Environmental Attitudes and Voting Behaviour in the 2019 Canadian Federal Election

by

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Abstract

Despite ubiquitous scientific evidence of climate change and the perceived increase in citizens' awareness and actions toward climate change in Canada, the Green Party of Canada (GPC) – the only major party with an explicit ideology of environmentalism – has a weak record of candidates being elected in federal elections and serving in the House of Commons. This paper examines what factors help to explain whether Dalhousie students voted Green or not in the 2019 Canadian federal election. It hypothesizes that gender, program of study, level of climate change concern, strategic voting, priority of climate change issue, party leader rating and climate change policy preference are factors which help to explain whether Dalhousie student voted Green or not. The logistic binary regression analysis using data from an online survey (N=411) reveals the significant relationships between 1) strategic voting, 2) priority of climate change issue, 3) party leader rating, with the outcome variable. The study highlights that strategic voting does affect a minor party such as the Green Party in the election outcome. Voting based on genuine interests, not by their second-best preference based on chances of winning, is crucial to prevent politicians and government from misunderstanding the will of the voters. Researching the role of social media or memes on young people's opinion formation on political parties, leaders or climate change as well as on their decision-making in voting might allow a deeper understanding of the result of this study.

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List of Abbreviations

AR5	The Fifth Assessment Report of the IPCC
BQ	The Bloc Québécois
CAT	Climate Action Tracker
CI	Confidence Intervals
CPC	The Conservative Party of Canada
ESS	Environment, Sustainability and Society
GHG	Greenhouse gas
GPC	Green Party of Canada
IPCC	Intergovernmental Panel on Climate Change
LPC	The Liberal Party of Canada
NDC	Nationally Determined Contribution
NDP	The New Democratic Party of Canada
PPC	The People's Party of Canada
SPSS	IBM Statistical Package for the Social Sciences
UNEP	The United Nations Environmental Programme
UN	The United Nations
WMO	World Meteorological Organization
YESS	Your Environmental Sustainability Society

Chapter 1: Introduction

Despite ubiquitous scientific evidence of climate change and perceived increase in citizens' awareness and actions toward climate change in Canada, the Green Party of Canada (GPC), the only major party with an explicit ideology of environmentalism, has a weak record of candidates being elected in federal elections and serving in the House of Commons.

1.1 Background

1.1.1 Science of climate change

The Fifth Assessment Report (AR5) published by the Intergovernmental Panel on Climate Change (IPCC) clearly indicates that human activities are dramatically impacting the planet's climate system (Intergovernmental Panel on Climate Change [IPCC], 2014). Cook et al. (2013) show that more than 97% of climate scientists who actively publish peer-reviewed studies agree that anthropogenic activities are causing recent global warming. The Government of Canada (2019a) also believes in anthropogenic climate change. The *Emissions Gap Report 2019* issued by the United Nations Environmental Programme (UNEP) updates that the last decade (2009-2019) experienced an increase in the total amount of global GHG emissions at the rate of 1.5% each year, reaching 55.3 GtCO_2e in 2018, which is the highest level in recorded history (United Nations Environmental Programme [UNEP], 2019). The *Global Carbon Budget 2019* shows that global CO_2 emission from fossil fuel use has kept increasing decade by decade (Friedlingstein et al., 2019). In the 1960s, the amount of atmospheric CO_2 emissions increased by an average of 3.0±0.2 GtC yr^{-1}, followed by 4.7±0.2 GtC yr^{-1} in the 1970s, 5.5±0.3 GtC yr^{-1} in the 1980s, 6.4±0.3 GtC yr^{-1} in the 1990s, 7.8±0.4 GtC yr^{-1} in the 2000s, and 9.5±0.5 GtC yr^{-1} in the 2010s (Friedlingstein et al., 2019). The consequences of increased GHG emissions in the

atmosphere are obvious: acidification of oceans, loss of Greenland and Antarctic ice sheets, reduction of cold days and nights, and an increase in heatwaves, among many other concerns. As an increased amount of GHGs accumulates more in the atmosphere, the existing impacts of climate change will be intensified (IPCC, 2014).

The *WMO Statement on the State of the Global Climate in 2019* report published by the World Meteorological Organization (WMO) indicates that the global mean temperature for 2019 was approximately 1.1± 0.1 °C above the 1850-1900 baseline, which might make 2019 the second warmest year on record after the warmest year in 2016 when El Niño contributed to the temperature increase (World Meteorological Organization [WMO], 2020). The last decade (2010-2019) marked the warmest ten-year period in recorded history. The last five-year period (2015-2019) also recorded the warmest half-a-decade in history (WMO, 2020).

In 2018, to further encourage decision-makers to take ambitious action toward climate change, the IPCC issued a special report comparing the impacts of global warming of 1.5 ºC and 2 ºC. The *Global Warming of 1.5 ºC report* argues that the impacts of global warming of 1.5 ºC on livelihoods, food security, health, water supply, human security, and economic growth would be more severe than the global warming we are experiencing at present (global warming of 0.8 ºC to 1.2 ºC); however, impacts will be less critical than with global warming of 2.0 ºC (IPCC, 2018). Unfortunately, in Canada, temperature increase has already surpassed 1.5 ºC level. Canada, as a whole, experienced an average annual temperature increase of 1.7 °C from 1948 to 2016 (Bush & Lemmen, 2019; Government of Canada, 2019b). In northern Canada, annual mean temperature increased by 2.3°C between 1948 and 2016 (Bush & Lemmen, 2019; Government of Canada, 2019b). The rate of temperature increase in Canada is double (Canada as a whole) and triple (Canadian North) the global average rate (Government of Canada, 2019b). Temperature

increase at a faster rate in Canada leads to extreme weather events, forest fires, droughts, floods, among other impacts (Bush & Lemmen, 2019). Temperature increase and climate change due to anthropogenic activities contributed to Southern Alberta's flood in 2013 and the Fort McMurray wildfire in 2016 (Bush & Lemmen, 2019).

1.1.2 Canada's progress on climate change goals

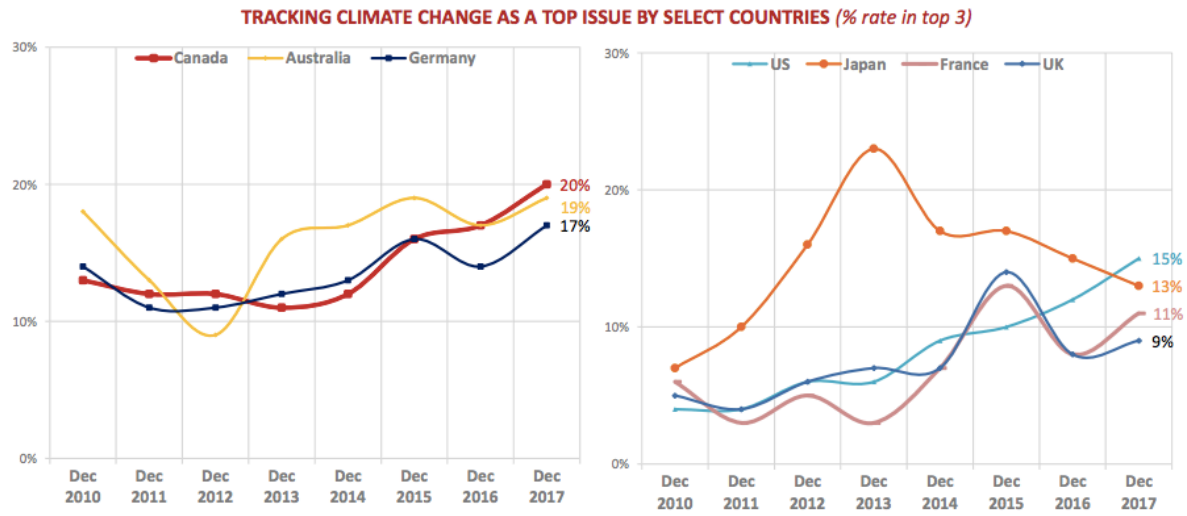
In order to respond to the scientific consensus on climate change and global warming, the Canadian government submitted its Nationally Determined Contribution (NDC) on May 15, 2015 (United Nations [UN], n.d.), and expressed its intention to reduce GHG emissions "by 30% below 2005 levels by 2030" (Government of Canada, 2015, p. 1). Unfortunately, according to the Climate Action Tracker (2019), Canada is taking "highly insufficient" (para. 11) actions to meet its NDC goals. Moreover, the Canadian NDC goals themselves had been criticized as "highly insufficient" ones until Canada declared its 2030 projection and clarified its goals. Currently, the Climate Action Tracker rates Canada's NDC goals as "insufficient" (Climate Action Tracker [CAT], 2019, para. 8). Canada's current climate policy will not be able to achieve its NDC goals under the Paris Agreement (CAT, 2019).

1.1.3 Canadian public opinion on climate change

While the Canadian government lacks actions on climate change, concern for climate change among citizens seems to be increasing in recent years. According to an Ipsos poll (2018), Canada is one of only two countries where concern for climate change as a priority national issue has constantly increased since 2015 (Figure 1).

Figure 1

Change in Citizens' Concerns for Climate Change as a Top Issue in Selected Countries.



Note. Canada and the United States are the only countries among other selected industrialized countries (Australia, Germany, Japan, France and the U.K.) where the percentage of people who consider climate change as a top issue has been increasing since 2015. This graph is retrieved from Ipsos (2018).

When the 2008 financial crisis hit the world economy, less attention was paid to climate change due to the increased concern for job security; 71% of Canadians agreed that the government should concentrate more on solving job issues than climate change (Ipsos, 2009). While it was only 13% of Canadians who ranked climate change as one of the top three concerns in 2015 (Young, 2015), a year later, 17% of Canadians said that climate change was their highest priority concern (Ipsos, 2016). In 2019, the percentage further increased to 19% (Ipsos, 2019). In addition, according to the *2019 Year-End Poll* published by Global News, 76% of Canadians think that government has to do more to tackle climate change challenges (Global News, 2019).

1.1.4 Canadian citizens' climate change activism

Canadian citizens' increased priority and concern for climate change, as well as demand for government to act more on climate change, increasingly appear in the form of climate change activism. This often corresponds with global movements, one of the key recent examples being #FridaysForFuture, initiated by a young climate change activist, Greta Thunberg (Associated Press, 2019). She is a Swedish girl who started an individual climate change demonstration outside the Swedish Parliament every Friday starting in August 2018. She was 15 years old at that time. She became the figurehead of youth climate change activists, inspiring one million young people around the world to take actions, and demand that governments meet the Paris Agreement commitments to solve climate change (Associated Press, 2019; The Lancet, 2019). Greta's activism has spread from Sweden to activists across the globe, including those in Halifax and other cities and towns in Canada. On September 27, 2019, the Global Climate Strike movement took place in more than 80 cities across Canada, starting in St. John's in Newfoundland and Labrador (Slaughter & Frisk, 2019). In Halifax, thousands of people participated in the strike to raise awareness of climate change and the need for action (CTV Atlantic, 2019; Davie, 2019; Slaughter & Frisk, 2019). Young participants skipped school on Friday and rallied with homemade signs, marching and yelling out the slogan: "What do we want? Climate action! When do we want it? Now!" (Armstrong, 2019, para. 5). A few weeks after the Global Climate Strike, approximately 100 protesters associated with the Extinction Rebellion climate protesters group blocked one of the two main bridges in Halifax (the Angus L. Macdonald Bridge) during the rush-hour morning commute (Munro, 2019). Protesters from Extinction Rebellion demand Canadian and provincial governments take more ambitious actions and make policies on climate change to achieve net-zero GHGs emissions by 2025 (Bradley, 2019). Yet, protesting is not the only means of delivering and reflecting citizens' opinions and

concerns to government in a liberal democratic state like Canada. The principles of free and fair elections, rule of law, equality, freedoms, and rights are vested in Canada's core values and institutions; thus, voting in the elections is also a means of voicing citizens' concern about climate change to the government (Marland & Wesley, 2016).

1.1.5 Green Party of Canada

The Green Party of Canada (GPC) was established in 1983 in Ottawa with Dr. Trevor Hancock as the first party leader (Green Party of Canada [GPC], 2020a). The GPC advocates for a green economy and the protection and preservation of the natural world through progressive social planning and accountable and responsible governance (GPC, 2020a, para. 8). The 1984 federal election was the first election the GPC participated in, and they fielded 60 candidates. Twenty years later, in 2004, the GPC's candidates ran for the election in all 338 ridings for the first time in history; the result of the election showed that the GPC gained "4.3 percent of the popular vote" (GPC, 2020a, para. 10). In 2011, then-party leader Elizabeth May won the election in her riding, and she was the first GPC candidate to win an election in Canadian history (GPC, 2020a). Since then, the GPC has only seen a small increase in the number of elected candidates. The GPC has sent only three candidates to the House of Commons throughout history: Elizabeth May to the 41st and the 42nd Parliaments, and Jenica Atwin, Paul Manly and Elizabeth May to the 43rd Parliament (Parliament of Canada, n.d.). The 43rd Parliament marked the highest representation of the Green Party in House of Commons, but with only three seats.

1.2 Problem Statement

The Green Party of Canada, as explained in the previous section, is a party which advocates for environmentalism. Despite the increase in climate change concern among Canadians, the GPC's share of the popular vote has declined since 2008 except for the 2019

election. In 2004, the GPC gained 4.3% of popular vote, followed by 4.5% in 2006 (GPC, 2020a), 6.8% in 2008 (Heard, n.d. a), 3.7% in 2011 (Heard, n.d. b) and 3.5% in 2015 (CBC News, 2015). In 2019, the Green Party gained 6.5% of the popular vote (CBC News, 2019).

It must be asked why, in a country where 83% of people believe that the Earth is getting warmer, and 60% believe this warming is partly or mostly due to human activity (Lachapelle, 2020), does the Green Party of Canada, which advocates for environmentalism, have less than 7% of popular vote? This study seeks to help understand why so few people vote Green considering a ubiquity of scientific evidence of climate change and perceived increase in climate change concern by exploring factors which help to explain voters' likelihood to vote for the Green Party.

1.3 Purpose Statement

Carroll, Casswell, Huakau, Perry and Chapman (2009) identified a problem similar to that stated above. They asked why the Green Party performs poorly in elections despite the fact that the majority of people in New Zealand consider environmental protection to be one of their highest priorities.

