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Delay and Geographic Discounting Exert Multiple Control over Climate Change Policy Preference

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**DELAY AND GEOGRAPHIC DISCOUNTING EXERT MULTIPLE CONTROL OVER
CLIMATE CHANGE POLICY PREFERENCE**

A Master's Thesis

Presented to

The Graduate College of
Missouri State University

In Partial Fulfillment

Of the Requirements for the Degree

Master of Science, Applied Behavior Analysis

By

Celeste Noelle Unnerstall

May 2020

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DELAY AND GEOGRAPHIC DISCOUNTING EXERT MULTIPLE CONTROL OVER CLIMATE CHANGE POLICY PREFERENCE

Psychology

Missouri State University, May 2020

Master of Science

Celeste Noelle Unnerstall

ABSTRACT

The procedures were informed by a pilot investigation conducted by this research team that is described below. In the primary study, students attending Missouri State University chose between a policy with no restrictions or taxation on their carbon emissions versus a restriction on the amount of mileage driven per month and taxation related to the mileage. The main study also included an added variable of the influence a redistribution taxation policy into different geographic distances would have on policy preference. Results were interpreted in terms of a multilevel hyperbolic discounting model using the “R” program. The results suggest that there is little to no preference for a policy in which half of the taxes would be redistributed to other countries, as long as the effects of climate change could remain delayed. These results have implications for future environmental policies that intend to redistribute taxation revenue to assist other states or countries in altering their systems to become more environmentally-friendly, given there is a delay of the effects from climate change. These results have implications for future environmental policies that intend to redistribute taxation revenue to assist other states or countries in altering their systems to become more environmentally-friendly, given there is a delay of the effects from climate change.

KEYWORDS: climate change, delay discounting, social discounting, policy preference, environmental policy

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May 2020

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In the interest of academic freedom and the principle of free speech, approval of this thesis indicates the format is acceptable and meets the academic criteria for the discipline as determined by the faculty that constitute the thesis committee. The content and views expressed in this thesis are those of the student-scholar and are not endorsed by Missouri State University, its Graduate College, or its employees.

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INTRODUCTION

Anthropogenic Causes of Climate Change

The effects of increased Carbon Dioxide (CO₂) in Earth's atmosphere on global warming has been studied for the past half-century (Benton, 1970). By 1988, the Intergovernmental Panel on Climate Change (IPCC) was established ("History of IPCC," n.d.). Due to the substantial amount of information recorded in those scientific reports, a majority of information regarding climate change for this study will be extracted from the IPCC reports specified summary for policymakers, released in August of 2019 (Masson-Delmotte et al., 2018). According to the IPCC, the climate change crisis will affect all species on the planet in several ways. First, agricultural production will be impacted globally. This will specifically target high poverty populations and underdeveloped countries, as when increases in drought or flooding occurs, lower socio-economic status (SES) countries will be unable to adjust environmentally to provide the needed crop to their population (Parry, Rosenzweig, Iglesias, Livermore, & Fischer, 2004). The IPCC report writers have pointed to the significant agricultural changes regarding livestock and grain in specific areas. For example, China's agricultural production has been negatively affected by an increase in extreme weather events, such as droughts and flooding (Huang, Wang, & Wang, 2015). This has caused crop reduction and income deficit for the farmer's in the affected areas.

The number of extreme weather events is rising along with the CO₂ atmospheric levels (Masson-Delmotte et al., 2018). These events can include heavy rainfall, flooding, drought, tropical storms, and tornadoes (Jentsch & Beierkuhnlein, 2008). Extreme weather events are often caused by an exceptional increase in temperature, which may result as a side effect from

increased CO₂ levels in the atmosphere. Unfortunately, crisis management surrounding extreme weather events are not long-term solutions but implemented immediately after the event has occurred (Linnenluecke, Griffiths, & Winn, 2012). Extreme weather events are still treated as low-probability events, although they are occurring at a higher frequency and intensity every year (Schleussner, Pfleiderer, & Fischer, 2017).

Species vulnerability has also become an increasing problem (Masson-Delmotte et al., 2018). One of the leading causes of species vulnerability is habitation loss or dramatic changes in the ecosystem (Pacifici et al., 2015). For example, the marten and lynx populations have been affected by climate change and habitation loss in the northern Appalachian mountain range (Carroll, 2007). Due to rising temperatures, decreased snowfall will affect the prey's vulnerability, and in turn decrease competition amongst carnivores in the area. Competition amongst predators balances the species hierarchy, so off balancing could cause drastic endangerment problems amongst prey species. Further, bumblebees are an important species also affected by the climate change crisis (Kerr et al., 2015). With rising temperatures comes the shrinkage of regions in which bumblebee species are able to pollinate. Without bumblebees, crops would not become pollinated, and therefore the agricultural industry would suffer leading to a shortage of food resources for humans. The challenges accompanying warming of the earth's climate are multifaceted requiring efforts to elucidate the causes of increased atmospheric CO₂.

One of the top contributors to the climate change crisis is anthropogenic emissions (Masson-Delmotte et al., 2018). For example, the IPCC report has estimated that human activity alone has caused approximately 1.0°C of global warming by 2017. It is also noted in the report that human-driven change has exceeded the rate of any biosphere forces or biophysical changes

that have altered the Earth System in similar contexts in the past. Per decade, global warming temperatures are increasing around 0.2 °C due to past and present human emissions. Cutting our man-made emissions to net zero CO₂ could halt global warming altogether. Working toward net-zero emissions could also reverse ocean acidification, in addition to minimizing sea level rise, which is currently predicted to rise between 0.26 to 0.77 meters by the year 2100. Reducing sea level rise is critical for ocean-neighboring cities, as it will greatly impact millions of inhabitants. Although sea level rise is a natural process for our planet, anthropogenic emissions have advanced the natural sea rising levels, which allows less time for species to adapt. The scientists behind the IPCC report from 2018 have provided a detailed insight into the dangers associated with the increase of CO₂ emissions into the Earth's atmosphere. The research from this report alone has provided a plethora of knowledge on why it is imperative that humans reduce CO₂ emissions to combat the side effects of climate change. They posit that because the challenges are occurring because of human action, they may be solved by adjusting human action, but doing so may require leveraging a science of human behavior and choice.

Applying Behavioral Economics to Predict Human Choice

Behavioral Economics is best defined by Laibson and List (2015) as follows, “Behavioral economics uses variants of traditional economic assumptions (often with a psychological motivation) to explain and predict behavior, and to provide policy prescriptions” (p. 385). This definition leads to perhaps the most important motive behind behavioral economics- to model irrationality within consumer choice behavior as an extension of behind traditional economic models that assume rationality, or resource optimization (Reed, Niileksela, & Kaplan, 2013). Although the traditional groundwork of economics is still utilized in behavioral economics, it has

become evident through psychological research that traditional methods do not explain the bounds of rationality in individuals (Kahneman, 2003). Delay discounting is a common example of how humans can make irrational choices, as it identifies the choice between receiving a smaller reward quickly or a larger reward after a longer period of waiting. For example, say a choice was given to an individual that they could either have \$100 today or \$500 in a year, they are more likely to choose the \$100 today. Although rationally it would be more beneficial to wait and take the \$500 in a year, the individual would irrationally decide that the \$100 has more value in that moment. Rachlin (1995) describes how behavioral economics is commonly defined as the study of human error, or the divergence from rational choice-making behavior. More specifically, he articulates how anomalies, or biases, have accumulated to the point that rationality is far left behind in the choice making process. It is also clear through Rachlin's (2006) notes on discounting, that many individuals do not take into account a future behavior or reward when being offered a choice. He gives the example that an individual who is hungover is more likely to vow away alcohol irrationally in the moment, however, if that individual finds themselves at a party later that day, they are more likely to forget that vow and begin drinking again, as they did not take their future behaviors and context into consideration. Rachlin (2003) also discusses how a heuristic, or shorter smaller reinforcers, have evolved through society from the irrational choice to the most rational choice in the moment. Individuals who are given a choice in the moment do not have the needed time to weigh the pros and cons of both choices in order to make the most rational decision. Therefore, the utilization of heuristics have become the best approach to several real world problems individuals face in today's society. An example of one of these adaptive heuristics is recognition, in which an individual is able to provide an answer or preference depending on their past experiences and knowledge. Heuristics can also be

referred to as rules, which are commonly used in behavioral research. Rules are determined through past experiences and context to determine an increase likelihood that a specific choice will be preferred.

Behavioral economics, specifically delay discounting, has been utilized in several research contexts. However, there is a large presence of delay discounting regarding addictive behaviors. For example, Saville, Gisbert, Kopp, and Telesco (2010) investigated the relation between internet addiction and delay discounting. College students at James Madison University were asked to fill out the Internet Addiction Test, which is comprised of eight questions to help identify internet addicts. Once the Internet Addiction Test was filled out, the students were then instructed to complete a 100-question survey regarding monetary delay discounting tasks. The delay discounting task portion asked for students to make a choice between a series of hypothetical monetary rewards that would increase in amount the longer they delayed. They utilized five delay values in this study: 1 week, 1 month, 6 months, 1 year, and 3 years. Saville and colleagues found that internet addicts were more likely to discount delayed rewards faster than the non-internet addicted sample. This meant that the internet addicts were more likely to choose the smaller, sooner reward when given a choice.

In another example, Weller, Cook, Avsar, and Cox (2008) investigated the relation between obesity and delay discounting. Introductory psychology students interested in participating in the study were screened for eligibility through their BMI score. The researchers also obtained exclusion information regarding any past behaviors relating to smoking, alcohol, drugs, eating disorders, and more. Once the criteria was met, the researchers selected the individuals for either the obese or control group. Similar to the study above, a discounting task containing hypothetical monetary amounts was utilized. The participants could either choose the

variable smaller amount available immediately, or the fixed larger amount that would be made available after a varying delay. Although results demonstrated a nonsignificant effect on BMI in general, they did find a significant difference in BMI and gender. Obese women were more likely to discount faster than women of a healthy weight. This research demonstrated that the obese women were more likely to choose the immediate, smaller reward, over the delayed, larger reward, which is similar to the above findings on internet addicts and delay discounting.

Originally, behavioral economists often employed the use of an exponential function equation to determine the continuously compounded interest (Rachlin & Jones, 2007). The exponential equation is as follows:

$$V = Ae^{-kD}$$

The decrease in subjective value of a reinforcer is considered V , whereas A is the exponential value of the reinforcer. k is the held constant and D is the delay in time until the reinforcer appears. The reason it has been disproved as an adequate model of human rationality is that humans are in fact irrational when making decisions, especially about the future. Along with this, hyperbolic discount functions have shown better explanations of choices amongst delays than the exponential function.

Delay Discounting will often result in a curve known as a hyperbolic function. The x -axis will display what reinforcer is being delayed, while the y -axis will display how long said reward is being delayed (Reed, Niileksela & Kaplan, 2013). The hyperbolic function in delay discounting was introduced by Mazur (1984) and is represented by the equation:

$$V_f = \frac{A_f}{1 + KD_f}$$

The subjective value of the reinforcer is considered the V_f , where A_f is the amount of reinforcement, K the free parameter, and D_f representing the delay (in seconds) to reinforcement.

