Figure 9: Average “remote meeting” score based on travel frequency (color) and average trip length (horizontal axis).



Finally, Figure 12 shows the mean score on the variable “prefer videoconferencing” on the vertical axis. Here, higher scores indicate the respondent prefers video conferencing to business travel. Thus, if corporate culture is driving business travel, it would be expected that those who travel less frequently (or perhaps, those who take shorter trips) would be indicated though increased scores on this measure. It was found that there was no significant difference based on travel frequency, $F(1, 99) = 4.34, p = 0.135$. Instead, the researcher discovered that trip length was more important for this measure, with those respondents taking shorter trips preferred the trip to videoconference, $F(1, 99) = 7.33, p = 0.053$. There was no significant interaction, $F(1, 99) = 3.57, p = 0.062$.

Figure 10: Average “prefer videoconference” score based on “travel frequency” (color) and “average trip length” (horizontal axis).



“Corporate culture” is displayed in relationship to “travel frequency” or “average trip length”. Those who travelled more frequently, indicated that they liked to travel more. Additionally, those who engaged in shorter average trips tended to indicate a preference for videoconferencing.

4.3.5 Hypothesis 5 is about the relationship between environmental awareness, corporate social responsibility, and global business travel.

The respondents were asked directly the following question:

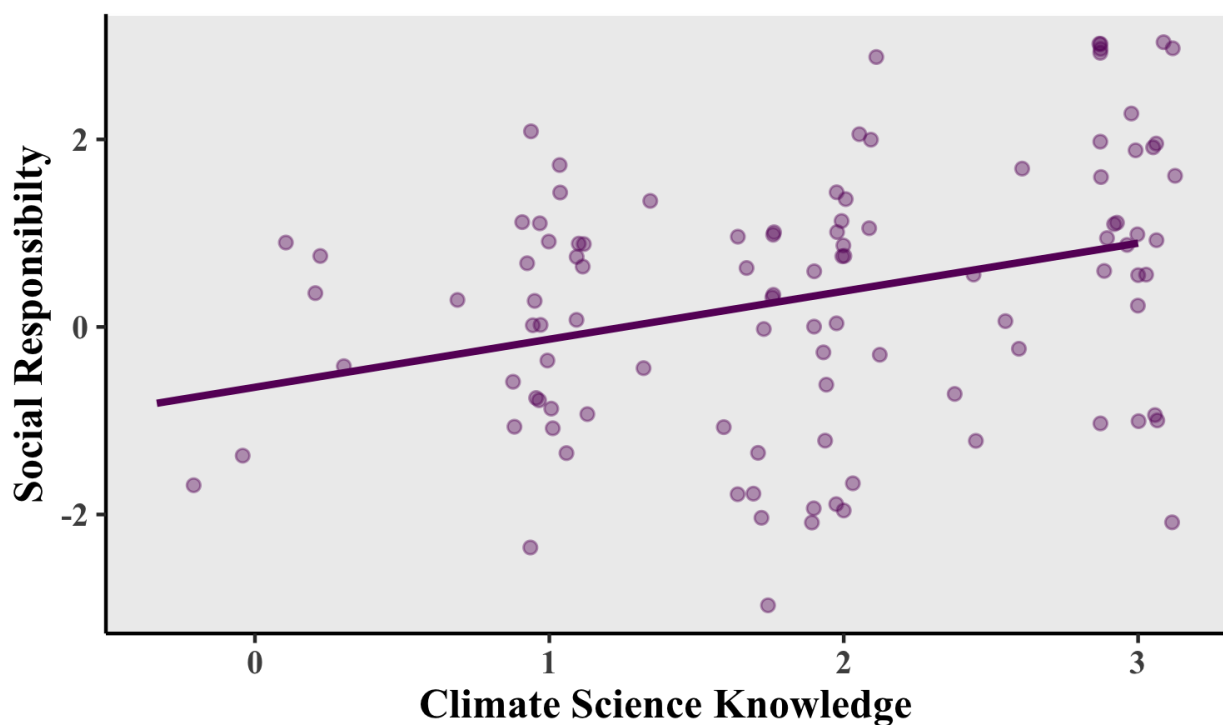
Q19) if corporations pursued pro-environment corporate social responsibility policies, would business travel increase or decrease?

Of 102 responses to that question, 93 responded that business travel would decrease in such a situation, and nine percent responded that it would increase. Therefore, 91 percent of the respondents supported Ha(5).