The purpose of this survey study is to identify factors which help to explain whether Dalhousie students voted for the Green Party or not in the 2019 Canadian federal election. This paper will expand on Carroll et al.'s study that assessed if voters' political position or preference for policies on social justice issues influence the intentions to vote Green or not, by examining the effects of the following independent variables: gender, program of study, level of climate change concern, strategic voting, priority of climate change issue, party leader rating and climate change policy preference, on voting behaviour. The dependent variable is if the Dalhousie student voted for the Green Party or not in the 2019 Canadian Federal Election. This paper tries

to answer this research question by conducting quantitative research using binary logistic regression analysis.

1.4 Hypothesis

Gender, program of study, level of climate change concern, strategic voting, priority of climate change issue, party leader rating, and climate change policy preference are factors which help to explain whether Dalhousie students voted Green or not in the 2019 Canadian federal election.

1.5 Research Design

1.5.1 Structure of the study

This study starts with a literature review of existing discussion on environmental opinion formation, attitudes, and behaviour on environmental issues such as climate change, and factors influencing voting behaviour. Reflection on the literature review also helps to develop a hypothesis about factors which help to explain whether Dalhousie students voted Green or not in the 2019 Canadian federal election. Following the literature review section, the methods section reintroduces the hypothesis with predictions for seven independent variables. The methods section also explains the procedure and design of the online survey, population and sample, data analysis model as well as research ethics. The thesis concludes with the results and discussion of the study by summarizing key findings and answers to the research question.

1.5.2 Limitations and delimitations

This study was conducted as a class assignment of the SUST4900XY thesis class; thus, time for thesis completion was limited to eight months (one academic year). In addition, a lack of experience of a primary researcher limited the population to be studied. In order to design a study that is within the capacity of the primary researcher, the research question was narrowed

and scoped in a way that helps to contribute to the bigger question stated in the problem statement.

1.5.3 Assumptions

Although climate change is discussed, and environmental policy is advocated across all political parties in Canada, including the Liberal Party of Canada (LPC) (2019), Conservative Party of Canada (CPC) (n.d.), and New Democratic Party of Canada (NDP) (n.d.), the Green Party of Canada (GPC) can be considered as the only party with an ideology of environmentalism. Among the GPC's fundamental principles such as non-violence, sustainability, social justice, and participatory democracy, its core values include ecological wisdom and respect for biological and ecological diversity (GPC, 2020b). The idea that "all life on the planet is interconnected and that humans have a responsibility to protect and preserve the natural world" (para. 8) emphasizes the GPC's values on environmentalism (GPC, 2020b). This study's research question was developed on an assumption that increased concern for climate change might lead to increased popularity for an environmentalist party in Canada: the Green Party. Why do only a few people vote Green in Canada where the majority of people (83%) believe that the Earth is getting warmer, and more than half of the people (60%) believe this warming is partly or mostly due to human activity (Lachapelle, 2020)? The problem statement and research question are constructed from the assumption described above.

Chapter 2: Literature Review

2.1 Climate Change Opinion Formation

Many scholars who contribute to studies of how people construct beliefs, ideas, and attitudes on climate change. Benegal and Scruggs (2018), Bolin and Hamilton (2018), Fielding, Head, Laffan, Western, and Hoegh-Guldberg (2012), Kevins and Soroka (2018) explain factors

which influence people to form opinions on climate change, as well as which factors amplify or change existing opinions on climate change. For example, Benegal (2018) introduces literature that claims educational levels, media, or exposure to extreme weather events influence opinion formation on climate change as well as attitudes toward climate change. Then, Benegal (2018) hypothesizes that unemployment and economic risk perceptions, as well as political affiliation, might have effects on the attitudes toward anthropogenic climate change. Benegal (2018) concludes that while political affiliation affects attitudes toward anthropogenic climate change, unemployment and economic risk perceptions have stronger effects in shifting opinions on climate change. Unemployment and higher economic risk perception seem to make people more doubtful about climate change science and the need for actions. Anderson and Stephenson (2011) argue that in Canada, environmental issues are a partisan topic. Depending on people's ideological spectrum positions of left to right, attitudes toward environmental issues and perception of Canadian political parties differ; this influences peoples' support for certain political parties.

2.2 Climate Change Opinion to Actions

Sloot, Kutlaca, Medugorac, and Carman (2018), Fielding, Mcdonald and Louis (2008), and Fisher (2016) take further steps in the literature on climate change opinion. They expand the knowledge on climate change opinion formation to how those ideas on climate change lead to actions. Sloot et al. (2018) assess how people's different values lead to different types of pro-environmental actions, such as collective actions of public protesting, community-based gardening initiatives, or individual actions based on recycling. Fielding et al. (2008) study what factors, among environmentally conscious people, make them more likely to engage in environmental activism as an action toward climate change. Fielding et al. (2008) conclude that

people who self-identify as environmental activists, and those who have positive images toward environmental activism are more likely to engage in environmental activism. These studies show the link between ideas on climate change and environmental issues to actions toward climate change.

2.3 Climate Change Opinions and Voting Behavior

Despite the rich amount of literature on climate change opinion formation, and on how values and opinions on climate change are associated with actions toward climate change, there aren't many studies assessing how values and opinions on climate change translate into voting behaviour. Mccrea, Leviston, and Walker (2016) and Milfont, Harré, Sibley and Duckitt (2012) are a few of the scholars who address topics on climate change opinions and voting behaviours. Mccrea et al. (2016) studied if political affiliation or actions of voting for a certain party has influence on forming or changing climate change opinions. They conclude that voting behaviour affects opinion formation about climate change. People try to align their ideas to the political party they support through their votes. Milfont et al. (2012) studied why people with strong support for climate change actions end up voting for a party that does not share the same level of attitudes and consciousness toward climate change. Milfont et al. (2012) conclude that people who have children are more likely to directly reflect their opinions on climate change into voting for a greener party than people who do not have children.

2.4 The literature on Green Parties Around the World

The literature on Green Parties around the world can be grouped into three main categories: studies that explain the organizational evolution of Green Parties (Jackson, 2012: Miragliotta, 2012; Miragliotta, 2015), election studies (Edwards & Lomax, 2012; Holloway, Miragliotta, & Manwaring, 2019; Manning, & Rootes, 2005; O'Brien, 2013; O'Brien, &

Huntington, 2018) and studies of membership, voters' characteristics and citizens' voting behaviours for Green Parties (Carroll et al., 2009; Gauja & Jackson, 2016; Hooghe, Heyndels, Jottier, Bircan & Botterman, 2010; Rüdig, 2012; Schumacher, 2014; Tranter & Smith, 2019).

Among all these studies on Green Parties, there is only one study, as far as the primary researcher found so far, that investigated factors that might help explain the intention to vote for a Green Party. Carroll et al. (2009) note that although a majority of people in New Zealand said environmental protection was one of their higher priorities, those considerations did not translate into voting for New Zealand's Green Party, which was performing poorly in elections. Carroll et al. (2009) hypothesized that the New Zealand Green Party's stance on social justice issues hinders its success in an election; thus, the Green Party's position on social justice issues is one of the factors that influence people's intention to vote Green. Their studies, which analyze data from the New Zealand Value Survey 2005, conclude that those who indicated the intention to vote Green in the future had higher pro-environmental attitudes as well as higher social justice concerns. Therefore, consideration of social justice issues influences the intentions to vote Green in New Zealand.

Camcastle's study, although it does not contribute to investigating factors which help to explain why people vote for the Green Party of Canada, offers analysis on various factors that lead people to become a member of the GPC. Camcastle (2007) found that 91% of members decided to join the GPC because the ideas and policies written in the GPC's platform matched their beliefs. Other factors which influence people to become a member of the GPC are exposure to media (64.6% of the GPC members learn about GPC through the media), attainment of higher education, and occupational sector (Camcastle, 2007).

2.5 Literature Gaps in Climate Change and Voting Behaviour

Although there are studies assessing: 1) how opinions on climate change are formed, amplified, or changed; 2) how climate change opinions lead to actions; 3) how positionality on social justice issues is correlated with citizens' intentions to vote for the Green Party in New Zealand; 4) and factors that affect people's choice to become members of the GPC, no studies have addressed what factors help to explain Canadian citizens' likelihood of voting for GPC.

2.6 Factors Influencing Voting Behaviour

This section expands the review of literature on climate change opinion formation and environmental actions such as voting for Green Parties to explore and include the literature on voting behaviour in general. This section tries to understand the discussion among scholars regarding factors which influence, correlate with, or explain voting behaviours.

2.6.1 Gender

There is a debate on whether gender, as a demographic factor, has an impact on voting behaviour or not - specifically, a debate over the hypothesis that "women vote for women and men for men" (Bird, Jackson, McGregor, Moore & Stephenson, 2016, p. 361). Sanbonmatsu (2002) and Sanbonmatsu and Dolan (2009) believe that gender has effects on voting choices; while Bird et al. (2016) believe it does not. Goodyear-Grant and Croskill (2011) agree more with Bird et al., although they do not deny the effects of gender in voting completely, and argue that gender affinity effects, which explains the tendency for women to vote for females rather than men, did not explain the result of Canadian federal elections in 2000 and 2004. Yet, these three studies cannot be compared because the targeted countries and levels of government for election differ.

Sanbonmatsu (2002) argues that gender does influence the way people vote because of the gender stereotypes people have toward traits such as the belief that females are more

egalitarian and feminine. A bias toward issue competency, such as the idea that women pay more attention to, and are more able to deal with, women's issues than men, while men can handle issues such as foreign policy, defence, and crime better than females, is also a reason why Sanbonmatsu (2002) believe that gender influences people's voting choice and behaviour. These gender stereotypes toward candidates' traits and abilities to handle certain issues (issue competency) affect voters' decisions. Sanbonmatsu revisited this topic on gender and voting behaviour in 2009 with Dolan and added that gender has a strong influence on voting behaviour by showing that the effects of gender exist regardless of the party affiliation. Sanbonmatsu and Dolan (2009) found commonalities between voters in the Democratic Party and the Republican Party of the United States in how gender influenced their decision-making in the election. Their analyses of data from the 2006 American National Election Studies Pilot Study show that respondents consider Democratic Congresswomen (24.6%) and Republican Congresswomen (23.9%) are better at handling issues of education than Democratic Congressmen (5.1%) and Republican Congressmen (4.3%). On the other hand, respondents answered that Democratic Congressmen (18.5%) and Republican Congressmen (19.7%) seem to be better at dealing with crime issues than Democratic Congresswomen (6.4%) and Republican Congresswomen (5.9%). In conclusion, partisanship does not diminish the effects of gender and issue competency such as education or crime; in other words, gender is one of the impactful factors in voting decision making.

On the other hand, Bird et al. (2016) oppose Sanbonmatsu and Dolan (2009)'s conclusion by stating that gender does not have an independent influence on voting decision-making. In their study on the influence of candidate's gender and race on voters' choices in a Toronto mayoral election in Canada (non-partisan municipal election), Bird et al. (2016) found that

gender shows its impacts on voting only when it is mixed with other factors such as ethnicity, ideology, and egalitarian attitudes. Therefore, Bird et al. (2016) conclude that ethnicity, values, and ideology matter in voting behaviour, not gender.

Goodyear-Grant and Croskill (2011) assessed the presence of gender affinity effects in the Canadian federal elections of 2000 and 2004 by measuring if voters cast a ballot for female or male candidates. Their tabular analysis and multivariate analysis showed that voters' gender did not have effects on their voting choices in the 2000 federal election: male and female voters voted for male and female candidates in similar proportions. The 2004 election showed more effects of gender affinity. Actually, a higher proportion of women voters (67%) voted for male candidates than male voters did (62%), and a higher percentage of male voters (38%) voted for female candidates than women voters did (33%). Therefore, Goodyear-Grant and Croskill's study on gender affinity effects on Canadian federal elections showed that gender may explain certain voting patterns and trends; thus, gender does affect voting behaviour. However, it does not always mean that women voters are more likely to vote for female candidates, and male voters are more likely to vote for male candidates. Besides, Goodyear-Grant and Croskill (2011) conclude that gender affinity effects play a role in voting behaviour when other factors also exist as a condition, such as high underrepresentation of women in politics. Therefore, Goodyear-Grant and Croskill (2011) regard the effects of gender in voting choice as conditional, like Bird et al. (2016) argue, which lead Goodyear-Grant and Croskill (2011) to conclude that effects of gender in voting behaviour are minimal.

In conclusion, studies introduced in this section show that there are multiple opinions and analyses on whether gender helps to explain voting behaviours or not. Sanbonmatsu and Dolan (2009)'s belief in the effects of gender on voting behaviour was challenged by Bird et al. (2016),

who claimed that gender does not have effects on voting behaviour unless gender is combined with other demographic factors such as ethnicity and race. Goodyear-Grant and Croskill (2011) also regard the effects of gender in voting behaviour as conditional and they admit that gender has only a minimal influence in voting behaviour. Even if gender does have effects, it does not always mean that women voters tend to vote for female candidates (Goodyear-Grant and Croskill, 2011).

2.6.2 Program of study

Schumacher (2014) recognizes the impacts of the level of education on voting for the Green Party in Germany. Molthan-Hill, Worsfold, Nagy, Leal Filho and Mifsud (2019) and Coffey, Joseph and Miller (2013) recognize the influence of education on environmental and sustainable consumer choices and daily decision making. Yet, no studies have asked if the effects of education in voting for a Green Party, or on sustainable behaviour and decision-making are program-of-study specific or not. I assume that program of study has impacts on voting Green based on framing theory.

According to Nisbet (2009), framing theory explains the pattern of interpretation of information, knowledge or thoughts which lead people to conclude what the issue is about, how important the issue is, what to do about it, and how to deal with it. Framing theory is useful in explaining how people react to the scientific truth of climate change. For example, Nisbet (2009) explains that economic framing makes people judge climate change as an economic issue, while an economic development frame allows people to consider climate change as a chance to advance economic development and growth. Other frames of climate change include social progress frame, economic development and competitiveness frame, morality and ethics frame, scientific and technical uncertainty frame, public accountability and governance frame, conflict

and strategy frame, among others (Nisbet, 2009). How people perceive climate change issues with which "framing" might influence the understanding of climate change, as well as the formation of ideas on how important climate change is and how to deal with it.

Two studies below explain how a program of study or a professor's discipline influences belief on climate change, climate change knowledge, degree of concern toward climate change, and behavioural change related to climate change. Nussbaum, Owens and Cordova (2016) conducted a study on professors in educational institutions in the United States to assess the impacts of subjects they teach on the formation of environmental political ideology on climate change, such as belief in anthropogenic climate change. The result of the study shows that science professors believe in climate change more strongly than professors of other disciplines regardless of their political orientation. Nussbaum et al. (2016) assume that science professors showed stronger belief in climate change because they understand climate change science and are exposed to the scientific evidence of anthropogenic climate change more than professors of other disciplines.