By utilizing this equation, Mazur tested a pigeon's choice preference between fixed and varying delays until the reinforcer would be presented. Mazur hoped to use this model to provide an indifference point in which the exact delay in seconds that the choice would be preferred for both alternative delays (fixed and variable). This would also provide insight into the delay in which the pigeon would switch from one preferred reinforcement to the other following the indifference point.

The hyperboloid model is a refinement to Mazur's original hyperbolic model, which describes the value of a reinforcer in correlation to the delay (Jimura, Myerson, Hilgard, Braver, & Green, 2009). The hyperboloid equation is as follows:

$$V = A/(1 + kD)^s$$

The decrease in subjective value is considered the V , where the delay is considered the D , and A represents how much of the reinforcement is delayed, while k is a constant to determine the steepness of the reward's discount. Lastly, s is considered the nonlinear scaling parameter. Altogether, the goal of this equation is to determine an indifference point in which the delayed reward is equivalent in value to the present reward. The additional s parameter should be introduced to the model with caution because it decreases the parsimony of the model. Researchers should conduct statistical analyses to determine the best fit model when describing discounting rates as they may affect choices related to climate change.

Delay discounting has also gained support in the research community over various topics in recent years. For example, Madden, Begotka, Raiff, and Kastern (2003) demonstrated delay discounting with both real and hypothetical monetary rewards. Along with these rewards, undergraduate students were given the choice between an amount that would be available to them at the current time (this amount did not change throughout the session), and an amount that

would be given at a delayed amount of time- anywhere from a few hours to a year. When given these choices, it was evident that the students preferred an amount at the current time, especially as the delay of time increased. Although the largest amount of monetary value was only ten dollars, the results still showed a hyperbolic curve.

Kirby and Maraković (1996) found similar results with their monetary delay discounting survey. Similar to the research study above, this survey was composed of two choices per question for the students. They could either choose a lower monetary value that would always be available right now, or they could choose a higher, but delayed monetary value. One difference from other studies is that the researchers decided to give the participants money, instead of hypothetical monetary rewards. The student would make their decision between the two presented choices, and then the answer they selected would go into a lottery. At the end of the session, the students were then given the chance to receive one of the choices they had made, at random. They found the same results, in which the higher the delayed value, the more likely students would choose it. However, the participants still chose the smaller monetary value given to them in the present moment. Along with these findings, they also found a difference in discounting between genders. Male participants tended to discount at higher rates than the females, meaning they were more likely to take the smaller, sooner reward.

The above study by Kirby and Maraković (1996) has been utilized in several other studies pertaining to delay discounting and monetary rewards. Johnson and Bickel (2002) are one of the several that have utilized Kirby and Maraković's (1996) computer system to display monetary reward options to the participant. In Johnson and Bickel's study, they employed the real and hypothetical monetary reward method as mentioned in the above study. The participants were given the choice between two rewards: option one with a lower reward and available now,

or option two with a higher reward and available at a delayed amount of time. There are two separate groups in which the participants could be put into: real then hypothetical monetary reward, or hypothetical then real monetary reward. When given the real monetary reward questions, it should be stated that the participants are given the chance to win one of these rewards after the study has been completed. Similar to the study above, the choices made by the participant will be put into a drawing for the end of the session, and they will be allowed to randomly choose one. The important aspect found in this study was that they found little to no difference in 5 of 6 participants regarding the monetary value when presented with either the real or hypothetical questions, meaning that the hypothetical questions were just as predictive of monetary reward value as the real questions.

Although delay discounting has become utilized primarily by researchers to show the value of monetary rewards, it is able to predict other behaviors as well. Smoking, unprotected sex, weight gain, and procrastination are just a few examples of the research areas utilizing delay discounting today. Johnson, Bickel, and Baker (2007) studied the effects of smoking habits on discounting monetary rewards, applying both hypothetical and real choice scenarios. The researchers recruited individuals and then determined whether they were eligible for participation based on prerequisites. The individuals were then split into one of three groups based on the number of cigarettes they consumed daily. These groups were identified as light smokers, heavy smokers, or never smokers. After running the assessment in sessions with the participants, the researchers found that light smokers were discounting the reward of money at a much higher rate than never smokers but were discounting at a similar rate in comparison to the heavy smokers. They also found that light smokers and heavy smokers discounted cigarettes at a much higher rate than the never smokers. The researchers also evaluated gains and losses related

to health but found the light smoking group had little to no change in discounting rates when compared to the other groups and variables.

As mentioned above, delay discounting is often utilized as a tool to predict future behaviors of individuals. The research study above evaluated smoking habits with discounted rates, but alcohol has become another common area of research to use delay discounting. Fernie et al. (2013) determined whether an array of tasks, including delay discounting tasks, would be able to determine an adolescent's future use of alcoholic substances. The students in this study were 12-13 years of age from schools in a region of North West England. The students were asked to complete a self-report survey on their past alcohol consumption, the Alcohol Problems Index (API) and information relating to their socio-economic status (SES). Just as in previous research, the reward for the delay discounting task in this study was an amount of money. Researchers found that by using delay discounting and impulsivity tasks, they were able to predict alcohol involvement demonstrated within the first 6 months following the study.

Unprotected sexual behavior is another common research topic when it comes to delay discounting. For example, Johnson and Bruner (2012) sought to find the relationship between rates of risky sexual behavior and HIV infection in individuals with cocaine dependence. The participants were required to complete a sexual discounting task, real rewards money delay-discounting task, and self-report data on current risky sexual behavior. The individuals were given the choice between immediate unprotected sex or protected sex with a condom after a delayed amount of time during the sexual discounting task. Along with these two options, they were also given the option of four separate partners, regarding the partner's sexual desirability and the likeliness of them having a sexually transmitted disease (STI). The researchers found that the participants showed a high rate of unprotected sex in relation to the sexual discounting task,

and high rates of delay of sexual behavior for possible STI. They also found cocaine dependence showed an increase in discounting condom use. Delay discounting could play a large part in unprotected sex, HIV, and other risky sexually behaviors, as well as the influence drugs has on these behaviors.

Delay Discounting and Environmental Policy

Delay discounting is a result of an increased reinforcement by a certain amount of time, to produce a larger reinforcement. This model of human decision making, by emphasizing impulsive choices resultant from delay to reinforcement, may have implications for informing public policy targeted climate change. The taxation rate for policies on climate change and the environment have become heavily discussed in recent years due to the knowledge that individuals value the present moment rather than the future (Hardisty & Weber, 2009). For example, with retirement plans, individuals are more likely to start investing more the closer they get to retirement, since it will be closer to the date of obtaining their retirement (Thaler & Benartzi, 2004). Also, saving for retirement in the present moment generally has limited immediate gains.

Kaplan, Reed, and McKerchar (2014) researched the discounting of environmental loss using a visual analogue scale (VAS). By doing so, they were able to assess how delay, social, and probability discounting would influence choice on environmental loss. The participants were asked to fill out a survey that took the model of delay discounting that is generally utilized. The students were presented with two separate choices, one that is titrated and one that is held constant and were required to select one of them. In this study, the researchers titrated the amount of time until the occurrence of a natural disaster, the likelihood of that disaster

happening, and the social distance of the individual in which the disaster happens to. Social distancing, also known as social discounting, is the amount of distance in relationship between two individuals. This means that an individual would typically be willing to assist a family member or close friend more so than a stranger in a given scenario, as they are closer in social distance. For example, say an individual is presented with two scenarios of either assisting their mother or their neighbor, who they barely know, with moving houses. On average, the individual would be more willing to help their mother than their neighbor, based on the distance between them socially. In this research study, researchers found that the majority of individuals discounted the delay until the natural disaster is to occur, the social distance of the person who is affected, and the likelihood of the natural disaster occurring at high rates.

Although natural disasters have become a common occurrence since the substantial increase of carbon emissions, plastic use has also become a problem contributing to the climate crisis. Kaplan, Gelino, and Reed (2018) researched green consumerism and the demand for reusable plastic bags. Participants were college students from an introductory behavioral course and were asked to complete a survey that consisted of a hypothetical purchase task. The hypothetical purchase task related to how many reusable shopping bags the participants were to purchase at the beginning of their shopping experience at a non-local grocery store, given the price points presented to them. The price points were titrated from anywhere between \$0.00 to \$9.00. The students were then asked to fill out a Likert-type scale called the New Ecological Paradigm Scale (NEPS), rating how strongly they agree or disagree to both pro-ecological and anti-ecological statements. The researchers found that individuals were willing to pay around \$2.00 per reusable bag in the scenarios presented, before the discount rate increased.

McKerchar, Kaplan, Reed, Suggs, & Franck (2019) also studied environmental outcomes related to discounting, but associated air quality gains and losses in their study. In this study, the students were presented with four different tasks following an overview of the Air Quality Index (AQI) pamphlet. These four tasks consisted of delayed environmental gains and losses, and probabilistic environmental gains and losses. The participants were randomly categorized as receiving the two gain tasks first, or the two loss tasks first. The researchers found that there was little to no difference in the rates of delayed environmental gains to losses. However, there was a higher rate of discounting associated with probabilistic environmental gains than losses.

Carbon emitting commodities has also become a subject of interest in the behavioral economic world. For example, Belisle, Campbell, and Todd (under review) sought to understand the difference in discounting monetary and environmental tasks. First, the researchers presented a monetary task to the participants similar to those in past research. This provided insight into whether individuals were willing to pay more money in an effort to delay a larger and later payment. Then, participants were asked to complete a second survey that presented two choices between constraints on access to CO₂ emitting commodities (such as number of miles driven), and no constraints on the amount of CO₂ emitting commodities. These CO₂ emitting commodities included driving, trash disposal, and shower water usage. This second task was utilized to determine whether the participants were willing to cut down on their own emissions in an effort to delay the point of no return. The point of no return, or PNR, is the point in time that it becomes too late to act in a way that will decrease carbon emissions to stay below the prescribed threshold of environmentally tolerable carbon emission levels. The researchers found that both money and climate were discounted hyperbolically. The researchers also found that participants were more likely to give up high emission commodities in order to slow down or

reverse the climate change crisis. In extension of the above study, researchers sought to disprove the common assumption that a climate change policy needs to tax people or take a large amount of money for overconsumption (Belisle, Campbell, & Todd, under review). For this study, participants were given similar surveys, in which they had to choose between one of two policies. One policy stayed constant with no consumption threshold expected to be met, while the other suggested a consumption threshold of a number of miles driven every month in order to delay the point of no return. If the individual was below this threshold, they were given money for under consuming a carbon emitting commodity (in this instance, fuel). Those who went over the threshold would be taxed for every mile driven over. The researchers found that the average participant was willing to reduce their driving/fuel consumption by a significant amount in order to receive the monetary reward.

The above research suggests that the climate change policies currently implemented or being proposed in today's society are contradictory and unfair to those who cannot afford a higher tax on carbon emitting commodities, such as lower SES communities and underdeveloped countries. A common rule in behavior analysis is to utilize a reinforcement-based intervention, and only take a punishment-based intervention if none of the reinforcement-based interventions are working. This can be applied to climate policy as well, especially in countries that can afford to give back, such as the United States. However, punishment and higher taxation is the method most commonly applied in policy.

