In nature there are neither rewards nor punishments; there are consequences.

Robert Green Ingersoll

It is change, continuing change, inevitable change, that is the dominant factor in society today. No sensible decision can be made any longer without taking into account not only the world as it is, but the world as it will be.

Isaac Asimov

University of Alberta

Public attitudes towards climate change in Alberta: The effects of beliefs and social structures on citizens' willingness to pay taxes that address climate change mitigation

by

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Abstract

This thesis is about climate change attitudes in Alberta, Canada. It applies a bivariate logistic analysis to the data gathered from a random stratified sampling survey held in Alberta in 2008. It finds that belief in the anthropogenic climate change and Conservative political ideology factors have a high predictive probability on an individual's willingness to pay a tax that addresses the negative effects of climate change. The subjects of individual capacity and reflexivity are examined in the light of these results and suggestions for future researchers are made. It thus offers insights on how to find human potentials within society that can help to cope with the idea of climate change.

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Introduction

The factors that shape an individual's thinking or actions are for the most part still a mystery (Bailey and Gayle, 2003). This is one of the primary reasons why several researchers from different fields are interested in investigating people's understanding, behaviours, attitudes and decision-making processes, in order to understand their consequent actions.

The degree to which people have agency free from any constraints or the extent to which individual decisions are passively driven by social structures remains an open question in social science circles. The debate is precisely around the relationship between society and individuals or more technically between *structure* and *agency* and their influence on people's decisions and lives. The disagreement reflects the impossibility of formulating an unambiguous statement that defines such intricate relationships. This case study in Alberta, Canada, will be considering a particular instance of agency in order to determine both socio-structural and social-psychological factors influencing people's willingness to pay taxes to address climate change mitigation. Moreover, it will show that their agency is determined by the combination of the relationship between these two elements.

Both individual and collective decisions that mould people's actions within social structures are partly conscious and deliberate and partly unconscious and

processed in people's mental schemata. More specifically, individual decisions are partially shaped by the cultural environment in addition to the combination of social structures and personal psychological factors. Therefore, my study does not presume to solve the intricate interplay between *structure* and *agency*, but it certainly collocates itself within this ongoing and wide debate. The broad purpose of this study is to better understand the forces that influence citizen's individual actions. More specifically, I will be looking at individual attitudes concerning climate change issues in the province of Alberta, Canada.

Alberta itself is an interesting research ground for the study of environmental issues, in general, and climate change related themes, in particular. This province is part of the Western industrialized world in the Northern Hemisphere where the politics and economy are heavily dependent on the extraction of natural resources, which in turn is a significant source of the emissions that alters the so called *equilibrium climate sensitivity* (Intergovernmental Panel on Climate Change [IPCC], 2001).

My overall research goal is to examine how people's understanding of climate change shapes their actions to mitigate it, specifically in Alberta. It resonates with an idea expressed by Hulme (2009) in his quest to clarify "why we disagree about climate change". He points out that "the full story of climate change is the unfolding story of an idea and how this idea is changing the way we think, feel and act. Not only is climate change altering out physical world, *but the idea of*

climate change is altering our social worlds [emphasis added]" (p. xxviii). This is the overarching factor that has shaped my interest in studying how and mostly why people have been affecting the environment in which they live and what they can do from now on to address the negative effects of their actions. To address this long-term interest, I will investigate the factors that influence individual attitudes towards climate change. More specifically, I will study the willingness of citizens to pay a tax that addresses climate change mitigation in Alberta. The factors that can influence this policy support are Albertans' social-psychological characteristics, e.g. beliefs, and other sociodemographic and sociopolitical variables. The study will empirically examine the relationship between those factors that mould the context in which Albertans decide whether to act or not. Then, it will turn to a wider set of implications that includes: the relationship between understanding climate change causes, ethical issues of responsibility and the individuation of possible actors that can address climate change mitigation and, more broadly, that can undertake social changes.

Efforts to mitigate climate change effects may involve on one hand, citizenship actions and policy support (e.g. taxation), and, on the other hand, individual *simple acts*[1] that affect direct personal behaviours and lifestyle (e.g. house insulation, reducing driving and buying more efficient cars). In fact, within this study, *action* is defined as a cost to the individuals, and as noted above, the individual's willingness to pay tax to mitigate climate change factors is used as

[1] http://www.onesimpleact.alberta.ca/

the test. Therefore, *individuals* are considered here in their political and public role as citizens and taxpayers.

To give a more empirical sense to the concepts just stated, the operationalized research questions for this study are: '*Which specific factors most strongly influence Albertans' likelihood to pay taxes that address climate change mitigation?*' and "*In terms of demographic characteristics, what are the most important differences?*'

In general, factors such as individual values, ideas, beliefs, feelings, and broader social structures are all relevant for understanding decision-making processes at any level and particularly for influencing people's actions. To partially contribute to the wider debate around *structure* and *agency* in the field of environmental sociology, I will be using a set of descriptive and logistic regression analyses to present and estimate results from a survey on attitudes towards climate change in Alberta. In particular, I will try to elucidate and clarify what are the predictors that have a major explanatory power with respect to the kind of action I am considering: willingness to pay a tax that seeks to address the negative impact of climate change. The factors that influence people's agency are the ones I will indicate as independent variables. They form two main conceptual groups: set of personal beliefs, as part of the social-psychological elements, and social structure characteristics that include sociodemographic and sociopolitical aspects (Dietz, Dan, & Shwon , 2007).

This study achieves the objectives by proceeding through two stages. One of the primary steps is to assess Albertans' individual beliefs towards climate change, such as the anthropogenic characteristic of their beliefs. The study then measures the influence of social structures on people to estimate their willingness to act accordingly. In the following sections I will introduce the main topics that inform the conceptual background of the study. The model derived from the survey I use for this research divides the set of personal beliefs from the characteristics of social structure as a means for estimating which factor most influences people's willingness to pay a tax that addresses climate change.

To conceptually situate this survey, I will start by clarifying what I believe are the theoretical foundations of current western society that inform the variables accounting for the beliefs examined in this study (anthropogenic climate change, modern science for the role of experts, and individual capacity as personal sense of empowerment). In this regard, I will explain what I believe are the conceptual origins of anthropogenic climate change and the different features of what I call the *anthropogenic factor* of modernity. I will then outline what modernity means according to some current literature. I note that one of its features is the authority of science and the primacy of its experts and how such a perceived 'fabricated' certainty (Latour, 1993) is currently changing into "manufactured uncertainties" (Beck, 1996). Moreover, I will address how individual capacity and the consequent sense of empowerment mediated through reflexive processes can account for social change. Such mental dialogues define the characteristics

of what Archer (2007) calls *reflexivity* and one way to study this process is through measuring the individual willingness to pay a tax that addresses the negative effects of climate change. Once I have built the conceptual background that holds the social-psychological characteristics as beliefs in this study – anthropogenic climate change, trust in modern science, individual capacity- I will turn my attention to empirical studies that combine such dimensions with the social structure characteristics as defined by Dietz and his colleagues (2007). Both characteristics influence people's agency and reproduce the dualistic vision of social reality as Janus-faced, which Archer (1995) addresses with her "morphogenetic approach" (p. 165). In fact, for Archer there is no automatism in the way we act and this is due to a gap between intention and consequences that is carried on through human activity. Such a hiatus between intentions and results make inevitable not only the study of the "analytical dualism" of structure and agency, which Archer (1995, pp. 132-133) articulates, but also that it becomes preeminent to address the interplay among the emergent entities – structural cultural and agential- as described in Archer's (2007) conception of reflexivity.

Chapter 1: Conceptual Background and Literature Review

Beliefs and Social Structures Roadmap

As a roadmap, in the following section I will flesh out the conceptual structures underpinning both the social-psychological and social structural factors which influence individual decision-making in general, and attitudes toward climate change in particular.

Social-Psychological Characteristics

The set of beliefs measured in this study –anthropogenic climate change, trust in modern science, and individual capacity- describe ideas about perceptions of causes, about responsibility with regard to climate change and about the potential for individual agency which potentially correspond with a course of action oriented towards climate change mitigation. Interestingly, in the literature, there is no specific definition of environmental belief (O'Connor, Bord, & Fisher, 1999), although a reasonable definition is the New Environmental Paradigm Scale (NEP). In terms of an ecological worldview, it best approximates the overarching environmental belief system (Dunlap, Van Liere, Mertig, & Jones, 2000) within social psychology theory. More specifically, it posits that "primitive beliefs" about the role of humans in nature form the "inner core of a person's belief system [more specific than values] and represent his 'basic truths'

about physical reality, social reality and nature of the self" (Rokeach, 1968, p. 6 as cited in Dunlap et al., 2000, p. 428). Moreover, as I will indicate in the section dedicated to empirical studies, risk perception is considered "an integral by-product of environmental beliefs and not an independent cause of behaviour" (O'Connor et al., 1999, p. 462).

It is also important to note that general definitions of *belief* vary widely. I have derived one from an interpretation of Dewey's theory by Dietz who describe the concept as "understandings about the state of the world; they are facts as an individual perceives them" (Dietz, Fitzgerald, & Shwom, 2005, p. 346). Sartori (1969), alternatively, stated that *belief* "is neither an opinion nor an idea. [In fact,] opinions […] characterize […a] superficial level of discourse, […and,] ideas […] belong to the more self-conscious dimension of discourse, to reasoning and theorizing." (p. 401) Therefore, "beliefs are inextricably value-laden […in the sense that] they precede the analytical distinction between value and fact" (p. 400) which means that "beliefs are *believed* not explored, [or] tested [from individuals]" (p. 401). An additional interesting definition of beliefs is provided by the Cambridge Dictionary of Philosophy which distinguishes between a *behavioural view* and a *state-object view*. The first is episodic and refers to propositional contents that dispose us to act accordingly (Audi, 2009, p. 78); while the second is a *dispositional belief* that "exist when no action is occurring" (p. 78) and describes the state of believing as a *propositional attitude* where the

time is not a relevant factor. The questions in the survey used for this study, which pertain to the set of beliefs, refer to the *propositional attitude*.

Social Structures Characteristics

In this study, the conceptualization of social structures is defined as the 'timeless emergent entities that constrain or enable agency, that are not reducible to people but pre-exist them and which people do not create, but activate to transform and process them' (Archer, 1995, p. 71). The empirical social structures characterization I use will follow the one adopted by Dietz et al. (2007), which includes gender, age, education, income, marital status, and political affiliation.

I will now ground theoretically the set of beliefs used in this study by linking them to the overarching discourse around modernity and human-nature roles. I will then anchor down the argumentation, referring more specifically to the complex social plot described by the interplay between structure and agency and considering how I can address it with the results from this study.

Climate: Its Sensitivity and its Changing Dimension

Before entering in the vivid debate around the Global Climate Change phenomenon, and particularly around the nature of its *changing* characterization, I believe it is worth mentioning some of the nuances of the

term *climate*. As Hulme (2009) points out "[Within human history and civilization] climate has both physical and cultural connotations" (p. 4) and the *idea* of climate has been constantly reshaped by social actors. In this respect, the main characteristic of the idea of climate and then of climate change, has always been its *plasticity* to be framed and molded in many different ways and from many different fields in society and, for example, research (Hulme, 2009). In fact, Hulme observe that climate change is the "story about the meeting of Nature and Culture" (Hulme, 2009, p. xxviii). I will return more in the next section to the relationship with nature as the overarching discourse for climate change genealogy.

In tracing the history of climate change, Hulme (2009) notes that an early suggestion about the sensitivity and changing dimension of climate emerged from the complex of six independent scientific discoveries begun with that of John Tyndall in 1859. Amongst them, one in particular in 1938 by Guy Stewart Callendar is considered the first attempt to detect the anthropogenic nature of such changes. Some years before, in 1896, a Swedish physicist named Svante August Arrhenius was the first to report a series of calculations of carbon dioxide concentration in the atmosphere that revealed a certain *sensitivity* of the climate (Hulme, 2009, p. 46). Hulme defines the latter atmospheric phenomenon as: "a temperature value which describes how much the world would eventually warm if the concentration of greenhouse gases in the atmosphere were doubled" (p. 47). It is interesting to note parenthetically that in more recent times, the

Intergovernmental-Panel on Climate Change (IPCC) first announced some data about what they defined as *equilibrium climate sensitivity* within their third report in 2001. The IPCC then provided a more precise definition in their fourth report (2007) which states that *climate sensitivity* refers to: "the global annual mean surface air temperature change experienced by the climate system after it has attained a new equilibrium in response to a doubling of atmospheric CO2 concentration" (IPCC, 2007, p. 629).

After Arrhenius and his acknowledgment of *climate sensitivity*, Callender was the first to "link together the three pillars of the idea of anthropogenic climate change: the physical theory of carbon dioxide and the greenhouse effect, the rising concentration of carbon dioxide in the atmosphere, and the increase in the world temperature." (Hulme, 2009, p. 50) After him the identification of anthropogenic climate change was considered again by the United Nations and the IPCC within the first assessment report in 1990. Notwithstanding the scientific calculations and estimations that prove the anthropogenic climate change, it remains to be seen where it originates conceptually. Moreover, how and why do laboratory experiments carry so much authority to influence society, environmental and also climate change issues?

I would like to briefly address these topics in the next sections to better situate the argument of my study around climate change and one of its primary elements: anthropogenicity.

The Negative Dialectic among Natures

In addressing anthropogenic climate change, it is important to consider Western perceptions on the relationship between humanity and nature, and on "naturalness". This represents another endless debate that overarches the one on climate and I will try to briefly provide an overview here. The debate around nature and its role related to humans could be simplified as consisting of 'nature-endorsing' and 'nature-sceptical' arguments (Soper, 1995). Those two approaches differ in that the former considers nature as having its own purpose and being an independent domain from human, while in the latter nature is a social and cultural construction (for more on this second group see also Eder, 1996; McNaughten & Urry, 1998; Wilson, 1990; Vogel, 1996, 2006 as cited in Soper, 2010).

A halfway position between the two is perhaps found in Critical Realism which draws on Roy Bhaskar's theory. It accounts for a maximum of three levels in nature: one layer of realistic, material nature that is external and independent to human activity and which becomes subjected to its "deep strata […] of physicality, causality" and that Carolan (2005) defines as "Nature as Nature" (406); a second about its 'surface' empirical characteristics (Soper, 1995, p. 157) that Carolan called "Nature as nature" (p. 403); and finally the socio-discursive concepts of "Nature as 'nature'" (Carolan, 2005, p.401) where humans actively

construct meanings and reinterpret all the three levels “nature”/nature/Nature (Carolan, 2005, p. 403).

By contrast, Adorno (1973) addresses not only the human mediator role, but also the issue of human domination over nature. Adorno (1973) pessimistically divides a *first* from a *second* nature. In Adorno’s Hegelian understanding, “history […] creates nature in the negative sense (what he terms ‘second nature’) by delivering us up to new forms of fatedness, the apparent necessities of a given social order and economy, and viewed in this light, capitalist society is itself ‘natural’ or a-historical, since it is committed to the eternal reproduction of its relations of production and commodification” (Soper, 2010, p. 229). ‘First nature’ is one unmediated by humans; it “refers to all forms of concrete, individually existing beings that are mortal or transitory (that is, to both corporeal existence and to the products of labour), and in this understanding nature is the embodiment of history, and history the vehicle of nature.” (Soper, 2010, pp. 229-230) Therefore, since “history is […] transitory […] the fate of first nature is always at any moment being decided” and those human decisions are the ones that “enter into a new zone of instrumental rationality creates a certain fatedness, becoming part of ‘second nature’ ” (Soper, 2010, p. 230). This second nature is *negatively* derived, ‘subtracted’, from the first one. Moreover, the ‘negative dialectic’ between *first* and *second* nature helps to stress how the “otherness” of nature (Soper, 2010, p. 233) has allowed humans to develop powers *over* nature and to achieve that decisive social role of controlling and

dominating it. Considering nature as "otherness to human culture" (Soper, 2010, p. 233), and embracing the Enlightenment's sense of freedom and personal autonomy, allows humans, first cognitively and then morally and practically, to control and dominate nature through reason and 'instrumental rationality'. In a *meta* sense, what preceded and what follows belongs to the "theoretical sedimentation within which we live intellectually today" (Alexander, 1995, p. 11). In other words, it represents the conceptual background that lies behind *modernity* and its anthropogenic characterization.

The Anthropogenic Character: a *Factor* in 'Modern' Western Ontology and a S*ource* of Climate Change

I noted earlier that Hulme (2009) underlines the importance of Callender's scientific discovery in 1938 as the one that for the first time detected and attributed the anthropogenic aspect of climate change. What follows logically for Hulme (2009) is that Callender discovered also that humans are active agents of those climatic changes. In fact, today we talk extensively about human planetary impact and of ecological footprints. On one side, what Hulme (2009) lists as Callender's scientific discovery represents at the same time a hidden aspect of his findings, which is the character of the discovery and the scientific method applied: the *anthropogenic*[2] *factor* of 'modernity' and its expression through

[2]It is a combining form of Ancient Greek ἄνθρωπος (anthrōpos, "man, human") and *–genic* ("production"). Therefore, it means literally: Caused, originated or influenced by humans: Human-made.

fabricated facts. This is what Latour (1993) describes when talking about the mediating role of the laboratory and of "the testimony of nonhumans" (p. 22) in the times of Hobbes and Boyle. This is a moment when "ideas have been replaced by practices, apodeictic reasoning by a controlled *doxa*[3], and universal agreement by groups of colleagues."(Latour, 1993, p. 21) It means to fabricate facts, matters of fact, in the laboratory and it represents the "essential characteristic of modern power: the change in scale and the displacements that are presupposed by laboratory work" (Latour, 1983 as cited in Latour, 1993, p. 22). It is important because it provides the conceptual building blocks that constitute the modernity project. In fact, and on the other hand, what Hulme stresses in Callender's 'discovery' is exactly that he proved through experimental linear findings, as matter of facts, the *anthropogenic source* of climate change.