Di Giusto, Lavallee and Yu (2018) conducted a study on university students in Taiwan using program of study as one of the independent variables to assess the knowledge on climate change, degree of concern toward climate change, and level of behavioural change due to climate change, and how these three dependent variables relate each other. The study showed that student major (program of study) has significant impacts on all three outcomes: climate change knowledge, degree of concern toward climate change, and degree of behavioural change related to climate change. Students in science and technology majors got higher points on climate change knowledge tests than social science students and cosmetic & beauty science students; however, when it comes to the degree of concern toward climate change, social science students

scored higher than science and technology students. This was also reflected in the behavioural change variable, which showed that social science students changed their behaviour due to climate change more than science and technology students, as well as humanities students. This study shows that it is not the level of education or understanding of scientific knowledge of climate change that leads to the behavioural change, but rather the degree of concern that correlates with behavioural change related to climate change, and its effect is program of study-specific. This result suggests that whether Dalhousie students voted Green or not might also be explained by their program of study, considering the fact that a degree of concern toward climate change can also be program-specific.

2.6.3 Level of climate change concern

Milfont et al. (2012) argue that there is a gap between a higher degree of consciousness toward climate change and actual decision-making in supporting a party that reflects their climate concern; thus, they are doubtful of the effects of higher climate change concerns on pro-environmental decision making. However, multiple scholars state the opposite. Studies introduced in the previous section (program of study) showed that students who had greater concern toward climate change had the highest level of climate-related behavioural change (Di Giusto at al., 2018). Jones, Hine and Marks (2017) support Di Giusto et al.'s argument by saying that emotional distance to the climate change issue hinders people from taking action on climate change. It means that lack of attention and motivation, thus lower level of climate change consciousness, is related to inaction or a low level of behaviour change to tackle climate change. Coffey et al. (2013) add that people who take action on climate change are those that have greater concern for climate change, because taking action on climate change is not an easy thing, and often its costs outweigh the benefits. Carroll et al. (2009) conclude that those who showed an

intention to vote for the Green Party in the future shared higher concern toward climate change and pro-environmental views. To summarize, it appears that a higher level of concern toward climate change does affect behavioural change and decision-making.

2.6.4 Strategic voting

Although most scholars understand that strategic voting is used by voters in Canada, some suggest that its effects are minimal and strategic voting rarely affects the election outcomes in Canada.

Duverger's Law is often mentioned by scholars when defining strategic voting. Duverger is the pioneer in the study of strategic voting in the society of the plurality system (Bowler & Lanoue, 1992; Kim & Kostadinova, 2011; Merolla & Stephenson, 2007). Duverger's Law explains that strategic voting involves casting a vote for a party that is not preferred, but the most acceptable second choice which has more chance to win the election than the most preferred one. By voting for a second-best party, voting can contribute to preventing the worst choice of a party from winning the election; thus, strategic voting allows an individual's vote to be less wasteful than voting for a most preferred party which has almost no chance to win the election (Bowler & Lanoue, 1992; Kim & Kostadinova, 2011; Merolla & Stephenson, 2007). Blais & Bodet (2006) summarized that strategic voting is a behaviour used by the voters who want to influence the election outcome with their vote; therefore, they consider their preference as well as the likelihood of parties winning in determining for whom to vote (Blais & Bodet, 2006; Blais, Nadeau, Gidengil & Nevitte, 2001).

Fowler (2012) explains that people make choices to vote strategically at two points: when they consider the election outcome at the local level, and when they anticipate the election outcome at the federal level. Blais et al. (2001) added that people choose to vote strategically by

estimating the election outcome of official opposition party; thus, Blais et al. (2001) included three levels of decision-making points for strategic voting in their study of strategic voting in the 1997 Canadian federal election. Blais et al. (2001) suggested the third point because of the following reason. In the 1993 Canadian federal election, the Bloc Québécois, which was advocating for separation from Canada won 54 seats and gained official opposition status in the House of Commons (Blais et al., 2001). Many Canadians opposed and disliked the Bloc Québécois' separatist ideas. Many Canadians were also worried about letting the Bloc Québécois gain more power by attaining official opposition party status again in the 1997 federal election. Therefore, Blais et al. (2001) assumed there would be people who vote strategically in order to prevent the Bloc Québécois from forming the official opposition in the 1997 Canadian federal election. This is why Blais et al. (2001) added one more factor of consideration to Fowler's (2012) two points of strategic voting choices.

Blais (2002) argues that the effects of strategic voting on people's choices in Canadian elections were minimal according to his 1988 Canadian Federal Election study. Blais (2002) found that only 13 percent of the third-party supporters voted for another candidate from a competitive party in the 1988 Canadian Federal Election. It means that only 13 percent of third-party supporters voted strategically while 87 percent of third-party supporters did not vote strategically (Blais, 2002). Although the third-party was not a competitive party in the 1988 federal election, that fact did not change third-party supporters' votes: they remained loyal to their most preferred party (Blais, 2002). Blais (2002) explained that people vote strategically when they perceive their second choice as acceptable, and when there is a weaker gap of relative preference between their first choice and the second choice. Expectations of the election outcome, such as the likelihood of their most preferred party to win in the election, also influence

people's decision to vote strategically or not (Blais, 2002). Blais et al. (2001) concluded that voters' motivations to reflect their votes in the election outcome and avoid wasting votes lead some people to vote strategically.

Kim and Kostadinova (2011) offer a more comprehensive study on strategic voting in Canada. They studied the trends of tactical voting in four elections: in 1988, 1993, 1997 and 2000. They found a variety of effects of "tactical voting across ridings, parties and elections" (Kim and Kostadinova, 2011, p. 59). Like Blais (2002), Kim and Kostadinova (2011) also explained that the 1988 federal election did not show the effects of tactical voting. In the 1993 and 1997 elections, the effects of tactical voting seemed bigger than the 1988 election. For all election periods used in this study (1988, 1993, 1997 and 2000) tactical voting was highly used by NDP supporters, which was the "minor party throughout the period of analysis" (Kim and Kostadinova, 2011, p. 59). Yet, Kim and Kostadinova (2011) conclude that effects of tactical voting in the Canadian election are minimal because their studies show that the existence of effects of tactical voting observed in these elections was not significant enough to change the election result or composition of seats in the House of Commons.

In the most recent case, according to the post-election survey report published by the Léger (2019), in the 2019 Canadian federal election, 35 percent of respondents answered that they voted by taking into account the chances that their vote might prevent another party's candidate from winning, which means they took strategic voting into account. Among these 35 percent who voted strategically, 43% of them ended up voting Liberal, followed by CPC (39%), NDP (28%), Bloc Québécois (BQ) (18%), and GPC (16%). On the other hand, the same study shows that respondents who voted for the Greens or BQ were the most determined to vote for a GPC or BQ candidate, respectively, without taking into account their candidate's chance of

winning compared to voters of other parties (no-strategic voting) (Léger, 2019). This study was conducted from October 22 to October 24, 2019 by The Canadian Press, with 1,503 Canadians participating (Léger, 2019).

Fowler (2012) relates the topic of strategic voting to the Green Party of Canada. Fowler (2012) explains that strategic voting might prevent people who care about environmental issues from voting Green because, in Canada, where the Green Party is not popular enough to win the election in many constituencies, the voters who are concerned with environmental issues end up voting for a party which is more likely to win the election and is better at handling environmental and climate change issues other than the Green Party.

To sum up, there is a consensus among scholars that strategic voting has only minimal effects in Canada. Some years showed more effects of strategic voting than others, but Blais (2002) and Kim and Kostadinova (2011) agree that strategic voting's effects are not significant. Blais (2002), Kim and Kostadinova (2011), Fowler (2012) all pointed out that strategic voting might influence the supporter of a minor party more than the supporter of a competitive party. The data from the Léger poll affirms their points by showing that competitive parties such as the Liberals or CPC gained the most from strategic voting.

2.6.5 Priority of climate change issue

Why, in a country where 83% of people believe that the Earth is getting warmer, and 60% of people believe this warming is partly or mostly due to human activity (Lachapelle, 2020), did the GPC, which advocates for environmentalism, gain only 6.48% of the popular vote in the 2019 federal election? Nisbet's (2009) statement that not everybody cares about climate change or environmental issues does not seem to offer any explanations in Canada, but Benegal's (2018) argument might. Benegal (2018) stated that when people have a higher

perception of economic risks such as unemployment, the likelihood of climate denial increases, and this trend transcends party affiliation. It shows that priority of issues of concern, regardless of party affiliation, influences the importance of other issues as economic concern increased and environmental concern decreased in this study. Opinion polls often ask what important issues influence the voting behaviour of Canadians. About two weeks before the 2019 Canadian federal election on October 21, Ipsos conducted an online interview poll of Canadians aged 18 or older, asking the three most important issues that might determine their vote for the coming federal election. The poll showed that more than a quarter of Canadians (29%) said climate change was an important issue that would help determine whom to vote for in the federal election (Bricker, 2019). Climate change as an issue was ranked number two, after health care (35%) and followed by affordability/cost of living 26%, taxes 26%, and the economy 25% (Bricker, 2019). Abacus Data also showed a similar result. Abacus Data asked 3092 Canadians with the age of 18 or more on June 28 to July 2, 2019 to list three issues that might influence voting choice in the 2019 federal election. Climate change was the third most important issue for Canadians that would influence the way they vote, after the cost of living and health care. Climate change, as an issue factor, was followed by taxes, housing affordability and good jobs & wages (Anderson & Coletto, 2019). This variance in issues of concern shared by Canadian citizens might influence which candidate or party Canadians vote for because each political party prioritizes different issues. Anderson and Coletto (2019) show that people who intended to vote LPC shared concerns about reducing discrimination, climate change, and standing up to Trump in order of most concerned with to third most concerned issues. For the CPC, shared concerns were deficits, securing the border, and managing immigration; for the NDP, it was income inequality, indigenous reconciliation, and out-of-pocket health cost. For the GPC, it was climate change,

indigenous reconciliation, and public transit. This poll indicates that the priority issue of concern might differentiate Canadians to vote for different parties. Schumacher (2014) argues that climate change issues might not be a priority concern for most voters; thus, concern for climate change shared among Canadian citizens does not necessarily lead to voting for the GPC.

2.6.6 Party leader rating

The influence of party leaders in determining how Canadians vote should not be ignored because many studies have shown that party leaders do affect voting behaviour. Cunningham (1971) asked participants in a study to pick the most important factors from the issues of leader, local candidate or party that might influence how you vote in the 1968 Canadian federal election. The result of this study shows that 27% of respondents answered party is the most impactful factor in their votes followed by leader (26%), local candidate (26%), issues (15%) and others (6%). More than a quarter of the voters determine their voting decisions based on the party leader, which is a significant factor. The political party was a more significant factor in affecting voting behaviour by 1% compared to party leaders. Fowler (2012) is skeptical about Cunningham's findings and doubtful about the influence of a party in voting choices. Fowler (2012) argues that Canadians do not have a strong sense of political affiliation to a single party; thus, factors other than political affiliation play significant roles in determining Canadians' voting choice in the federal elections. Goodyear-Grant and Croskill (2011) elaborated on that point by mentioning flexible voters who do not have a political affiliation, and are thus considered as independents. Goodyear-Grant and Croskill (2011) argue that in the Westminster parliamentary system, flexible voters make their voting choice based on factors other than party, such as local candidates. Although Goodyear-Grant and Croskill (2011) did not directly mention that party leader influences the voting choice, their argument infers that individual candidate

(including party leader) can be a determinant of voting choice. Blais, Gidengil, Dobrzynska, Nevitte and Adeau (2003) found from their 2000 Canadian federal election studies that party or political leader mattered more than the local candidates in determining how Canadians vote.

2.6.7 Climate change policy preference

Anderson and Stephenson (2011) state that in Canada, climate change was addressed by all political parties according to their studies that analyzed the elections of 2000, 2004, and 2006. Climate change can be considered as a valence issue in Canada, which means that since climate change is addressed by parties of different positions on the political spectrum in Canada, what matters the most to voters is not whether political parties believe in climate change or not, but how the party might be able to perform in dealing with climate change issues (Anderson & Stephenson, 2011).

According to the Abacus Data, among Canadians who said climate change was one of the three most important issues that affect how they might vote, 41% of them indicated their intention to vote LPC, 21% Green, 18% NDP and 13% CPC (Anderson & Coletto, 2019). This study might infer that people with a higher level of concern toward climate change count on different parties in solving climate change issues. The Liberal Party was the most popular party for those who said climate change was one of the top three issues that might affect how they vote in the pre-election survey of the 2019 Canadian federal election. Does it indicate that people who are concerned about climate change in Canada prefer the Liberal Party's climate change policies the most?

The post-election poll issued by the Léger (2019) shows that the main reasons respondents voted for a particular party is because the party's program, platform and values are in line with the respondents (37%). The second main reason is to get rid of the government led

by Justin Trudeau (at the time of the 2019 federal election) (9%), followed by voting against another party (6%), candidate preference at the local level (4%), and so on. Among the respondents who voted Green in the 2019 Canadian federal election, almost half of them (46%) answered that the main reason they voted Green is that Green's program, platform or values align with theirs. The second biggest factor (10%) for voting for the Greens was "other parties didn't speak to me" (page. 10).

To conclude, respondents to Léger's post-election poll (2019) indicate that a party's platform, program and values are important factors in voting decision-making. The Abacus Data showed that the Liberal Party attracted the highest percentage of respondents who indicated that climate change is one of their top three concerns, in terms of their intention to vote for a particular party according to the pre-election study (Anderson & Coletto, 2019). Climate change policy preference might influence the way people vote, especially for those concerned about climate change.

2.7 Conclusion

Despite the abundance of studies on voting behaviour, the literature on the Green Party of Canada is limited. No study addresses factors that contribute to people voting for the Green Party of Canada. The most relevant study is conducted by Carroll et al. (2009), which study motivation and factors that explain people's intention to vote for the New Zealand Green Party. Carroll et al. (2009) produced the only study that asked why high levels of environmental concern in New Zealand do not lead to an increased number of votes for the Green Party. This question has to be asked in Canada because Canada is also a country with a high level of climate change concern, but a lack of Green success in elections. This study tries to contribute to the expansion of voting behaviours studies on the Green Party in Canada by asking what factors help to explain whether

Dalhousie students voted for the Green Party of Canada or not in the 2019 federal election. Results of the study might help estimate reasons why in Canada, where 83% of people believe that the Earth is getting warmer, and 60% believe this warming is partly or mostly due to human activity (Lachapelle, 2020), the Green Party of Canada, which advocates for environmentalism, has less than 7% of the popular vote.