4.3.6 Summary

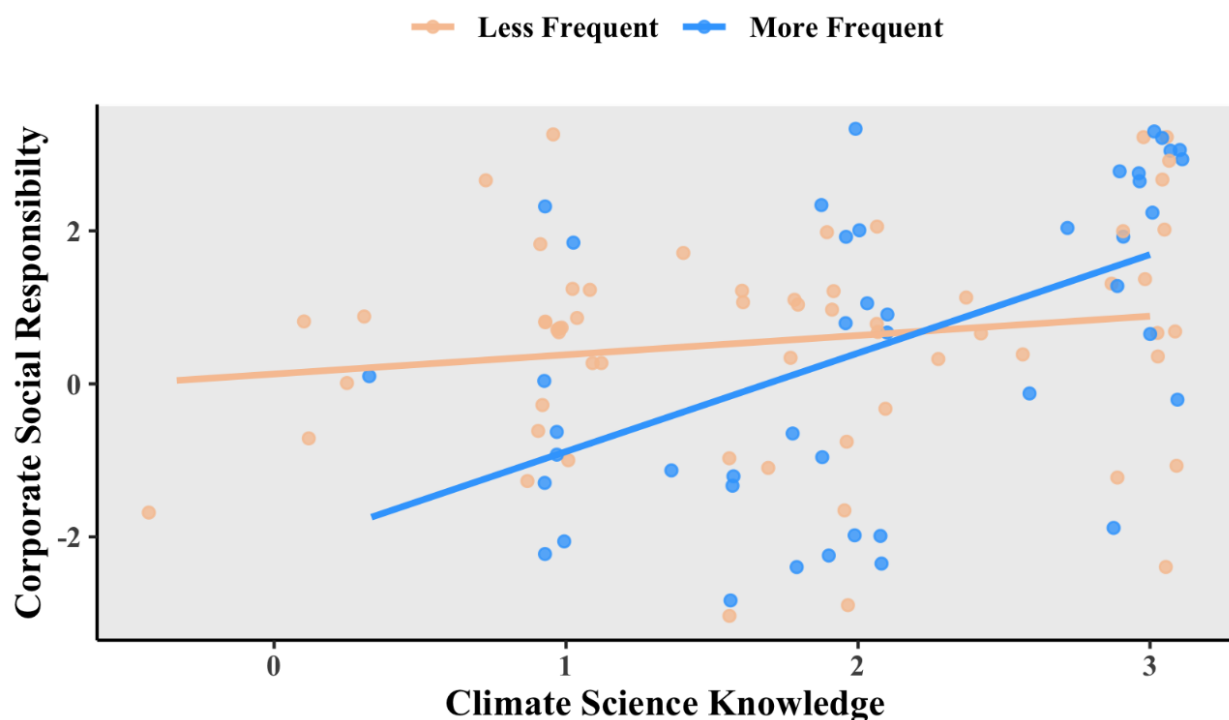
The analysis of Hypotheses 2 and 3 did not provide sufficient evidence to reject Ha(2) and Ha(3). Therefore, the researcher wanted to further investigate the relationships between the variables making up environmental awareness at the corporate level: “climate science knowledge” and “corporate social responsibility”. The data for those two variables can be seen in Figure 13, where it a positive correlation is found, Pearson’s product-moment correlation $R = 0.309$, 95% $CI = 0.124 - 0.473$, $t(102) = 3.282$, $p = 0.0014$. In other words, the more “climate science knowledge” an individual has, the more likely he or she is “willing to engage in corporate social responsibility”.

Figure 11: Relationship between Social Responsibility and Climate Science knowledge.



The next question which needed addressing was: is this relationship affected by business travel? To examine this more closely, the respondents were split into more frequent and less frequent travelers to be plotted in that relationship. This can be seen in Figure 14. For those who tend to travel more frequently, “climate science knowledge” and “social responsibility” are positively related, $R = 0.528$, 95% CI = 0.274 – 0.713, $t(42) = 4.03$, $p = 0.0002$. However, there is no such correlation for those who travel less frequently, Pearson’s product-moment correlation $R = 0.160$, 95% CI = -0.097 - 0.398, $t(58) = 1.24$, $p = 0.221$.

Figure 12: Relationship between Corporate Social Responsibility and Climate Science knowledge for less frequent (orange) and more frequent (blue) travelers.



The analysis combined all of the variables that were found related to global business travel, here operationalized as travel frequency. The researcher discovered that elements of “corporate culture” were related to “business travel”: liking business travel; and believing business growth comes from travel. It was also found that an interaction of the elements of

“environmental awareness” were related to “business travel”: similarly, “science knowledge” and “corporate social responsibility” are related.