Overall, *anthropogenic* as I define it here, characterized as a *factor* of Western ontology, represents the main element throughout the modernity project. That factor underwrites the Renaissance's humanistic optimism about improving nature and society, which the Enlightenment philosophically turned into the quest for perfectionism (Alexander, 1995, p. 66). More precisely, the *modern attitude* is to believe that the "world can become the mirror to the divine [and men the masters that can transform and dominate it] no matter was the disaster, the hope […and the] belief in the imminent perfection […] never disappears" (Alexander, 1995, p. 66). In such a quest for perfectionism we can

[3] Doxa (δόξα) is a Greek word meaning common belief or popular opinion.

read again the anthropogenic element as humans (anthrōpos) that are the origin and cause (-genic) of the 'modern' world. Humans propose and interpret themselves as the new Alpha (A) and Omega (Ω) in creating the mirror of the divine on earth. This underpins the *modern* Western ontology.

In this sense, through Western 'instrumental rationality' and *modern* social institutions such as the police, legal systems, the world of finance, and linear and *arithmomorphic* neoliberal economies (Georgescu-Roegen, 1999), the state of scientific authority has been socially constructed. However, the anthropogenic factor and modernity itself has turned out to be also a cause for many ecological disasters and climatic changes. From this perspective I will focus on the *anthropogenic belief* that has led humans, as active agents, to interact and dominate their environment and, for what now is the interest of this study, altering the climate. Before doing that I will briefly discuss the broader theme of modernity to give a sense of the significance of the anthropogenic factor in this study.

The Project of Modernity

Sometimes it is most effective to describe concepts and theories by looking at their 'negative image', stressing what they are not and what their limits and downsides are. This is a useful way to describe the theory of modernity that as I stated before represents the most recent Western ontology.

Alexander (1995), by engaging himself in the genealogy of modernization theory, lists the social 'idealtypical' characterizations of modernity as the following:

> 1) Societies were conceived as coherently organized systems whose subsystems were closely interdependent.
>
> 2) Historical development was parsed into two types of social systems, the traditional and the modern, statuses which were held to determine the character of their societal subsystems in determinate ways.
>
> 3) The modern was defined with reference to the social organization and culture of specifically Western societies, which were typified as individualistic, democratic, capitalist, scientific, secular, and stable, and as dividing work from home in gender-specific ways.
>
> 4) As a historical process, modernization was held to involve non-revolutionary, incremental change.
>
> 5) The historical evolution to modernity—modernization—was viewed as likely to succeed, thus assuring that traditional societies would be provided with the resources for what Parsons (1966) called a general process of adaptive 'upgrading', including economic take-off to industrialization, democratization via law, and secularization and science via education. (pp. 11-12)

Following these institutional characterizations, Giddens (2007; 1991) identifies modernity with capitalism, industrialism, social control of information, and military power. Elsewhere Soper (1995) inevitably draws attention to the side effects of modernity in relation to nature by describing modernity as the ethnocentric "technocratic Prometheanism of the Enlightenment project, […] the 'anthropocentric' privileging of our own species encouraged by its 'humanism' has […] resulted in cruel and destructive forms of dominion over it." (p. 5) Beck (2009), always having in mind the ecological drawbacks of this theory, states that:

> modernity is a *workshop of certainty* […because while it is] dissolv[ing] certainties, […] it also cements and celebrate new certainties. […] The fact [is] that true certainties do not descend *from above* […] but are produced, achieved and practiced *from below*. […] To simplify somewhat, the intellectual world of modernity is composed of 'machines of reason' into which doubts were fed and necessities came out the other end. Modernity is inconceivable without the ability to transform uncertainty and chaos into anthropological certainty and self-justification. (pp. 217-218)

The *modern* binary logic and the dualistic paradigm at the core of modernity make it even more problematic to address problems like climate change. The scientific complexity of the problem is combined with individual, political, and economic responses all around the world. The dualism is reiterated nowadays in the conflict between science and politics –in its wide sense- that adds uncertainty to the outcomes. The role of experts too, as it was understood in its scientific authority within modernity, is changing its significance (Beck, 2009). Part of this change is due to elements of uncertainty. Since one of the beliefs in my study is about 'trust in modern science', I will deal next with scientific uncertainty and policy-making issues.

Scientific Uncertainty

As Hulme (2009) reminds us, "science can only progress through disagreement and challenge" (p. xxxv; for more Freudenburg, Gramling, & Davidson, 2008). Nevertheless, the authority of science has been used not only for 'positive statements that universally assert how the world *is*, but also for the normative

ones about how the world *should be'* (Hulme, 2009). One means of dealing with uncertainty in the scientific world, and to bridge the gap with the decision-making sectors, is to accept uncertainty as a regular feature of science. The authority of science as the outcome of the "workshop of certainty" (Beck, 2009, p. 217) built within the modernity project has to be reinterpreted. For example, risk assessment based on predictable estimations of linear, in the sense of causal, outcomes are not applicable in complex and non-linear topic like climate change. A shift from linear to non linear thinking is needed (Mainzer, 2007), which means from predictability to probability and, for example, from 'risk to uncertain society' (Georgescu-Roegen, 1999).

Since 'modern' predictions cannot be made, the "uncertainty associated with climate change science has been interpreted as an undermining of scientific authority and a hindrance to policy" (Martin, & Richards, 1995; Shackley, & Wynne, 1996 as cited in Bradshaw & Borchers, 2000, p. 5). Moreover, as Kuhn and others argue, "some facets of uncertainty are always obscured" (Kuhn, 1970; Wynne, 1992 as cited in Shackley, & Wynne, 1996, p.284) and they have to be accepted as part of scientific knowledge and not as 'ignorance' (Bradshaw & Borchers, 2000). Therefore, we need to recognize that:

> (1) science and knowledge are intrinsically uncertain, with new information continually altering our perceptions and beliefs;
>
> (2) decisions based on scientific information must be made in a context of uncertainty; and

> (3) faster and better science as an adequate basis for policy formulation is inconsistent with the nature of scientific inquiry and resilient policy formulation. (Bradshaw & Borchers, 2000, p. 7)

This and the emphasis on science that cannot provide certainty, but just disproves certain events and data, heavily influence decision-making processes. For example, it shows the inadequacy of "wait and see" policy in favour of the precautionary principle (Bradshaw & Borchers, 2000; Sterman & Sweeney, 2007; Freudenburg et al., 2008) that was first formulated at the Earth Summit in 1992.

Reflexive Modernization

In analyzing the current times, it is important to address the criticism of modernity, to define stages and to address outcomes. For example, authors such as Beck, Giddens, and Lash (1994) argue that we are currently in late modernity. The theory of "reflexive modernization" (Beck et al. 1994) describes such a belated phase of modernity and within it the authors address its consequences.

Along with the human-fabricated facts common to modernity, "manufactured uncertainties" (Beck, 1996) and the notion of risk are human-made factors in what Beck calls late or second modernity. In fact, "as modernization dissolved the structure of feudal society in the nineteenth century and produced the industrial society, modernization today is dissolving industrial society and another modernity is coming into being." (Beck, 1992, p. 10) He characterizes this phase as "reflexive" in the sense of being self-referential (Beck, 2009) "It is

thus a condition in which science is now applied to science, by public actors as well as by experts." (Delanty, 2005, p. 287)

According to Beck (1996) society becomes *reflexive* in three senses:

> First, it becomes an issue and problem for itself: global dangers set up global mutualities, and indeed the contours of a (potential) world public sphere begin to take shape. Second, the perceived globality of the self-endangerment of civilization triggers a politically mouldable impulse towards the development of co-operative international institutions. Third, the boundaries of the political come to be removed: constellations appear of a subpolitics at once global and direct, which relativizes or circumvents the co-ordinates and coalitions of nation-state politics and may lead to worldwide 'alliance of mutually exclusive beliefs'. (p. 2)

On a more individual level, Giddens recognizes a subjective process of emancipation from constraining structures, in which society, which is characterized by 'individuation or individualization' is *re*-shaped from the bottom up through mechanisms of 'sub-politics' (Delanty, 2005).

Although all of those authors look at individual empowerment through reflexive modernization, Giddens argues that individuals grow in their self-identity and take responsibility for actions (Beck et al. 1994; Giddens, 1991). Margaret Archer considers those positions inadequate, because they are misleading about how processes of social changes really take place. According to Archer, the consequences for individuals within a globalized world are substantially different: human reflexivity and not reflexive modernization is the key concept that stands behind the current times.

Reflexivity for Social Change

By definition *reflexivity,* as a crucial part of internal conversation, is the "regular exercise of the mental ability, shared by all normal people, to consider themselves in relation to their (social) contexts and vice versa" (Archer, 2007, p. 4). It is what distinguishes people from animals because of the ability for the former to determine future courses of action and redesign life's projects (Archer, 2007). Moreover, as Archer notes, it "involves a subject considering an object in relation to itself, bending that object back upon itself in a process which includes the self being able to consider itself as its own object" (Archer, 2007, p. 72). In her words, the mediating role of reflexivity is not passive, "*not* a vague self-awareness but a *questioning* exploration of subject in relation to object, including the subject as object, one which need not have any practical outcome or intent" (p. 73). According to the author, promoting reflexivity has never been more timely than in the current social globalized world that expands and changes at a fast pace. Internal conversations, typical of reflexivity, are the ones that characterize people as 'active agents' able to "exercise some governance in their own lives, as opposed to 'passive agents' to whom things simply happen"(p. 6) In fact, according to her, people act to promote their concerns and they make projects to address those concerns throughout their lives. This is how people make their "*way through the world"* (Archer, 2007).

According to Archer (2007), human causal powers work reflexively rather than automatically and this is exactly where she likes to distinguish her theory of

structure and agency from those, for instance, of Beck and Giddens. She accuses both authors of underexploring and underevaluating the interplay between structure and agency by sinking instead of linking both sides of the Janus –faced social reality (Archer, 1995; 2007). From this standpoint, Beck and Giddens are Elisionists because they merge both objective and subjective sides of society in the error of 'central conflation' (Archer, 1995; 2007). By contrast, her ontology is dual and it always accounts for the autonomy of 'individuals and the parts' in society (King, 1999). The latter elements form themselves spontaneously in society and she defines them as the "emergent properties – structural, cultural, and agential" that are not reducible one into the other (Archer, 1995, p. 175). Therefore, authors such as Beck and Giddens omit the specific interplay, or reflexivity, between the two faces of society, which enables individuals to re*act* to the structured context (Archer, 2007). In fact, "for an objective structure or cultural properties to exercise its causal powers […need] to be activated by agents" (Archer, 2007, p. 12) and it is mediated through reflexivity. The main reason why the central conflation is incompatible with reflexivity is because reflexive deliberations need a clear distinction of subject-object (Archer, 2007). It is in this gap where reflexivity 'deconstructs and reconstructs' life narratives and where, methodologically speaking, we can examine them "as the causally powerful relationship between deliberation and action in people's social lives" (Archer, 200, p. 37). Therefore, the emergent structures pre-exist people and cannot be reducible to them. Indeed, "people are not puppets of structures

because they have their own emergent properties which mean they either reproduce or transform social structure rather than creating it" (Archer, 1995, p. 71). Even though the properties of the parts emerge, they are "activity-dependent" (Archer, 1995, p. 167), which means that they have to be activated by people (Archer, 1995; 2007). Therefore, each life "describe[s] a trajectory, shaped by structural properties and powers, as reflexively interpreted and activated by individuals"(Archer, 2007, p. 61).

At the methodological core of Archer's dualistic ontology there is what she calls the "morphogenetic approach" (1995). Such an approach "refers to 'those processes which tend to elaborate or change a system's given form, state or structure' " (Buckley, 1967, p. 58 as cited in Archer, 1995, p. 166), while " 'morphostasis' refers to those processes in complex system-environmental exchanges which tend to preserve or maintain a system's given form, organization or state" (Archer, 1995, p. 166). The morphogenetic approach includes three phases' cycle which happen at a different time scales:

> At Time1, "structural conditioning" sets the constraints within which processes of "social interaction" occur at Time2; these processes, depending on the nature of the phenomena under consideration, may encounter resistance, support or indifference to changing the pre-existing structures in ways that become clearer by Time3. Time4 is the time of "structural elaboration," meaning pre-existing structures were reproduced or transformed and a new cycle begins, as the outcomes at Time4 become, eventually, Time1 or the starting point in a new process of interplay between structure and agency. (Gimenez, 1999, p.20)

This cycle shows how the social structures are preexistent (at Time1) and timeless, but since our subjectivity is dynamic they need to be activated. According to what an individual's concerns are, he or she may find 'contextual incongruity' which refers to constraints of social structures. By contrast, the congruity between course of action and context is described as 'structural enablement' (Archer, 2007).

Although reflexivity is the regular exercise of mental ability, Archer is mostly interested in the strongest reflexives processes. She categorizes types of individuals who favour each of the four modes of reflexivity as: 'Communicative reflexives', 'Autonomous reflexives', 'Meta-reflexives', and 'Fractured reflexives' (Archer, 2007, p. 93). Amongst the four, Meta-reflexives are those individuals who qualitatively differ in their concerns. The individuals' c*onstellation of concerns* (Archer, 2007, p. 22) are the ones defined within the agent's entity -in his/her dynamic subjectivity- and the ones that are eventually addressed in regard to their congruity or incongruity with context and possible structural constraints. The distinctive character of concerns around which Meta-reflexives build their internal conversations are *value-oriented,* while, for instance, the ones in Autonomous-reflexives are *task-oriented* (Archer, 2007, p. 130). The former care about moral issues and they criticize contexts as well as themselves by taking responsibility for personal actions. They are critical thinkers and in a sense political activists. Their commitment is entirely towards their values, but their focus is on how to act to make a difference in the social world which they

perceive as incongruent with their expectations (Archer, 2007). With respect to the other three modes, Meta-reflexives, who are "both architectonic in nature and holistic in scope" (Archer, 2007, p. 310), seek an organic integration within their constellation of concerns. Although, as Archer also realizes, the holistic approach is the most difficult to bear, the combined collective dimension of meta-reflexives is the engine for the reconstitution of civil society.

I Care, Therefore I Am, and Therefore I Do

As I noted earlier, as Archer argues, during the globalization currently taking place everyone becomes *increasingly* reflexive and individual responsibility grows too. In this respect, for Archer (2007), the increasing 'disembedding' mechanism originated by globalization processes coincides not with a destructuring but with a restructuring phase. Archer sees individual personal identity as aligned with social identity through practices that she calls *modus vivendi* (Archer, 2007, p. 88). In others words, personal identity is defined by a unique constellation of concerns. Therefore, since the critical thinkers or meta-reflexives are value-oriented, "they cannot divorce questions of doing and being from one another" (Archer, 2007, p. 131). I have paraphrased the previous concept with the following statement: *I care, therefore I am, and therefore I do*.

Although individual identity is aligned with social identity, social changes have to pass the close examination of contextual congruity and incongruity. Nonetheless, meta-reflexives are endowed with a strong commitment because they are

intrinsically value-oriented people with a preoccupation with moral issues; therefore, they are the only ones, according to Archer, who can make the difference in the current globalized world. In this respect, climate change is

> far from being a simple problem of science […] or of economics […;] there is a deepening appreciation that climate change-both in the way we frame it and the way we define our response – can only be grasped through appreciation of its ethical dimensions. (Hulme, 2009, p. 174)

From a different and more postmodern perspective, Bauman (1993) underlines that in the current phase of society, a universal ethical code where general and all inclusive values are realized through legislative means such as universal laws is impossible. Within a world of cultural relativity and uncertainty he too insists on the importance of individual moral responsibility. Such an analytical and cross-theoretical reorientation towards studies of complex human subjectivity indicates how ethical and responsibility issues are a focal point to address climate change attitudes.

Linking Psychosocial and Social Structure Characteristics within the Empirical Environmental Studies

Although there is a significant body of theory around modernity and its ecological side effects, and despite the fact that a majority of mainstream scientists (e.g., IPCC; United Nations Framework Convention on Climate Change [UNFCCC]; US Environmental Protection Agency [EPA]; and Tyndall Center for Climate Change Research) agree with the anthropogenic thesis of climate

change, there are still many 'scientific misinterpretations' with respect to the attribution of causes for climate change. For example, Plimer (2009) lists 2,300 peer-reviewed scientific studies and more sources that support climate change skepticism. Such a scientific entrenchment partially reflects what I have previously outlined regarding the dualistic paradigm at the core of modernity, and it is what makes it even more problematic to address complex issues like climate change. Moreover, I have already briefly addressed the uncertainty that emerges when such a dualism is reiterated by the conflict between science and policy-making sectors. In addition to the intricate scientific core of the problem, the combination derived from the interaction with the complex of individual, political, and economic response is magnified at the global level. Through the humble means of this study, I won't aim to unravel such a global Gordian knot, but I will try to account for the situation in Alberta as sampled in 2008.