Chapter 3: Methods

This study tests if gender, program of study, level of climate change concern, strategic voting, priority of climate change issue, party leader rating and climate change policy preference are factors that help to explain whether Dalhousie students voted for the Green Party or not in the 2019 Canadian federal election.

3.1 The 2019 Canadian Federal Election

The 2019 Canadian federal election took place on October 21. The major parties that contested the election were the LPC led by Justin Trudeau, the CPC led by Andrew Scheer, and the NDP led by Jagmeet Singh. The GPC, BQ, and PPC also competed in the election. The GPC got 1,160,694 votes, which is 6.5% of total votes, and 3 seats in the House of Commons (CBC News Labs, n.d.). The 2019 Canadian federal election was chosen because this is the most recent federal election, allowing this study to investigate the most recent trend of voting behaviour toward the Green Party. In addition, considering the population of the study (Dalhousie students), selecting the year of election prior to 2019 (2015 is the second latest election) might exclude the majority of students.

3.2 Hypothesis and Predictions

This study hypothesizes that gender, program of study, level of climate change concern, strategic voting, priority of climate change issue, party leader rating, and climate change policy

preference help to explain whether Dalhousie students voted for the Green Party in the 2019 Canadian federal election. Seven predictions might support the hypothesis.

Prediction 1

Female students at Dalhousie University were more likely to vote for the Green Party in the 2019 Canadian federal election.

Prediction 2

Sustainability students at Dalhousie were more likely to vote for the Green Party than other students in the 2019 Canadian federal election.

Prediction 3

Dalhousie students with higher levels of concern about climate change were more likely to vote for the Green Party in the 2019 Canadian federal election.

Prediction 4

Dalhousie students who voted strategically were less likely to vote for the Green Party in the 2019 Canadian federal election.

Prediction 5

The higher a Dalhousie student ranked climate change as a priority issue at the time of the 2019 federal election, the more likely they voted for the Green Party in the 2019 Canadian federal election.

Prediction 6

The higher the student's rating of Elizabeth May, the more likely they voted for the Green Party in the 2019 Canadian federal election.

Prediction 7

The greater the student's preference toward the Green Party's climate change policies, the more likely they voted for the Green Party in the 2019 Canadian federal election.

3.3 Procedure and Design of the Online Survey

In order to test the hypothesis, primary data was sourced from an online survey using Opinio for a period of 12 days between January 27 and February 7, 2020. The online survey consisted of 9 questions, which took participants about 3-5 minutes to complete. All questions were closed-ended questions which participants were expected to pick a response from options. Each question was designed to gather data on a specific independent variable. The following table (Table 1) is a summary of the survey questions design. All questions asked in the survey can be found in Appendix A.

Table 1

Survey Design Summary

Variable Name	Purpose	Items on Survey
Eligibility to Vote	To test the eligibility of a respondent to participate in the survey	Q1
Independent Variable		
Gender	To test if females were more likely to vote Green	Q 2
Programs of study	To test if sustainability students were more likely to vote Green	Q 3
Level of climate change concern	To test if students with a higher level of concern about climate change were more likely to vote Green	Q 4.1 to Q 4.6
Strategic voting	To test if students who voted strategically were less likely to vote Green	Q 5.1 to Q 5.3
Priority of climate change issue	To test if students whose priority issue of concern is climate change were more likely to vote Green	Q 6
Party leader rating	To test if students with a higher rating for Elizabeth May as a leader were more likely to vote Green	Q 7
Climate change policy preference	To test if students with a higher preference for the Green Party's climate change policy proposals were more likely to vote Green	Q 8.1 to Q 8.8
Dependent Variable		
Voting behavior	To gather data on which party respondents voted in the 2019 Canadian federal election	Q 9

Participants were recruited and approached by the researcher conducting this study at Dalhousie University throughout the survey study period (January 27 to February 7, 2020). Students in five classes were approached by the researcher and asked to participate in an online survey on environmental attitudes and voting behaviour in the 2019 Canadian federal election. The researcher was given the first five minutes of a class to introduce the study for one minute and provided four minutes to students to voluntarily participate in the online survey. Respondents participated in the online survey by scanning a QR code or clicking the website link displayed in the lecture slide or the course-specific page on Brightspace (Dalhousie's learning

management system) which all Dalhousie students have access to. To my knowledge, the Brightspace announcement about survey opportunity was made in 12 classes. The email was sent to 54 faculty staff (i.e. program coordinators, department head) 24 professors from 27 classes, 13 student societies, and one university staff from Dalhousie Student Union to promote the survey opportunity within their circle. The Faculty of Arts and Social Science, Chinese Studies, Department of History, International Development Studies, Early Modern Studies Program, Faculty of Health, Political Science Administrative Assistant, DSU Member Services Coordinator, NSPIRG, Dalhousie Greens, Your Environmental Sustainability Society (YESS) replied to the invitation email to the survey and confirmed that they shared the email with their students, colleague, or society members.

3.4 The Population and Sample

The population for this study is Dalhousie students who were eligible to vote in the 2019 Canadian federal election. According to Dalhousie University (n.d.), there are more than 19,000 students enrolled, and 22% of them are international students. Therefore, the population size for this study is estimated to be 14,820.

A total of 426 students responded to the survey, which represents about 3% of the population. 411 responses were used for data analysis which represents about 2.8 % of the total population. Fifteen responses were excluded from the data analysis because they indicated that they were not eligible to vote in the 2019 Canadian federal election. The sample consists of 244 females, 84 males and 9 non-binary people. Six people indicated that they prefer not to answer their gender, and 68 respondents did not answer the gender question. The sample fails to represent the gender ratio in the total population (7948 female undergraduate students, 6753 male undergraduate students, 2051 female graduate students, and 1639 male graduate students as of

December 1, 2018) (Dalhousie University, 2018). Purposive sampling was used: students in different programs of study were intentionally targeted for recruitment in order to seek responses from these groups for data analysis. Students in sustainability programs are one of the groups from which the researcher of this study deliberately sought respondents.

3.5 Data Analysis and Model

IBM Statistical Package for the Social Sciences (SPSS) was used to carry out the data analysis. Data analysis was conducted to explore the relationship between seven independent variables and behaviour of voting for the Green Party of Canada in the 2019 Canadian federal election. Answers to the questions in the online survey consist of both categorical and continuous scores. For the outcome variable, the data is dichotomous (voted Green or not). Therefore, binary logistic regression was performed using seven independent variables and one dichotomous dependent variable. Binomial logistic regression informs the presence or absence of independent variables' effects on outcome (Oyedepo & Etu, 2015).

The binomial logistic regression model:

$$logit\ (voted\ green) = \beta_0 + b_1\ (gender) + b_2\ (program\ of\ study) + b_3\ (level\ of\ climate\ change\ concern) + b_4\ (strategic\ voting) + b_5\ (priority\ of\ climate\ change\ issue) + b_6\ (party\ leader\ rating) + b_7\ (climate\ change\ policy\ preference)$$

Logit shows a dependent variable, which is the behaviour of voting for the Green Party of Canada. β_0 is the estimate of intercept and $b_1, b_2, \ldots, b_7$ are estimates for the coefficients of the seven independent variables.

The independent variable *Gender* was represented by a variable Gender (Female). All the other gender groups (male, non-binary, prefer not to answer) were combined as Gender (other), which was selected as the reference group. The *Program of Study* was represented as Program of Study (Sustainability), 1 for respondents who are in the Environment, Sustainability and Society (ESS) program, and 0 for respondents in programs other than ESS.

Question 4 asked respondents to indicate to what extent they agree or disagree with six statements related to climate change scientific evidence, needs and degree of behavioural change to mitigate climate change.

Table 2

Question 4 in the Online Survey

Q4: Please read each statement and indicate to what extent you agree or disagree with it.
4.1. The Earth is getting warmer.
4.2. The Earth is getting warmer primary due to human activity.
4.3. Climate change's negative impacts will be greater than its positive impacts.
4.4. Urgent action to mitigate climate change's negative impacts is necessary.
4.5. The world will definitely get warmer if people don't change their behaviour.
4.6. I have changed my behaviour to reduce my personal carbon emissions.

The answer *Strongly Agree* gets 5 points, which indicates the higher levels of climate change concerns, and the answer *Strongly Disagree* gets 1 point respectively. The points for each statement were accumulated to display the score (30 points maximum), which provided the numeric data for the variable *level of climate change concern*.

Question 5 asked respondents to answer *Agree* or *Disagree* with the three sentences.

Table 3

Question 5 in the Online Survey.

Q5: Please read each statement and indicate if you agree or disagree with it.
5.1. In the 2019 federal election, I voted for a party that was not my most preferred because I thought that party had a better chance of winning in my constituency.
5.2. In the 2019 federal election, I voted for a party that was not my most preferred because I thought that party had a better chance of winning the election in Canada as a whole and forming government.
5.3. In the 2019 federal election, I voted for a party that was not my most preferred because I thought that party had a better chance of forming the official opposition.

This question was asked to assess if respondents voted strategically in the 2019 Canadian federal election or not. When respondents answered *Agree* to at least one of the three sentences, the respondent voted strategically in the election (variable "Strategic Voting"). The respondents are considered "no strategic voting" when they answered *Disagree* to all three sentences.

Question 6 provides data for an independent variable of the *Priority of Climate Change Issue*. It asked respondents to rank six issues in order of importance to respondents at the time of the 2019 federal election.

Table 4

The Question 6 in the Online Survey.

Q6: Please rank the following issues in order of importance to you at the time of 2019 federal election, where 6 is the most important and 1 is the least important.
Cost of living
Health care
Strong action on climate change
Taxes
Good jobs & wages
Education

The most important issue to the respondents gets 6 points, and the least important issue gets 1 point. This question provides data on how many points "strong action on climate change" got, in order to assess the degree of priority of climate change compared to other issues listed in the Table 4.

Question 7 asked "How did you feel about Elizabeth May as Green Party leader on a scale from 0 to 10 where 0 is the lowest possible ranking and 10 the highest?" Respondents who gave Elizabeth May the highest rating received 10 points, while respondents who gave Elizabeth May the lowest rating received 0 points. Question 7 provided data for the independent variable of the *Party Leader Rating*.

Question 8 asked to what extent respondents agree or disagree with the climate change policy proposals of the Green Party of Canada.

Table 5

Question 8 in the Online Survey.

Q8: Please read each climate change policy proposal and indicate to what extent you agree or disagree with it.
8.1. Doubling Canada's greenhouse gas emission reduction goals from 30% below 2005 level by 2030 to 60% below 2005 level by 2030.
8.2. Cancel operations and development of new pipeline projects.
8.3. Cancel subsidies to fossil fuel industries.
8.4. Ending the use of oil by 2050. Until then, Canada will rely on its existing oil operations and stop importing foreign oil.
8.5. 100% renewable electricity by 2030.
8.6. Make all new buildings in Canada carbon neutral by 2030.
8.7. Zero-carbon public ground transportation everywhere in Canada by 2040.
8.8. Revenue neutral* carbon fee on all sources of carbon dioxide pollution (*revenues from the carbon fee would be returned to Canadians as a dividend).

The answer *Strongly Agree* gets 5 points, which indicates the higher preference toward the climate change policy proposal, and the answer *Strongly Disagree* gets 1 point. The points for each statement were added to determine an overall score (40 points maximum) for this question, which provided the numeric data for the variable *Climate Change Policy Preference*.

The outcome variable of the study is the response to Question 9, which asked "Which party did you vote for in the 2019 Canadian federal election?"

Table 6

Question 9 in the Online Survey.

Q9: Which party did you vote for in the 2019 Canadian federal election?
Liberal Party of Canada
Conservative Party of Canada
New Democratic Party
Green Party of Canada
Other
Did not vote

The response "Green Party of Canada" was coded 1 for "voted Green", while the remaining options were coded 0 for "did not vote Green".

3.6 Research Ethics

This study received Research Ethics approval from the Research Ethics Office at Dalhousie University (REB file # 2019-4992) and by ethics officers of the College of Sustainability at Dalhousie University. All participants gave their informed consent to participate in the online survey.

Chapter 4: Results

4.1 Descriptive Summary of the Binary Logistic Regression

The results of binary logistic regression analysis show that the full logistic regression model including all seven predictors is statistically significant with x^2=93.536, df=7, N= 411, p<.001. The Cox& Snell R Square value is 24.1%, and the Nagelkerke R Square value is 34.5% for the full model. These values indicate that 24.1% and 34.5% of the variance in the dependent variable can be explained by the independent variables, depending on the measure used. The model predicted correctly 49.5 % of respondents who voted Green, and 90.5% of respondents who did not vote Green. An overall classification success rate of the model was 78.8%, which is better than the null model: 71.5%.

4.2 Relationship Significance

The results of the data analysis showed significant relationships between the dependent variable (voting behaviour: voted Green or not) and three independent variables: strategic voting (p<.001), priority of climate change issue (p<.005), and party leader rating (p<.001). The other four independent variables failed to have a significant relationship with the dependent variable. The confidence intervals (CI) of Gender(Female), Program of Study(Sustainability), Level of Climate Change Concern, and Climate Change Policy Preference contain the value of 1, indicating that these independent variables do not have effects on the outcome variable (Table 7). In this chapter, the relationships between strategic voting and voting behaviour, priority of climate change issue and voting behaviour, party leader rating and voting behaviour will be explored in detail.

Table 7

Binary Logistic Regression Predicting Likelihood of Voting Green in the 2019 Canadian Federal Election.

Variable	B	S.E.	Wald	P	Exp (B)	95% CI for EXP(B) Lower	Upper
Strategic Voting	-2.222	0.46	23.358	0.000	0.108	0.044	0.267
Party Leader Rating	0.504	0.089	31.766	0.000	1.656	1.390	1.974
Priority of Climate Change Issue	0.308	0.105	8.543	0.003	1.360	1.107	1.672
Gender (Female)	0.248	0.324	0.583	0.445	1.281	0.678	2.420
Level of climate change consciousness	0.023	0.046	0.262	0.609	1.024	0.936	1.120
Climate Change Policy Preference	-0.001	0.030	0.001	0.981	0.999	0.942	1.060
Program of Study (Sustainability)	0.023	0.348	0.004	0.948	1.023	0.517	2.024
Constant	-6.360	1.478	18.522	0.000	0.002		

Note. This displays the logistic regression coefficients (B), Standard Error (S.E.) Wald test (Wald), degree of freedom (df), p-value (P), odds ratio (Exp(b)) and 95% confidence interval for odds ratio (95% CI for EXP(B)) for each of the predictor variables.