A logistic regression model was constructed, to include all these variables for analysis. Each respondent was assigned with a “0” if they were a less frequent traveler (one to a few times per year) and a “1” if they were a more frequent traveler (monthly or more often). The regression model will use the variables to predict the likelihood that a given individual is a frequent traveler, based on their responses to the questions for each variable. The outcome of that analysis can be seen in Table 10. The table shows that “business growth” is a significant positive predictor of a frequent traveler, ($Beta = 0.59$, $p = 0.013$), as is liking travel ($Beta = 0.57$, $p = 0.007$). “Social responsibility” is a marginally significant negative predictor ($Beta = -0.87$, $p = 0.06$). Environmental scientific awareness and knowledge is a significant positive predictor, ($Beta = 0.82$, $p = 0.011$), which is the opposite of what had been anticipated. However, it is qualified by its interaction between science “knowledge” and “social responsibility”, ($Beta = 0.40$, $p = 0.05$).

Table 9: Logistic Regression Coefficients.

	Estimate	Std. Error	z value	p value	sig
(Intercept)	-3.55	0.89	-3.98	0.000	***
Business Growth	0.59	0.24	2.49	0.013	*
Likes Travel	0.57	0.21	2.68	0.007	**
Science Knowledge	0.82	0.32	2.54	0.011	*
Social Responsibility	-0.87	0.48	-1.84	0.066	.
Knowledge * Responsibility	0.40	0.21	1.93	0.054	.

4.3.7 Additional outcomes

4.3.7.1 *Green taxes at corporate level*

Analysis was conducted regarding the relationship between “environmental awareness” and “willingness to pay “green taxes” at the corporate level”. The theory is that, as environmental awareness increases, so does the willingness to pay more corporate taxes for polluting products and services.

There were three items on the questionnaire regarding environmental awareness: 1) “I understand the greenhouse effect, its causes, and its consequences”; 2) “I understand the greenhouse gas emissions caused by an aircraft”; and 3) “I understand the consequences of the global warming”. Responses on these three items were correlated with responses on the item “I am willing to pay more, as a corporation, when purchasing pollution products and services, through “green taxes”.” The Pearson product-moment correlation value, R , for each correlation is shown in Table 11 below.

Table 10: R values for correlations between self-reported environmental awareness and willingness to pay corporate green tax.

Greenhouse effect		0.89	0.75	0.23
Aircraft emissions	0.89		0.75	0.26
Global warming	0.75	0.75		0.37
Corp green tax	0.23	0.26	0.37	
	Greenhouse effect	Aircraft emissions	Global warming	Corp green tax

Unsurprisingly, the three questions about environmental awareness were highly positively correlated with one another, with R values ranging from 0.75 to 0.89. The correlation with willingness to pay corporate green tax were also positive, and statistically significant, with R values of 0.23, 0.26, and 0.37.

Figure 15 demonstrates the relationship between responses to the greenhouse effect understanding and the opinion on corporate green tax. Respondents strongly agreed that they understood the greenhouse effect: the mean score for this item was 1.93 (SD = 0.93). On average, respondents were neutral about their willingness to pay corporate green tax (M = 0.54), but the spread of data was wide (SD = 1.64), suggesting that opinions about corporate green tax vary quite widely among the respondents. There was a significant positive

correlation between “greenhouse effect understanding” and “willingness to pay corporate green tax”, $R = 0.231$, $95\% CI = 0.040 - 0.406$, $t(102) = 2.398$, $p = 0.018$.

Figure 13: Positive correlation between greenhouse effect understanding and willingness to pay corporate green tax.