Environmental studies have tried to understand people's attitudes toward climate issues by evaluating the public's risk perception and environmental concerns (Slimak & Dietz, 2006; Stern, Dietz, T., & Kalof, 1993). Those authors, by drawing on social-psychological aspects, have particularly stressed the key role of values (Stern & Dietz, 1994; Stern et al. 1993; Dietz, Stern, & Guagnano, 1998; Dietz et al., 2005) as preeminent in shaping environmental concerns. Again, personal values and beliefs (Stern, Dietz, Kalof, & Guagnano, 1995; Dietz et al., 2007) together with norms (Stern, Dietz, Abel, Guagnano, & Kalof, 1999) shape attitudes and pro-environmental actions, and to some extent, through the

mediation of social structure characteristics, they can also support social movements by forming the identity needed for it. Others have also looked at social structure characteristics such as demographic variation (Stern et al. 1993; Flynn, Slovic, & Mertz, 1994) and in particular gender (Davidson & Freudenburg, 1996) with respect to environmental risk and concerns. Overall, the majority of outcomes from the studies that focus on social psychological factors, and which can be recapitulated under the Value Belief Norm (VBN) theory of environmental concern and behaviour (Stern et al., 1999), state that social structure characteristics, such as gender, familiar status, age, education and income, have a weak explanatory power for people's environmental decisions compared to the strong influence of values, beliefs and worldviews that support the ecological paradigm. However, other studies have registered a difference in gender variance whereby women are more environmentally concerned than men (Davidson & Freudenburg, 1996; Bord & O'Connor, 1997; Slovic, 1999). This variation in gender confirms the argument around pro-environmental values and the "ethic of caring" which are stronger in women (Stern et al., 1993). Nonetheless, the same exact statement cannot be made for such a "wicked issue" as climate change (Lorenzoni, Doria, Leiserowitz, Poortinga, & Pidgeon, 2006). In fact, equivalent demographic variables that varied with respect to environmental attitudes and pro-environmental behaviours are poorly associated in estimating climate change attitudes (Dunlap, 1998; O'Connor et al., 1999; 1999a; O'Connor, Bord, Yarnal, & Wiefek, 2002). This previous group of

findings in total state that we can't apply the same parameters to climate change issues as to other environmental issues, nor can we draw the same conclusions according to the findings we gathered on those issues. In fact, environmental attitudes as considered in the previous studies have generally been associated with people's willingness to address certain local environmental concerns (i.e., polluting of waters, changing waste sites into environmental habitats, and Wildlife preserves) related, for instance, to moral norms (Stern, Dietz, Black, 1986). These attitudes are somewhat similar to those toward global climate change, but the former address the issue on a more localized level than the latter. To support the different variation in relevance about climate change perceptions, Wilbanks, and Kates, (1999) state that the -'local'- scale matters in order for lay people to grasp the risk of climate change (Leiserowitz, 2006; Dietz, Gardener, Gilian, Stern, & Vandenbergh, 2009; Lorenzoni et al., 2006; Pruneau, Liboiron, Gravel, Bourque, & Langis, 2001; O'Neill & Hulme, 2009) and to have a cognitive understanding of its implications and consequences (Sterman & Sweeney, 2007). In other words, although local experience of environmental degradation increases people's perception of risk, global topics, such as climate change are still difficult for individuals to situate spatially and temporally. Such a geographic and temporally distant dimension remains a cognitive challenge in raising people's concerns around the risks and implications of global climate change (Leiserowitz, 2005; 2007). These differences in findings between studies of more concrete environmental concerns and those of climate change, and the

additional conflicting results of studies on gender variations and climate change concern, could be attributed to lay people's "perceived ambiguity" of the phenomena (Davidson & Haan, in press). Here again, such a "perceived ambiguity" is an additional factor that contributes to the uncertainty that, as I stated before, characterizes our current society. Even though, in this case, it is not an issue of disagreement around the existence of climate change. In fact, it is more that on one hand the scientists, also the ones agreeing on anthropogenic climate change, are producing conflicting and sometimes ambiguous information on the factors that influence people's attitudes. Moreover, often the scientific information that is produced is presented in an ambiguous manner by the media.

Although there are differences in scale, and temporal and spatial vicinity, there is still a large majority of the literature on people's attitudes toward global climate change and pro-environmental behaviours (e.g., Bord & O'Connor, 1998; O'Connor et al., 1999) that apply the topic of risk perception (i.e., Bord & O'Connor, 1997; Leiserowitz, 2005; Stedman, 2004; O'Connor et al., 1999; 1999a; 2002) as a predictor of people's behavioural intention to mitigate climate change. Although risk perceptions cannot be considered a 'by-product of environmental beliefs', they definitively "share the stage with general environmental beliefs and demographic characteristics. [Moreover,] although related, risk perceptions, knowledge, and general environmental beliefs are somewhat independent predictors of behavioural intentions" (O'Connor et al.,

1999, p. 461). In addition, the findings of this latter study state that knowledge about the causes of climate change –the anthropogenic component- has a stronger influence on behavioural intention than did the belief on its negative implications. However, other authors suggest that the "knowledge-deficit model is inadequate for understanding" (Kellstedt, Zaharan, , & Vedlitz, 2008) levels of climate change concerns and the consequent personal efficacy.

Again, another relevant study (Dietz et al., 2007) found that worldviews and environmental beliefs are preeminent in filtering the influence of social structure characteristics such as political affiliation and personal values and future orientations. Political ideology is considered a social structure characteristic by Dietz et al. (2007) however there is close association with belief in anthropogenic climate change and related attitudes that has been confirmed in Canada by Davidson and Haan (in press). For example, the political ideology of the US general public has highly ideologically polarized, and during the last decade the gap between Republicans and Democrats has increased (Dunlap, 2008). Researchers have noticed that during this time Republicans have decreased their belief in the anthropogenic aspect of climate change, which was already weaker than Democrats, by 10% from 2003-2008. According to McCright and Dunlap (2010) this is probably due to the success of the American conservative movement in boycotting the idea of climate change during recent decades.

Overall, it is possible to state that within the environmental literature, it is clear that no matter what predictors of levels of concern are invoked, environmental

beliefs, or demographic characteristics: people's willingness to take action decreases, if either a financial or personal cost in terms of lifestyle changes is asked of them (O'Connor et al., 2002; Dietz et al., 2007; Leiserowitz, Maibach, & Roser-Renouf, 2009). Stern et al. (1993) have named such a concept *Ego-environmentalism*.

This study aims to contribute to the limited research about public attitudes of climate change in Alberta. In particular, it will look to the Albertans' willingness to pay taxes that address negative effects of climate change to test the factors, either psychosocial or structural, that enable or constraint such an action. More specifically, what I have indicated within the conceptual background as anthropogenicity as a factor of modernity ontology and then as a source of climate change negative effects will be considered here part of the belief system within the psychosocial characteristics of the sample. In following the lead of previous empirical research examining the willingness to pay tax that mitigate climate change, the following sections will ground the conceptual discussion borne here through a series of descriptive and multivariate analysis.

Chapter 2: Method, Sample and Measurement

In order to quantitatively operationalize the concepts outlined above, I have gathered data from the annual Alberta Survey (AS) conducted between May and June 2008 and administrated by the Population Research Laboratory (PRL) at the University of Alberta. The sample inventory contains individuals of age 18 and over living in the province of Alberta. A total population of 1211 was interviewed by using a random-digit dialing telephone approach where a computer program generates the telephone numbers and consequent database of households to call. The sample was divided almost equally among Edmonton (387) and Calgary (403), intended as metropolitan areas representing 2/3 of the sample, and "other Alberta" (422) which includes any other towns and villages. Specific attention was paid to ensuring an equal representation of men (49.7%) and women (50.3%) (Table1).

Table 1. Frequencies and descriptive analysis of demographic data

Demography		**Frequencies (%)**	**Total (%)**	
Gender	Male	602 (49.7%)		
	Female	609 (50.3%)		
			1211 (100%)	
	Minimum	**Maximum**	**Mean**	**Std. Deviation**
Age	18	91	48.78	15.997

The survey for this study uses a specific module of the 2008 version of the Alberta Survey that was added as a research prize award by my colleague, Kendra Isaac. The module was designed with ten specific questions on climate change related issues. All questions and survey protocols were reviewed and approved by the Faculties of Arts, Law and Science Research Ethics Board before being administrated to the general public. The data gathered were progressively tabulated, cleaned, recoded and analyzed by using SPSS version 18.

The dataset provided by the PRL was for the most part raw data and I have created subgroups from the sample (Table 2). The majority of the interesting variables for this study were initially nominal; therefore, I began by recoding them into a series of dummies. The dependent variable –willingness to pay a tax that mitigates the effects of climate change - is represented by the following closed question: 'Would you be willing to pay a tax if it were used to address the negative effects of climate change?' I have recoded it as a dummy for which the affirmative responses account for *one* and the negatives for *zero*. While, to measure the independent variables, I have conceptually grouped them in two categories: *set of beliefs* and *social structure characteristics*.

The first set includes three main beliefs that are measured by one question and two statements. '*Do you believe that human activity is a major cause of recent climate change?*' is the question that in the survey measures the respondent's belief in and awareness of the anthropogenic climate change. '*I have the*

capacity to address climate change' is the statement that accounts for the individual's sense of empowerment and self-efficacy. The concept of *self-efficacy* is the belief of people that they can or cannot ameliorate the negative consequences of climate change (Heath, & Gifford, 2006). It is therefore a determining factor for understanding reflexivity and its implications. Finally, '*I have trust in modern science*' measures people's confidence in the role of experts in general and in this context as a trusted source of information on climate change and potentially their ability to develop scientific outcomes to mitigate climate change. About this set of beliefs the only variable I have recoded is the one that accounts for the anthropogenic climate change where the affirmative responses account for *one* and the negatives for *zero.* Whereas, the responses for the other two beliefs are ranked with a Likert scale: five points for the 'individual capacity' and seven for 'trust in modern science'.

The second set of independent variables has been grouped under the label of *social structure characteristics* as Dietz and his colleagues (2007) have done previously. This second series includes demographic variables such as age, gender, and current marital status as well as information on respondents' educational level, political orientation, and income. I have started by recoding the demographic information. The new variable that accounts for gender, 'Female', is weighted on women coded *one* with males coded *zero*. The age of the sample ranges from 18 to 91 years old and it is ordered in six groups (18-24; 25-34; 35-44; 45-54; 55-64; 65 and over). Marital status is measured by the

question 'What is your *current* marital status?' and the new dummy variable assigns *one* to married respondents and those that are in a common law relationship, and *zero* to everything else. Education is measured by the question '*What is your highest level of education?*' and the variable used here has been recoded in three subcategories (less than high school; high school complete; post-secondary studies). Political orientation has been approximated by Federal electoral preferences. The question that measures it is '*If an election was held today, how would you vote federally?*' For the purpose of this study I have recoded the variable into two dummies and I have approximated this question into political ideology: Liberal views and Conservative views. The new variable labeled 'Liberal views' assigns *zero* for the Conservative Party of Canada, Canada's NDP, and Green Party of Canada and *one* for Liberal. While, the recoded variable that account for 'Conservative views' assigns *zero* to Liberal, Canada's NDP, and Green Party of Canada and *one* to Conservative. Finally, the variable that accounts for income levels is measured by the following question: '*What was your own total* individual *income for this past year* before *taxes and deductions*?' I have recoded income into low, medium and high groups and the latter is the one I will be using for this study. The range for high income people is from $70,000 to $150,000+.

Table 2. List of variables used

Dependent Variable		Measurement
		Would you be willing to pay a tax if it were used to address the negative effects of climate change?
Independent Variables	**Description**	**Measurement**
	Set of Beliefs	Anthropogenic climate change?
		Individual capacity
		Trust in science.
	Social Structure Characteristics	Age
		Married
		Female
		Liberal Views
		Conservative Views
		High Income
		Education

As I noted in this section, I have progressively added complexity to my procedures and consequent analysis. Specifically, I have started by considering some of the frequencies of response that show the incidence in distribution of the sample, and then I have designed different cross tabulations to better record and analyze the relationship among the categorical variables. Based on the preliminary descriptive results, I have built three different binary logistic regression models that show the main findings of this study. In fact, to assess the

predicted probability of the models the Ordinary Linear regression (OLS) would not be as accurate as the logistic one. The reason is because the OLS is commonly used when the response variable is continuous. One assumption of linear models is that the residual errors follow a normal distribution. This assumption fails when the response variable is categorical, as is the case in this study, so an ordinary linear model is not appropriate. The kind of analysis suitable for a dichotomous dependent variable (i.e. one with two categories), is the binary logistic regression (Moffit, 1999). This is appropriate in my case where I am asking whether or not the survey respondents believe in anthropogenic climate change. Actually, since the distribution (Table 3) of the dependent variable –willingness to pay taxes to mitigate climate change- within the sample is roughly split in half between those who agree (46.9%) and those who do not (49.8%), the outcome of the OSL would not have been so distant from the ones in the logistic regression. However, they would have been less precise and they would not have classified the predictive probability of each variable. In fact, I use the *odds ratio* resulting from the logistic regression to classify respondents with respect to their willingness to pay a tax that addresses climate change.

Table 3. Frequencies of willingness to pay a tax that addresses climate change mitigation

	Willingness to pay taxes			
	YES	**NO**		
Overall Alberta	568 (46.9%)	603 (49.8%)		
Male	265 (45.10%)	323 (54.90%)		
Female	302 (51.80%)	281 (48.20%)	**Total population**	**Missing**
			1211 (100%)	40 (3.3%)

Chapter 3: Findings

Descriptive Results

The following sections outline in detail the differences in beliefs considered in the study with respect to willingness to pay taxes to mitigate climate change according to the age and gender of the sample.

The main questions and statements that describe the set of beliefs that of interest to this study are the following:

a) Do you believe that human activity is a major cause of recent climate change?
b) I have the capacity to address climate change.
c) I have trust in modern science.

After considering a series of frequencies I have studied the dependencies hidden in the sample by running a general and broad correlation. The overall outcome for it is moderate with, for instance, the highest Pearson at (.389) -with significance indicated by $p < 0.01$- between the dependent variable (willingness to pay) and the belief in the anthropogenic climate change.

Demographic Characteristics of Respondents Who Believe Human Activity Is a Major Cause of Recent Climate Change

I will start by describing the overall population in the province (Alberta), and later in the section I will look at the interactions among the set of beliefs and the set of social structure characteristics.

More than two thirds (67.4%) of the respondents believe that human activity is the major cause of recent climate change and they represent 78.3% of the women and 63.3% of the men questioned (Figure 1).

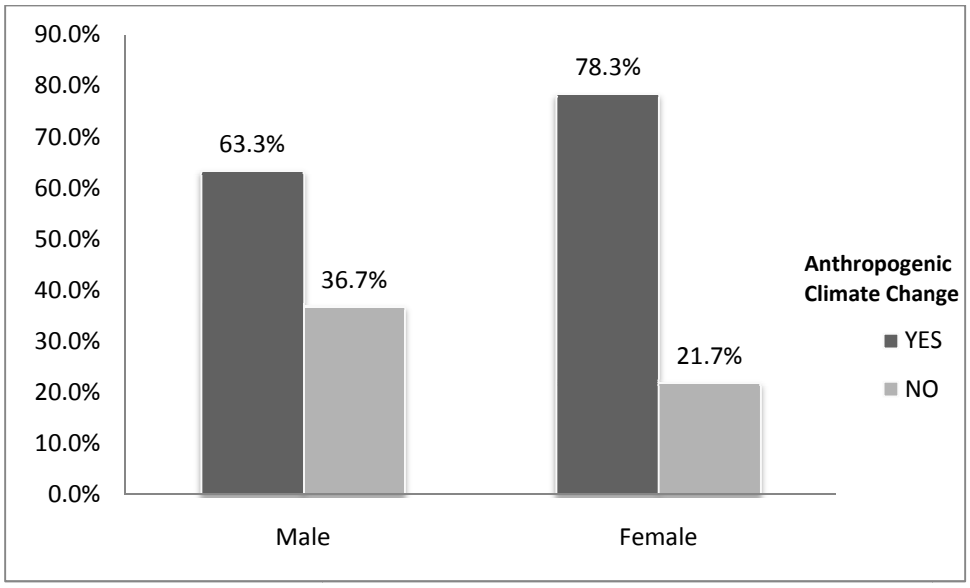

Figure 1. Belief in the anthropogenic climate change and differences in gender across Alberta

There is a trend for the younger age groups to respond more positively to this question, but a majority (57%) is still affirmative even in the oldest group (Figure 2). It is interesting to see that the two main groups of people who believe that

we as humans are the cause of climate change are the young. In fact, the group from 18 to 24 years old has given 79.5% of positive responses, and adults from 35 to 44 years old has also given 79.7% of affirmative replies. The other two groups of people that significantly agree with such a statement are those between 25 and 34 and those between 45 and 55 years old with 71.3% and 71.8% positive replies respectively. While, older people seem to be more reluctant to agree with the statement, the proportion of positive responses is still relatively high with 67.3% of those between 55 and 64 years old saying yes and only 57.5% of those older than 65.

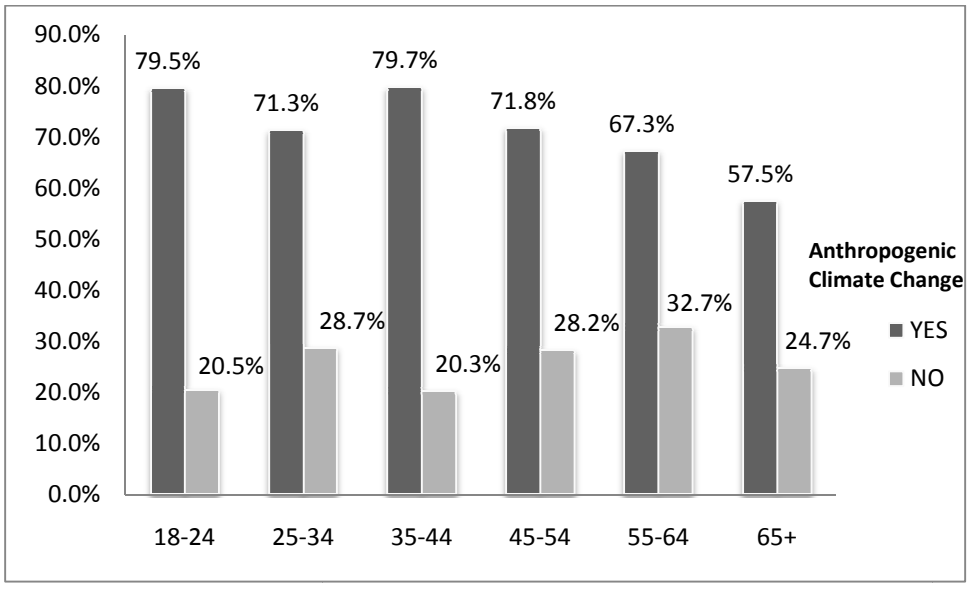

Figure 2. Belief in the anthropogenic climate change and differences in age across Alberta

Individual capacity

Overall approximately half of Albertans agree or strongly agree that they have the capacity to address climate change (Figure 3). The proportion of men who feel this way is less (44.3%) than that of women (54.3%). More males (37.6%) tend to register disagreement than women (22.8%).