4.2.1 Strategic voting

The *Strategic Voting* variable has P<0.001, odds ratio of 0.108, 95% CI (0.044, 0.267). The odds of voting Green for respondents who voted strategically is 0.108 times the odds of voting Green for respondents who did not vote strategically holding other independent variables constant. This means that the odds of voting Green is 89.2%, i.e. ((0.108-1)*100)%, lower for respondents who voted strategically than respondents who did not vote strategically.

4.2.2 Priority of climate change issue

The *Priority of Climate Change Issue* variable has P<0.005, an odds ratio of 1.36, 95% CI (1.107, 1.672). The survey question asked respondents to rank issues in order of importance to them at the time of the 2019 Canadian federal election. These issues included the cost of living, health care, taxes, strong action on climate change, good jobs & wages, and education. The respondents who answered "strong action on climate change" as the most important issues got 6 points, and those who ranked "strong action on climate change" as the least important issues got 1 point. The rise in importance of "strong action on climate change" by one rank increases the odds of voting Green by 1.36 times, holding other independent variables constant. The odds of voting Green gets 36.0%, i.e. ((1.36-1)*100)%, higher for every increase in point given to "strong action on climate change" by respondents. This indicates that the more important "strong action on climate change" was to respondents compared to other issues, the more likely respondents voted Green in the 2019 Canadian federal election.

4.2.3 Party leader rating

The *Party Leader Rating* variable has P<0.001, an odds ratio of 1.656, and 95% CI (1.390, 1.974). The survey asked respondents to rate Elizabeth May, the leader of the Green Party of Canada at the time of the 2019 Canadian federal election, in terms of their positive or negative feeling toward her leadership. The answer was given on a scale of 0 to 10, where 0 is negative and 10 is positive. For each increase in the score, the odds of voting Green is 1.656 times bigger, holding all the other independent variables constant. A change in the value of this independent variable by one point, which indicates an increase in favourable rating toward Elizabeth May, increases the likelihood of voting Green by 65.6%, i.e. ((1.656-1)*100)%, holding other independent variables constant.

4.3 Gender

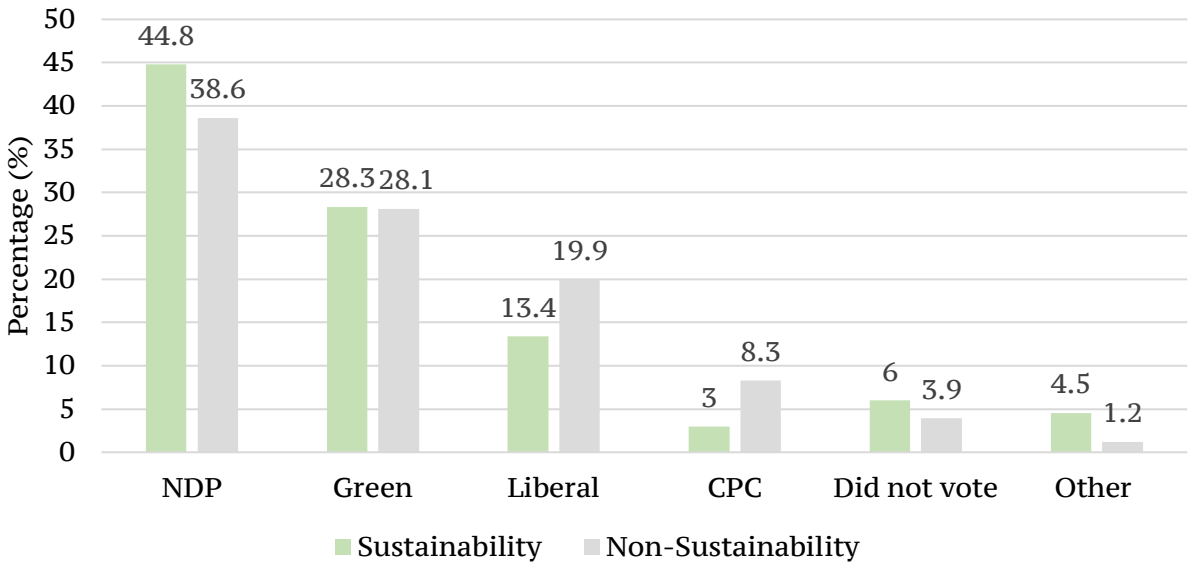
Although the result of the binary logistic regression analysis did not show a significant relationship between *Gender* and voting behaviour (voted Green or not), the data showed that the percentage of Green voters among female respondents was slightly higher than the percentage of Green voters among male or non-binary respondent groups. Among female respondents (N=244), 30% voted Green while 22.6% of male respondents (N=84) were Green voters. Among non-binary respondents (N=9), 22.2% voted Green. Therefore, the share of Green voters was higher in percentage among female respondents compared to male or non-binary respondent groups (Appendix B).

4.4 Program of Study

The data showed that there is no significant difference between sustainability students and non-sustainability students in terms of the share of Green voters in the 2019 Canadian federal election.

Figure 2

Party voted for by respondents in sustainability and non-sustainability programs in the 2019 Canadian federal election.



44.8% of respondents in the Sustainability program voted NDP, followed by Green (28.3%), Liberal (13.4%), Did not vote (6%), other (4.5%) and CPC (3%) (Figure 2). Similarly, the NDP was the most popular party among respondents in non-sustainability programs (38.6%), followed by GPC (28.1%), Liberal (19.9%), CPC (8.3%), Did not vote (3.9%), and other (1.2%) (Figure 2). Although the popularity rank of parties does not change between sustainability students and non-sustainability students, Liberal Party support increased from 13.4% to 19.9% from sustainability students to non-sustainability students. The share of CPC supporters also increased from 3% (Sustainability) to 8.3% (Non-Sustainability). For the NDP, the votes decreased from 44.8% (Sustainability) to 38.6% (Non-Sustainability). The Green party votes remained almost the same (28.3% for sustainability students, and 28.1% for non-sustainability

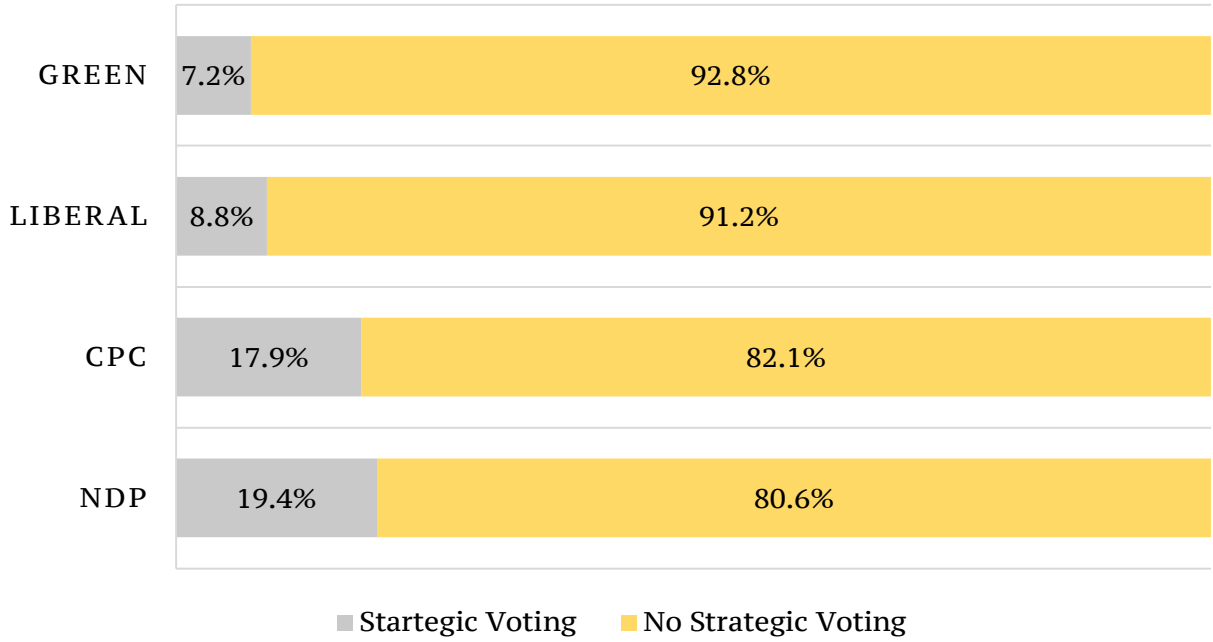
students). The results indicate that the NDP and Greens were popular parties among student respondents at Dalhousie University.

4.5 Strategic Voting

Strategic voting was found to be a factor which helps to explain whether Dalhousie students voted Green or not in the 2019 Canadian federal election.

Figure 3

Strategic voting among respondents in the 2019 Canadian federal election.



Note. The ratio of voters in each party who voted strategically, and who did not vote strategically is displayed in percentage.

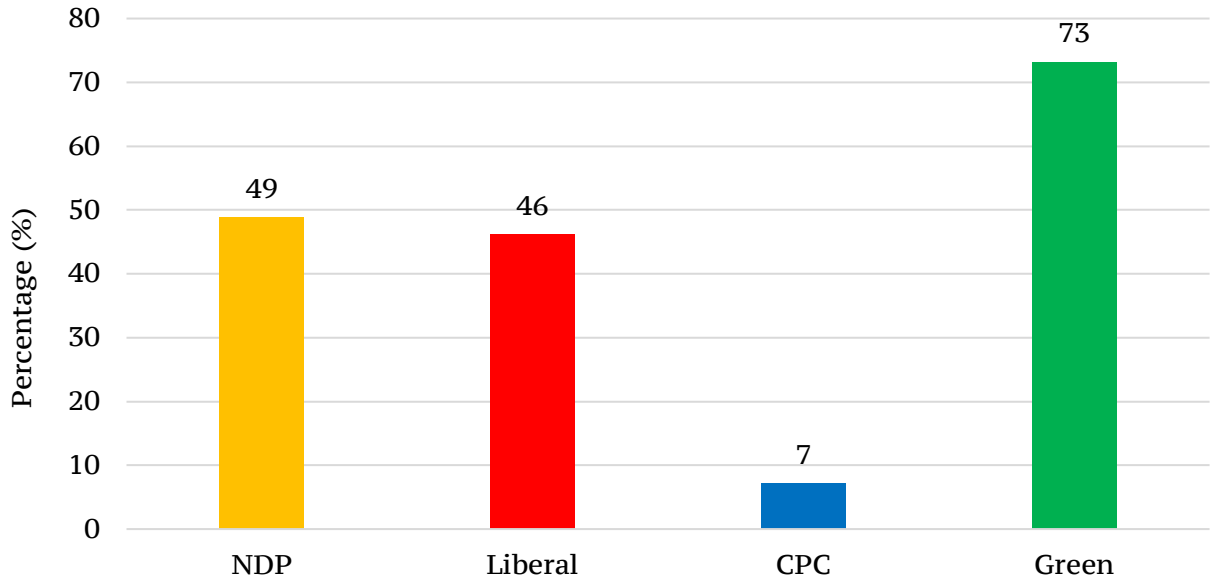
19.4% of NDP voters ended up voting NDP due to strategic voting. 17.9% of CPC voters, 8.8% of Liberal voters, and 7.2% of Green voters were influenced by strategic voting (Figure 3). 92.8% of Green voters voted Green because it was their first choice. The percentage of people who did not vote strategically was highest for those who voted for the Green Party of Canada, followed by LPC (91.2%), CPC (82.1%), and NDP (80.6%).

4.6 Priority of Climate Change Issue

The data analysis showed that there is a significant relationship between the *priority of climate change issue* variable and the outcome variable. As predicted, the higher the importance to respondents of "strong action on climate change" among five other issues, the higher the likelihood of voting for the Green Party of Canada in the 2019 Canadian federal election.

Figure 4

The percentage of respondents, by party, who considered "strong action on climate change" the most important issue at the time of the 2019 Canadian federal election.



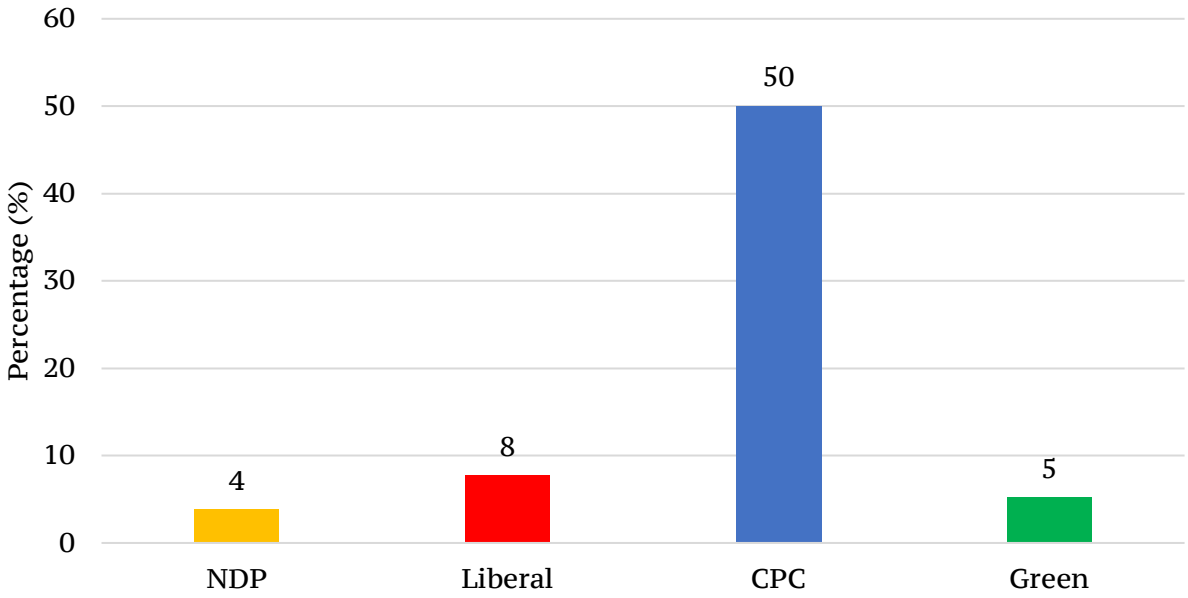
Note. The importance of "strong action on climate change" compared to other five issues (cost of living, health care, taxes, good jobs & wages, education) was asked. This shows the percentage of respondents, among each party, who considered "strong action on climate change" the most important to them at the time of 2019 Canadian federal election.