Policy Solutions and Discounting

Several countries have entered the Paris Climate Agreement to combat the climate change crisis (Wallach, 2019). Starting in December of 2015, leaders of the United Nations

invited every country around the world to have a seat in this climate agreement to help slow down carbon emissions and reverse the effects of climate change. The Paris Climate Agreement is a set of guidelines for all countries who have signed on to not only cut back on emissions, but recognize the importance of conserving clean air, food, and water sources. The United States is not currently part of the Paris Climate Agreement. The United States government has an agency known as the Environmental Protection Agency (EPA) that oversees the effects and regulation pertaining to carbon emitting commodities. For instance, they have stated that light-duty vehicles, such as a sedan, account for 60 percent of the transportation emissions in America. The United States also has the Corporate Average Fuel Economy (CAFE) that maintains regulations on environmental standards for newer models of cars. Currently, the Clean Air Act regulates the emissions produced by existing power plants. However, the Obama administration presented the Clean Power Plan to oversee carbon emissions from all power plants as a collective. The current Clean Air Act oversees carbon emissions from power plants individually.

There are two basic models for taxation in the U.S.- direct and indirect taxes (Handbook on Carbon Taxation, 2019). Direct taxes are specified for individual taxation, such as income, property, and wealth taxes. Indirect taxes are on a collective scale, in which an entire group is taxed the same rate, such as service or sales tax. The majority of taxation policies being distributed for climate change reflect an indirect taxing system, in which everyone pays a tax to help reduce carbon emissions. The 2019 handbook on carbon taxation states that a carbon tax, which is presented in most emission policies, will incorporate an indirect excise tax, or per unit tax. Although the U.S. and the majority of other countries have taken an indirect tax model for their carbon tax, British Columbia in Canada has taken a different viewpoint on taxation policy. Though they are still implementing an indirect climate action tax, individuals and households are

allowed to apply for a credit that will help them pay for a portion or all of this tax, depending on how much income they obtain annually, as well as number of individuals in a household (Income Taxation Branch, 2019). Despite the fact that it is not the same as a redistribution policy for staying under a carbon emission threshold, it is one of the closest policies representing an individualized taxation structure. We do not yet know how indirect or direct taxation systems differentially influence support for climate policies and willingness to forego access to CO₂ emitting commodities. Therefore, we will conduct a pilot analysis to determine if these policies produce a hyperbolic curve function as in prior research and if any systematic differences in discounting rates are observed.

Social discounting may also affect preference-for and adoption-of carbon taxation policies. Social discounting indicates the association between delay discounting and altruistic choice making, by presenting hypothetical scenarios relating to those closest or farthest away from you in relations. Ideally, individuals would rather assist those closest to them in a hierarchy of their relationships. For example, several carbon tax policies being proposed are suggesting a redistribution of the tax to underdeveloped countries to help their economy stabilize while transitioning to more environmentally ethical practices. According to a social discounting model, people may be unwilling to give half of their tax to an underdeveloped country. Instead, they may prefer their tax be redistributed to their local communities or back into their own country for economic redistribution. Although not identical to social discounting, geographic discounting could be another factor that influences choices related to climate adoption.

Rachlin and Jones (2007) tested how likely individuals would be willing to give a certain amount of money to those around them depending on their social distance. Participants were directed to imagine a list of 100 people, #1 being the person closest to them (relationship wise,

such as family member or best friend), and #100 being the person farthest from them (an acquaintance, met once or twice). Participants were then presented with several different amounts in monetary rewards, ranging from \$5 to \$85. They were then presented with both of these aspects together, and asked to choose between two scenarios: one in which they could keep a certain amount for themselves, which was titrated between the \$5 and \$85 amounts, or that they could give a certain amount (let's say \$75 for every question) to the N^{th} person on their list. The results showed that the farther away the individuals were in relation, the less likely they were to give the money to them and would instead prefer to keep the money to themselves. In experiment two, they ran a similar study, but also implemented four different delays in reinforcement. The participants were then expected to choose as they did before, but the reinforcement would follow after a delayed amount of time- between 1 day and 1 month. As expected, participants were more likely to discount reinforcers if they were lower and farther away in time.

The equation for social discounting is as follows:

$$v = \frac{V}{(1 + sN)}$$

In this equation, v is the value of the reward after being discounted, V is the undiscounted value, and N represented the social distance, while s is the held constant. Belisle, Dixon and Rowsey (2019) conducted a similar study by presenting three separate surveys to participants in a social discounting study. In study one, similar to the Rachlin and Jones study, individuals were identified with choices resulting from how likely they were to give their money to someone else depending on their social distance, including their current economic hardship. Again, this study showed that individuals were less likely to give the money to those who were farther down their list of relationships. Altogether, they found that economic hardship could be a motivating factor

in social discounting rates. The above studies do not provide a ready metric or evaluate how multiple sources of discounting, such as delay and social discounting, or delay and geographic discounting, exert multiple control over human choices. Belisle, Paliliunas, Vangsness, Dixon, & Stanley (under review) provide such as metric in the context of delay and social discounting on altruistic choices within a monetary discounting task. In the first set of questions, participants were given the choice between keeping an amount of money for themselves they would receive after a (titrated) amount of delay, or they could give an amount of money to the N^{th} person on their list right now. During the second task, they were presented with similar questions, but they would receive X amount of money for themselves now, while the other option presented giving an amount of money to the N^{th} person on their list at a delayed amount of time. The researchers found that social and delay discounting could account for the altruistic behaviors presented by individuals.

Purpose

The purpose of the present study was to evaluate a behavioral economic model of environmental choice making within a preferred policy. This represents an extension of research by Belisle, Campbell, & Todd (under review) as well as prior studies on delay discounting and climate change. The purpose of the pilot study was to investigate individual and group taxation policies in a small randomized control trial to inform the development of the discounting task used within the main study. The purpose of the main study was to investigate multiple control exerted by delay and geographical distance on discounting of earth's climate within a public policy preference. This included evaluating the redistribution of taxation from overconsumption

of fuel-related carbon emissions. Redistributed tax revenue will be evaluated between closer and developed countries versus farther and underdeveloped countries.

PILOT INVESTIGATION: GROUP AND INDIVIDUAL CONTINGENCIES

Methods

Participants. The participants of this study were college students who attend Missouri State University. The participants were recruited from undergraduate Psychology courses. The students in these courses were compensated with either research credit or extra credit, as determined by the professor they were enrolled under. Students could access one of the two surveys online, at any time. By accessing the online Psychology research system at Missouri State University, known as SONA, participants were granting their consent to participate in the research. This research was approved by the Institutional Review Board (IRB) in August 8th of 2018. The IRB is listed as IRB-FY2019-95, and the IRB approval page can be found in Appendix A.

Procedure. To provide an insight to the validation of the survey, this pilot study was conducted previous to the thesis proposal. This study was created using Qualtrics and made available to students through the Psychology research system at Missouri State University, known as SONA. After choosing the survey on SONA, the student was randomly selected and redirected to one of the surveys. The pilot study comprised of two surveys, with 50 questions each, and one was randomly assigned to the participant through the utilization of Qualtrics's randomization tool. At the beginning of both surveys, a short introduction to climate change, the point of no return (PNR), and current policies being presented to combat climate change was provided for the participants to read. Below is an example of the short introduction they were presented:

"At this point in time, anthropogenic causes of climate change are resulting in our planet facing increasingly dire circumstances. The Intergovernmental Panel on Climate Change

(2019) states that the point of no return can occur within the next 15 years if we continue to make the same environmental decisions we are currently making. The point of no return (PNR) is defined as the point in time in which it is too late to act in order to stay below the prescribed threshold of environmentally tolerable CO₂ (carbon dioxide) levels. This will cause a rise in an average global temperature above 1.5°C relative to pre-industrial levels. Due to this, several politicians have proposed new policies to combat the climate change crisis. In general, these policies specify a high tax on carbon emissions (approximately \$60 per ton of carbon), and an increased tax every year until net zero emissions are reached. It should be noted that the average carbon emissions per person within America is 20 tons (40,000 lbs.) per year.

During this survey, you will be presented with several questions where you will decide on which policy you would prefer to be implemented nationwide.”

There were two separate surveys created based on the following taxation systems: a direct individual tax or an indirect collective group tax. The randomization tool in Qualtrics determined whether the participant would be presented with either the individual tax survey or the group tax survey. Each survey comprised of 50 questions in total, with 10 questions per block. There were five blocks in total, each comprised of a different quantity of years until the PNR would be met. The presented years per block were as follows: 15 years, 20 years, 25 years, 35 years, or 50 years. Further, each question per block was titrated with a different amount of carbon emissions that needed to be met under for taxation to be avoided. These titrated amounts were anywhere between 5,000 pounds and 50,000 pounds of carbon emissions. Once hitting this threshold, the taxation would go into effect. Participants would either be taxed as an individual or a group at \$0.03 per pound exceeding the threshold.

Each question presented two policy options that the participant could choose from. Policy A was the same for both surveys, and never changed throughout the questions. Policy A composed of no taxation policy, and that there was no carbon emission threshold that needed to be met under. However, the PNR would follow in 15 years. Policy A provides a resemblance to

the nonexistence of a carbon policy presently in the United States. Below is an example of the Policy A option presented during the survey:

“Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.”

Policy B was presented differently for each participant, depending on which survey they received from the randomization tool. Each Policy B option contained a titrated amount of carbon emissions met before hitting the threshold, the amount of years until the PNR, and whether they would be taxed as an individual or as a collective group (direct taxation vs. indirect taxation).

For the indirect group taxation survey, Policy B would present that the entire group (here being every citizen of the United States) would need to stay under the provided target carbon emission threshold to avoid taxation. At the end of the year, every person would be taxed the same amount, and be responsible for the entire group’s collective amount of carbon emission produced. This would convey the idea that even though personal efforts could be made to decrease carbon emissions, the participant would still be required to pay for others personal efforts, or lack of, through this taxation policy. An example of how this Policy B option was presented is as follows:

“Policy B - You will be taxed for the group’s overall carbon emissions. You must remain below 20,000 lbs. (10 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 20 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 20,000 lbs. of CO₂.”

In contrast, the individual direct taxation survey would account for only the participants carbon emissions. Instead of being taxed at the end of the year for the entire group’s collective tax emissions, the only tax collected would be that of the individuals personal carbon emissions. This would convey the idea that you can personally work to decrease your personal carbon emissions, and the amount of taxation will reflect that effort. The participant alone would be

responsible for their own carbon emissions, instead of the entire population's. An example of how this Policy B option was presented is as follows:

“Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 15,000 lbs. (7.5 tons) of CO₂ per year to avoid taxation. The PNR will occur in 20 years. You will be taxed at approximately \$0.03 for each pound exceeding 15,000 lbs. of CO₂. ”

A copy of the full pilot study survey can be found in Appendix B.