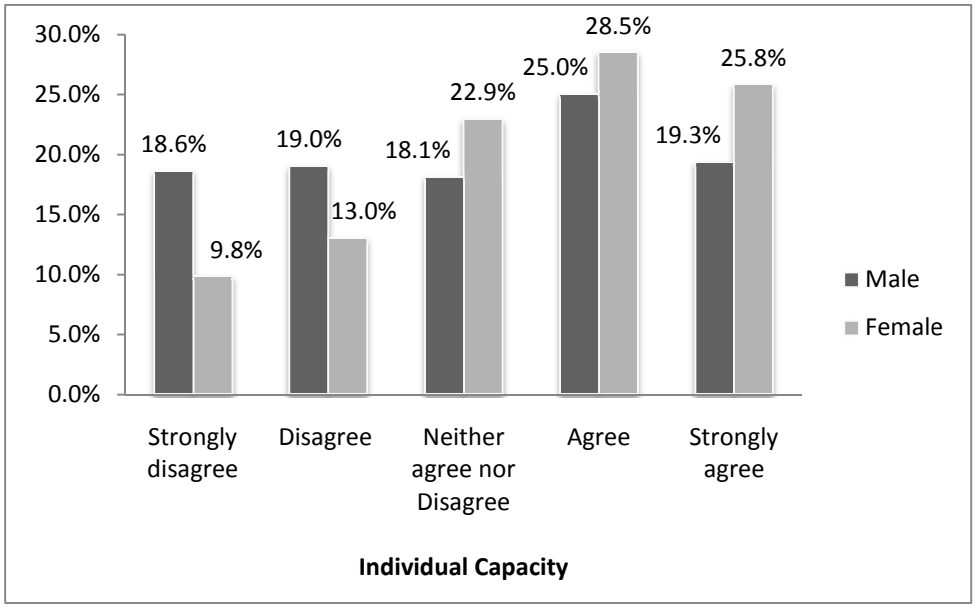

Figure 3. Belief in individual capacity and gender differences across Alberta

The range in age (Table 4) of those agreeing (agree and strongly agree) with the statement is spread throughout the sample with the highest proportions among the groups of 18-24 (52.6%) and 35-44 (58.9%). The exception is those older than 65, who are almost equally split between those that are overall favourable (44.4%) to the statement and those who are not (42.4%) with more of this group

(23.4%) showing strong disagreement than any other age group (range 10.3-14.3%).

Table 4. Belief in individual capacity and age differences across Alberta

	Age in six groups					
Individual capacity	18-24	25-34	35-44	45-54	55-64	65+
Strongly disagree (%)	10.3	11.3	11.4	14.3	12	23.4
Disagree (%)	15.4	14.9	13.6	14.3	17.7	19
Neither agree nor Disagree (%)	21.8	26.2	16.1	22.9	24.9	13.2
Agree (%)	32.1	26.8	34.3	23.3	22.5	24.9
Strongly Agree (%)	20.5	20.8	24.6	25.2	23	19.5

Trust in Modern Science

A majority of respondents (Table 5) agree somewhat or more with the statement, with a tendency for this to reduce with age: the highest proportion (79.3%) is in the 18-24 age group with the lowest aged 65 and over (64%). Although, the 25-34 age group is lower (69.7%) than might be expected.

Table 5. Trust in modern science and age differences across Alberta

	Age in six groups					
Trust in modern science	18-24	25-34	35-44	45-54	55-64	65+
Strongly disagree (%)	0	1.8	2.1	0.4	5.6	3.8
Disagree (%)	1.3	3.6	3.3	1.1	3.3	7.2
Disagree somewhat (%)	5.2	8.9	6.7	7.7	6.5	5.3
Neutral (%)	14.3	16.1	14.2	17.2	19.5	19.6
Agree somewhat (%)	20.8	27.4	31	33.3	28.8	23.9
Agree (%)	37.7	25.6	25.5	21.1	23.3	23.4
Strongly agree (%)	20.8	16.7	17.2	19.2	13	16.7

In terms of gender differences (Figure 4), it is interesting to observe that just slightly more women appear to take a moderate stance by "agreeing somewhat" (29.1%) with the statement than men (28.4%); however, for the other two positive responses (Agree and Strongly Agree), the trend is reversed, although the differences between the two sexes is still small. In fact, only 2.3% divides the men (25.5%) who agree with the statement from the women (23.2%), and amongst those more strongly confident, the gap between males (18%) and females (15.5%) is 3.3%. It seems that women are slightly (0.7%) more likely to be moderately positive, while men are more likely to provide the most positive responses. Overall, therefore, men typically are more likely to hold stronger views than women.

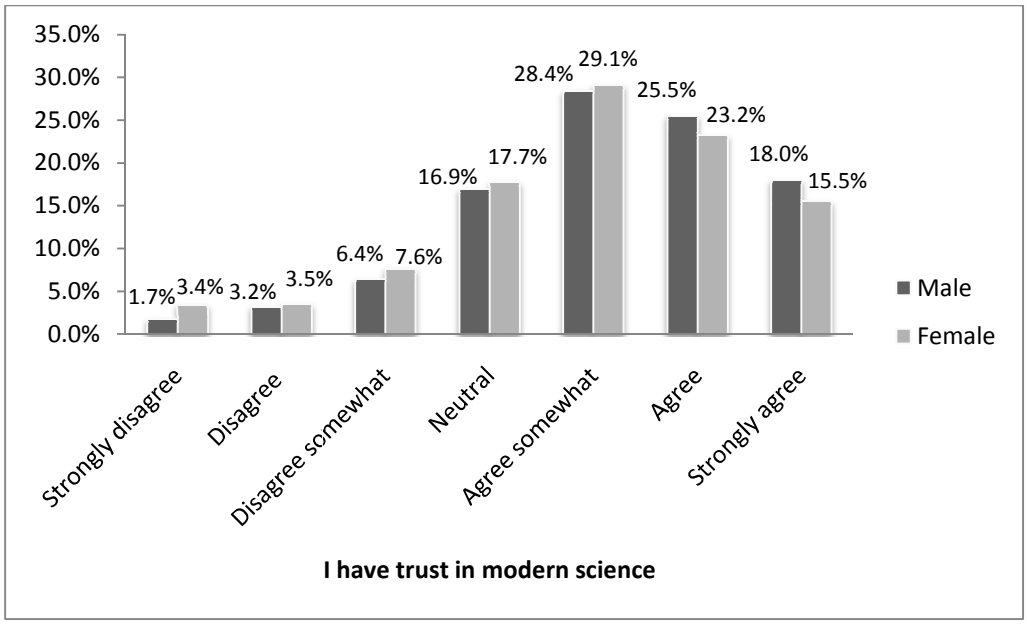

Figure 4. Trust in modern science and gender differences across Alberta

Sociodemographic Differences towards the Willingness to Pay Taxes that Address Climate Change Mitigation

Albertans' willingness to pay taxes that mitigate climate change is almost equally spread between those who agree (46.9%) and those who not (49.8%). Amongst the ones willing to pay (Figure 5 and Table 3) women are the most inclined to (51.8%), while men are more reluctant (54.9%) to pay.

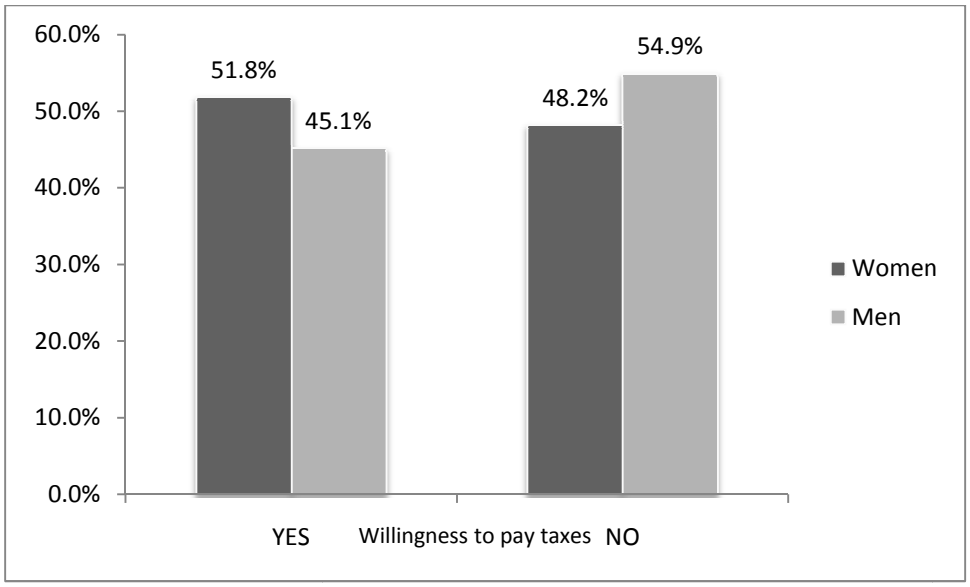

Figure 5. Differences in gender across Alberta respect to the willingness to pay a tax that addresses climate change mitigation

In terms of age differences in Alberta, the respondents who are more willing to pay an economic cost to face negative effects of climate change (Figure 6) range from 18 to 44 years old (i.e. more than 50% say "Yes"). The percentage of positive responses is almost homogeneous among the first three groups with the highest score among the youngest (57.1%). After that the percentage of affirmative responses drops down as the age increases. The lowest score for willingness to pay (39%) comes from the oldest group (65+ years old).

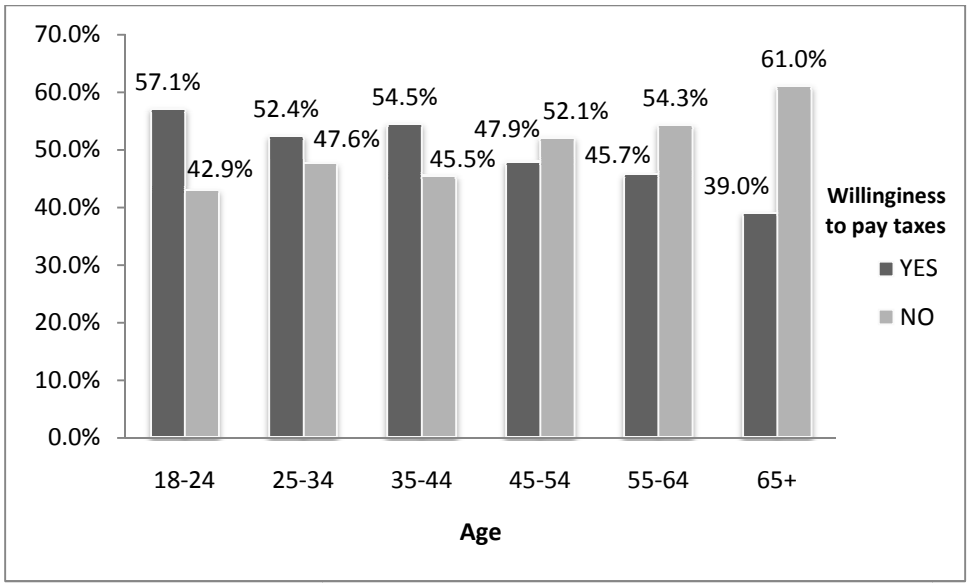

Figure 6. Differences in age across Alberta respect to the willingness to pay a tax that addresses climate change mitigation

Set of Beliefs and Dependent Variable in Comparison

In the following section I will present several cross tabulations that analyze the relationship between each belief and the dependent variable considered in this study.

Across the province of Alberta (Figure 7), only 61.2% of respondents who believe in the anthropogenic climate change are also inclined to accept (or carry some of) the economic cost of it. There seems to be a trend between these elements as, in fact, 81.6% of those who don't believe in the human cause as a major factor for recent climate change are unwilling to contribute to the economic cost of mitigating its effects.

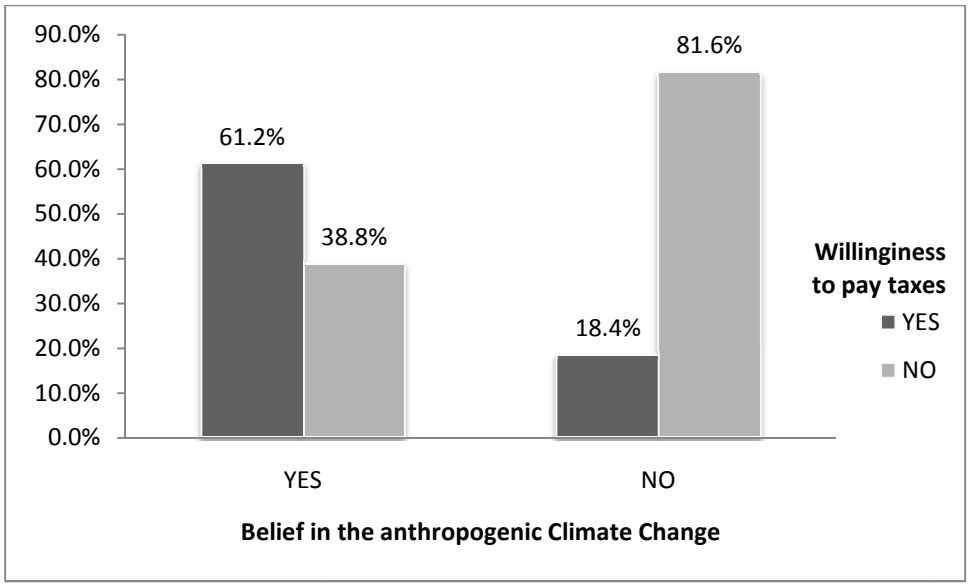

Figure 7. Willingness to pay a tax that addresses climate change mitigation and belief in the anthropogenic climate change

There is also a positive trend between belief in individual capacity to act and a willingness to pay (Figure 8). The 58.9% of those who strongly agree and 53.6% who agree on their individual capacity to address climate change are also in favour of paying a tax to mitigate it.

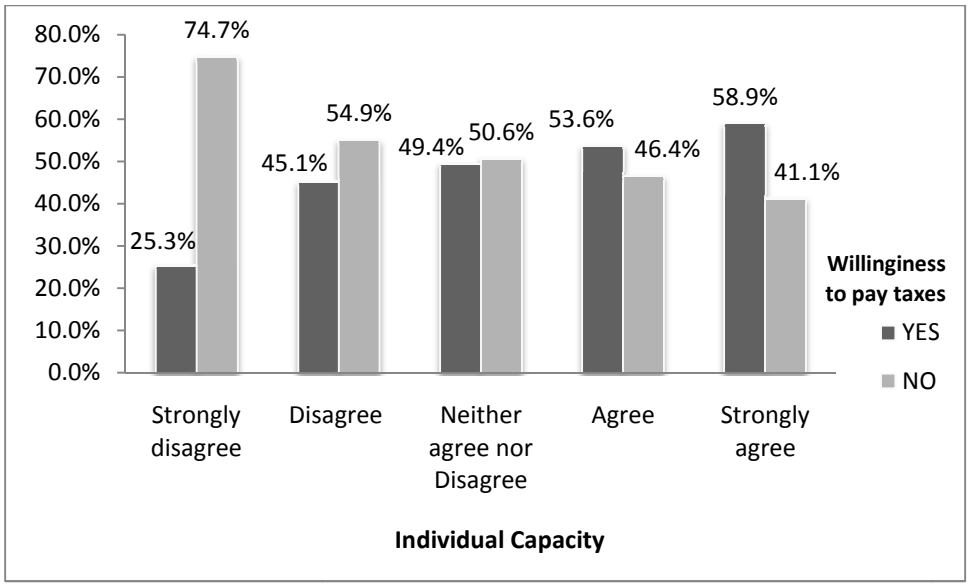

Figure 8. Willingness to pay a tax that addresses climate change mitigation and belief in individual capacity

There is also an interesting relationship between those who "strongly disagree" with paying tax and those who lack trust in science (Figure 9). For example, unwillingness to pay a tax is greatest (86.2%) in those respondents who "strongly disagree" on "trust in modern science," whereas this proportion is only 42.2% for those who are more confident in the scientific world (Strongly Agree).