73% of Green voters answered that "strong action on climate change" was the most important issue at the time of the 2019 Canadian election compared to five other issues (cost of living, health care, taxes, good jobs & wages, education). For the NDP and Liberals, about half of their voters indicated "strong action on climate change" as the most important issue (NDP, 49%; Liberal, 46%) There was only 7% among CPC voters who considered "strong action on

climate change" as the most important issue (Figure 4), and 50% of them indicated "strong action on climate change" was the least important of the six issues (Figure 5). 8 % of Liberal voters, 5% of Green voters and 4% of NDP voters said that "strong action on climate change" was their lowest priority among the six issues (Figure 5).

Figure 5

The percentage of respondents, by party, who considered "strong action on climate change" the least important of six issues at the time of 2019 Canadian federal election.



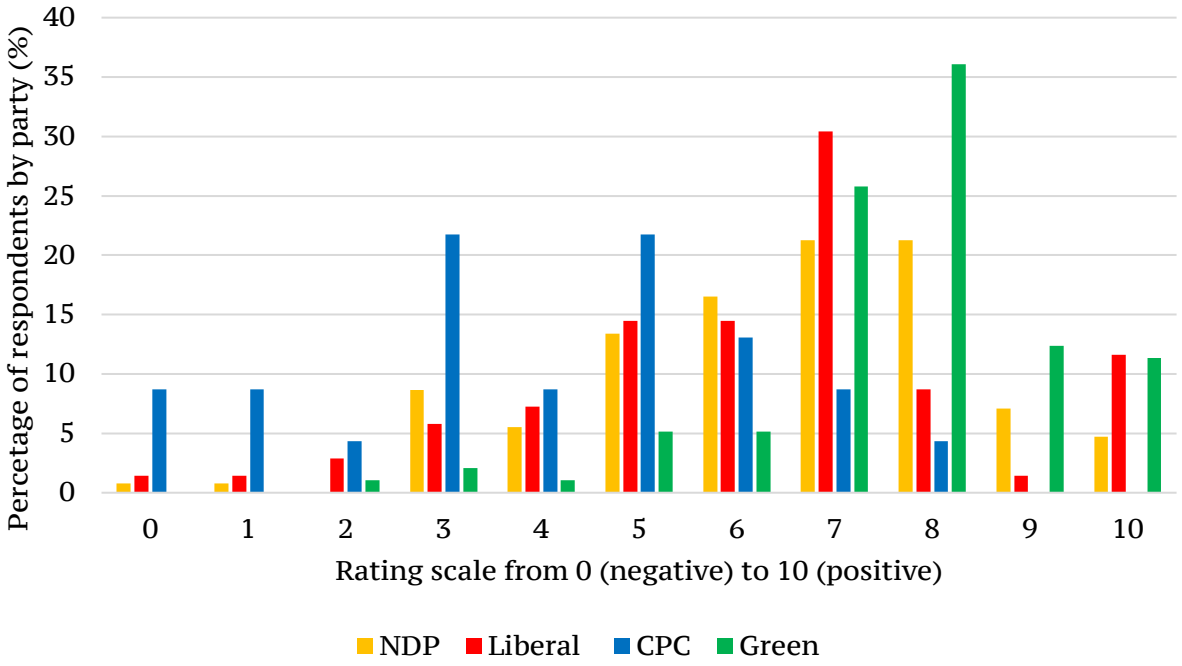
Note. The importance of "strong action on climate change" was asked compared to other five issues (cost of living, health care, taxes, good jobs & wages, education) in order of 1 to 6

4.7. Party Leader Rating

The data analysis showed that there is a significant relationship between party leader rating variable and the dependent variable (voting behaviour: voted Green or not). Most of the Green voters had a positive feeling toward Elizabeth May.

Figure 6

Respondents' rating of Elizabeth May on a scale of zero (negative) to ten (positive).



Note. This shows the distribution of ratings on a scale from 0 (negative) to 10 (positive) given by supporters of each of the four main political parties to Green Party leader Elizabeth May at the time of the 2019 Canadian federal election.

The overall mode is 7, while 8 is the mode for Green voters. 36% of Green voters indicated that they rate Elizabeth May 8 out of 10. The second most frequent answer for Green voters was 7 (26%). Although the majority of Liberal voters rated Elizabeth May between 5 and 7, 12% of Liberal voters rated Elizabeth May 10 out of 10, a higher percentage than Green Party voters, which was 11%.

4.8 Alternative Model and Multicollinearity

More factors (independent variables) included in the model failed to show a significant relationship with the dependent variable. In order to make sure that the model did not fail to show significance between the independent variable and dependent variable due to multicollinearity, an alternative model was used to test it. The regression coefficients (B) and

odds ratio (Exp(b)) in the model explain the association between independent variables and the dependent variable. The change in values in regression coefficients (B) and odds ratio (Exp(b)) were observed so as the P-value between original model and the alternative models. If dramatic change in values from the original model to the alternative model are observed, there might be a possibility of multicollinearity in the original model.

4.8.1 Alternative Model 1: Gender

Alternative Model 1 was developed by using the three independent variables which showed a significant relationship with the dependent variable in the original model (strategic voting, priority of climate change issue, and party leader rating) and another independent variable (Gender).

Alternative Model 1:

$$logit\ (voted\ green) = \beta_0 + b_1\ (gender) + b_2\ (strategic\ voting) + b_3\ (priority\ of\ climate\ change\ issue) + b_4\ (party\ leader\ rating)$$

The results of data analysis for *Alternative Model 1* show that coefficient values for the independent variable (Gender) did not show a significant change from the original model (Table 8). In the original model, the value of the regression coefficients (B) was 0.248 for Gender (Female). In the *Alternative Model 1*, the regression coefficients (B) was 0.247 for Gender (Female). The original model's odds ratio was 1.281 for Gender (Female) while the alternative model's odds ratios was 1.280 for Gender (Female).The gender variable in *Alternative Model 1* did not show a significant relationship with the dependent variable, and values for the coefficients and odds ratio did not show significant changes. Therefore, it can be concluded that removing the other three independent variables that might have multicollinearity with gender does not change the conclusion of the study with the original model.

Table 8

Binary Logistic Regression Predicting Likelihood of Voting Green in the 2019 Canadian Federal Election, Alternative Model 1.

Variable	B	S.E.	Wald	P	Exp (B)	95% CI for EXP(B) Lower	Upper
Strategic Voting	-2.268	0.454	24.914	0.000	0.104	0.042	0.252
Party Leader Rating	0.510	0.086	34.796	0.000	1.665	1.406	1.973
Priority of Climate Change Issue	0.311	0.100	9.612	0.002	1.365	1.121	1.661
Gender (Female)	0.247	0.322	0.590	0.443	1.280	0.681	2.407
Constant	-5.787	0.835	47.988	0.000	0.003		

Note. This displays the logistic regression coefficients (B), Standard Error (S.E.) Wald test (Wald), degree of freedom (df), p-value (P), odds ratio (Exp(b)) and 95% confidence interval for odds ratio (95% CI for EXP(B)) for each of the predictor variables.

4.8.2 Alternative Model 2: Program of study

The program of study and three independent variables which showed a significant relationship with the outcome variable were included to develop *Alternative Model 2*.

Alternative Model 2:

$$logit\ (voted\ green) = \beta_0 + b_1\ (program\ of\ study) + b_2\ (strategic\ voting) + b_3\ (priority\ of\ climate\ change\ issue) + b_4\ (party\ leader\ rating)$$

The result of *Alternative Model 2* showed that coefficient values for an independent variable (program of study) did not change dramatically compared to the original model (Table 9). In the original model, the value of the regression coefficients (B) was 0.023. In *Alternative Model 2*, the regression coefficient (B) was 0.04. The original model's odd ratio for program of

study variable was 1.023, while the *Alternative Model 2*'s odds ratio is 1.041. The *Alternative Model 2* did not show a significant relationship between the program of study and the dependent variable. Removing the other three independent variables that might have multicollinearity with program of study does not change the conclusion of the study with the original model.

Table 9

Binary Logistic Regression Predicting Likelihood of Voting Green in the 2019 Canadian Federal Election, Alternative Model 2.

Variable	B	S.E.	Wald	P	Exp (B)	95% CI for EXP(B) Lower	Upper
Strategic Voting	-2.256	0.456	24.448	0.000	0.105	0.043	0.256
Party Leader Rating	0.513	0.087	34.796	0.000	1.669	1.408	1.979
Priority of Climate Change Issue	0.316	0.101	9.731	0.002	1.371	1.124	1.672
Program of Study (Sustainability)	0.040	0.345	0.014	0.907	1.041	0.529	2.048
Constant	-5.655	0.813	48.434	0.000	0.004		

Note. This displays the logistic regression coefficients (B), Standard Error (S.E.) Wald test (Wald), degree of freedom (df), p-value (P), odds ratio (Exp(b)) and 95% confidence interval for odds ratio (95% CI for EXP(B)) for each of the predictor variables.

4.8.3 Alternative Model 3: Level of climate change concern

The three independent variables which show a significant relationship with the dependent variable in the original model (strategic voting, priority of climate change issue, and party leader rating) and an additional independent variable (level of climate change concern) were used to develop *Alternative Model 3*.

Alternative Model 3:

logit (voted green)= $ß_0$ + b_1 (level of climate change concern) + b_2 (strategic voting) + b_3 (priority of climate change issue) + b_4 (party leader rating)

The result of the data analysis shows that there is no significant change in coefficient value (B) of the level of climate change concern variable with *Alternative Model 3* (Table 10). In the original model, the value of the regression coefficients (B) for the level of climate change concern variable is 0.023. In *Alternative Model 3*, the regression coefficient (B) was 0.024. The original model's odds ratio is 1.024, while the *Alternative Model 3's* odds ratio is 1.024. The odds ratio did not change and *Alternative Model 3* shows no significant relationship between the level of climate change concern and the dependent variable (voting behaviour, voted Green or not). To conclude, removing the other three independent variables that might have multicollinearity with the level of climate change concern variable does not change the conclusion of the study with the original model.

Table 10

Binary Logistic Regression Predicting Likelihood of Voting Green in the 2019 Canadian Federal Election, Alternative Model 3.

Variable	B	S.E.	Wald	P	Exp (B)	95% CI for EXP(B) Lower	Upper
Strategic Voting	-2.242	0.451	24.662	0.000	0.106	0.044	0.257
Party Leader Rating	0.510	0.087	34.733	0.000	1.666	1.406	1.974
Priority of Climate Change Issue	0.309	0.101	9.279	0.002	1.362	1.116	1.662
Level of Climate Change Concern	0.024	0.044	0.293	0.588	1.024	0.939	1.117
Constant	-6.266	1.408	19.815	0.000	0.002		

Note. This displays the logistic regression coefficients (B), Standard Error (S.E.) Wald test (Wald), degree of freedom (df), p-value (P), odds ratio (Exp(b)) and 95% confidence interval for odds ratio (95% CI for EXP(B)) for each of the predictor variables.

4.8.4 Alternative Model 4: Climate change policy preference

The three independent variables which show a significant relationship with the dependent variable in the original model (strategic voting, priority of climate change issue, and party leader rating) and an additional independent variable (climate change policy preference) were used to develop the *Alternative Model 4*.

Alternative Model 4:

$$logit\ (voted\ green) = \beta_0 + b_1\ (climate\ change\ policy\ preference) + b_2\ (strategic\ voting) + b_3\ (priority\ of\ climate\ change\ issue) + b_4\ (party\ leader\ rating)$$

The result of the data analysis with *Alternative Model 4* shows that the coefficient value for an independent variable (climate change policy preference) did not change dramatically from that of the original model (Table 11). In the original model, the value of the regression coefficient (B) for climate change policy preference was -0.001. In *Alternative Model 4*, the regression coefficient (B) was 0.006. The odds ratio for the original model was 0.999, while *Alternative Model 4*'s odds ratio is 1.006. *Alternative Model 4* did not show a significant relationship between the independent variable (climate change policy preference) and the dependent variable. Therefore, the conclusion of the original model: there is no significant relationship between climate change policy preference and the outcome variable, seems correct.

Table 11

Binary Logistic Regression Predicting Likelihood of Voting Green in the 2019 Canadian Federal Election, Alternative Model 4.

Variable	B	S.E.	Wald	P	Exp (B)	95% CI for EXP(B) Lower	Upper
Strategic Voting	-2.2	0.455	23.350	0.000	0.111	0.045	0.271
Party Leader Rating	0.502	0.088	34.402	0.000	1.652	1.390	1.964
Priority of Climate Change Issue	0.315	0.104	9.109	0.003	1.370	1.117	1.681
Climate Change Policy Preference	0.006	0.028	0.050	0.824	1.006	0.952	1.064
Constant	-5.787	1.080	28.738	0.000	0.003		

Note. This displays the logistic regression coefficients (B), Standard Error (S.E.) Wald test (Wald), degree of freedom (df), p-value (P), odds ratio (Exp(b)) and 95% confidence interval for odds ratio (95% CI for EXP(B)) for each of the predictor variables.

4.8.5 Alternative Model 5: No gender

Alternative Model 5 was developed by removing the gender variable from the original model.

Alternative Model 5:

logit (voted green)= $ß_0$ + b_1 (program of study) + b_2 (level of climate change concern) + b_3 (strategic voting) + b_4 (priority of climate change issue) + b_5 (party leader rating) + b_6 (climate change policy preference)

The data show that program of study, level of climate change consciousness and climate change policy preference do not have a significant relationship with the outcome variable (Table 12). In the original model, the value of the regression coefficients (B) was 0.023 for program of

study, 0.023 for level of climate change concern, and -0.001 for policy preference. In *Alternative Model 5*, the regression coefficients (B) were 0.031 for program of study, 0.024 for level of climate change concern, and 0.002 for policy preference. The original model's odds ratio was 1.023 for program of study, 1.024 for level of climate change concern, and 0.999 for policy preference, while *Alternative Model 5*'s odds ratio is 1.032 for program of study, 1.024 for level of climate change concern and 1.002 for policy preference. There is no dramatic change in these values and none of the three independent variables (program of study, level of climate change concern, climate change policy preference) showed significance with the dependent variable in *Alternative Model 5*.

Table 12

Binary Logistic Regression Predicting Likelihood of Voting Green in the 2019 Canadian Federal Election, Alternative Model 4.

Variable	B	S.E.	Wald	P	Exp (B)	95% CI for EXP(B) Lower	Upper
Strategic Voting	-2.203	0.457	23.204	0.000	0.11	0.045	0.271
Party Leader Rating	0.505	0.089	31.862	0.000	1.656	1.390	1.974
Priority of Climate Change Issue	0.310	0.106	8.642	0.003	1.364	1.109	1.677
Level of climate change concern	0.024	0.046	0.265	0.607	1.024	0.936	1.120
Climate Change Policy Preference	0.002	0.030	0.004	0.951	1.002	0.944	1.063
Program of Study (Sustainability)	0.031	0.347	0.008	0.928	1.032	0.522	2.038
Constant	-6.291	1.472	18.265	0.000	0.002		

Note. This displays the logistic regression coefficients (B), Standard Error (S.E.) Wald test (Wald), degree of freedom (df), p-value (P), odds ratio (Exp(b)) and 95% confidence interval for odds ratio (95% CI for EXP(B)) for each of the predictor variables.