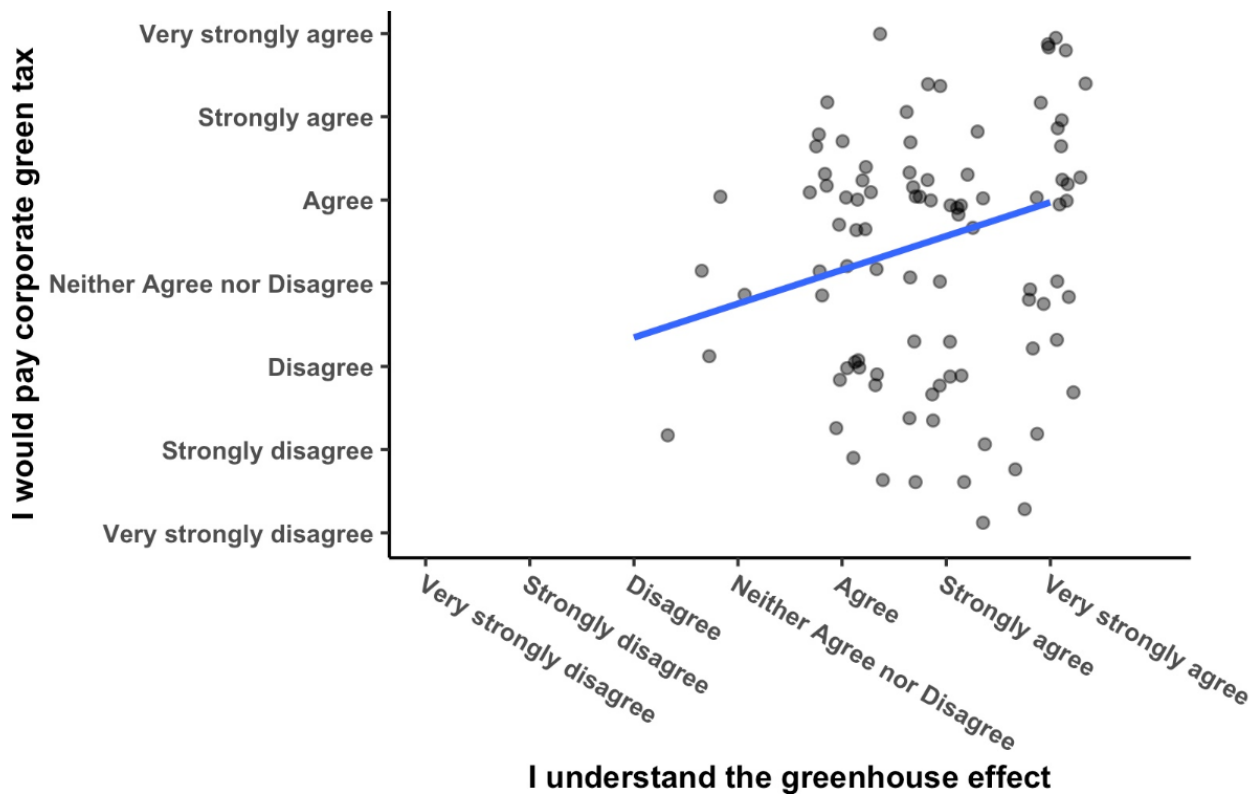


Figure 16 shows the relationship between responses to the aircraft emissions understanding item and the willingness to pay corporate green tax. On average, respondents strongly agreed that they understood aircraft emissions: the mean score for this item was 1.83 (SD = 0.99). There was a significant positive correlation between an understanding of airplane emissions and the willingness to pay corporate green tax, $R = 0.264$, $95\% CI = 0.075 - 0.434$, $t(102) = 2.760$, $p = 0.007$.

Figure 14: Positive correlation between aircraft emissions understanding and willingness to pay corporate green tax.