Statistics. The pilot data was analyzed by calculating the area under the curve for the individual and group surveys. The area under the curve formula is as follows:

$$(x_2 - x_1) [(y_1 + y_2)/2]$$

Once the sum of the five PNR delays (15, 20, 25, 35, 50) for both surveys was calculated, they were plotted in a graph. The five delays were shown on the x-axis, and the y-axis contained the sum of each delay. Once plotted, a line was drawn between the point and x-axis. Once completed, this generated several trapezoids. Using Excel's auto-calculation tool, the area for each trapezoid was calculated using the above formula. Once found, each trapezoid was calculated together to create a sum for the area under the curve for both surveys. The two area under the curve sums were then compared using a paired samples t-Test to determine if there were any significant differences between discounting rates produced by the tasks. We also fit linear and hyperbolic equations to the mean indifference point data produced using both methods and with an aggregated group to determine if the discounting task as developed produced patterns of responding consistent with prior research in this area.

Results and Discussion. Table 1 presents the area under the curve (AUC) scores for each participant. This data shows that the AUC was close for both the group and individual contingency, meaning that there was little to no difference between a preferred policy. The group survey's AUC was calculated at 0.30331, where the individual was calculated at 0.30338. The

results of the independent samples t-test, presented in Table 2, suggested that these differences were not statistically significant, as the variance for the individual contingency resulted as 0.86, and the group contingency resulted as 0.91. The calculated t state resulted in a 0.31, demonstrating that the differences between the individual and group contingency was not statistically significant.

Table 3 presents the delay of the point of no return for both the individual and group contingency indifference point scores. The average between the two contingency indifference point scores are also presented in the table. At the given point of no return values (15, 20, 25, 35, 50), the scores for the group contingency were as follows: 18316.33, 18724.49, 14642.86, 13724.49, and 13622.45. In comparison, the scores for the individual contingency at the given point of no return values were as follows: 19130.43, 17608, 17282.61, 17282.61, and 13913.04. Again, here you can interpret the data as very closely related, but the numbers for both contingencies decrease over time. This is represented by the obtained linear equation: $y = 38095x^{-0.259}$, which shows a negative slope coefficient for the average. We additionally fit the hyperbolic function to the mean indifference point data for both groups, which produced R^2 values of 0.7835 for the group contingency and 0.8131 for the individual contingency, as seen in Figure 1. Because there were no significant differences between the two groups, we also aggregated the groups together which produced a strong curve fit resulting in an R^2 value of 0.95. This suggests that a larger sample may be needed to optimize the curve fit using a similar discounting task structure.

Purpose. The pilot study, and feedback from the committee, allowed an insight into implications and further alterations for the main study of the thesis. First, it is made clear from the pilot study that the delay values were meaningful and had the expected effect on discounting

rates. Second, little to no difference between the individual and group contingencies was found, however, the individual contingency seemed to produce a better fit. Therefore, the discounting task in the thesis will be the individual contingency. Third, carbon emissions may have been too broad of a subject for the participants to understand on an equal level. We will be utilizing a more specific carbon emissions to target in the main study, which will be driving/car emissions. Fourth, the introduction paragraph to our survey was far too lengthy and detailed and will need to be shortened to keep the participant's attention. Lastly, and coinciding with number one and four, we will be reducing the number of delay values to four instead of five. This will be due to the significant increase in number of questions from the third added variable (geographic distance).

THESIS: EFFECT DELAY AND GEOGRAPHIC DISCOUNTING ON CLIMATE POLICY PREFERENCE

Methods

Participants. The 40 participants of this study were college students who attended Missouri State University. The majority of these students were between the ages of 18-21 (53%) and were female (83%). The participants were recruited from Psychology courses at the Springfield university location, which is located in southwest Missouri, in the central midwestern area of the United States of America. The population in Springfield is 85% White/Caucasian with a median household income of \$34,755 (Springfield, MO, n.d.). The students in these courses were compensated with either research credit or extra credit, as determined by the professor they were enrolled under.

This study was conducted online, through a Qualtrics survey. Participants were given access to the survey from an email provided by a researcher on this project. Once reading the consent forms attached to the email, students were redirected to the Qualtrics survey, in which they could begin answering the demographic questions provided. All personal information provided on the survey is considered confidential, which is why each survey will be counted as anonymous.

This research was approved by the Institutional Review Board (IRB) on August 8th, 2018. The IRB is listed as IRB-FY2019-95, and the IRB approval page can be found in Appendix B.

Procedure. The design used for the pilot data allowed insight into the unexpected cracks that may arise for the methods of the main study for this thesis. For these reasons, the main study is an updated extension from the pilot study. The design of the survey was formatted almost

exactly as the pilot study, except with an added third variable. Originally, the researchers planned to print and distribute the main study during class periods provided by professors who were willing to participate. Unfortunately, campus was closed for the remainder of the semester due to the coronavirus (COVID-19) global pandemic and related stay-at-home orders. These orders were instated the week following Missouri State University's spring break. The original word document to be printed for in person distribution was uploaded into a format suitable for Qualtrics. The online survey should take between 10-15 minutes for the average student to fill out. Due to this change in the procedure, completion of the thesis was extended by two-weeks to allow for analysis of the data described below. This change was accepted by the Graduate College at the university.

An email was sent out by the head investigator of this thesis to the student emails provided by the professors. An attached consent form was given to the students to read over before beginning the survey. Once they began the survey, they were offering their form of consent for us to record their answers through Qualtrics. The students were first required to fill out a block of questions with demographic questions related to their majors, age, sex, and what year they were at Missouri State University. After beginning the survey, the students were provided with a block of introduction information to read that was similar to the pilot study, but more to the point with information that was understandable for the participants. The paragraph included information on the current climate change crisis, the average miles driven per person every month, and a brief explanation on the point of no return. To ensure basic comprehension of the information provided, the participants were asked three questions relating to the introduction paragraphs they had read. Also, there was a time minimum set for this page, so participants were

not allowed to move to the survey questions until 90 seconds had passed. An example of the introduction paragraphs provided for the participants can be found below:

“At this point in time, anthropogenic causes of climate change are resulting in our planet facing increasingly dire circumstances. The Intergovernmental Panel on Climate Change (2019) states that the point of no return can occur within the next 15 years if we continue to make the same environmental decisions we are currently making. The point of no return is defined as the point in time in which it is too late to act in order to stay below the prescribed threshold of environmentally tolerable CO₂ (carbon dioxide) levels.

During this survey, you will be presented with several questions where you will decide on which policy you would prefer to be implemented nationwide regarding a tax on car emissions.

In Policy A, you will have no restrictions on the number of miles you can drive every month, and the point of no return will follow in 15 years.

In Policy B, you will be given a specified number of miles in which you must personally remain under in order to delay the point of no return. You will be taxed based on the average amount of miles you have personally accumulated in the past month. This means your personal effort to decrease the number of miles will affect the amount you are taxed. Half of the tax revenue accumulated will be distributed into the U.S. government, while the other half will be redistributed to one of the four geographic locations specified. For example, Larry has worked hard to cut his average monthly miles in half, but his neighbor Tom has not made that effort. At the end of the month, Larry will receive a lower car emissions tax than Tom, based on his personal efforts.”

There were a few changes made in this survey in comparison to the pilot study. For example, the pilot study aimed to eliminate all carbon emissions by targeting all carbon emissions. This could have been a limitation to our first survey, as “carbon emissions” as a whole is subjectively quantified and understood. For this reason, car emissions, or more specifically- gas consumption, was targeted in the main study. Driving was targeted as a threshold, meaning the consumer will need to stay under the threshold to avoid an additional taxation. The taxation began at 1,300 miles, and decreases in titration until reaching 100 miles, as follows: 1,300 miles, 1,100 miles, 900 miles, 700 miles, 500 miles, 300 miles, and 100 miles. Each titration consisted of taxation at 10 cents per mile, per month, over this threshold. In other

words, if an individual is given the 100 miles threshold to stay under every month, they will likely be charged more in taxation every month. Driving less than 100 miles a month may be difficult for the average person to stay under. In comparison, staying under the 1,300 miles threshold is more obtainable, and taxation can be easier avoided. Therefore, the individual driving over 100 miles per month will be taxed more every month than the person driving over 1,300 miles per month. The accumulated tax from this variable will be split in half, in which half will remain in the country (United States of America) while the other half will be redistributed to another specified geographic location. More information will be given on the specified geographic locations in the following paragraphs.

The point of no return titrations followed in the same pattern as the pilot data, except the year “20” was removed. This left four titrations instead of five, with the following point of no return years provided: 15, 25, 35, 50. Removing one titration allowed for a significant reduction in the amount of questions needed to be filled out by the students, while still providing the needed data. As an extension of the pilot data, a third variable was implemented into the survey question choices. Geographic distance was this third variable, and consisted of four titrations. The demographic distances accounted for the location in which half of the accumulated taxation will be redistributed to. These locations were: 1) Missouri, 2) The United States of America (USA), 3) The “Western World” (North America, Europe, Australia), and 4) The “Whole World.” Each of the four titrations consists of the geographic location previous to it. In example, for the second titration, Missouri is contained within the United States of America and is therefore already part of that titration. Each geographic distance was presented to the students in the survey, and each geographic location was highlighted. Figure 2 is an example of the geographic distance #2 that the students were presented with during their survey. Here, all of the

USA is highlighted in maroon. The figure was presented at the beginning or a new page, following a page break, so the participants could recall the location accurately.

A classification of the variables and their titrations has been listed in Table 4. Every question included two choices for the participants to choose from: Policy A or Policy B. Policy A was similar to the pilot study, in which no restrictions were held and the point of no return followed in x amount of years. Policy B presented a titration from each of the three variables and was presented similarly to the pilot data, except with the added third variable of geographic distance. An example of the formatting for Policy B was as follows:

“Policy B- You must remain below X miles per month in order to avoid taxation. The point of no return will occur in Y years. You will be taxed at approximately \$0.10 for each mile exceeding the X mile threshold. Half of the tax revenue will be redistributed to geographic location Z (specified location information).”

Policy B required that X, Y, and Z be changed for each question, regarding the block of questions and titrations mentioned in Table 4. There were four blocks of questions, and for every block of questions, the amount of miles driven (X) and delay of years until the point of no return (Y) will be titrated, but the region (Z) will remain the same throughout that block. For example: block one contains region one while X and Z are titrated, block two contains region two while X and Z are titrated, block three contains region three while X and Z are titrated, and block four contains region four while X and Z are titrated. With there being seven titrations of miles driven and four delays until the point of no return, the first block results in 28 questions. With there being four blocks of questions, the survey contains a total of 112 questions. A copy of the full survey for this study can be found at the of this thesis under Appendix C.

Statistics. The data for this study were analyzed using a customized script within the programming language known as “R” (The R Project for Statistical Computing, n.d.). R is a software that combines data manipulation, calculation, and graphic display. Analyses were

similar to those reported by Belisle, Paliliunas, Vangsness, Stanley, and Dixon (under review). This program also allows the users to customize and add new functions. Before running the program, the data were organized and a quantifiable number for geographic distance was evaluated. For this study, we went with the approximate population for each geographic location. Therefore, the larger the population, the greater the total geographic distance from the participant. Alternative approaches to analyzing these data could be the total area encompassed by the recipients or total distance from the participant. We selected population as the parameter after conducting initial analyses of the data in terms of each of these values. In R, the first step to analyzing the data was to upload already existing libraries that will clean and analyze the data. Libraries will contain previous codes and functions that have been saved by the individual using the program. During this process, the data set is also uploaded into the program to be run accurately. The data were cleaned before anything was run to ensure all datasets were complete and there was no missing values or participants.