4.8.6 Conclusion

Conducting binary logistic regression with the alternative models developed by adding or deleting an independent variable from the original model did not change the conclusion of the data analysis with the original model. The original model's result seems trustful to conclude that only three factors (strategic voting, priority of climate change issue, party leader rating) showed a significant relationship with the dependent variable.

Chapter 5: Discussion

5.1 Conclusion on Hypothesis and Predictions

This study asked what factors help to explain whether Dalhousie students voted Green or not in the 2019 Canadian federal election. The three predictions were supported by the evidence while four predictions were not. The results of the study revealed no evidence of a significant relationship between gender and voting behaviour (*Prediction 1*), program of study and voting behaviour (*Prediction 2*), level of climate change concern and voting behaviour (*Prediction 3*), and climate change policy preference and voting behaviour (*Prediction 7*). Significant relationships were found between strategic voting and voting behaviour (*Prediction 4)*, priority of climate change issue and voting behaviour (*Prediction 5*), and the party leader rating and the voting behaviour (*Prediction 6*). The results suggest that respondents who did not vote strategically, who considered action on climate change a higher priority than other issues, and who rated Elizabeth May more highly as a party leader showed a higher likelihood of voting Green in the 2019 Canadian federal election. Therefore, this study concludes that strategic voting, priority of climate change issue, and party leader rating help to explain whether Dalhousie students voted Green or not in the 2019 Canadian federal election.

5.2 Gender

The result of the study on gender contradicts Sanbonmatsu (2002) and Sanbonmatsu and Dolan (2009)'s conclusion that gender does affect voting behaviour. Although the result did not show a significant relationship between gender and the outcome variable, the data also showed a higher proportion of Green voters among females (30% of whom voted Green) compared to males (22.6%) and non-binary individuals (22.2%) (Appendix B).

Bird et al. (2016) and Goodyear-Grant and Croskill's (2011) argument that the effects of gender on voting behaviour are conditional, might be one of the possible explanations to a slightly higher percentage of Green supporters among females. At the time of the 2019 Canadian federal election, Elizabeth May was the only female party leader. Goodyear-Grant and Croskill (2011) explained that high underrepresentation of women in politics influences the gender affinity effects in voting behaviour (Chapter 2). There is a possibility that the underrepresentation of women in party leader debates might have amplified the effects of gender in the 2019 Canadian federal election.

5.3 Program of Study

Despite the arguments of Di Giusto et al. (2018) and Nussbaum et al. (2016), who conclude that program of study does influence awareness toward climate change and the response to climate change issues, it was not the case for the voting behaviour of Dalhousie students. Enrollment in the sustainability program does not help explain whether Dalhousie students voted Green or not in the 2019 Canadian federal election. The results showed that the NDP was the most popular party among respondents regardless of the program of study (sustainability or non-sustainability). Understanding which program's students were more likely to vote Green might have benefited Green Party members and politicians make some strategies

in conducting effective election campaigns. It might have offered ideas for what kind of approaches the Green Party should take in communicating about climate change with potential supporters and helping community members understand climate change and encourage climate change actions. The result of the study did not offer any information on these assertions.

5.4 Strategic Voting

Although it is beyond the purpose of this study to explore how many respondents among Green supporters ended up voting for their second-choice party due to strategic voting, understanding it might have helped deepen understanding of strategic voting as a factor which helps to explain whether Dalhousie students voted Green or not. Yet, the result was clear enough to conclude that strategic voting did have an effect on voting behaviour in the 2019 Canadian federal election among Dalhousie students. Strategic voting influenced respondents to vote NDP (19.4% of NDP voters voted strategically), CPC (17.9% of CPC voters voted strategically), and Liberal (8.8% of Liberal voters voted strategically) (Figure 3). There seems to be a consensus among scholars introduced in the literature review chapter that the effects of strategic voting on election outcomes overall in Canada are minimal (Blais, 2002; Kim and Kostadinova, 2011). However, strategic voting seems to have had more than minimal effects on the election outcome for a minor party such as the Green Party, at least among students in this study.

Strategic voting might be one of the causes to explain gaps between citizens' climate change concerns and the government's actions. Twenty percent of the total respondents did not vote for their first choices in the 2019 Canadian federal election. This might indicate that strategic voting might have guided elected candidates or government to misunderstand the will of voters because some ballots reflect voters' second-best preference. Elizabeth May is aware of the downsides of strategic voting. CTV News (2015) reported Elizabeth May's statements on

strategic voting: "If you don't vote for what you want, you have to stop complaining about a government that you don't want in power" (as cited in CTV News, 2015, para. 5). “Voting Green is not throwing one's vote away, as a handful of Green MPs can still have significant impact under a minority government” (Elizabeth May as cited in CTV News, 2015, para. 5).

Fowler (2012) argued that strategic voting is one of the factors that prevents environmentally concerned people from voting Green because the Green Party of Canada is not popular enough to win the election in a local constituency (Chapter 2). Mildenberger (2019) elaborated on Fowler’s point by saying that it is difficult for minor parties like the Green Party to be successful in a first-past-the-post electoral system: the election system used in federal elections in Canada. Both Fowler and Mildenberger’s arguments might be relevant to explain why 20% of the total survey respondents voted strategically, as well as why few people vote for the Green Party, which has less than 1% of the seats in the House of Commons.

5.5 Priority of Climate Change Issue

Almost half of the Liberal and NDP voters indicated that “strong action on climate change” is the most important issue to them (Figure 4). This might indicate that the Green Party is not the only option for people who have strong concerns about climate change. Climate change was not the only reason to differentiate Green voters from non-Green voters, and this study indicated that other factors also influence whether Dalhousie students voted Green or not.

5.6 Future Studies Recommendation

The result of the study attracted the curiosity of the researcher to ask why strategic voting, party leader rating, and priority of climate change issue had significant relationships with the outcome variable. The majority of the survey respondents are assumed to be in their 20s considering the fact that they are university students mostly in undergraduate programs. They are

in the generation-group for which the Internet is the major source of information. Young people obtain and gather information through social media platforms or media outlets. The researcher of this study wondered if social media helps to explain the result of this study.

The use of social media as a way to deliver or obtain political messages was seen during the 2019 Canadian federal election. The candidates for the 2019 Canadian federal election utilized their social media accounts as a tool for campaigning. For example, Bañares (2019) from the *Star* reported that Jagmeet Singh, the leader of the NDP, shared his party's policy interests on TikTok, which is the short video-sharing social media platform. Jagmeet Singh's video gained more than 174,999 likes and 7,000 comments at the time of news publication (Bañares, 2019).

The other emerging trend for political campaigning and political conversation on social media is the use of memes.[1] Frenzel (2019) analyzed the memes published after the Climate Strike that happened on September 27, 2019 in Canada and found that there was a lack of memes related to the Green Party compared to other parties such as LPC, CPC and NDP. The representation and coverage of the party leader on the internet such as by candidate's own social media accounts, memes, live-streaming candidate debates and news might offer explanations in young people's engagement with politics, influences of party leaders on voting choice, and overall decision-making on which candidate of which party to vote.[2]

[1] Huntington (2016) explains meme as "groups of digital items or texts created and shared separately by many individuals" (p.78). Contents of memes are reflections of public opinion and it is a tool for people to "identify with parties, leaders and movements" using the internet (McKelvey, 2019a, para. 6).

[2] McKelvey (2019b) analyzed memes posted in seven Facebook groups during the 40 days of the 2019 Canadian federal election campaign. Among the collected and analyzed 589 memes, there were no positive memes for Trudeau, but 212 negative and 368 neutral ones (McKelvey, 2019b). For Andrew Scheer, the leader of CPC, there were 87 negative, 479 neutral and 13 positive memes (McKelvey, 2019b). The 11 negative, 521 neutral and 47 positive memes were found targeting NDP leader, Jagmeet Singh (McKelvey, 2019b). The 11 negative, 566 neutral, and 3 positive memes were addressing Elizabeth May, the leader of the GPC (McKelvey, 2019b). An almost equal number of memes targeted each leader from a major party; yet, the number was slightly higher for Justin Trudeau. Trudeau received a significant number of negative memes compared to other party leaders.

Future studies should focus on how exposure to the information online including fake news or polls, polarized opinions, party leader's personal life, biased news or memes might be able to help explain the result of this study. Researching how information online helps young people form opinions about political parties, climate change, party leaders, and politics, in general, might help to explain whether Dalhousie students voted Green or not. In addition, researching ways opinion polls show the probability of certain party to win or lose, and the ways party leaders or other local candidates comment on strategic voting might offer some explanations on what motivated voters to remain loyal to their most favourite party or vote strategically in the 2019 Canadian federal election.

5.7 Limitations

The sample size is one of the limitations of this study. The limited sample size might have influenced the p-value of some variables and led to the failure to show a significant relationship with the dependent variable.

There was a bias in the recruitment process. Only five classes were visited for the recruitment and targeted classrooms for recruitment was limited to two programs: political science (2 classes), and sustainability (3 classes). The difference in the number of respondents from different gender groups was large. Among those who indicated gender (female, male or non-binary) in the online survey question, the majority of respondents were female (N=244, 72.4%). The number of male respondents was less than half of female respondents (N=84, 24.9%).[3] The sample failed to represent the gender ratio of the Dalhousie population.

There was quite a significant number of incomplete surveys. Question 1 was used to assess the eligibility to vote in the 2019 Canadian federal election. 15.49% of the respondents did

[3] Non-binary group represented only 2.6% of respondents who indicated gender in the online survey question.

not answer. The study could treat 15 responses which indicated that they were not eligible to vote in the 2019 Canadian federal election by eliminating these data from the sample. However, unanswered data remained in the sample population, and it was out of the researcher's ability to know if any non-eligible voters' data were included in the analysis. Overall, the rate of completion of all questions in the survey was 84.7%.

5.8 Reflections on the Study and Sustainability

At the UN Climate Action Summit in New York City on September 23, 2019, Swedish climate activist Greta Thunberg gave a speech to world leaders (National Public Radio, 2019):

> For more than 30 years, the science has been crystal clear. How dare you continue to look away and come here saying that you're doing enough, when the politics and solutions needed are still nowhere in sight. You say you hear us and that you understand the urgency. But no matter how sad and angry I am, I do not want to believe that. Because if you really understood the situation and still kept on failing to act, then you would be evil. And that I refuse to believe. (para. 5-6).

Greta made some key points regarding politics and sustainability: 1) Politicians and world leaders are saying that they are doing enough, 2) necessary political actions are not being made, and 3) politicians say that they hear citizens' and youths' voices on climate change. At the COP21 in 2015, Prime Minister Justin Trudeau said that Canada would take more action to address climate change, and it is a chance to "build a sustainable economy" (Justin Trudeau Prime Minister of Canada [Trudeau], 2015). Justin Trudeau also sold the images and brand of Canada as a global climate leader by saying that "Canada is back" and "We are here to help"

(Trudeau, 2015). Yet, in the past five years, Prime Minister Justin Trudeau approved the Trans Mountain pipeline expansion project while knowing that the pipeline to carry oil from Alberta to British Columbia might pose negative impacts on the environment and marine life (Tasker, 2019). The Climate Action Tracker (2019) labels Canada as taking "highly insufficient" (para. 11) actions to meet its own NDC goals and warns that Canada shows almost no possibility of meeting its Paris Agreement commitments. Despite the contradiction between Trudeau's branding strategy of Canada as a climate change leader and Canada's actions on climate change, the Canadian government continued to tell public that "the Government takes strong action to fight climate change" (para 41) in the Throne speech to open the first session of the 43rd Parliament of Canada in December 2019. Governor-General Julie Payette added that the Canadian government recognizes that "a clear majority of Canadians voted for ambitious climate action now. And that is what the Government will deliver." (Parliament of Canada, 2019, para. 36).

Can a sustainable future be achievable when the Canadian government keeps saying that it understands Canadians' demand for climate actions, and insists that Canada is taking and will take action on climate change when, in fact, necessary actions are not being made to meet the goals under the Paris Agreement to mitigate climate change? The researcher assumed that lack of representation of the Green Party of Canada in the House of Commons, and the lack of popularity of Greens in Canada might be one of the reasons why concerns on climate change are not delivered to the decision-making chamber. Therefore, this study analyzed the Dalhousie students' climate change concerns, environmental attitudes and voting behaviour by asking what factors help to explain whether Dalhousie students voted Green or not in the 2019 Canadian federal election.

This study indicated that strategic voting, priority of climate change issue, and party leader rating helped to explain Dalhousie students' votes for the environmentalist party: the Green Party of Canada. Even though the current election system makes it harder for the Greens to have seats in the House of Commons and therefore some voters are inclined to vote strategically, it is still important to vote for their first choice and keep delivering the true voice to decision-makers. Increasing the representation of the Green Party in the House of Commons might allow more voices to be heard by politicians in Ottawa, and it might help Canada take necessary and further actions on climate change.

Many Canadians, especially the youth and indigenous people are aware that climate change is happening, and they understand that it is important and necessary to take action on climate change. The government's lack of actions on climate change indicates the ignorance of these voices. Citizens' votes are an important reflection of public interests and politics based on citizens' voices are of fundamental importance for sustainable communities. Citizens have a civil responsibility to cast a vote based on true, honest and genuine interests, and the government has a duty to listen. The core interests of this research arise from the curiosities of how political engagement and citizens' privilege of voting can be better used to build an equitable and sustainable future.

Chapter 6: Conclusion

Canada's environmentalism party, the Green Party of Canada, has a weak record in increasing the percentage of popular votes despite the ubiquitous scientific evidence of climate change and the perceived increase in citizens' awareness and actions toward climate change. In every decade, the record of greenhouse gas (GHG) emissions and accumulation in the atmosphere has been updated to show its increase (IPCC, 2014). Now that more than 97% of

climate change scientists recognize the anthropogenic climate change (Cook et al., 2013), the UNEP announced that 2018 hit the highest record in GHG emission (UNEP, 2019).

Responding to a climate situation that is getting worse and worse, awareness of issues and need for actions have been mounting among multiple stakeholders such as government, citizens, youth, among others around the globe. Swedish youth climate activist Greta Thunberg's influence spread to Canadian cities such as Halifax where citizens including adults and children) protested to demand government strong actions on climate change (CTV Atlantic, 2019; Davie, 2019; Slaughter & Frisk, 2019).