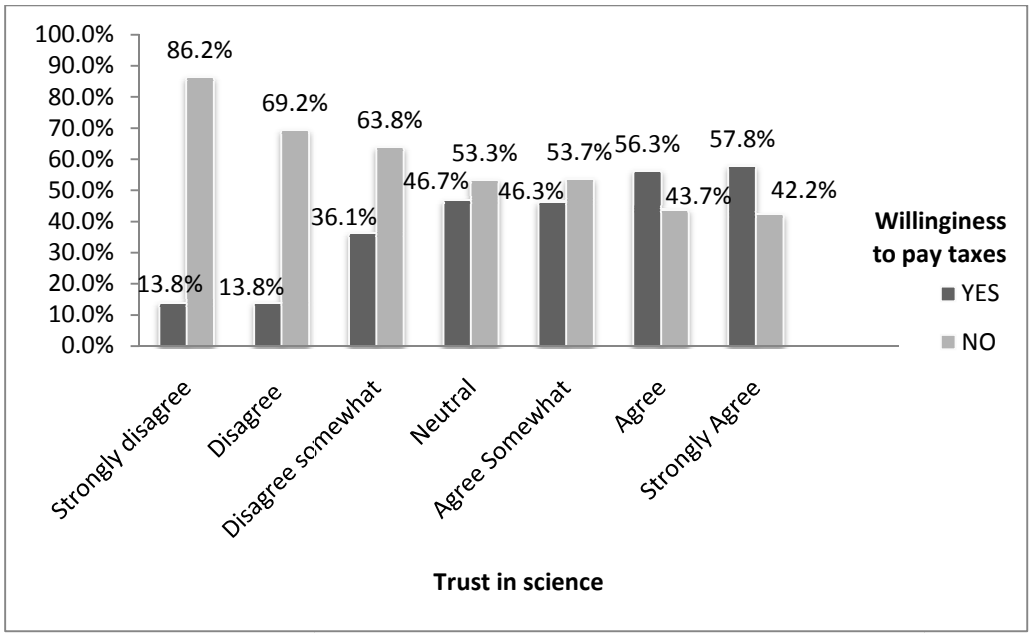

Figure 9. Willingness to pay a tax that addresses climate change mitigation and trust in modern science

Figure 8 and 9 also reveal that although there is a significant difference (49.4%) in willingness to pay between those strongly disagreeing with having a personal capacity and feeling a sense of empowerment, there is little difference across all the other groups (Figure 8). Therefore, there is a slight trend to greater willingness to pay as belief in individual capacity increases. This trend is smoother in terms of willingness to pay and trust in the role of science (Fig 9). Yet the overall outcome is similar to the previous variable with only about 58% of willingness to pay in both of those scenarios (Figure 8 and 9): 58.9% of those who "strongly agree" on their individual capacity to act vs. 57.8% of those who rely on an external agent to act as shown by trust in scientific experts.

Relationships among Beliefs

The following descriptive results provide the outcomes of several cross tabulations that analyze the relationships between the three independent variables representing the set of beliefs for this study. By observing the relationship between those who do and do not believe in modern science and in humans as the cause of climate change (Figure 10), the most significant result is that neither belief seems to interact with the other. As I stated before, by running the correlation matrix I was already aware that all of the variables used in this study are relatively independent. In fact, the following relationship (Figure 10) shows that both respondents' groups which either believe (29.3%) or do not believe (29.1%) in the anthropogenic climate change still trust modern science somewhat. A similar proportion is again found between believers (24%) and non-believers (23.3%) who trust in science. Finally, the same closeness in percentages with only a 1.1% of gap is also found amongst those who "disagree somewhat" that they trust modern science and believe in the anthropogenic climate change (6.8%), and those who do not share this belief (7.9%).

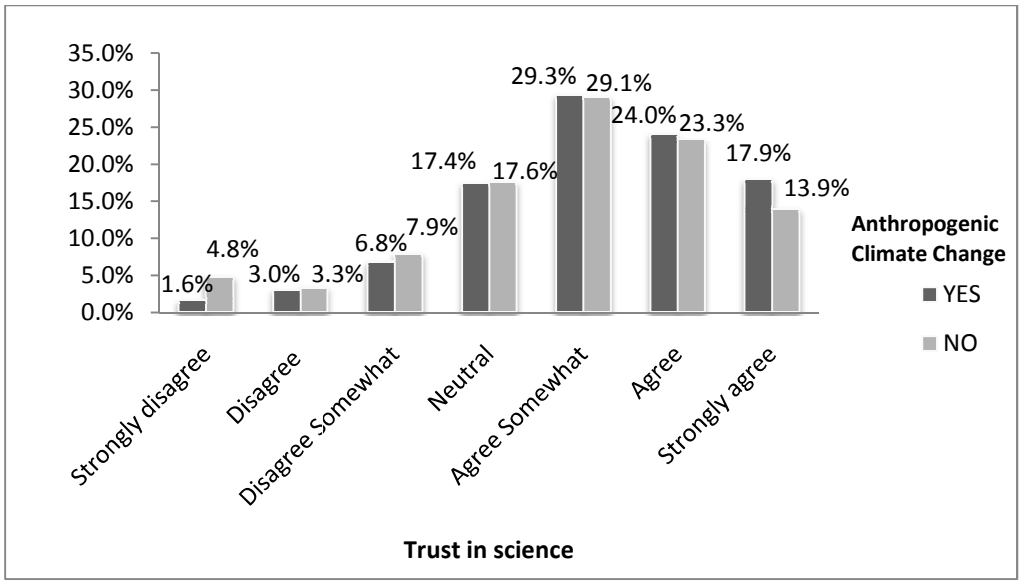

Figure 10. Belief in the anthropogenic climate change and trust in modern science

In the following set of cross tabulation (Table 6), by contrast, that considers the relationship between responses for the individual capacity and trust in modern science, it is interesting to observe that a relatively high score comes from the respondents who *strongly* believe in individual capacity and at the same time *strongly* rely on modern science (26.1%). This is at least 10% higher than the other capacity classes (13-16%). The same coincidence applies to those who "agree" (29.7%) with either statements, or who just "agree" (28.4%) on the individual capacity but are *somewhat* confident in modern science. However, the scores are not particularly different from the other individual capacity class scores. The highest score (32%) of all comes from those who are indifferent towards their personal capacity and who also agree somewhat to trust scientific experts to take care of climate-change-related issues. Again although higher it does not seem that different to any of the other classes (26.5-28.4%). The stand

out relationship is therefore for those individuals that have the strongest convictions in general. This is perhaps to be expected and may relate to Archer's four modes of reflexivity. This may be something to explore in future studies.

Table 6. Belief in individual capacity and trust in modern science

	I have the capacity to address climate change				
I have trust in modern science	Strongly disagree (%)	Disagree (%)	Neither agree nor Disagree (%)	Agree (%)	Strongly Agree (%)
Strongly disagree (%)	7.4	1.1	2.1	1.9	1.5
Disagree (%)	4.3	3.8	2.5	3.9	2.7
Disagree Somewhat (%)	10.4	7	7.1	6.8	5.3
Neutral (%)	14.7	18.4	20.7	14.5	17
Agree Somewhat (%)	28.2	27.6	32	28.4	26.5
Agree (%)	19	29.2	22	29.7	20.8
Strongly agree (%)	16	13	13.7	14.8	26.1

Finally, in this element of the analysis, 30.7% of those who believe in the anthropogenic climate change also agree they have an individual capacity to address its consequences (Figure 11). Perhaps in a similar way, 29.4% do not believe in the anthropogenic climate change and therefore they strongly disagree in their personal capacity for change, and 26.2% believe in the human cause and also "strongly agree" that they can personally do something about it.

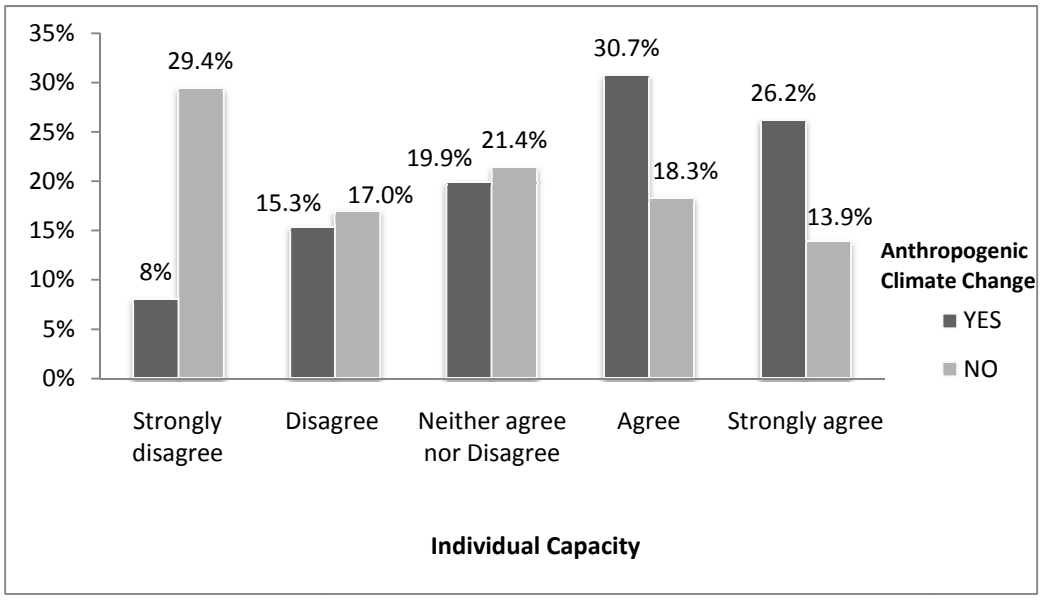

Figure 11. Belief in the anthropogenic climate change and in individual capacity

Most Relevant Social Structure Characteristics

Surprisingly, there is a very little variation (Figure 12) between people who believe and do not believe in the anthropogenic climate change throughout all levels of education in Alberta. There is no difference between believers (7.9%) and non-believers (8%) that stopped their education prior to high school; this is likewise only a 1.6% difference between those interviewed who are believers (16.8) and non-believers (18.4%) that have completed high school; and 1.7% between those believers (75.3%) and non-believers (73.6%) who have post secondary school as the highest level of education.

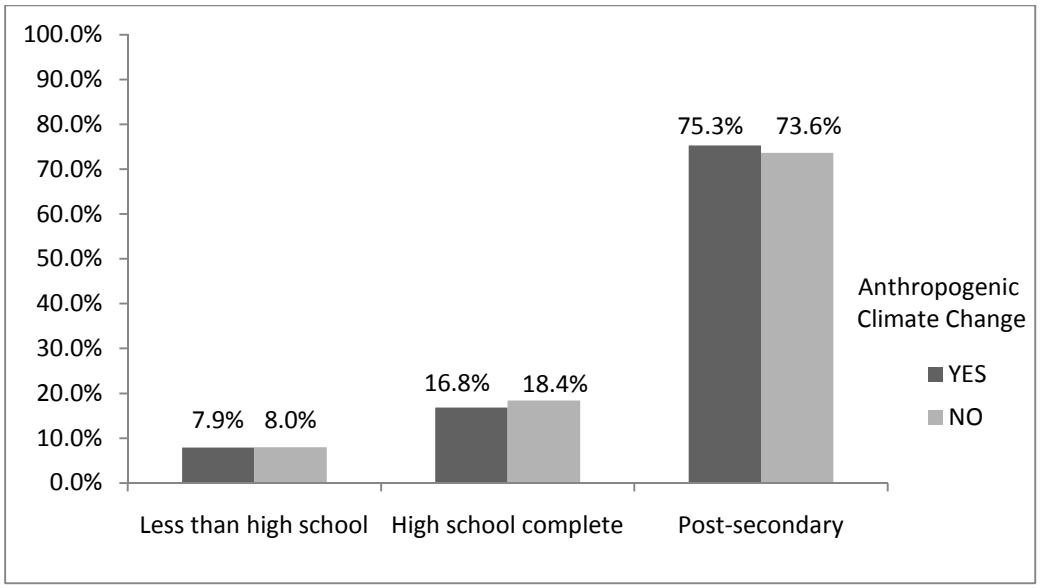

Figure 12. Levels of education and belief in the anthropogenic climate change

While there is a slight trend (Figure 13) throughout the first two levels of education with respect to political ideology, which indicate Conservative being more prominent than Liberals, such a tendency is reversed in the third group. The gap between Conservatives (73.2%) and Liberals (81.8%) that have accomplished post secondary schools is 8.6%.

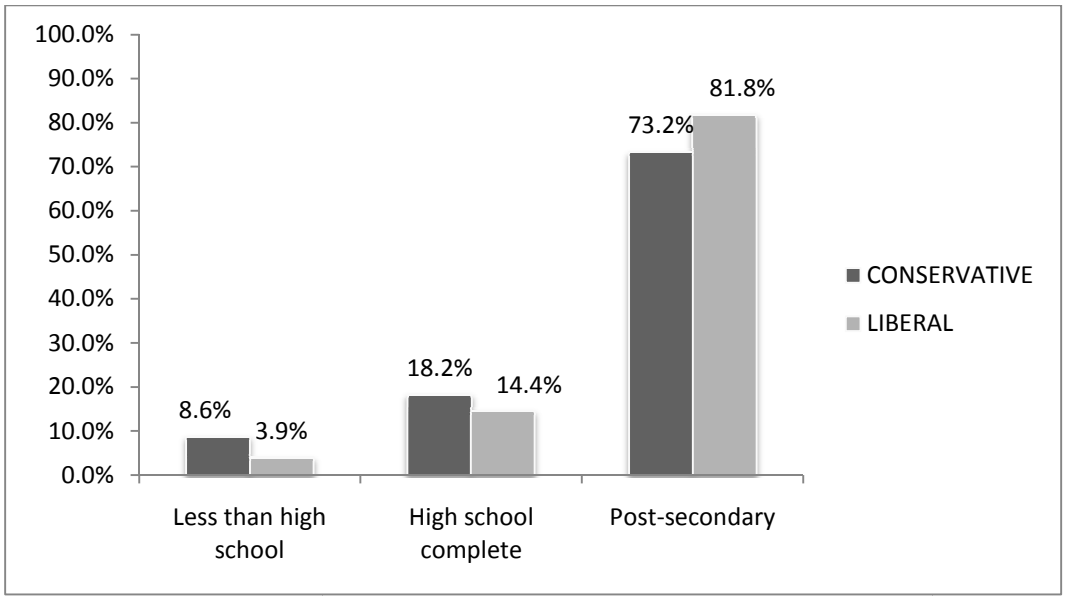

Figure 13. Levels of education and political ideology

There is a significant and interesting gap (Figure 14) between Conservative and Liberal voters (as defined here) with respect to their belief in the anthropogenic climate change. The difference between groups of Conservatives (61.1%) and Liberals (83.8%) who believe is 22.7%.

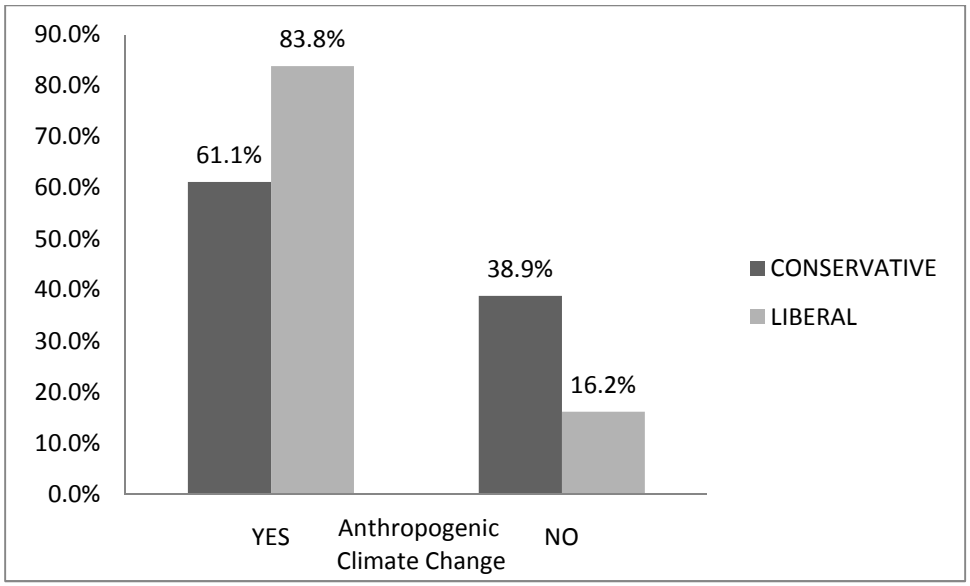

Figure 14. Political ideology and belief in anthropogenic climate change

The gap (51.6%) is also definitely large between Conservative (70.3%) and Liberals (18.7%) in the income range $70,000 to $150,000+ (Figure 15).

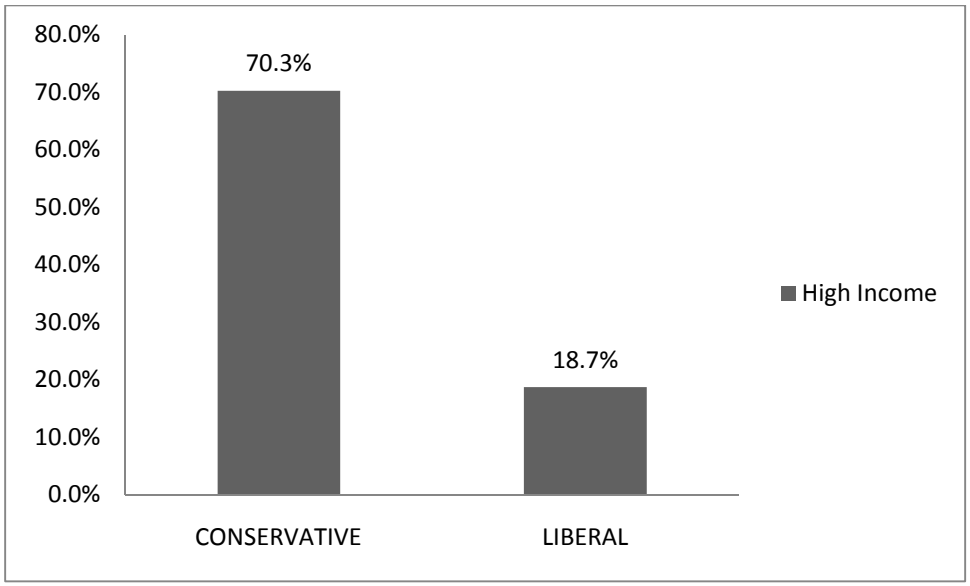

Figure 15. Political ideology and variation in high income

Another large gap (27.9%) is observed between women (15.8%) and men (43.7%) who earn a high income.