One of the libraries, lattice, allowed an early visualization into the relationships of the dependent and independent variable and whether they would be able to provide a hyperbolic curve. This code breaks down a visualization for each individual for their relationship with delay to the point of no return and the population. The second step in running the data through R was to evaluate the functional relationship by fitting the data to a hyperbolic model. Akaike information criterion (AIC) and Bayesian information criterion (BIC) are common methods used in statistical analyses to choose the best fit model for the data (Burnham and Anderson, 2004). These two methods were both used to determine the best fit for our data set. The discounting rate per delay, k , and the discounting rate per population, p , were both run separately. This step allows for a multilevel analysis, which creates an exceptionally smooth and fitting hyperbolic curve. A random

effects structure was also run to determine if the participants showed hyperbolic discounting. Then, the 40 individuals were fitted individually in their personal hyperbolic discounting curve for delay. The same was run for the geographic/population discounting.

Results. The first results to come from the data analysis is each participant's indifference points in relation to their survey answers as a function of delay and geographic distance (population). Figures 3 and 4 show these indifference points for each individual as a function of delay and population. From these figures we can notice a stronger relationship amongst the participants indifference points and delay, than the relationship between the participants indifference points and population. These figures give us an early visualization of what our final hyperbolic discounting curve may look like.

The next step was evaluating the relationship between the participants indifference points, delay, and population. The early visualizations, Figures 3 and 4, allowed insight into how well our third variable (population) would fit with the other two variables. Since there was not a strong relationship amongst the indifference points and population, AIC and BIC values were used to determine the best fit model for the data. Fitting the hyperbolic function to the data only results in one parameter- either the discounting rate due to delay or the discounting rate due to population. Figure 5 displays the best fit multilevel hyperbolic curve model from the data analysis. The random effects structure was then determined, which displayed the majority of the participants showed hyperbolic discounting. This structure can be found as Figure 6 below. From here, the discounting rate for delay was fit into a hyperbolic curve structure for each participant across condition. This is displayed by Figure 7 and looks similar to the early visualizations from early Figure 3. Unfortunately, the data for the population did not fit well to any model, so we were unable to provide hyperbolic curve models for each participant as a function of population.

Figure 8 exhibits the closest model we were able to achieve. Here, you will notice that it is a linear relationship, and that there was no difference based on the geographic location.

Discussion. Although we were unable to achieve a non-linear hyperbolic discounting model including both delay and geographic distance, there were several other significant findings during our data analysis. We were successful in finding a hyperbolic curve fit for delay to the point of no return, as shown below in Figure 5. Previous research completed in our lab has extended this finding, in which individuals are willing to decrease their carbon emissions to delay the point of no return (Belisle, Campbell, & Todd, under review). This also extends on research mentioned on delay discounting and reinforcer loss earlier in the introduction section (Kaplan, Reed, & McKerchar, 2014; Saville, Gisbert, Kopp, & Telesco, 2010).

The implications of our data analysis on policy preference displays that individuals would be willing to constrain their consumption of carbon-emitting commodities to delay the point of no return. However, the value of the delay of climate change itself (i.e. saving our and other species) must be worth more than the carbon-emitting commodities that are to be decreased or given up entirely. Figures 3, 5, and 7 all provide and understanding into our participants willingness to cut down on their personal carbon emissions to delay climate change. This finding can be associated with previous findings in which individuals are willing to cut down their personal carbon emissions to delay climate change (Belisle, Campbell, & Todd, under review). To further recognize participants hyperbolic discounting, figure 6 identifies that the majority of the participants did in fact show a hyperbolic discounting function due to their results from the survey. Having a mathematical function of this phenomenon is important because it allows for a universal interpretation for present and future complications our society may face and how to manage those complications. This mathematical phenomenon also allows us to understand

potential outcomes of natural phenomena regarding human behaviors without having to physically interfere those behaviors.

As shown in Figures 4 and 8 below, we were not able to successfully fit geographic distance into a hyperbolic curve model. The important implication that this provides for us is that geographic distance may not matter in a redistribution-based policy. This is an important finding because we can assume that a climate change policy offering a tax redistribution to other states or countries could be acceptable by taxpayers. The current climate change policies being presented hope to redistribute up to 50% of taxation, especially to underdeveloped countries, to alter their economic practices to be more ethical and environmentally friendly. Given our results, it appears that our participants may be willing to forego up to 50% of their tax revenue to those locations to assist them in the process of becoming more environmentally friendly. This also implicates that tax money could potentially be redistributed throughout the country to assist other states who may struggle with higher populations and carbon emissions, such as California and New York. However, it should be noted that our sample size and population were very limited and these results may not reflect the overall opinion of public populations throughout the United States.

There were several limitations to our study that should be evaluated before further investigations. First and previously mentioned, our sample size and population were both a considerable limitation to this study. Not only were the majority of the students between the ages of 18-21, but they were also all higher education students. This could imply that a higher education could show greater understanding of climate change, as well as the predicted consequences associated with it. The students in this age range are also younger and could hold more anxieties toward what the future of our environment could hold for them (or their children)

due to climate change. Our sample size was also reduced significantly due to the coronavirus. Following spring break, classes were moved to remote and online application, meaning we had limited access to obtain survey data. Future research could improve these limitations by expanding survey availability to the general public, where increased diversity of knowledge and age can be achieved.

Another limitation is the chosen quantitative value for analyzing the geographic discounting measure. Measuring geographic discounting was difficult, so population was the chosen value for this thesis. However, there are other values that were considered and could have shown better results, such as the physical square mileage amongst each location. Further investigations into this subject should research other potential values for measuring a geographic discounting variable and consider utilizing square mileage as a quantifiable measure.

A last limitation to this study was the survey itself. For one, the survey length exceeded 100 questions, which could deter students from answering accurately or to the best of their ability. The survey layout was also repetitive, which could have become overwhelming for the students after a certain number of responses were recorded. Lastly, there were no specific measures put in place to ensure the students fully understood the information being provided for them in the introduction paragraphs besides the three questions they answered at the beginning of the survey. To decrease this limitation in future studies, researchers could allow randomization of sections, instead of providing the entire survey. This would allow for less time to complete the survey, while also decreasing repetitiveness. Presenting the survey in person or providing a video explaining the survey could also aid the participants in understanding the survey's contents.

Future research should extend into the realms of geographic discounting measures and adding a third variable to create non-linear regression models of discounting. Discovering an

accurate quantifiable value for geographic distance could be the key to implementing a geographic discounting measure into future research within this field.

Another example of future research could extend into targeting specific climate change events as a reinforcer loss. Climate change as a whole is extremely broad, and reports such as the IPCC are able to break down areas and species that are being effected more so than others. An example would be to include a specific climate change related event in the survey itself. In late 2019 and early 2020, Australia was devastated by wildfires and lost an estimated 1 billion species (Lassman, 2020). By targeting this specific climate change related disaster, students may take the survey more seriously or have an increased willingness to delay climate change. A reason for the lack of extreme climate change policy in the United States is having little to no knowledge on the impact of climate change or considering it to be a conspiracy. As we have learned over the past few decades is that climate change is a slow process that cannot be seen on a day-to-day basis. Instead it is noticed through large catastrophic events that happen every few months or years. By implementing a specific event that has personally impacted a population or species, it could change the effects of individuals willingness to delay climate change and cut their carbon emissions.

Another possibility for future research extending from this study could be a marginalized taxation rate in general. Although we have completed research on a marginalized taxation rate that is implemented once a consumption threshold of a carbon-emitting commodity has been met, further investigation into a basic marginalized taxation should be considered. An example being: once an individual's income has exceeded one million dollars in one fiscal year, every dollar over that one million is taken as tax revenue and redistributed to an environmental policy of their choosing. An issue with implementing a marginalized taxation policy in the United

States is that individual's either don't know where their taxes are being redistributed or they are being redistributed to causes they do not care for (war, bank and corporation bailouts, etc...). Allowing a choice for where their taxes are being redistributed could allow more willingness for a marginalized tax rate to occur.

A final recommendation for future research would be to put a "cap" on major corporations' personal carbon emissions. This would not allow them to exceed a threshold that can be paid off later with no problems. Unfortunately, this is a problem in modern-day United States of America, as several corporations either receive bailouts or end up paying off any additional taxes without reducing their carbon emissions. However, it has already been done here in the USA with car emissions. As mentioned in the introduction section, a new requirement is evaluated and written out for new car models every year regarding how many carbon emissions they can emit. If this can be done for modern cars then it can be done for all carbon-emitting corporations and commodities.

In conclusion, climate change is happening around us every day and time is not something we have when choosing the perfect policy to be implemented. The outcomes of a healthier environment significantly outweigh the chaos that will continue in the following decades if climate change and human behavior is not addressed and regulated. Due to the considerable amount of research that has shown the impact humans have on the environment, the policies we choose to put in place need to focus specifically on restraining human behavior. Although there might not be a "perfect policy," the use of behavioral economics could assist politicians in the policy making process to best benefit every species. Also, seeking out models that have already been put in place by other governments could be beneficial in deferring climate change. For example, the Cape Town water crisis was able to successfully avert exhausting the

water supply by implementing several guidelines to decrease water usage (Parks, McLaren, Toumi, & Rivett, 2019). By educating their population on how to best reduce their water usage (and with rain finally falling on the area), the water resources were able to replenish. This specific example could show other countries how limiting human behavior through recommendations or policy could best benefit the general population. Although specific policy was not implemented in that real world example, it could benefit larger governments and populations. Given our sample, our pilot study suggests a hyperbolic curve of discounting and that there was little to no difference between an individual or group taxation policy. Our main study further displayed little to no preference for a policy that redistributes taxes to a given geographic location, however, further research is needed to obtain an accurate representation of preferences. In closing, we need to implement a policy that will restrain human behaviors while also providing a larger and later reinforcer following a delay to the point of no return.

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TABLES

Table 1. The area under the curve (AUC) scores for each participant, presented in both the individual and group contingencies.