Why, in a country where 83% of people believe that the Earth is getting warmer, and 60% believe this warming is partly or mostly due to human activity (Lachapelle, 2020), does the Green Party of Canada, which advocates for environmentalism, have less than 7% of the popular vote? This question guided the researcher to conduct a survey study to identify factors which help to explain whether Dalhousie students voted for the Green Party or not in the 2019 Canadian federal election. This study hypothesized that gender, program of study, level of climate change concern, strategic voting, priority of climate change issue, party leader rating, and climate change policy preference are factors which help to explain whether Dalhousie students voted Green or not in the 2019 Canadian federal election.

The study found significant relationships between *strategic voting* and voting behaviour ($p<.001$), *priority issue of concern* and voting behaviour ($p<.005$), and *party leader preference* and voting behaviour ($p<.001$). Therefore, the results suggested that respondents who did not vote strategically, who considered actions on climate change as priority issues, and who showed a higher positive feeling toward Elizabeth May as a party leader were more likely to vote Green in the 2019 Canadian federal election.

Does exposure to social media as a way of obtaining political information for young people help to explain the result of the study? The coverage of the political leader was significant on social media and politicians used their own social media accounts to engage with voters in the 2019 Canadian federal election. Future research should explore the impacts of social media and memes for young people on opinion formation on party leaders, political parties, decisions to vote strategically, and voting choices in general. It might help explain why strategic voting, priority of climate change issue, and party leader rating are factors which help to explain whether Dalhousie students voted Green or not in the 2019 Canadian federal election.

Chapter 7: Comments from the Green Party of Canada

7.1 Elizabeth May

As leader of the Green Party of Canada in the 2008, 2011, 2015 and 2019 elections, I think a number of factors are paramount in our success- or lack of it.

First, even though three seats may seem to be a poor result, the Green Party of Canada has achieved more electoral success than any other Green Party operating in a country with First Past the Post voting. In my experience, this is a huge factor as a barrier. While you have found articles that say "strategic voting" is not a factor in Canadian elections, that is certainly not the experience for smaller parties. The NDP and Green experience is very strongly that fear-based voting snatches votes from us near election day. The NDP, having suffered from decades of Liberal appeals to vote Liberal to stop a Conservative, the NDP does this to Greens very forcefully.

Another factor is the media coverage and debates. Our popular vote correlates quite closely to inclusion in debates. I was included in the 2008 debate - and that really brought up our popular votes, although not sufficiently to elect anyone. We were kept out in 2011, but I managed to win the first Green seat despite the lower national vote. In 2015, Greens had cleared all the "rules" (such as they were within the Consortium) to be in the debate, but the Conservatives and NDP boycotted the main debates and - as a result- they were canceled. Being in the 2019 debates was a huge factor in bringing back up our national vote.

Media coverage tends to follow debate participation, so that is a very large factor in the lower results in the election years we were blocked from debates.

7.2 Jo-Ann Roberts

Environmental Attitudes and Voting Behaviour

Response from Jo-Ann Roberts, the GPC Candidate in Halifax 2019
And Interim Leader of the Federal GPC, 2019-2020

I am very impressed by the work done by Haruka Aoyama on voting behaviour by Dalhousie students in the 2019 Federal election. As the Green Party candidate in the Halifax riding I have a vested interest in her findings and am happy to share some thoughts from my perspective.

I knew it would be a challenge when I accepted the nomination to be the Green Party candidate for the federal riding of Halifax in the 2019 election. In 2015 the GPC candidate received 1,745 votes (3.29%), finishing fourth behind the Liberal (51.73%), the NDP (36.13%) and the Conservative (8.61%).

The results in 2019 (compared to 2015) re-elected the incumbent Liberal with 42.48% (-9.25%). The NDP finished second with 30.04% (-6.09). The big change was the GPC vote. I finished third with 14.37%, an 11.08% increase over 2015. The Conservatives finished fourth with 11.58% (+2.97).

Aoyama's conclusions based on her data are consistent with what we heard anecdotally on doorsteps. I was not surprised to find that the more concerned someone was with climate change, the more likely they were to vote Green. These concerned Canadians were our core volunteers and donors as well. We also found we were popular with students studying sustainability. However, Ms Aoyama's findings help us realize that this factor was not enough to be significant.

Climate change was also a strong reason students were likely to vote NDP. When you combine these findings with the substantial data about strategic voting, it provides insight to the challenge a smaller party like GPC has in winning seats. Strong Green voters don't vote strategically, however, almost 20% of students who voted NDP voted strategically. That means, from my observation, they felt the NDP had a greater chance of winning than the Greens. Thus, it would indicate that the more we can convince voters that Greens can win, the better our chances of gaining strategic votes. We see in areas where Greens have won at any level, the greater the chance of Greens winning at another level. Our breakthrough 2019 win in Fredericton is a good example.

It's also not a surprise Elizabeth May is a popular leader, and not only with Green voters. She is without a doubt the best known member of the Green Party and has credibility that can be felt with voters. Elizabeth May made a couple of visits to the riding during the writ period and it definitely helped our vote. I believe being the only female leader in the race also influenced some female voters, but I would agree with Ms. Aoyama's findings that it was not a significant factor.

Finally, I would like to add that I would love to see Ms. Aoyama continue her work in this field of study. I believe the level of visibility and quality of a local candidate can make a difference in a riding. To explain the 11% increase in our vote in Halifax I would say the Green campaign was much more vigorous and visible than ever before. We came very close to winning the "sign" war for the first time in the history of the riding. Further, as Deputy Leader of the Party and an experienced campaigner, I was able to run an informed campaign and performed very well in

debates. Obviously not enough to win the seat, but it was a significant gain and one I hope the party will be able to build on provincially and in future. Again, let me commend Ms. Aoyama on the depth and quality of her work. I look forward to following her career.

7.3 Thomas Trappenberg

Leader, Green Party of Nova Scotia
Federal Candidate in South-Shore - St. Margarets, 2019

Your research question of why the overwhelming awareness of the climate emergency does not result in more votes for the only party who does not make a compromise in addressing the IPCC report is indeed a crucial one that shows the failing of an ailing political system.

As a scientist myself, it was very interesting for me to see that in your study you found the strongest evidence for correlates involved strategic voting. I have been running in federal and provincial elections since 2006, and I have spoken to many people about voting for the Green Party. I can tell you that I had many encounters where even strong Green supporters stated to me that they would vote strategically. There are several reasons for the perceived benefit of strategic voting. The main motivation for strategic voting is to vote against a party that is not desired by the voter. In a two-party system, for which our ailing Westminster system was design, this is not different than voting for the other party, but strategic voting has clearly never worked in a multi-party system. I want to go as far as to conjecture that strategic voting is really undermining a true democracy.

We are at a critical time for our survival in this world, and our political system is a major stumbling block for progress. All modern democracies have a strong principle not to give an advantage of an incumbent party during elections. In Canada this is not the case. For example, the way the Green Party was denied inclusion in leader debates has a profound impact on electoral results and shows the strong influence and biased approach of media in our society. Also, in terms of electoral strategies, it is advantageous for the big traditional party with their habitual base to discourage voting, and I see increasingly how young voters are getting

disinterested and disgusted by politics in Canada. Unfortunately, sticking our heads into the sand is not a solution either.

However, it is very encouraging to see the awareness of our youth and having seen the large crowd at climate emergency rallies. I firmly believe that the next step will be to realize that just protesting on the street is not sufficient and that we need to elect people who truly believe in actions, and not just supporting parties that are speaking about actions (as in the Paris COP meeting) while their actions point in the other directions (as in buying a pipeline). I firmly believe that only our youth and young adults have the power to save their future. The current COVID19 pandemic will leave our world in a different state, and it is now the time to act wisely, not just falling back into a failing system.

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Appendices

Appendix A: Survey Questions

Environmental Attitudes and Voting Behavior in 2019 Canadian Federal Election Research Survey

This study is being conducted by a Dalhousie University student as part of the SUST4900XY undergraduate honours thesis class. It involves research on Dalhousie students' environmental attitudes and voting behavior in the 2019 Canadian federal election. This survey should take you only 3-5 minutes to complete. This is an anonymous survey and all answers you provide will be kept in the strictest confidentiality.

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1. Were you eligible to vote in the 2019 Canadian federal election?
    - Yes
    - No

2. What is your gender?
    - Female
    - Male
    - Non-binary
    - Prefer not to answer

3. Which academic program are you enrolled in? If you are enrolled in more than one of the following programs, you can choose more than one option.

    - Continuing Education
    - Sustainability
    - Agriculture
    - Architecture and Planning
    - Arts and Social Science
    - Computer Science
    - Engineering
    - Health
    - Management
    - Medicine
    - Science
    - Dentistry
    - Schulich School of Law

4. Please read each statement and indicate to what extent you agree or disagree with it.

4.1.The Earth is getting warmer.
-strongly disagree -disagree -neutral -agree -strongly agree

4.2.The Earth is getting warmer primarily due to human activity.
-strongly disagree -disagree -neutral -agree -strongly agree

4.3.Climate change's negative impacts will be greater than its positive impacts.
-strongly disagree -disagree -neutral -agree -strongly agree

4.4.Urgent action to mitigate climate change's negative impacts is necessary.
-strongly disagree -disagree -neutral -agree -strongly agree

4.5.The world will definitely get warmer if people don't change their behaviour.
-strongly disagree -disagree -neutral -agree -strongly agree

4.6.I have changed my behaviour to reduce my personal carbon emissions.
-strongly disagree -disagree -neutral -agree -strongly agree

5. Please read each statement and indicate if you agree or disagree with it.

5.1. In the 2019 federal election, I voted for a party that was not my most preferred because I thought that party had a better chance of winning in my constituency.
-agree -disagree

5.2. In the 2019 federal election, I voted for a party that was not my most preferred because I thought that party had a better chance of winning the election in Canada as a whole and forming government.
-agree -disagree

5.3. In the 2019 federal election, I voted for a party that was not my most preferred because I thought that party had a better chance of forming the official opposition.
-agree -disagree

6. Please rank the following issues in order of importance to you at the time of 2019 federal election, where 6 is the most important and 1 is the least important.

- Cost of living
- Health care
- Strong action on climate change
- Taxes
- Good jobs & wages
- Education

7. How did you feel about Elizabeth May as Green Party leader on a scale from 0 to 10 where 0 is the lowest possible ranking and 10 the highest?

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8. Please read each climate change policy proposal and indicate to what extent you agree or disagree with it.

    8.1. Doubling Canada's greenhouse gas emission reduction goals from 30% below 2005 level by 2030 to 60% below 2005 level by 2030.
    -strongly disagree -disagree -neutral -agree -strongly agree

    8.2. Cancel operations and development of new pipeline projects.
    -strongly disagree -disagree -neutral -agree -strongly agree

    8.3. Cancel subsidies to fossil fuel industries.
    -strongly disagree -disagree -neutral -agree -strongly agree

    8.4. Ending the use of oil by 2050. Until then, Canada will rely on its existing oil operations and stop importing foreign oil.
    -strongly disagree -disagree -neutral -agree -strongly agree

    8.5. 100% renewable electricity by 2030.
    -strongly disagree -disagree -neutral -agree -strongly agree

    8.6. Making all new buildings in Canada carbon neutral by 2030.
    -strongly disagree -disagree -neutral -agree -strongly agree

    8.7. Zero-carbon public ground transportation everywhere in Canada by 2040.
    -strongly disagree -disagree -neutral -agree -strongly agree

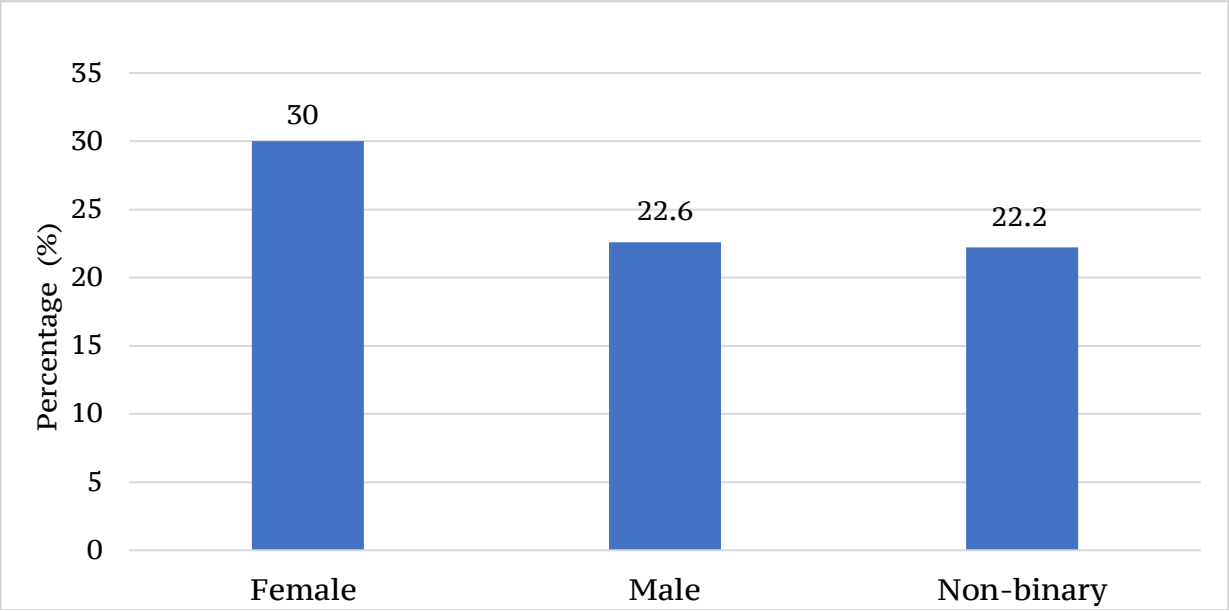
    8.8. Revenue neutral* carbon fee on all sources of carbon dioxide pollution (*revenues from the carbon fee would be returned to Canadians as a dividend).
    -strongly disagree -disagree -neutral -agree -strongly agree

9. Which party did you vote in the 2019 Canadian federal election?
    - Liberal Party of Canada
    - Conservative Party of Canada
    - New Democratic Party
    - Green Party of Canada
    - Other
    - Did not vote

Appendix B:

Figure 7

The percentage of Green voters among different gender groups in the 2019 Canadian federal election.



Note. Among female respondents (N=244), 30% voted Green while 22.6% of male respondents (N=84) were Green voters. Among non-binary respondents (N=9), 22.2% voted Green.