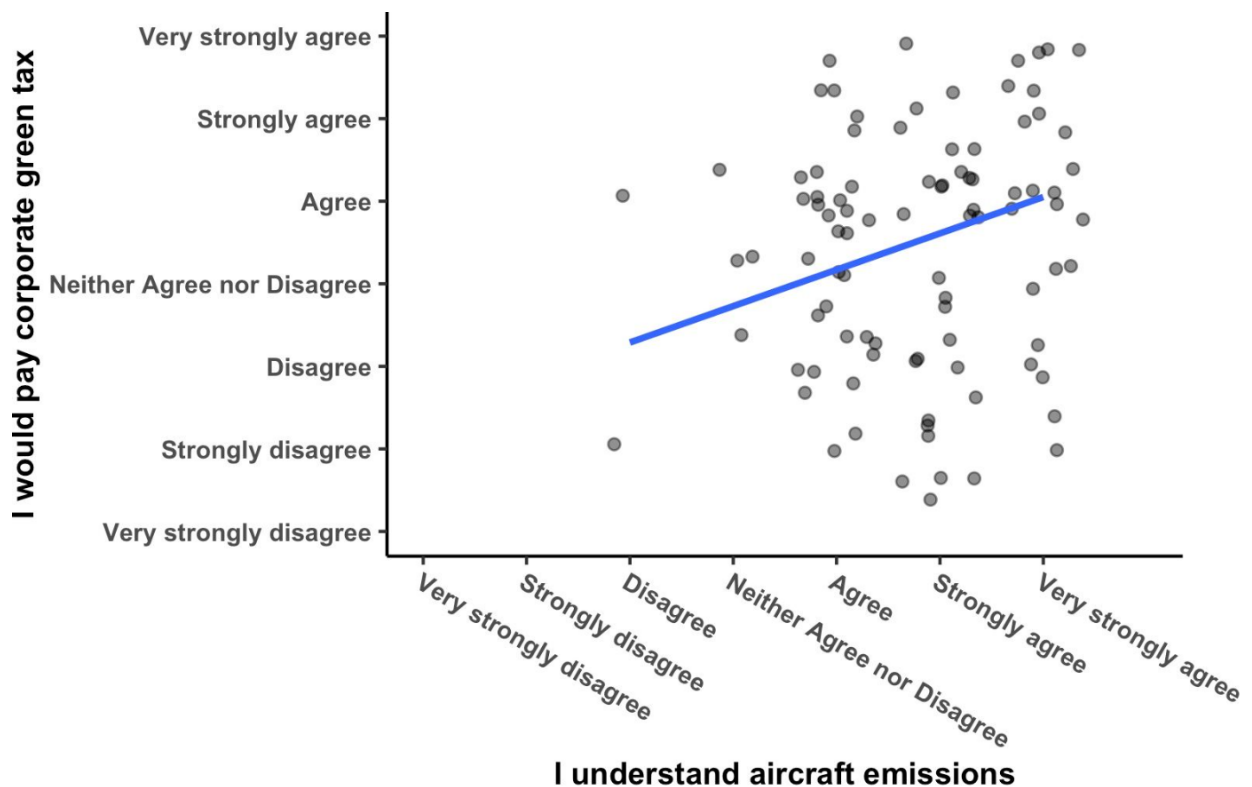
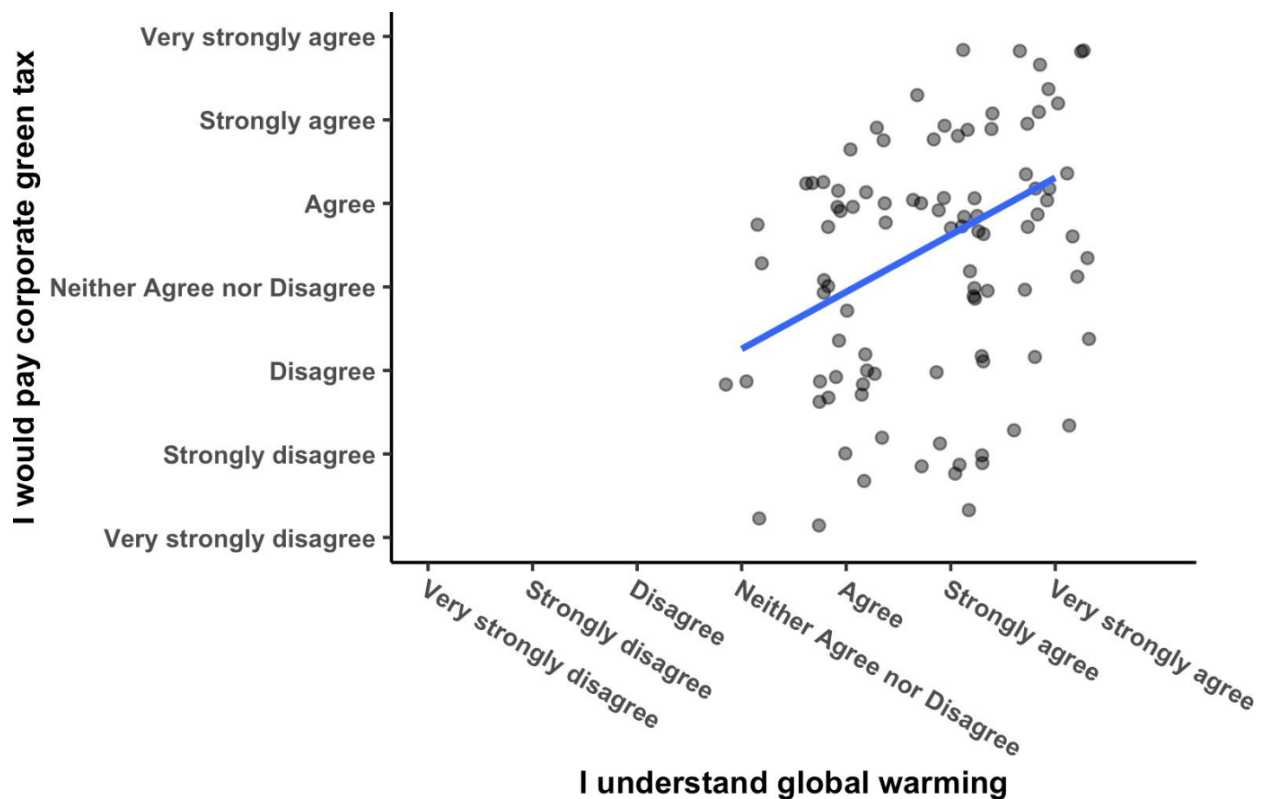


Figure 17 illustrates the relationship between responses to the global warming understanding item and the corporate green tax item. The majority of respondents strongly agreed that they understood aircraft emissions: the mean score for this item was 1.88 (SD = 0.90). There was a significant positive correlation between “airplane emissions understanding” and “willingness to pay corporate green tax”, $R = 0.373$, 95% $CI = 0.195 - 0.528$, $t(102) = 4.062$, $p < 0.001$.