Participant	Auc Total Ind	Auc Total Group
1	1.0001	1
2	1.0001	1
3	1.0001	1
4	1.0001	1
5	0.8232	0.82313
6	0.62593	0.62585
7	0.72119	0.72109
8	0.44905	0.44898
9	0.42864	0.42857
10	0.42184	0.42177
11	0.23817	0.2381
12	0.34021	0.34014
13	0.3334	0.33333
14	0.3266	0.32653
15	0.31979	0.31973
16	0.29258	0.29252
17	0.39463	0.39456
18	0.34701	0.34694
19	0.23135	0.23129
20	0.20414	0.20408
21	0.14291	0.14286
22	0.59189	0.59184
23	0.34021	0.34014
24	0.53751	0.53741
25	0.27217	0.27211
26	0.2382	0.2381
27	0.08849	0.08844
28	0.18375	0.18367
29	0.12252	0.12245
30	0.07489	0.07483
31	0.06128	0.06122
32	0.04767	0.04762
33	0.1157	0.11565
34	0.06808	0.06803
35	0.04767	0.04762
36	0.04767	0.04762
37	0.04767	0.04762
38	0.04767	0.04762
39	0.04767	0.04762
40	0.04767	0.04762
41	0.04767	0.04762
42	0.04767	0.04762
43	0.04767	0.04762
44	0.04767	0.04762
45	0.04767	0.04762
46	0.04767	0.04762
Total	0.30338	0.30331

Table 2. The t-Test results from the pilot study.

t-Test: Two-Sample Assuming Equal Variances		
	<i>IND</i>	<i>GROUP</i>
Mean	0.303379096	0.284671186
Variance	0.08642563	0.091173728
Observations	46	49
Pooled Variance	0.088876261	
Hypothesized Mean Difference	0	
df	93	
t Stat	0.305666295	
P(T<=t) one-tail	0.380270942	
t Critical one-tail	1.661403674	
P(T<=t) two-tail	0.760541883	
t Critical two-tail	1.985801814	

Table 3. The indifference points for each delay value of the point of no return and the average for the two contingencies.

Delay to PNR	15	20	25	35	50
Group	18316.33	18724.49	14642.86	13724.49	13622.45
Individual	19130.43	17608	17282.61	17282.61	13913.04
Average	18723.38	18166.24	15962.73	15503.55	13767.75

Table 4. A listing of the three variables and their titrations. Every question will provide a choice with one of the titrations from each of the three variables.

Variables	Titrations
	1,300
	1,100
	900
Gas Consumption	700
Threshold	500
	300
	100
	15
Years Until the	25
Point of No Return	35
(PNR)	50
Geographic	1) Missouri
Distance/	2) United States of America
Location Number	3) Western World (USA, Europe, Australia)
	4) The whole World

FIGURES

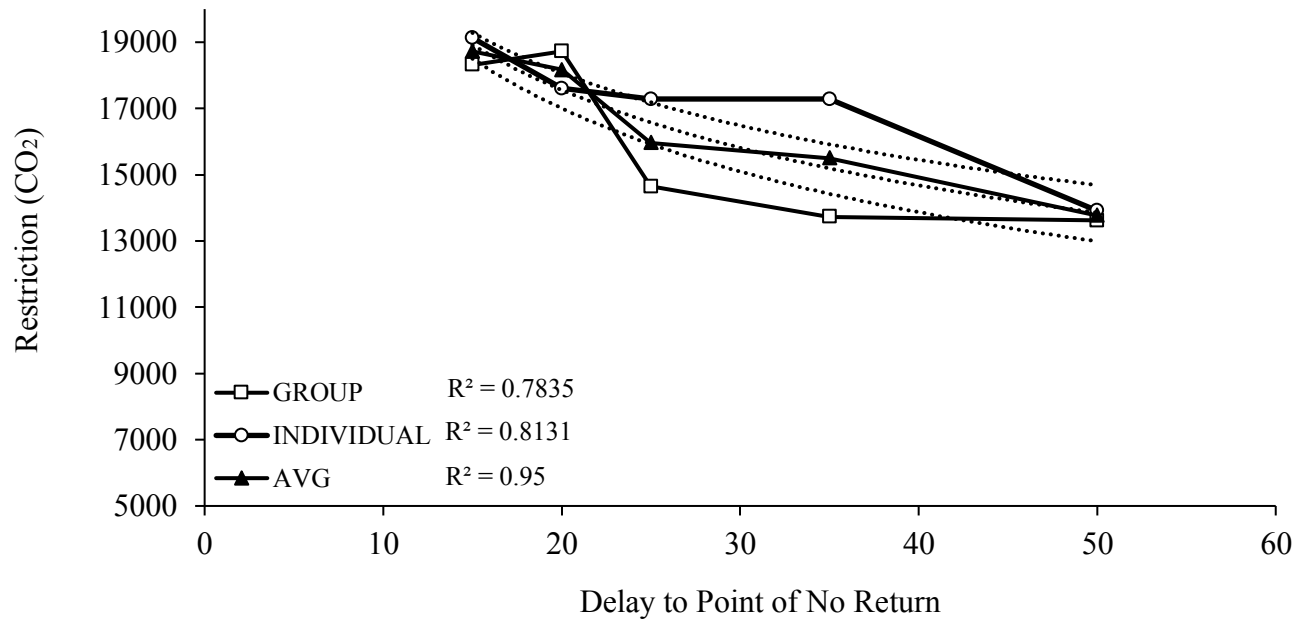


Figure 1. Plotted indifference points presenting each delay for the point of no return values, as well as the R^2 value for each contingency and average.



Figure 2. Geographic location number 2. Here, the United States of America is highlighted in maroon to dictate the location of the tax redistribution chosen.

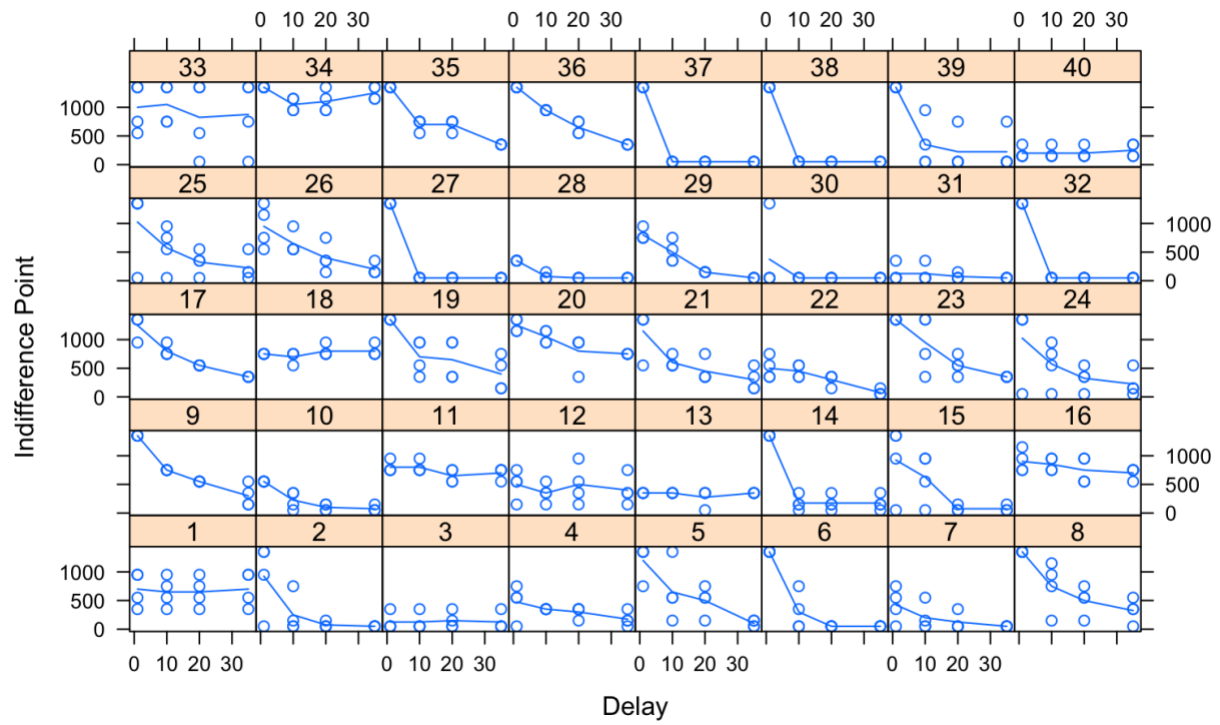


Figure 3. The indifference point for each participant as a function of delay.

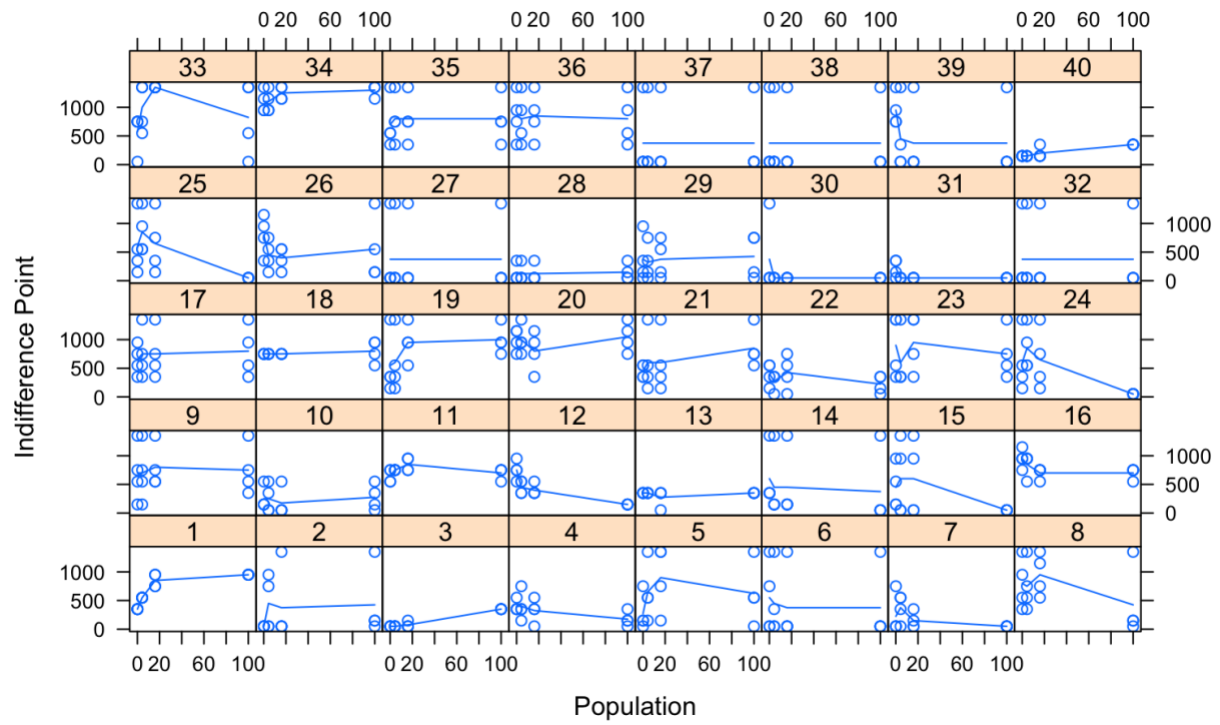


Figure 4. The indifference point for each participant as a function of geographic distance (population).