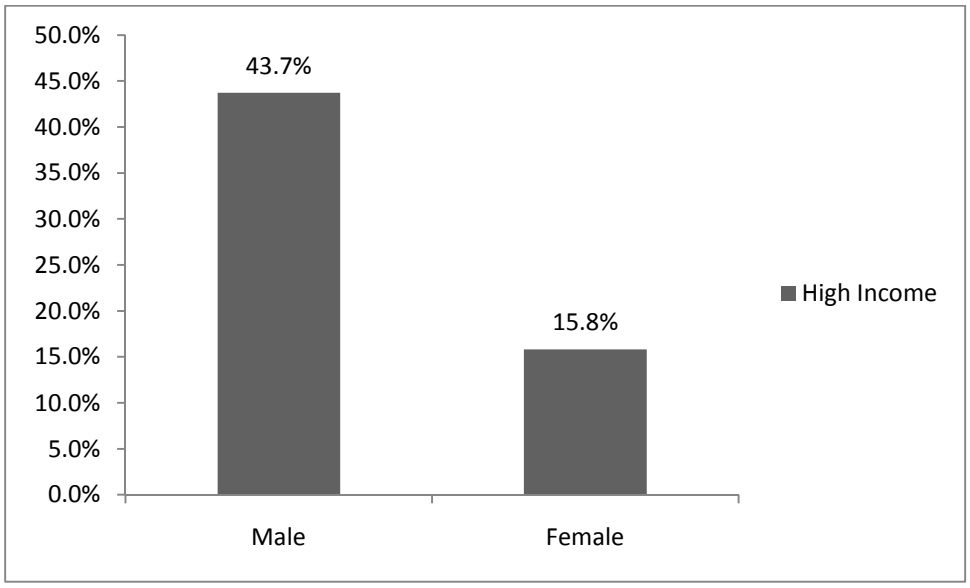

Figure 16. High income and gender differences

Statistical Analysis

Three different binary logistic regression models have been tested to show the main findings of this study. Results of the logistic regression are used to classify respondents with respect to their willingness to pay a tax that addresses climate change. The exponential coefficients -EXP(B)- represent the odds ratio predicted by the model (Table 7).

In the first bivariate logistic regression model (Table 7) the predictor variables are the set of beliefs: anthropogenic climate change, individual capacity, and trust in modern science. All three were statistically significant ($p<0.001$; $p<0.001$)

with “anthropogenic cause” having the strongest effect. Individuals who believe in the anthropogenic climate change (coded 1) are 6 times more willing to pay a tax that mitigates climate change, while for those who trust in the role of experts this willingness is only 1.3 times that of those that don’t. The final variable, “individual capacity”, which describes the personal sense of empowerment, also has a relatively low impact (1.2 times) on the dependent variable.

Predictor variables in the second bivariate logistic regression model (Table 7) are the social structures characteristics, which include sociodemographic and sociopolitical variables. The list of predictor variables includes: educational level, gender, political affiliation with regard to Liberal and Conservative views, and high income. The odds of only two variables – ‘Married’ status and political ‘Liberal Views’- have no impact (1) on willingness to pay and they are also therefore not significant. The exception is “Conservative Views” where the ratio is 0.4; those who hold such a political ideology are 0.4 times less likely to be willing to pay the tax. Of the other significant variables, people earning more money in the high income range ($70,000 - $150,000+) are 1.5 times more willing to pay a tax that addresses negative climate change effects. Age, as for married status and Liberal views, has little impact (0.9). As the education level of people grows within the three categories (less than high school; high school complete; post secondary) the odds that the respondent is willing to pay the tax are 1.4 higher. Women are 1.5 times more willing than men to pay a tax that address the negative effects of climate change.

The third binary logistic regression model (Table 7) accounts for both social-psychological and social structure characteristics. In fact, it gives a better overview of the context in which agency is embedded. It helps to understand both social-psychological and social structures forces that either constrain or enable the willingness to pay taxes to address climate change mitigation. The following factors were statically significant in the model: anthropogenic climate change, trust in modern science, levels of education, Conservative views and high income, with the first two being the most significant. Individual capacity, age, marital status, gender and Liberal views were not significant. Just as in the first model, in this third one the belief in the anthropogenic climate change has the biggest effect on the dependent variable. Someone who believes in the anthropogenic source of climate change is 5.8 times more willing to pay a tax that mitigates that change. Once again the next biggest effect, but inverted, is "Conservative views" (0.4 – equivalent to 2.5 times) which is followed by levels of Education (1.6) and Income (1.5). Being a woman or to believe in the role of science both have a smaller effect (1.3). By contrast, being married or belief in personal individual capacity have no impact (1) on willingness to pay. The same is true for those who hold a Liberal political view (0.9). Moreover, in this model, the belief in "Individual Capacity" no longer has a significant effect (0.203), and nor do the remaining variables, Age and Marital Status.

To briefly compare the three models (Table 7), where complexity has been added progressively from the first two to the third, it is worth noting how levels

of predictive probability remain overall stable. In other words, each variable in the third model does not change the explanatory power, or if it does it is in a very slight way. More specifically, the odds of the anthropogenic belief affecting willingness to pay only decrease slightly from 6 to 5.9 from model one to model three; the odds for Conservative political ideology slightly increase from model two (0.4) to model three (0.5) (meaning that there is less impact); the predicted probability for the levels of education moderately increases from model two (1.4) to model three (1.6). The odds for high income from model two to three remains 1.5; the odds for trust in modern science remain stable from model one to three (1.3); and finally, the predictive probability of women decreases from model two (1.5) to model three (1.3).

Table 7. Binary Logistic regression models: willingness to pay a tax that addresses climate change mitigation as Dependent Variable

Description	Independent Variables	Log. Regression Model(1)	Log. Regression Model (2)	Log. Regression Model (3)
Beliefs	Anthropogenic cause	6.040***		5.801***
	Individual capacity	1.156**		1.099
	Trust in modern science	1.278***		1.281***
Social structure characteristics	Age		.876*	.941
	Female		1.475*	1.286
	Married		1.033	1.036
	Education		1.416*	1.626**
	High Income		1.531*	1.511*
	Liberal views		.999	.917
	Conservative Views		.363***	.476*

Note. Significance indicated by * $p < 0.05$; **, $p < 0.01$; ***, $p < 0.001$.

Chapter 4: Discussion and Conclusions

Based on the results of the three statistical models (binary logistic regression models), it can be seen that the two biggest factors in mediating willingness to pay a tax that addresses climate change negative effects are the belief in the anthropogenic climate change (positive) and Conservative political views (negative). Several other factors influence willingness to pay a tax targeting climate change mitigation, but less dramatically; they all make a respondent between 1.2 to 1.5 times more likely to do so. This provides a clear response to the first research question I proposed in this study: *Which specific factors most strongly influence Albertans' likelihood to pay taxes that address climate change mitigation?* The strongest influence is belief in the anthropogenic nature of climate change, and this is "opposed" by a Conservative political view.

The second research question was: *In terms of demographic characteristics, what are the most important differences?* We have seen within the descriptive findings that overall in Alberta individuals who have a strong belief in the anthropogenic climate change are mostly women and young people (see Figure 1 and 2). The other factors impacting willingness to pay are income and education.

In addition, and based on the empirical findings, a wider set of implications is worth noting and it includes: the relationship between understanding climate

change causes, ethical issues of responsibility and the individuation of possible actors that can address climate change mitigation and, more broadly, that can undertake social changes.

Limitations of This Study

The first limitation of this study is related to its use of secondary data and their quality. Only two of the ten questions designed for the main topic of this study have been used here: belief in anthropogenic climate change and belief in individual capacity. The rest of the variables used to address the research questions were entirely conceived by the PRL and part of a general annual survey in Alberta. Therefore, most of the questions were either not pertinent or not accurately formulated and sometimes they were wrongly coded. Particularly the variable that accounts for the role of experts that has been used for this study –*I have trust in modern science*- is described by a very unclear statement. I have stressed before the conceptual connotation and implications of the word "modern" and I am not sure what meaning the lay people interviewed for this survey have attributed to such a statement. "Modern" in common language is an adjective that indicates something that pertains "to present and recent time; not ancient or remote" (Dictionary.com). Therefore, there is the chance that people have interpreted "modern science" as the latest brand of new technology. This would fall in that specific conviction that climate change mitigation could be

achieved by the use of what Beck refers to "linear technocracy" (Beck, 2009, p. 110). Yet, according to some specific risk literature, this concept of linear "technological fixes" is sometimes an even more problematic approach to find solutions and the source of major troubles (Perrow, 1999; Clarke, 2006; Homer-Dixon, 2001, Freudenburg, Laska, Gramling, & Erikson, 2009).

Key and Unexpected Findings

Albertans' willingness to pay taxes that mitigate climate change is almost equally spread between those who agree (46.9%) and those who do not (49.8%) to bear the expense. However, we should notice that close to a majority of Albertans is unwilling to accept the economical cost.

As I noted above the belief of anthropogenic climate change represents the strongest predictor that Albertans are willing to act to mitigate climate change through their taxes. Although the majority of respondents (67.4%) hold such a belief, there is still a relatively large number of respondents in the survey (27.8%) who disagree and 4.6% that do not know the cause or believe that climate change is not happening. Previous research has shown how an understanding of the causes is essential to engage the public so as to gain a general willingness to address climate change (for ex. Brechin, 2003; O'Connor et al., 1999; 2002; Dunlap, 1998; Kempton, 1991; 1993; Kempton, Boster, & Hartley, 1995). More broadly, it is important to adapt to the negative consequences of climate change (Adger et al., 2009). In this area of environmental sociology, the interpretation of

specific actions such as willingness to pay taxes that address climate change mitigation is not always straightforward. In fact, as previous researchers have found in the USA, public attitudes towards climate change are sometimes contradictory (Sterman, & Sweeney, 2007, Leiserowitz, 2003; 2006; 2007; Lorenzoni, Nicholson-Coleb, & Whitmarsh, 2007). Although, within the descriptive findings, two thirds of Albertans (67.4%) believe that human activity is the major cause of recent climate change, nearly half of them (49.8%) are not willing to pay taxes that mitigate climate change. Those findings are consistent with the stream of research on policy support that have found a general public resistance towards mitigation policies that involve a personal economic cost (Dietz et al., 2007; O'Connor et al., 2002; Leiserowitz, 2003; Leiserowitz et al., 2009; Sterman & Sweeney, 2007; Brewer, 2005) or lifestyle changes (Bord & O'Connor, 1998; O'Connor et al., 2002; Dietz et al., 2007; Lorenzoni et al., 2007).

As I stated in the previous sections we cannot expect the same predictive power, mostly within demographic characteristics, in the findings related to general environmental concerns as in those concerning climate change issues. Moreover, the findings from the descriptive analysis are not consistent with the findings from the binary logistic regression. Nonetheless, in this study the descriptive results show some similarities with other environmental literature findings for age and gender (for example, Davidson & Freudenburg, 1996; Davidson & Haan, in press; Stedman, 2004; O'Connor et al., 2002; Dietz, 2007) or the differences are just small. In fact, in Alberta, the descriptive findings indicate that women

are more likely to pay than men and they are more inclined to believe in the anthropogenic climate change. By contrast, older people are more reluctant to pay than younger generations and overall their belief in anthropogenic climate change is more moderate (see Figure 2). However, within the third binary logistic model (Table 7), age has no predictive power (0.9) with respect to the dependent variable, and being a woman limits the odds of willingness to pay taxes that mitigate climate change to just 1.3. An overall explanation for this demographic difference can be related to caring about future generations. While women are more inclined to such a feeling, older people tend to think more about their near future than on longer term issues (Fingerman & Perlmutter, 1995 as cited in Dietz et al., 2007, p. 189). As a consequence, "individuals who think about long-term consequences of actions are also likely to be aware of the consequences of global warming and have a personal normative belief to act" (Dietz et al., 2007, p. 189).

Education in the literature has an intermediate predictive value since it is collinear with income and status. For example, it is sometimes an indicator of "openness-to-change" (Dietz et al., 2007, p. 205) but not policy support; while, sometimes it is particularly important for support (O'Connor et al., 1999; 2002; Tjernstrom & Tietenberg, 2008). In this study the level of education is the third best predictor for willingness to pay (although only slightly more than income). As we have previously seen, with respect to the belief in the human cause of climate change, levels of education are not relevant, and political ideology too.

The most relevant outcome of the descriptive findings is the slight reversed gap (8.6%) between Conservatives (73.2%) and Liberals (81.8%) that have completed post-secondary schooling with respect to the other two levels of schooling. Therefore, connecting some dots it is relevant to notice how the odds with respect to level of education are 1.6 times positively affecting willingness to pay, but 0.5 negatively in the case of Conservatives (or 2 times less likely) and zero in the case of Liberals.

Although the majority of people believe in an *ecological domain* (Davidson & Haan, in press; Stedman, 2004) and "liberal" statements such as those affirming anthropogenic climate change, their willingness to pay resembles more "Conservative view" and "economic domain" positions. This is due not only to the fact that the majority of people that are Conservatives (49.1%) and not Liberals (14.9%)[4], but also to a generalized reluctance towards this kind of action, as verified by major findings in the literature (Dietz et al., 2007; O'Connor et al., 1999; 2002; Leiserowitz, 2003; Leiserowitz et al., 2009; Sterman & Sweeney, 2007; Brewer, 2005; Bord & O'Connor, 1998; Lorenzoni et al., 2007). This effect has been previously found in Alberta (Davidson & Haan, in press), that is the same predictive strength for political ideology that can be compared with a decade of trends in the USA (Dunlap, 2008; Leiserowitz et al., 2009). Also in the USA Conservatives are more reluctant to believe in anthropogenic climate

[4] Other respondents included supporters of the New Democratic Party (4.2%), Green Party (3.4%) and Others (0.9%), while 4.6% would not vote. 22.9% of responses are missing values.

change and to take consequent measures to address it than Liberals. Such a political ideological gap has been attributed in the USA to the American Conservative movement and, for example, its constant actions of censuring and spin doctoring the "impact science" (McCright & Dunlap, 2010, p. 104). In this respect, Alberta is one of the rare representative democratic regions where the same political party, Conservative, has been in power for several decades (since 1971). Moreover, in this study the high income variable is an important predictor that represents taxpayers inclined to pay the climate change mitigation cost. The descriptive results show that a high percentage (70.3%) of high income people is Conservative in Alberta though.

The fact that belief in anthropogenic climate change has the highest odds with respect to willingness to pay a tax that addresses climate change could suggest that some Albertans are perhaps showing signs of increasing skepticism regarding certain facts of the Dominant Social Paradigm, particularly the belief that humans are exempt from Nature. On the other hand, Albertans have sustained a high level of reliance on dominant institutions such as Science to solve emerging problems. In other words, the shift is from what I have previously indicated as "economic domain" into the ecological one. As Dietz et al. (2007) state, "the DSP reflects beliefs in progress and development, science and technology, and a laissez-faire economy, all in forms that do not give much weight to environmental protection" (p. 189). For such a reason Alberta is an interesting region to study the interaction among those worldview domains and

the negative outcomes of its very preponderant natural resources extractive economy.

As I have explained before, in the current period which Beck calls late modernity, uncertainty is widespread. In fact, he states that the three pillars of security-state, science and the economy - are crumbling (Beck, 2009). Therefore, together with scientific authority, the related role of experts, and production of knowledge is becoming more questionable and it is shifting more onto lay people. Interestingly, however, it seems that in Alberta trust in the role of science and its experts as agents that can better address climate change mitigation counts more than the belief in individual capacity in predicting willingness to pay taxes. I want one more time to stress that the question in the survey that addresses the role of science is ambiguous. Having said that, I would interpret the results by relating the question to the role of science and scientific experts as external agents with respect to the individual sphere of action. I have explained that, as a generalized outcome of "modernity", experts represent scientific authority and for this reason are called on by the public and then politicians to find solutions and certainties about climate change issues. It seems from the findings in Alberta that the public relies more on them than on their own individual capacity. It is important to note its predictive relevance in the model, even if it is not extremely high, because, as I said previously, the modernity project is based on a *workshop of certainty* (Beck, 2009, p. 217) and this represents that *anthropogenic factor* which has currently evolved into a

source, among others, of current climate change. Therefore, it seems that Albertans are again looking for certainty of causes and solutions from the scientific world. This is because science is the one agent that people feel or hope will find that *certain* "technological fix" to address climate change mitigation. In fact, as can be seen from the descriptive results people that trust modern science are almost equally split in those that believe or not in the concept of anthropogenic climate change (Figure10). As a consequence, it seems really challenging to break that modernity loop which, for instance, makes people look for the, conceptually same, linear solutions that have been the source of the problem itself. In fact, even if people in late modernity are acknowledging its negative aspects (anthropogenic climate change) and they are self-critiquing (reflexive modernization), they are still caught in a mechanism that makes them rely on the authority of science and its positivistic language to take action. Moreover, as Hulme (2009) states, it really seems that people have reached a point where "science is being used to justify claims not merely about how the world is ([…] 'positive' statements), but about what is or is not desirable – about how the world *should* be ('normative statements)" (p. 74). This thought can fall into the overarching discourse around the idea of climate change that regardless of the scientific connotations and debates is already affecting our social world, and it is becoming an ethical issue of 'individual moral responsibility'. As I introduced in Chapter 1, Hulme (2009) once again underlines how climate

change is “far from being a simple problem of science […] or of economics […] can only be grasped through appreciation of its ethical dimensions. (p. 174)

Similarly, Bauman (1993) underlines that in the current postmodern phase, it is impossible to have a universal ethical code where universal values are realized by legislative means through universal laws. Instead, he insists on a conception of individual moral responsibility within a world of cultural relativity and uncertainty. Therefore, this broader analytical reorientation towards a study of complex human subjectivity points out the importance of individuating *meta-reflexive* agents characterized by their value oriented feature and preoccupied by moral issues (Archer, 2007). In this regard, this study presents some unexpected findings. In fact, the individual capacity, that was intended to approximate that ethical dimension as sense of empowerment, is neither significant or a good predictor of probability for willingness to pay. One explanation that comes from the descriptive analysis could be that those people who believe in their personal sense of empowerment rely less on this kind of economic measure to address climate change mitigation. Another possible reason is that instead of taking personal responsibility they externalize it (e.g. to scientific experts, government institutions, market economy, and advance technology). Indeed, “externalizing responsibility and blame” is what Lorenzoni et al. (2007, p. 450) has listed as being one ‘perceived barrier to engagement for climate change’.