Figure 15: Positive correlation between understanding global warming and willingness to pay corporate green tax.



4.3.7.2 Green taxes at individual level

In examining the relationship between “environmental awareness” and “willingness to pay “green taxes” at the individual level”; the theory was that as environmental awareness increases, so does willingness to pay additional individual taxes for the products and services creating excessive pollution.

There were three questionnaire items covering environmental awareness: 1) “I understand the greenhouse effect, its causes, and its consequences”; 2) “I understand the greenhouse gas emissions caused by an aircraft”; and 3) “I understand the consequences of the global warming”. Responses on these three items were correlated with responses on the item “I am willing to pay more, as an individual, when purchasing pollution products and services, through “green taxes”.” The Pearson product-moment correlation value, R , for each correlation is shown in Table 12.

Table 11: R values for correlations between self-reported “environmental awareness” and “willingness to pay individual green tax”.

Greenhouse effect		0.89	0.75	0.26
Aircraft emissions	0.89		0.75	0.3
Global warming	0.75	0.75		0.31
Indiv green tax	0.26	0.3	0.31	
	Greenhouse effect	Aircraft emissions	Global warming	Indiv green tax

The three questions about environmental awareness were highly positively correlated with one another, with R values ranging from 0.75 to 0.89. The correlations with “willingness to pay individual green tax” were also positive, and statistically significant, with R values of 0.26, 0.30, and 0.31.

Figure 18 shows the relationship between responses to the greenhouse effect understanding item and the individual green tax item. On average, respondents strongly agreed that they understood the greenhouse effect: the mean score for this item was 1.93 (SD = 0.93). On average, respondents were neutral about their willingness to pay an individual green tax (M = 0.41), but the spread of data was wide (SD = 1.62), suggesting that opinions about individual green tax vary quite widely among the respondents, just as they did for corporate green tax. There was a significant positive correlation between greenhouse effect

understanding and willingness to pay individual green tax, $R = 0.256$, 95% $CI = 0.066 - 0.427$, $t(102) = 2.670$, $p = 0.009$.

Figure 16: Positive correlation between greenhouse effect understanding and willingness to pay individual green tax.