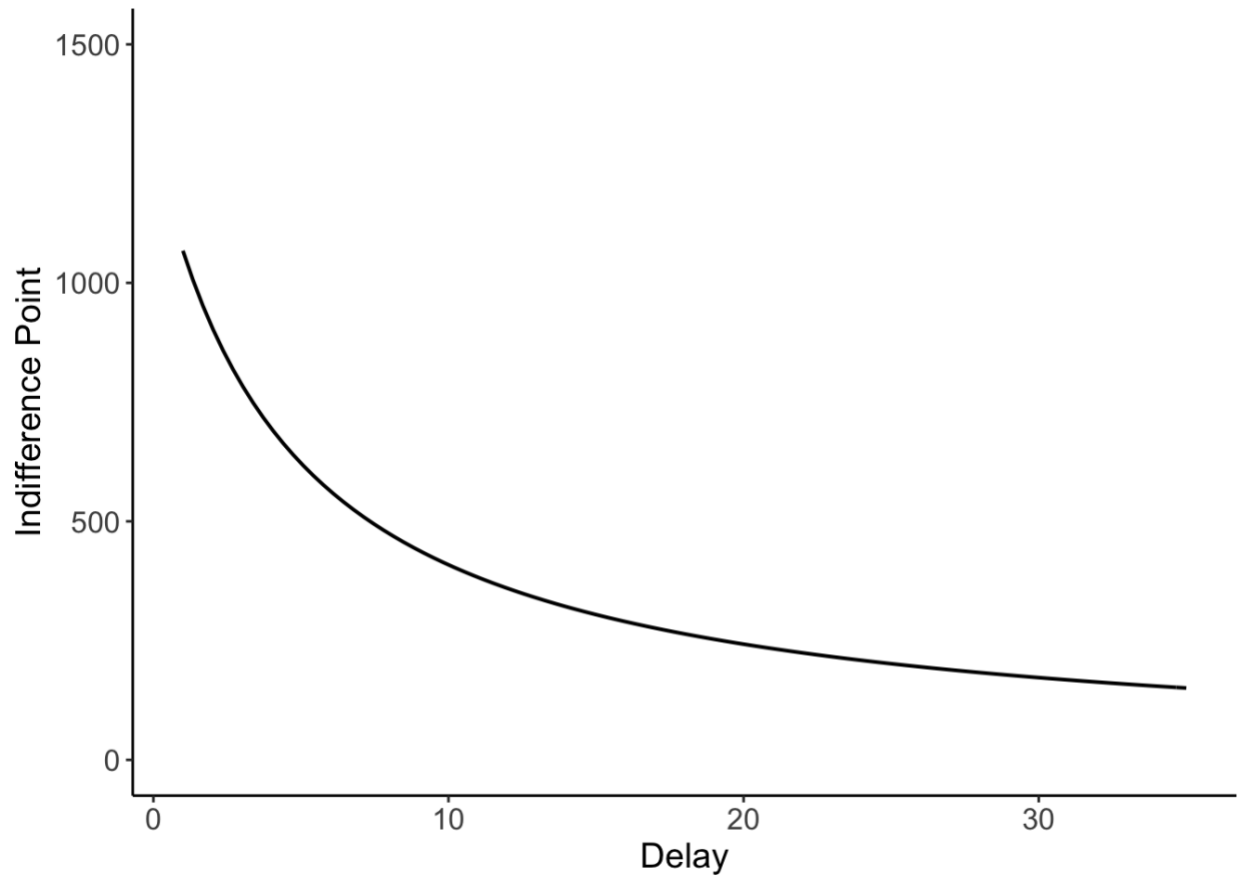


Figure 5. The best fit hyperbolic curve model for discounting delay due to a multilevel analysis.

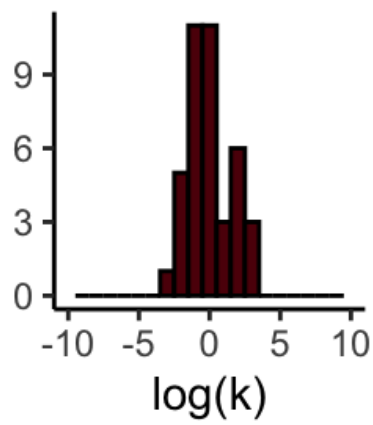


Figure 6. The random effects structure.

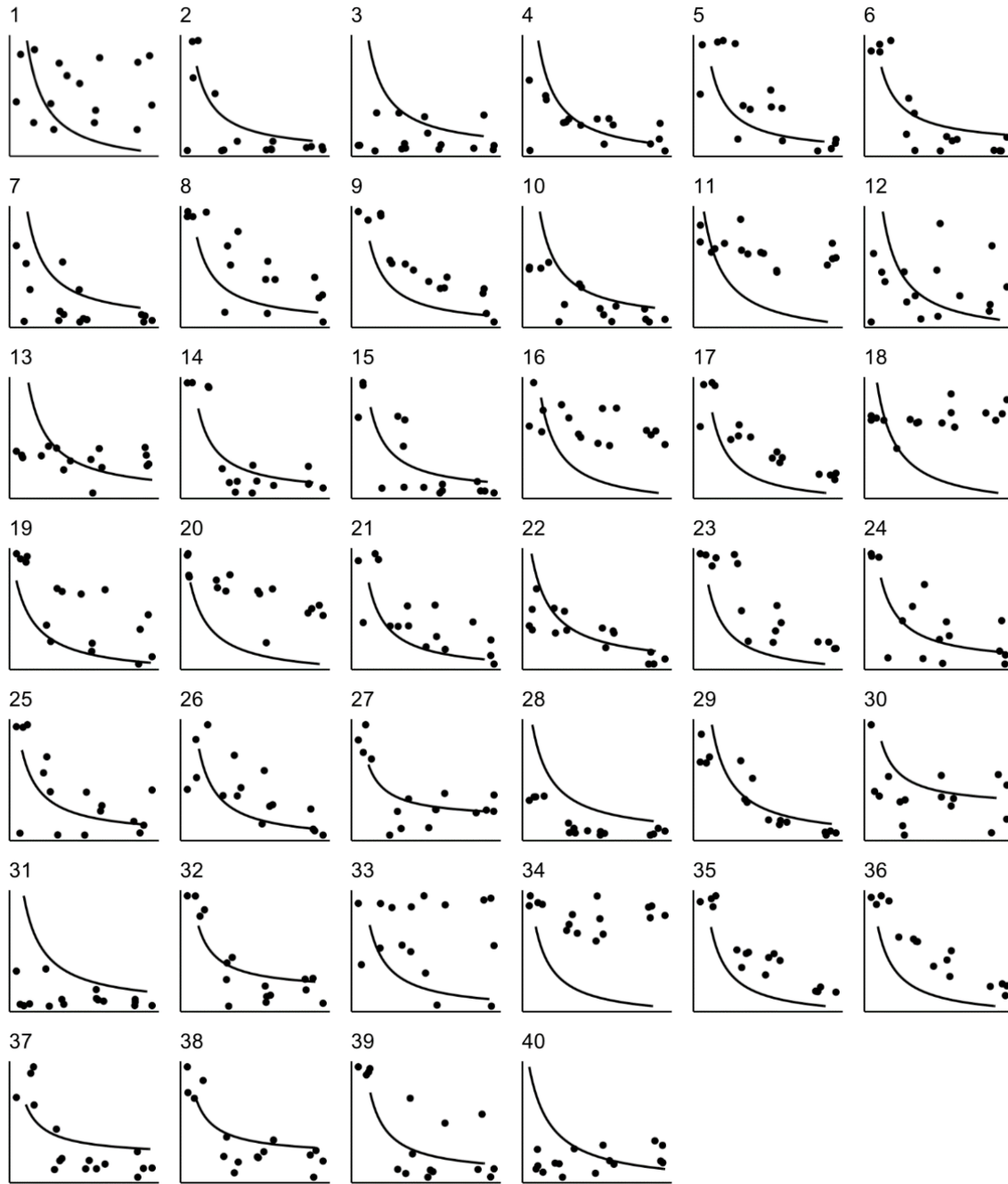


Figure 7. The hyperbolic curve models for each participant as a function of delay.

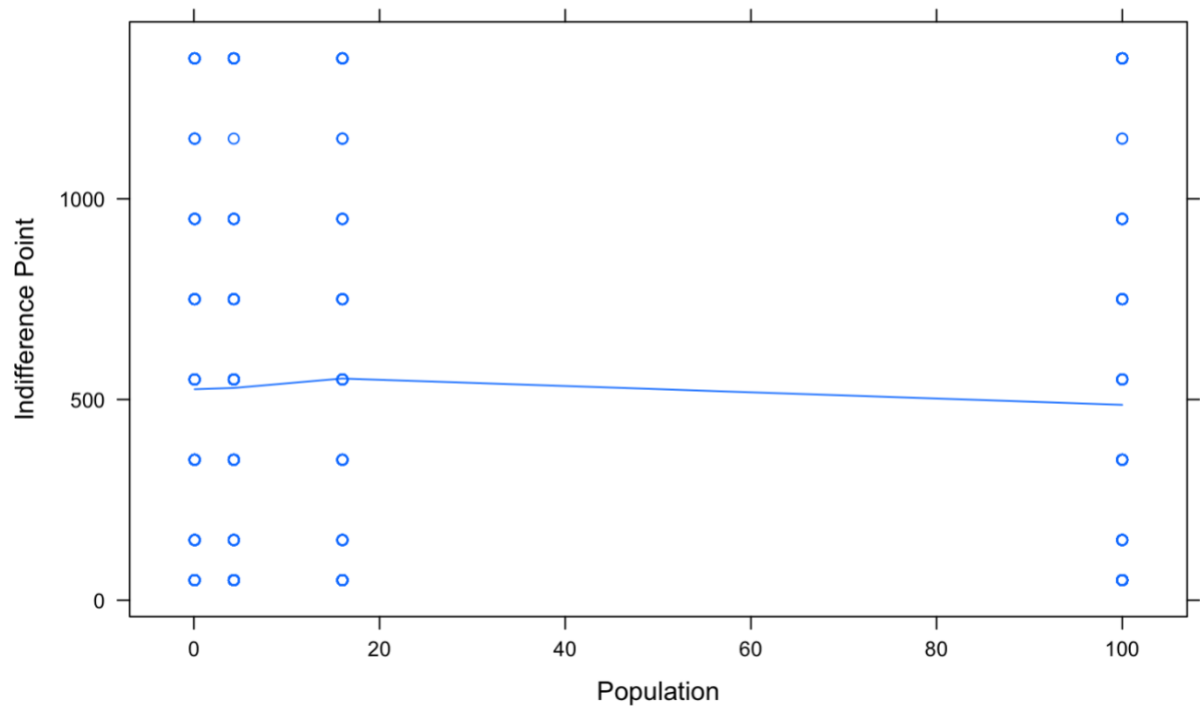


Figure 8. The best fit model for participant indifference points and population.