However, something more about the descriptive findings is worthy of note. Women are more willing than men to pay taxes even though they represent only 15.8% of the high-income population in the sample. However, when we study women as a social factor variable within the third logistic regression model (Table 7), their likeliness to pay accounts just for 1.3 times in respect to men. This could suggest that women *care* about climate change issues more than men, in other words they are more likely to hold a belief system that supports willingness to pay a mitigation tax, among other things. This agrees with all of the studies on gender and environmental concern that I have previously discussed within the literature review. Moreover, I have illustrated how Archer views individual personal identity as aligned with social identity through practices that she calls *modus vivendi* (Archer, 2007, p. 88). In particular, the personal identity is defined by the unique constellation of concerns. Therefore, since the critical thinkers or meta-reflexives are value-oriented, "they cannot divorce questions of doing and being from one another" (Archer, 2007, p. 131). This is what I have paraphrased as: *I care, therefore I am, and therefore I do*. The descriptive findings could suggest that women represent that "fund of potentials" (Archer, 2007, p. 314) of human subjectivity that constitutes meta-reflexive individuals. In fact, the descriptive findings suggest that the majority of women (54.3%) have more of a sense of empowerment, as compared to a minority of men (44.3%).

Overall, the study of the engagement to act with climate change is part of what I have been describing before as the study of structure and agency. However, we have seen how the complexity of the topic of climate change and the difficulty of connecting it with people's actions to mitigate it has to deal with a certain embeddedness in social-psychological and social structure contexts. Therefore, this confirms how people's agency does not result from a linear pattern of causality. As a consequence, the mediating role of *reflexivity* through internal conversations between structure and agency is certainly somehow operating. Therefore, future studies should try to account for such a dimension. It would be particularly interesting to focus on searching in society for those meta-reflexives inclined to act for social change. Political activists and critical thinkers, people with high moral commitment who engage themselves on the front line, either as citizens or consumers, are required to take responsibility and actions to address climate change issues. This is why future research should find new ways to address individual capacity and the related sense of empowerment together with other beliefs and ideologies that I have in part used for this study (e.g. political ideology, trust in the role of experts, and of religious belief). In this respect, it would be interesting to subdivide this set of beliefs into two main categories: one that accounts for the "individual capacity" and a second group that account for the rest. This is because, regardless of the kind of belief, the second group characterizes people who rely on external agents, either transcendental, scientific experts, or institutional bodies, to take actions that

mitigate climate change while the first belief rely on individuals and their self-efficacy.

In the work of Dietz et al. (2007), political affiliation, which this study revealed to be the second most relevant predictor after the one of belief in anthropogenic climate change, is listed within the social structure characteristics. As I have stated, for the analytical part of this study I have followed this repartition. However, I have related the variable of political affiliation to Liberal and Conservatives worldviews. I did it so as to anticipate a conceptual distinction I care to make here. The concept of *Ideology* has mainly been framed within its political connotation since its first formulation by Marx (1998). In particular, Marxist critical analysis of the concept of ideology was based on social class and power relationship and later extended to the idea of hegemony. At this point I won't enter in much detail on the connotation of ideology, but I would like to claim to expand its definition. In my opinion, political ideology should be redefined within the system of beliefs and worldviews. This is because the institutionalized role of political parties, and their consequent individual affiliation, is crumbling as part of those social pillars of "modernity" – e.g. state, science, and family. In my opinion political ideology does not pertain anymore to those social structure characteristics such as, for instance, income and gender. Political ideology encompasses a grand set of ideas, worldviews that go beyond conventional political party affiliation and that can be used as a strong predictor, as I have shown in this study, in conjunction with the belief system. Moreover,

political ideology should also be freed from its social structure embeddedness in light of the *idea* of climate change as intended by Hulme (2009; 2010). I have stated more than once how climate change is an idea that carries the anthropogenic characteristic of its atmospheric manifestation. This opens up, on the one hand, to issues of moral individual responsibility, and on the other, to the need to look for specific agents such as the meta-reflexives who carry a high moral commitment. According to Archer they are the "spearheading [for] the reconstitution of civil society on the basis neither of power relations nor of exchange relations but upon 'free giving as the motor of reciprocity' " (Donati, 2003, pp. 243-72, cited in Archer, 2007, p. 313). Once again, to better study those individuals it is important to account for an ideological and political dimension free from power relations. On the other hand, and according to Hulme (2010), the idea of climate change is "altering our social worlds" (Hulme, 2009, p. xxviii) and it is performing the *cosmopolitanism* that Beck refers to (2006). Therefore, there is a need for indicators that account more for this shifting dimension from modernity structures to more boundless and ideological ones that characterize cosmopolitanism. Moreover, a cosmopolitan perspective "offers a way of asking 'What can climate change do for us?' rather than 'What can we do for climate change?'" Therefore, the term 'ideology' should have a more overarching significance than the one attributed to it until now. Moreover, to account for the research question presented by Hulme, the *ideology of climate change,* not only as anthropogenic belief or belief in its existence, should

be studied less as a dependent variable and more as a social-psychological characteristic that influences the other contexts including political ideological factors.

This study has tried to stretch its secondary dataset as much as possible in order to account for either the human subjectivity dimensions as stated by Archer, the ideological one around beliefs and the social structures characteristics. In fact, if we read the results from a cosmopolitan perspective, we see how ideology in its broad sense triumphed in scoring the most important odds for willingness to pay taxes that address climate change mitigation. From this point of view this study is consistent with that mainstream literature whose findings stress the role of personal values, beliefs, norms and worldviews (e.g. Stern & Dietz, 1994; Stern et al., 1993; 1995; Dietz et al., 1998, 2005; 2007) as preeminent over social structure characteristics in shaping environmental concerns and consequent pro-environmental actions.

According to this case study in Alberta the anthropogenic *source* of climate change should be made clearer but definitely not by searching for that *chimera* of scientific certainty. Normative statements too should come back to the individual level and leave that of the scientific world. People and governmental decision-makers should learn the lesson that climate change is teaching: “the future is irredeemably precarious and beyond all our efforts of prediction and control” (Hulme, 2010, p. 274). Therefore, we should accept uncertainty as the

new paradigm for adaptation. In fact, we are experiencing a shift from linear to non-linear thinking, which means from predictability to probability and from risk to uncertain society (Georgescu-Roegen, 1999). This is also why the methodology of this study stresses the importance of probability through the odds ratio with respect to the predictive indicators of OLS. Finally, this is also why this study is about how to find human potentials within society that can help to cope with the idea of climate change.

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Appendix: 2008 Alberta Survey

2008 ALBERTA SURVEY

QUESTIONNAIRE-CODEBOOK

Population Research Laboratory

Department of Sociology

University of Alberta

July 2008

Intro1

Hello, my name is _____. I'm calling (long distance) from the University of Alberta.

Have I dialed XXX-XXXX? Just to let you know, your phone number was randomly selected.

Hello, I am calling back from the Population Research Laboratory at the University of Alberta to continue an interview that we started previously.

Intro2

The Population Research Laboratory at the University is conducting a public opinion survey of Albertans. The study is being done on behalf of a variety of researchers. We'd like you to know that your input is valuable to this project. It will assist researchers to develop public policies and understand issues that affect our lives.

(OPTIONAL READ): The topics range from physical and lifestyle activities, to voting behaviour, genetic testing, youth participation in the labour market, climate change issues, risk behaviour in teenagers, avian flu, and nanotechnology.

(OPTIONAL READ): The study sponsors are: the Alberta Centre for Active Living**,** a government agency, the Centre for Work and Community Studies at Athabasca University, the Health Law Institute, two departments from the University of Alberta (Sociology and Rural Economy) and the Population Research Laboratory.

Intro3

The interview will take about 25 minutes. Is this a good time for me to continue?

1 YES [Press '1' to go to next screen]
NO [Esc to first screen, control-end, and add appropriate disposition]

NUMWOM

Before we start the interview, we need to make sure that we speak to an equal number of men and women. Can you please tell me…

How many women aged 18 or over live at this number?

____ Number of women

99 Refused [DO NOT READ]

NUMMEN

And how many men aged 18 and over live at this number?

____ Number of men

99 Refused [DO NOT READ]

[IF NO ONE 18 YEARS OR OLDER LIVES IN THE HOUSEHOLD, TERMINATE THE INTERVIEW. SELECT A HOUSEHOLD RESPONDENT ACCORDING TO THE STANDARDIZED RESPONDENT SELECTION GUIDELINES]

(OPTIONAL READ: "We don't always speak to the person who answers the phone. If possible, we would like to speak to an adult member of the household who is 18 years or older. May I speak to the male/female who is available? (Repeat intro if necessary)).

[Schedule callback if not available].

VERIFY18

And just to confirm, are you 18 years of age or older?

1 Yes, 18 years or older.
2 No, Underage.

(Ask to speak to ADULT member of household)

(OPTIONAL READ: We don't always speak to the person who answers the phone. For this interview, I would like to speak to an adult member of the household who is 18 years or older. May I speak to the male/female who is available?)

(Repeat intro if necessary)

Intro4

May we start the interview now?

1 YES [Press '1' to go to next screen]
NO [Esc to first screen, control-end, and add appropriate disposition]

[NOTE: CELL PHONES - If the person is on a cell phone, continue if he/she says it is okay. If they provide you with another number they would like you to call instead, record the new number in message line and schedule callback.]

FOIPP

I would like to assure you that your participation in this interview is completely voluntary. If there are any questions you don't wish to answer, please point these out to me and we'll go on to the next question. You, of course, have the right to end this phone call at any time.

The information you provide will be used only for the indicated purposes in conformity with the Alberta Freedom of Information and Protection of Privacy (FOIPP) Act.

If you have any questions about this study, you can call Janet Ngo, the Research Coordinator, at the Population Research Lab (collect) at (780) 492-4659, extension 228.

SEX1

RECORD GENDER OF RESPONDENT (IF NOT SURE, PLEASE ASK)

1 Male
2 Female

TIME

[Interviewer note: Start timing now]

CLIMATE CHANGE

I1

These next set of questions are about climate change.

Do you believe that human activity is a major cause of recent climate change?

1 Yes
2 No

3 I don't believe that the climate is changing [DO NOT READ]
[SKIP TO I8]
0 Don't know [DO NOT READ]
-1 No Response/Refused [DO NOT READ]

I2

Studies have shown that climate change is linked to greenhouse gases. In your opinion, what has been the largest human factor contributing to increasing greenhouse gas emissions?

[READ RESPONSE CATEGORIES; SELECT ONE]

1 Increased multi-national corporate influence
2 Consumption patterns in developed countries
3 Population growth in developing countries
4 Political leadership

5 None of the above [DO NOT READ]
0 Don't know [DO NOT READ]
-1 No response/Refused
[DO NOT READ]
-5 NA-Don't believe that the climate is changing. [DO NOT READ]

I3

The next few questions relate to the capacity of different governing bodies. (Capacity meaning the means to be effective)

(DEFINITION OF "CAPACITY": the means to be effective. NOT whether or not the government will/would do anything about climate change)

Using a scale from 1 to 5, where 1 means 'strongly disagree' and 5 means 'strongly agree', please indicate how much you agree with the following statements:

...I am confident that the FEDERAL government has the capacity to address climate change.

1 Strongly disagree
2 Disagree
3 Neither agree nor disagree
4 Agree
5 Strongly agree

6 I do not believe that is the responsibility of the federal government [DO NOT READ]
0 Don't know [DO NOT READ]
-1 No response/Refused [DO NOT READ]
-5 NA-Don't believe that the climate is changing.

I4

(Using a scale from 1 to 5, where 1 means 'strongly disagree' and 5 means 'strongly agree', please tell me how much you agree with the statement)

...I believe that the PROVINCIAL government has the capacity to address climate change.

1 Strongly disagree
2 Disagree
3 Neither agree nor disagree
4 Agree
5 Strongly agree

6 I do not believe that is the responsibility of the provincial government [DO NOT READ]
0 Don't know [DO NOT READ]
-1 No response/Refused [DO NOT READ]

-5 NA-Don’t believe that the climate is changing.

I5

(Using a scale from 1 to 5, where 1 means 'strongly disagree' and 5 means 'strongly agree', please tell me how much you agree with the statement)

...I feel that the MUNICIPAL government has the capacity to address climate change

1 Strongly disagree
2 Disagree
3 Neither agree nor disagree
4 Agree
5 Strongly agree

6 I do not believe that is the responsibility of the municipal government [DO NOT READ]
0 Don't know [DO NOT READ]
-1 No response/Refused [DO NOT READ]
-5 NA-Don’t believe that the climate is changing.

I6

(Using a scale from 1 to 5, where 1 means 'strongly disagree' and 5 means 'strongly agree', please tell me how much you agree with the statement)

...I have the capacity to address climate change

1 Strongly disagree
2 Disagree
3 Neither agree nor disagree
4 Agree
5 Strongly agree

6 I do not believe that is my responsibility to address climate change [DO NOT READ]
0 Don't know [DO NOT READ]

-1 No response/Refused
[DO NOT READ]
-5 NA-Don’t believe that the climate is changing.

I7

Would you be willing to pay a tax if it were used to address the negative effects of climate change?

1 Yes
2 No

0 Don't know [DO NOT READ]
-1 No Response/Refused [DO NOT READ]
-5 NA-Don’t believe that the climate is changing.

I8

Research has shown that climate change is likely to cause more frequent and intensive weather-related events. The following two questions relate to your community's capacity to cope with weather related disasters or crises.

Using a scale from 1 to 5, where 1 means 'strongly disagree' and 5 means 'strongly agree', please tell me how much you agree with the statements...

...In the event of a major disaster, I believe there are strong leaders in my community who would act in the best interest of citizens.

1 Strongly disagree
2 Disagree
3 Neither agree nor disagree
4 Agree
5 Strongly agree

0 Don't know [DO NOT READ]
-1 No Response/Refused [DO NOT READ]

I9

(Using a scale from 1 to 5, where 1 means 'strongly disagree' and 5 means 'strongly agree', please tell me how much you agree with the statement...)

...A natural disaster or crisis affecting the community in which I live would bring community members together.

1 Strongly disagree
2 Disagree
3 Neither agree nor disagree
4 Agree
5 Strongly agree

0 Don't know [DO NOT READ]
-1 No Response/Refused [DO NOT READ]

I10

Are you aware of any organizations that address environmental issues in your community?

1 Yes
2 No

0 Don't know [DO NOT READ]
-1 No Response/Refused [DO NOT READ]

I11

Which of the following sources of information about climate change do you believe to be the MOST reliable? [READ; SELECT ONE]

1 National media (e.g., television, newspapers)
2 Local media (e.g., television, newspapers)
3 My personal experience and/or the experiences of people I know
4 Scientists/University researchers
5 Federal or provincial government agencies
6 Environmental Organizations
7 International bodies like the United Nations
8 Industry/Industries

9 None of the above [DO NOT READ]
0 Don't know [DO NOT READ]

-1 No Response/Refused [DO NOT READ]

DEMOGRAPHICS

K1a

The next questions will give us a better picture of the Albertans who took part in this study. The first questions are about employment.

Do you presently have a paid job or are you self employed?

1	Yes, paid job	(SKIP TO K1d)
2	Yes, self employed	(SKIP TO K1d)
3	Yes, paid job & self employed	(SKIP TO K1d)
4	No, neither	(CONTINUE TO K1b)
0	No Response [DO NOT READ]	(SKIP TO K2a)

K1b

Are you currently unemployed, that is, out of work and LOOKING for work?

1	Yes	(SKIP TO K2a)
2	No	(SKIP TO K1c)
0	No Response [DO NOT READ]	(SKIP TO K2a)
-5	NA-Have paid work	

K1c

Are you retired?

1	Yes	(SKIP TO K2a)
2	No	(SKIP TO K2a)
0	No Response [DO NOT READ]	(SKIP TO K2a)
-4	NA-Looking for work	
-5	NA-Have paid work	

K1d

Are you employed full-time?

1 Yes
2 No

0 No Response [DO NOT READ]
-5 NA-Not working for pay
-6 NA-No response to K1a

K1e

Are you (also) employed part-time?

1 Yes
2 No

0 No Response [DO NOT READ]
-5 NA- Not working for pay
-6 NA-No response to K1a

K2a

(The responses of K2a to K2c were coded into **WORK** and **KINDUSTRY**. See Appendix A, B for categories)

What kind of work do/did you normally do? That is, what is/was your job title?