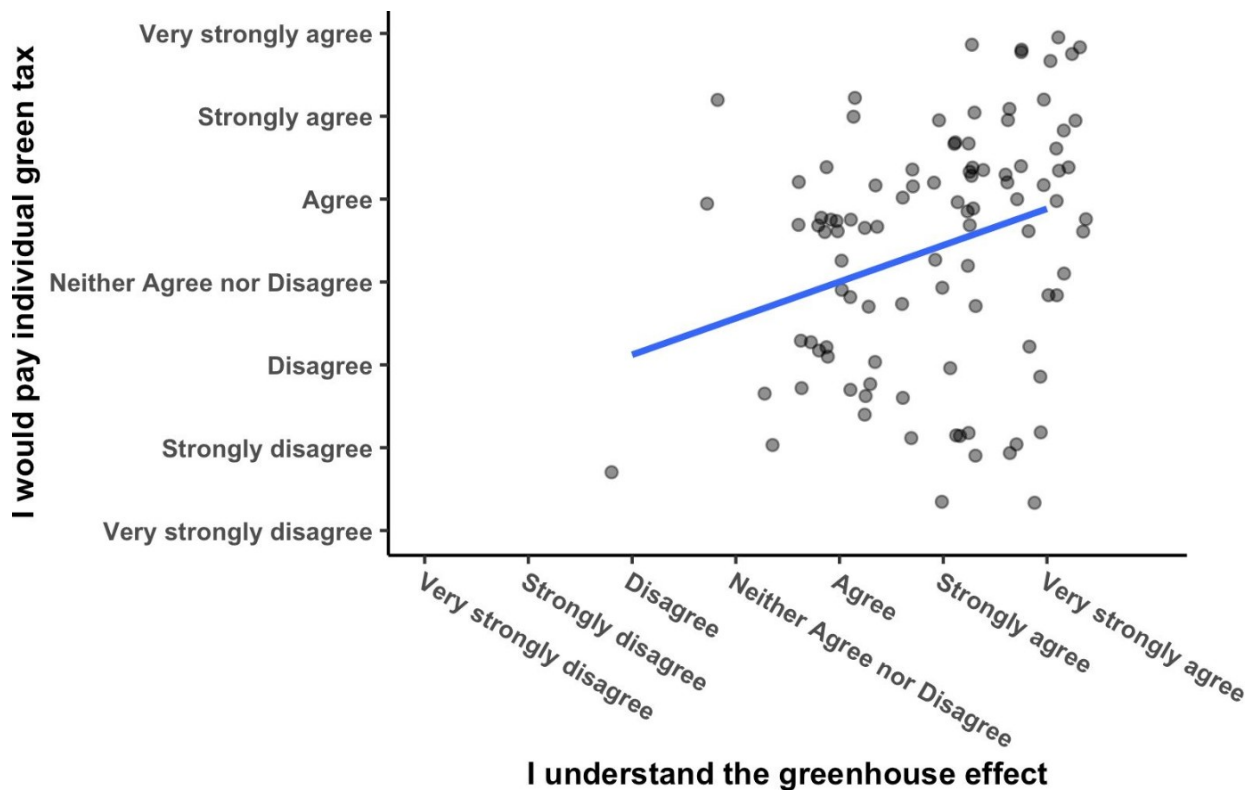


Figure 19 demonstrates the relationship between responses to the aircraft emissions understanding item and the individual green tax item. Again, respondents strongly agreed that they understood aircraft emissions: the mean score for this item was 1.83 (SD = 0.99). There was a significant positive correlation between airplane emissions understanding and willingness to pay individual green tax, $R = 0.298$, 95% $CI = 0.112 - 0.464$, $t(102) = 3.159$, $p = 0.002$.

Figure 17: Positive correlation between aircraft emissions understanding and willingness to pay individual green tax.