[PUT SPECIFIC OCCUPATION, e.g. (noun) elementary school teacher, not just teaching or teacher]

Interviewer notes:

1. DO NOT LEAVE BLANK! Probe if needed.

2. If the respondent has NEVER worked in a paid job in his/her lifetime, type in response, e.g. Student never worked or Homemaker never worked.

3. If respondent has more than one job, ask about the job that they work the most hours in.

K2b

What does/did that job involve?
[Describe using VERB, e.g., teaching grade 3 and 4 students, not just teach]
[OPEN ENDED]

Interviewer note: DO NOT LEAVE BLANK!

K2c

What kind of business or organization do/did you work for? What does/did your employer do or make?

[NOTE e.g. elementary school (noun) or educates elementary school children (verb)]

[NOTE: If "self-employed", we still need to know the specific type of business, sector or industry].

Interviewer note: DO NOT LEAVE BLANK!

K3a

Including yourself, how many ADULTS live at this number (related to you or not)?

_____ # Adults (18+)

99 No Response [SKIP TO AGE]

K3b

...and how many CHILDREN under the age of 18 (live at this number)?

_____ # Children (Under 18) [SKIP TO AGE]

99 No Response

-5 No Response to K3a

K3c

That is a total of ___ people in the household, right?

[Interviewer note: enter the total number of people.]

-5 No Response to K3a, K3b

AGE

What is your age?

_____ YEARS OLD (18-110)

-1 No Response

AGEX

Age Grouped (Computed Variable)

1 18-24
2 25-34
3 35-44
4 45-54
5 55-64
6 65 and over

-1 No Response

K5a

What is your CURRENT marital status?

1 Never Married (Single) (SKIP TO K6)
2 Married (SKIP TO K6)

3 Common-Law Relationship/Live-In Partner (CONTINUE TO K5b)
4 Divorced (SKIP TO K6)
5 Separated (SKIP TO K6)
6 Widowed (SKIP TO K6)

0 No Response (SKIP TO K6)

K5b

What was your marital status before your present relationship? Were you…

1 Never Married (Single)
2 Married
3 Common-Law Relationship/Live-In Partner
4 Divorced
5 Separated
6 Widowed

0 No response
-5 NA-Not in common-law relationship

K6

What is your highest level of education?
(This includes complete and incomplete.) [DO NOT READ]

1 NO SCHOOLING
(SKIP TO K8a)

ELEMENTARY
2 Incomplete
3 Complete

JUNIOR HIGH
4 Incomplete
5 Complete

HIGH SCHOOL

6 Incomplete
7 Complete

COLLEGE/TECHNICAL INSTITUTE (non-University)

8 Incomplete
9 Complete

UNIVERSITY

10 Incomplete
11 Diploma/certificate (e.g. hygienists)
12 Bachelor's Degree
13 Professional Degree (vets, doctors, dentists, lawyers).
14 Master's Degree
15 Doctorate

0 No Response
(SKIP TO K8a)

K6GROUP

Education Grouped (Computed Variable)

1 Less than High School
2 High School Complete
3 Post-Secondary

0 No Response

K7

In total, how many years of schooling do you have? (This includes the total of grade school, high school, vocational, technical, and university.)

_____ Years of Schooling

98 No Response
-5 No schooling
-6 No response to K6

K8a

What is your religion, if any? (Probe with categories if needed)

1 No Religion (Including agnostic and atheist)
2 Anglican
3 Baptist
4 Greek/Ukrainian Orthodox
5 Jewish
6 Lutheran
7 Mennonite
8 Latter Day Saints (Mormon)
9 Pentecostal
10 Presbyterian
11 Roman Catholic
12 Ukrainian Catholic (Including Greek Catholic)
13 United Church
14 Sunni (Sunni Islam)
15 Shiite (Shi'a Islam)

16 Protestant, not on list (Probe: Any particular denomination?) [DO NOT READ]
17 Christian, not on list (Probe: Any particular denomination?) [DO NOT READ]
18 Islam (Probe, any particular sect) [DO NOT READ]
19 Other (specify) **K8a_OTH** [DO NOT READ]

0 No Response

(NOTE: "Other" includes other faiths, i.e. Hindu, Buddhism, Baha'i, Wicca, Native Spirituality, etc.)

K8b

Using a 7-point scale where '1' is Strongly Disagree and '7' is Strongly Agree, please tell me how much you agree or disagree with the following statement.

... I would describe myself as religious.

1 Strongly Disagree
2 Disagree
3 Disagree Somewhat

4 Neutral
5 Agree Somewhat
6 Agree
7 Strongly Agree

8 Don't Know [DO NOT READ]
0 No response/Refused [DO NOT READ]

K8c

Again, using a 7-point scale (where '1' is Strongly Disagree and '7' is Strongly Agree) please tell me how much you agree or disagree with the following statement.

…I have trust in modern science

1 Strongly Disagree
2 Disagree
3 Disagree Somewhat
4 Neutral
5 Agree Somewhat
6 Agree
7 Strongly Agree

8 Don't Know [DO NOT READ]
0 No response/Refused [DO NOT READ]

K9 (See Appendix C for further categories)

To which ethnic or cultural group(s) did your ANCESTORS belong?

[SPECIFY UP TO FOUR GROUPS. FOR EXAMPLE, FRENCH, ENGLISH,SPANISH, CHINESE, ETC. IF RESPONDENT SAYS CANADIAN, RECORD THEIR RESPONSE AND ASK WHAT COUNTRY THEIR ANCESTORS CAME FROM]

1 Aboriginal*
2 African (**Probe)
3 American
4 Asian (Unspec/Probe)
5 Austrian
6 Belgian
7 Bulgarian
8 Canadian
9 Caribbean (**Probe)
10 Chilean
11 Chinese
12 Croatian
13 Czech
14 Danish
15 Dutch
16 East Indian (**Probe)
17 English
18 Filipino/a

19 Finnish
20 French
21 German
22 Greek
23 Hungarian
24 Indonesian
25 Iranian
26 Irish
27 Italian
28 Japanese
29 Jewish
30 Korean
31 Lebanese
32 Métis
33 Norwegian
34 Pakistani
35 Polish
36 Romanian
37 Russian
38 Scottish
39 Serbian
40 Slovakian
41 Spanish
42 Swedish
43 Ukrainian
44 Vietnamese
45 Welsh
46 Yugoslavian
47 Other (Spec)
K9_OTH
48 Don't Know
49 Refused
50 No Other/ Exit
0 NA-No further responses

(*Including First Nations)

K9_1 First Response
K9_2 Second Response
K9_3 Third Response
K9_4 Fourth Response

K10

Would you say that you (and your family) are BETTER OFF, just the SAME, or WORSE OFF financially than you were a year ago?

1 Better Off
2 Just the Same
3 Worse Off

8 Don't Know [DO NOT READ]
0 No Response [DO NOT READ]

K11

Now looking ahead, do you think that a YEAR FROM NOW, you (and your family), will be BETTER OFF, just about the SAME, or WORSE OFF financially than now?

1 Better Off
2 Just the Same
3 Worse Off

8	Don't Know	[DO NOT READ]
0	No Response	[DO NOT READ]

K12a

What is the TOTAL income of ALL members of this HOUSEHOLD for the past year, BEFORE taxes and deductions?
We're just looking for a ballpark figure.

(NOTE: Probe with categories as examples if needed.)

1	Under $6,000	14	30,000-31,999	27	80,000-84,999
2	6,000-7,999	15	32,000-33,999	28	85,000-89,999
3	8,000-9,999	16	34,000-35,999	29	90,000-94,999
4	10,000-11,999	17	36,000-37,999	30	95,000-99,999
5	12,000-13,999	18	38,000-39,999	31	100,000-
6	14,000-15,999	19	40,000-44,999	124,999	
7	16,000-17,999	20	45,000-49,999	32	125,000-
8	18,000-19,999	21	50,000-54,999	149,999	
9	20,000-21,999	22	55,000-59,999	33	150,000+
10	22,000-23,999	23	60,000-64,999		
11	24,000-25,999	24	65,000-69,999	34	Don't Know
12	26,000-27,999			35	No Response
		25	70,000-74,999		
13	28,000-29,999	26	75,000-79,999		

K12b

What was your own total INDIVIDUAL income for this past year BEFORE taxes and deductions?

Again, we're just looking for a ballpark figure.

(NOTE: Probe with categories as examples if needed)

1	Under $6,000
2	6,000-7,999
3	8,000-9,999
4	10,000-11,999
5	12,000-13,999
6	14,000-15,999
7	16,000-17,999
8	18,000-19,999
9	20,000-21,999
10	22,000-23,999
11	24,000-25,999
12	26,000-27,999
13	28,000-29,999
14	30,000-31,999
15	32,000-33,999
16	34,000-35,999
17	36,000-37,999
18	38,000-39,999
19	40,000-44,999
20	45,000-49,999
21	50,000-54,999
22	55,000-59,999
23	60,000-64,999
24	65,000-69,999
25	70,000-74,999
26	75,000-79,999
27	80,000-84,999
28	85,000-89,999
29	90,000-94,999
30	95,000-99,999
31	100,000-124,999
32	125,000-149,999
33	150,000+
34	Don't Know
35	No Response

K13

Do you (or your spouse/partner/parents) presently own or rent your residence?

(NOTE: i.e., if respondent lives in parents' home and they own it, put own for respondent too.)

1 Own
2 Rent

0 No Response [DO NOT READ]

K14

Do you presently live in…

1 A City (SKIP TO K17)
2 A Town (SKIP TO K17)
3 A Village (SKIP TO K17)
4 A Rural Area (CONTINUE TO K15)

0 No Response [DO NOT READ] (SKIP TO K17)

K15

Do you live on a farm?

1 Yes
2 No

0 No Response
8 Don't Know
-5 NA-Don’t live in a rural area.

K16b

If an election was held today, how would you vote provincially?

[DO NOT READ CATEGORIES. PROBE FOR THE NAME OF A POLITICAL PARTY]

1 Progressive Conservative (PC/Tory)
2 Alberta Liberal Party (Liberals)
3 Alberta NDP (New Democratic Party)
4 Wildrose Alliance Party

5 Alberta Party
6 Alberta Greens/Green Party of Alberta
7 Separation Party of Alberta
8 Alberta Social Credit Party (Socreds)
9 Communist Party
10 Other (Specify) **K16b_OTH**

11 Would not vote
12 Not Eligible
13 Don't Know
0 No Response/Refused

K16a

For this next question, please tell me: If an election was held today, how would you vote federally?

[DO NOT READ CATEGORIES. PROBE FOR THE NAME OF A POLITICAL PARTY]

1 Liberal Party of Canada (Liberals)
2 Conservative Party of Canada (PC or Tory /Alliance)
3 Canada's NDP (New Democratic Party)
4 Green Party of Canada
5 Other (specify) **K16a_OTH**

6 Would not vote
7 Not Eligible
8 Don't Know
9 No Response/Refused

BLAST

We've reached the end of the interview. All your answers are confidential and anonymous.

If you have any questions about this study, here is the name and number again of the PRL research coordinator. You may call Janet Ngo at (780) 492-4659, ext.228.

Thank you very much for your time and participation.

PRESS '1' TO CONTINUE

LENGTH

PLEASE ENTER THE LENGTH OF THE INTERVIEW.

_____ minutes

SEX2

Enter sex of respondent

1 Male
2 Female

[Interviewer Note: This should be the same as SEX1.]

SEX3

Please type in "him" or "her" to indicate the sex of the respondent you just interviewed.

_____

[NOTE: No computer check is done in SEX3 on gender agreement; manually check against SEX2]

DECLARE

I declare that this interview was conducted in accordance with the interviewing and sampling instructions given by the Population Research Laboratory at the University of Alberta. I agree that the content of all respondent's comments/answers will be kept confidential.

PLEASE ENTER YOUR INTERVIEWER NUMBER.

_____ ID

ENDQ

Go back through the questionnaire for your final edit before recording it as complete.

Please ensure you edit all responses.

Once you have finished editing your responses, press '1' to code as complete.

Wt

Weight:

Edmonton	0.953001
Calgary	1.001361
Other Alberta	1.045991

Appendix A

NATIONAL OCCUPATIONAL CLASSIFICATION 2006[1]

Major Group Structure - Two-Digit Code Numbers

Question K2a - Demographics (WORK)

WORK represents the NOC two-digit Major Group Structure categories of the occupational variable **K2a** (Question 2a - Demographics).

The NOC Major Group Structure is as follows:

01 Senior Management Occupations

02 Middle and Other Management Occupations
03 Professional Occupations in Business and Finance
04 Skilled Administrative and Business Occupations
05 Clerical Occupations
06 Professional Occupations in Natural and Applied Sciences
07 Technical Occupations Related to Natural and Applied Sciences
08 Professional Occupations in Health
09 Technical and Skilled Occupations in Health
10 Assisting Occupations in Support of Health Services
11 Professional Occupations in Social Science, Education, Government Services and Religion
12 Paraprofessional Occupations in Law, Social Services, Education and Religion
13 Professional Occupations in Art and Culture
14 Technical and Skilled Occupations in Art, Culture, Recreation and Sport
15 Skilled Sales and Service Occupations
16 Intermediate Sales and Service Occupations
17 Elemental Sales and Service Occupations
18 Trades and Skilled Transport and Equipment Operators
19 Intermediate Occupations in Transport, Equipment Operation, Installation and Maintenance
20 Trades Helpers, Construction Labourers and Related Occupations
21 Skilled Occupations in Primary Industry
22 Intermediate Occupations in Primary Industry
23 Labourers in Primary Industry
24 Processing, Manufacturing and Utilities Supervisors and Skilled Operators
25 Processing and Manufacturing Machine Operators and Assemblers
26 Labourers in Processing, Manufacturing and Utilities

Missing Values

28 Homemaker-never worked (note: code assigned for this study & not part of NOC)
29 Student-never worked (note: code assigned for this study & not part of NOC)
0 No Response

[1]Source: National Occupational Classification, Human Resources Development Canada.

http://www5.hrsdc.gc.ca/noc-CNP/app/occupation_index.aspx?1c=e

Appendix B

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM 2007-CANADA[1]

Industry Sector - Two-Digit Code Numbers

Question K2c - Demographics (KINDUSTRY)

KINDUSTRY represents the NAICS two-digit Industry Sector categories of the business/organization variable **K2c** (Question 2c - Demographics).

The NAICS Industry Sector is as follows:

11 Agriculture, Forestry, Fishing and Hunting
21 Mining, Quarrying, and Oil and Gas Extraction
22 Utilities
23 Construction
31 Food Manufacturing
32 Wood Product Manufacturing
33 Primary Metal Manufacturing
41 Wholesale Trade
44 Retail Trade - Retail Type 1
45 Retail Trade - Retail Type 2
48 Transportation & Warehousing - Transportation
49 Transportation & Warehousing - Postal, Courier & Storage

51 Information and Cultural Industries

52 Finance and Insurance

53 Real Estate and Rental and Leasing

54 Professional, Scientific and Technical Services

55 Management of Companies and Enterprises

56 Administrative and Support, Waste Management and Remediation Services

61 Educational Services

62 Health Care and Social Assistance

71 Arts, Entertainment and Recreation

72 Accommodation and Food Services

81 Other Services (except Public Administration)

91 Public Administration

0 No Response

99 Not Applicable

[1]Source: North American Industry Classification System, Statistics Canada.

http://www.statcan.ca/english/Subjects/Standard/naics/2007/naics07-menu.htm

Appendix C

LIST OF ETHNICITIES

(Variables K9_1 to K9_4, Question 9 Demographics)

N.I.E. – Not Indicated Elsewhere

4	Welsh	98	Turk
5	British	102	Punjabi
10	French Canadian	105	Indian (Asian)
16	Amerindian	107	Pakistani
17	Canadian	108	Sri Lankan
19	American	109	Japanese
21	Haitian	110	Korean
22	Jamaican	111	Filipino
25	Caribbean N.I.E.	112	Burmese
27	Argentinean	114	Laotian
29	Chilean	115	Thai
31	Mexican	116	Vietnamese
32	Peruvian	117	East Indian N.I.E.
38	Central & South American N.I.E.	120	Mongol
40	Afro-American	122	Asian N.I.E.
43	Black N.I.E.	123	Fiji Islander
45	African N.I.E.	125	Pacific Islander N.I.E.
46	Austrian	126	Australian/New Zealander

47	Belgian
48	Flemish
49	Luxembourger
50	Swiss
53	Finnish
54	Danish
55	Icelander
56	Norwegian
57	Swede
58	Scandinavian N.I.E.
60	Estonian
61	Latvian
62	Lithuanian
64	Czech
66	Hungarian
67	Romanian
68	Russian
69	Slovak
72	Albanian
73	Bulgarian
74	Croatian
76	Serbian
77	Slovene
78	Yugoslavian
130	Hindu
131	Sikh
132	Muslim
135	Mennonite
136	Religious N.I.E.
137	White N.I.E.
140	Ismaili
142	Iraqi
144	Gujarati
149	Ethiopian
151	Somali
152	Trinidadian/Tobagonian
154	Creole
160	Moroccan
171	West Asian N.I.E.
172	South East Asian N.I.E.
173	Indonesian
208	French
209	English
210	German
211	Scottish
212	Italian
213	Irish
214	Ukrainian

80	Greek
83	Maltese
84	Portuguese
85	Spanish
86	Basque
87	Gypsy
88	European N.I.E.
90	Lebanese
91	Palestinian
78	Yugoslavian
80	Greek
92	Syrian
94	Middle East Arab N.I.E.
95	Egyptian
96	Iranian
97	Israeli
92	Syrian

215	Chinese
216	Dutch
217	Jewish
218	Polish
220	North American Aboriginals
221	Métis
213	Irish

Missing Values

997	Don’t Know
998	Refusal
0	No Further Response