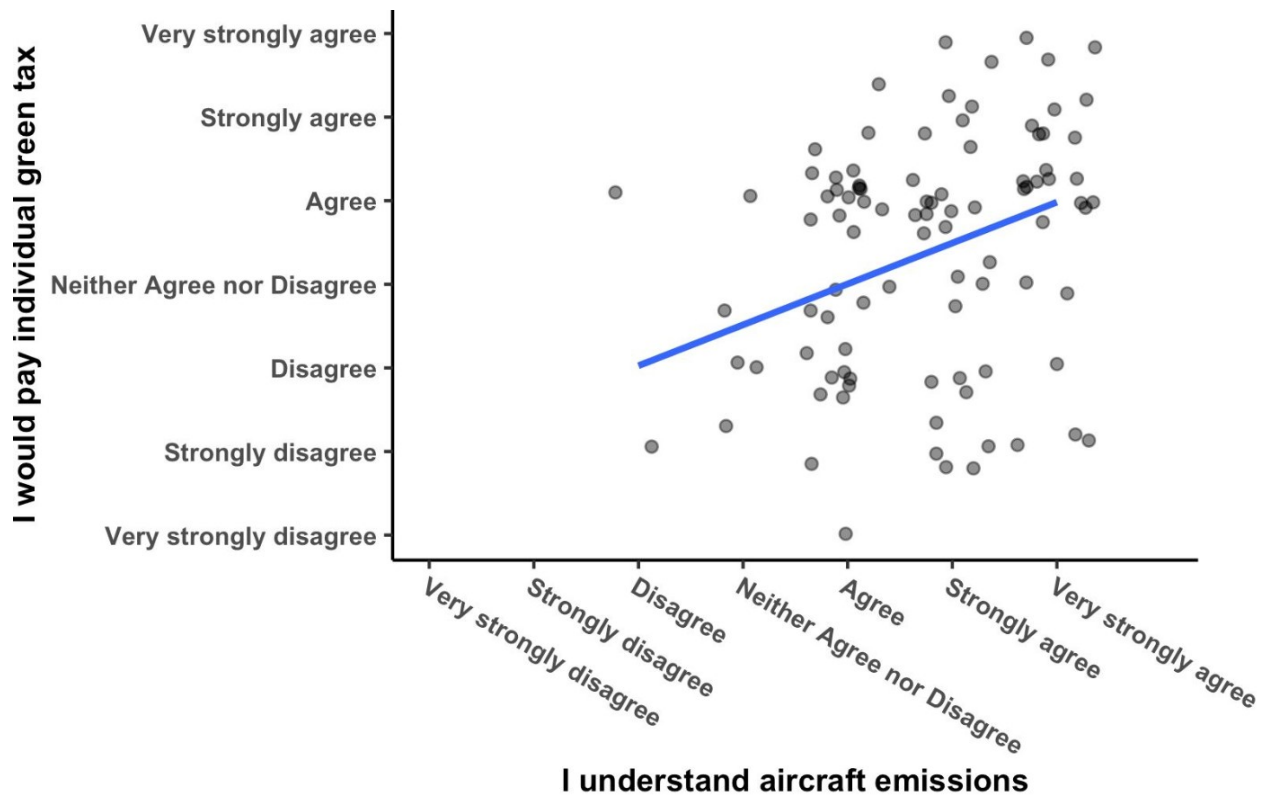
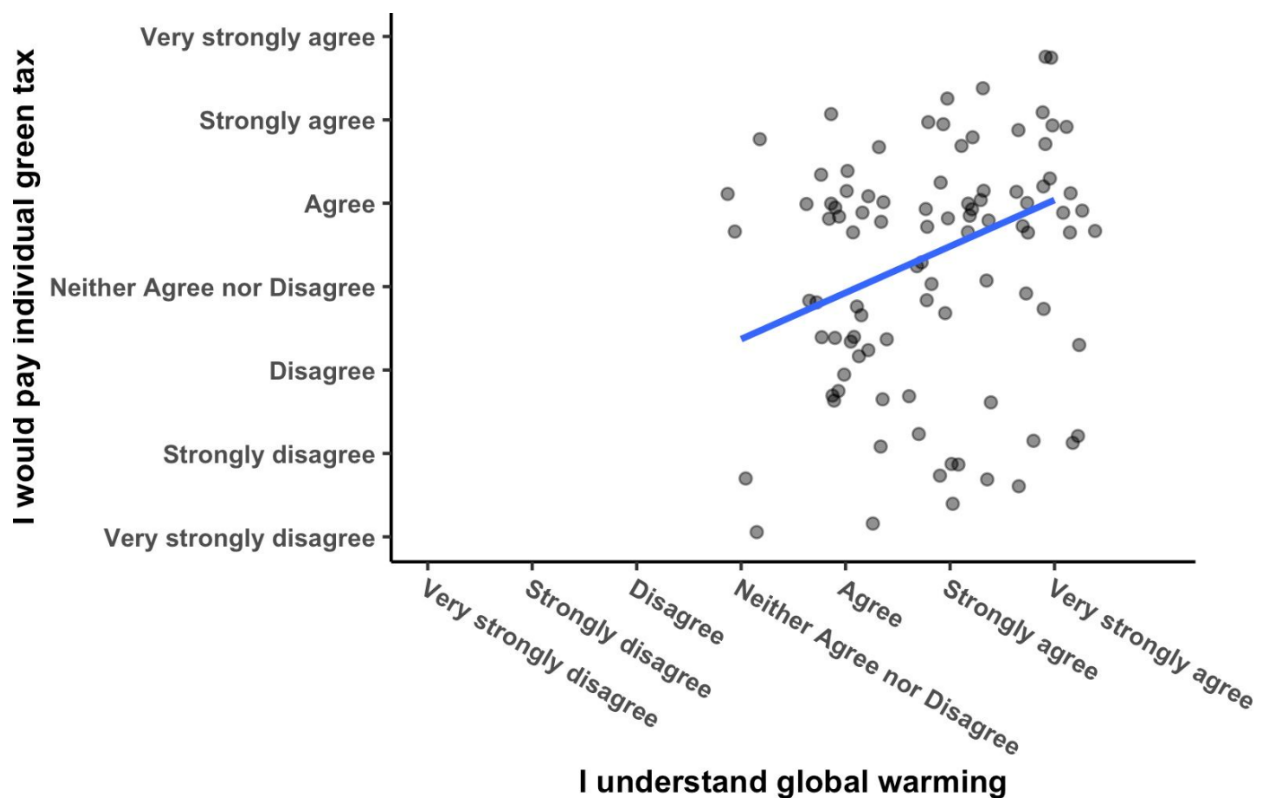


Figure 20 shows the relationship between responses to the global warming understanding item and the individual green tax item. Again, respondents strongly agreed that they understood aircraft emissions: the mean score for this item was 1.88 (SD = 0.90). There was a significant positive correlation between airplane emissions understanding and willingness to pay individual green tax, $R = 0.310$, 95% CI = 0.124 - 0.474, $t(102) = 3.2876$, $p < 0.001$.

Figure 18: Positive correlation between understanding global warming and willingness to pay individual green tax



4.4 Summary

Table 12: Summary and conclusion on hypotheses.

Null Hypothesis	Empirical Evidence	Decision
Ho(1)	Rejected	Reject Null Hypothesis; adopt alternative hypothesis
Ho(2)	Supported	No significant evidence to reject Ho(2) Supported
Ho(3)	Supported	No significant evidence to reject Ho(3) Supported

Ho(4)	Rejected	Reject Null Hypothesis; adopt alternative hypothesis
Ho(5)	Rejected	Reject Null Hypothesis; adopt alternative hypothesis

However, there is a limitation related to the concept of result in whether the result is business growth or of any other nature. This is a limitation to the study as the purpose of the traveling and the classification are for further study.