APPENDICES

Appendix A. Human Subjects IRB Approval

Date: 5-21-2020

IRB #: IRB-FY2019-95

Title: Subjective Valuation of Rewarding Commodities and Individual Discounting of Reward Value

Creation Date: 8-20-2018

End Date: 9-25-2020

Status: **Approved**

Principal Investigator: Jordan Belisle

Review Board: MSU

Sponsor:

Study History

Submission Type	Initial	Review Type	Expedited	Decision	Approved
Submission Type	Modification	Review Type	Exempt	Decision	Approved
Submission Type	Renewal	Review Type	Expedited	Decision	Approved
Submission Type	Modification	Review Type	Expedited	Decision	Approved

Key Study Contacts

Member	Dana Paliliunas	Role	Co-Principal Investigator	Contact	dpaliliunas@missouristate.edu
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Member	Jordan Belisle	Role	Primary Contact	Contact	jbelisle@missouristate.edu
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Member	Celeste Unnerstall	Role	Investigator	Contact	unnerstall13@live.missouristate.edu

Appendix B. Pilot Study Survey

It's Getting Hot in Here - Climate Change Survey

Start of Block: INTO- G

At this point in time, anthropogenic causes of climate change are resulting in our planet facing increasingly dire circumstances. The Intergovernmental Panel on Climate Change (2019) states that the point of no return can occur within the next 15 years if we continue to make the same environmental decisions we are currently making. The point of no return (PNR) is defined as the point in time in which it is too late to act in order to stay below the prescribed threshold of environmentally tolerable CO₂ (carbon dioxide) levels. This will cause a rise in an average global temperature above 1.5°C relative to pre-industrial levels. Due to this, several politicians have proposed new policies to combat the climate change crisis. In general, these policies specify a high tax on carbon emissions (approximately \$60 per ton of carbon), and an increased tax every year until net zero emissions are reached. It should be noted that the average carbon emissions per person within America is 20 tons (40,000 lbs.) per year.

During this survey, you will be presented with several questions where you will decide on which policy you would prefer to be implemented nationwide.

In Policy A, you will have no restrictions on the amount of human created carbon that can be emitted, and the PNR will remain in 15 years.

In Policy B, you will be given a specified number of pounds in carbon emissions in which the group (here being the entire population of the United States) must remain under in order to delay the PNR. You will be individually taxed based on the collective carbon emissions of the group. This means that regardless of your personal effort to decrease emissions, your effort may not reflect that of those around you. Every individual will receive the same amount of taxation at the end of the year. For example, Larry has worked hard to cut his emissions in half, but his neighbor Tom has not made an effort to decrease his personal emissions. Although Larry has made the effort, he will still be taxed the same amount as Tom.

End of Block: INTO- G

Start of Block: Part 1- G

In Policy A, you will have no restrictions on the amount of human created carbon that can be emitted, and the PNR will remain in 15 years.

In Policy B, you will be given a specified number of pounds in carbon emissions in which the group (here being the entire population of the United States) must remain under in order to delay the PNR. You will be individually taxed based on the collective carbon emissions of the group. This means that regardless of your personal effort to decrease emissions, your effort may not reflect that of those around you. Every individual will receive the same amount of taxation at the end of the year. For example, Larry has worked hard to cut his emissions in half, but his neighbor Tom has not made an effort to decrease his personal emissions. Although Larry has made the effort, he will still be taxed the same amount as Tom.

Q1 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 5,000 lbs. (2.5 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 15 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 5,000 lbs. of CO₂.

Q2 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 10,000 lbs. (5 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 15 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 10,000 lbs. of CO₂.

Q3 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 15,000 lbs. (7.5 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 15 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 15,000 lbs. of CO₂.

Q4 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 20,000 lbs. (10 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 15 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 20,000 lbs. of CO₂.

Q5 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 25,000 lbs. (12.5 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 15 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 25,000 lbs. of CO₂.

Q6 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 30,000 lbs. (15 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 15 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 30,000 lbs. of CO₂.

Q7 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 35,000 lbs. (17.5 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 15 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 35,000 lbs. of CO₂.

Q8 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 40,000 lbs. (20 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 15 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 40,000 lbs. of CO₂.

Q9 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 45,000 lbs. (22.5 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 15 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 45,000 lbs. of CO₂.

Q10 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 50,000 lbs. (25 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 15 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 50,000 lbs. of CO₂.

End of Block: Part 1- G

Start of Block: Part 2- G

In Policy A, you will have no restrictions on the amount of human created carbon that can be emitted, and the PNR will remain in 15 years.

In Policy B, you will be given a specified number of pounds in carbon emissions in which the group (here being the entire population of the United States) must remain under in order to delay the PNR. You will be individually taxed based on the collective carbon emissions of the group. This means that regardless of your personal effort to decrease emissions, your effort may not reflect that of those around you. Every individual will receive the same amount of taxation at the end of the year. For example, Larry has worked hard to cut his emissions in half, but his neighbor Tom has not made an effort to decrease his personal emissions. Although Larry has made the effort, he will still be taxed the same amount as Tom.

Q11 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 5,000 lbs. (2.5 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 20 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 5,000 lbs. of CO₂.

Q12 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 10,000 lbs. (5 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 20 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 10,000 lbs. of CO₂.

Q13 Choose the preferred policy

- Policy A - There are no restrictions on the amount of CO2 emitted. The PNR will occur in 15 years.
- Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 15,000 lbs. (7.5 tons) of CO2 per year as a group to avoid taxation. The PNR will occur in 20 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 15,000 lbs. of CO2.

Q14 Choose the preferred policy

- Policy A - There are no restrictions on the amount of CO2 emitted. The PNR will occur in 15 years.
- Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 20,000 lbs. (10 tons) of CO2 per year as a group to avoid taxation. The PNR will occur in 20 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 20,000 lbs. of CO2.

Q15 Choose the preferred policy

- Policy A - There are no restrictions on the amount of CO2 emitted. The PNR will occur in 15 years.
- Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 25,000 lbs. (12.5 tons) of CO2 per year as a group to avoid taxation. The PNR will occur in 20 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 25,000 lbs. of CO2.

Q16 Choose the preferred policy

- Policy A - There are no restrictions on the amount of CO2 emitted. The PNR will occur in 15 years.
- Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 30,000 lbs. (15 tons) of CO2 per year as a group to avoid taxation. The PNR will occur in 20 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 30,000 lbs. of CO2.

Q17 Choose the preferred policy

- Policy A - There are no restrictions on the amount of CO2 emitted. The PNR will occur in 15 years.
- Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 35,000 lbs. (17.5 tons) of CO2 per year as a group to avoid taxation. The PNR will occur in 20 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 35,000 lbs. of CO2.

Q18 Choose the preferred policy

- Policy A - There are no restrictions on the amount of CO2 emitted. The PNR will occur in 15 years.
- Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 40,000 lbs. (20 tons) of CO2 per year as a group to avoid taxation. The PNR will occur in 20 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 40,000 lbs. of CO2.

Q19 Choose the preferred policy

- Policy A - There are no restrictions on the amount of CO2 emitted. The PNR will occur in 15 years.
- Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 45,000 lbs. (22.5 tons) of CO2 per year as a group to avoid taxation. The PNR will occur in 20 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 45,000 lbs. of CO2.

Q20 Choose the preferred policy

- Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 50,000 lbs. (25 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 20 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 50,000 lbs. of CO₂.

End of Block: Part 2- G

Start of Block: Part 3- G

In Policy A, you will have no restrictions on the amount of human created carbon that can be emitted, and the PNR will remain in 15 years.

In Policy B, you will be given a specified number of pounds in carbon emissions in which the group (here being the entire population of the United States) must remain under in order to delay the PNR. You will be individually taxed based on the collective carbon emissions of the group. This means that regardless of your personal effort to decrease emissions, your effort may not reflect that of those around you. Every individual will receive the same amount of taxation at the end of the year. For example, Larry has worked hard to cut his emissions in half, but his neighbor Tom has not made an effort to decrease his personal emissions. Although Larry has made the effort, he will still be taxed the same amount as Tom.

Q21 Choose the preferred policy

- Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 5,000 lbs. (2.5 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 25 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 5,000 lbs. of CO₂.

Q22 Choose the preferred policy

- Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 10,000 lbs. (5 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 25 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 10,000 lbs. of CO₂.

Q23 Choose the preferred policy

- Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 15,000 lbs. (7.5 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 25 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 15,000 lbs. of CO₂.

Q24 Choose the preferred policy

- Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 20,000 lbs. (10 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 25 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 20,000 lbs. of CO₂.

Q25 Choose the preferred policy

- Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 25,000 lbs. (12.5 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 25 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 25,000 lbs. of CO₂.

Q26 Choose the preferred policy

- Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 30,000 lbs. (15 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 25 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 30,000 lbs. of CO₂.

Q27 Choose the preferred policy

- Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 35,000 lbs. (17.5 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 25 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 35,000 lbs. of CO₂.

Q28 Choose the preferred policy

- Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 40,000 lbs. (20 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 25 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 40,000 lbs. of CO₂.

Q29 Choose the preferred policy

- Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 45,000 lbs. (22.5 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 25 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 45,000 lbs. of CO₂.

Q30 Choose the preferred policy

- Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 50,000 lbs. (25 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 25 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 50,000 lbs. of CO₂.

End of Block: Part 3- G

Start of Block: Part 4- G

In Policy A, you will have no restrictions on the amount of human created carbon that can be emitted, and the PNR will remain in 15 years.

In Policy B, you will be given a specified number of pounds in carbon emissions in which the group (here being the entire population of the United States) must remain under in order to delay the PNR. You will be individually taxed based on the collective carbon emissions of the group. This means that regardless of your personal effort to decrease emissions, your effort may not reflect that of those around you. Every individual will receive the same

amount of taxation at the end of the year. For example, Larry has worked hard to cut his emissions in half, but his neighbor Tom has not made an effort to decrease his personal emissions. Although Larry has made the effort, he will still be taxed the same amount as Tom.

Q31 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 5,000 lbs. (2.5 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 35 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 5,000 lbs. of CO₂.

Q32 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 10,000 lbs. (5 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 35 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 10,000 lbs. of CO₂.

Q33 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 15,000 lbs. (7.5 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 35 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 15,000 lbs. of CO₂.

Q34 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 20,000 lbs. (10 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 35 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 20,000 lbs. of CO₂.

Q35 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 25,000 lbs. (12.5 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 35 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 25,000 lbs. of CO₂.

Q36 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 30,000 lbs. (15 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 35 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 30,000 lbs. of CO₂.

Q37 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 35,000 lbs. (17.5 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 35 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 35,000 lbs. of CO₂.

Q38 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 40,000 lbs. (20 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 35 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 40,000 lbs. of CO₂.

Q39 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 45,000 lbs. (22.5 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 35 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 45,000 lbs. of CO₂.

Q40 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 50,000 lbs. (25 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 35 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 50,000 lbs. of CO₂.

End of Block: Part 4- G

Start of Block: Part 5- G

In Policy A, you will have no restrictions on the amount of human created carbon that can be emitted, and the PNR will remain in 15 years.

In Policy B, you will be given a specified number of pounds in carbon emissions in which the group (here being the entire population of the United States) must remain under in order to delay the PNR. You will be individually taxed based on the collective carbon emissions of the group. This means that regardless of your personal effort to decrease emissions, your effort may not reflect that of those around you. Every individual will receive the same amount of taxation at the end of the year. For example, Larry has worked hard to cut his emissions in half, but his neighbor Tom has not made an effort to decrease his personal emissions. Although Larry has made the effort, he will still be taxed the same amount as Tom.

Q41 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 5,000 lbs. (2.5 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 50 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 5,000 lbs. of CO₂.

Q42 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 10,000 lbs. (5 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 50 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 10,000 lbs. of CO₂.

Q43 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 15,000 lbs. (7.5 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 50 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 15,000 lbs. of CO₂.

Q44 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 20,000 lbs. (10 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 50 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 20,000 lbs. of CO₂.

Q45 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 25,000 lbs. (12.5 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 50 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 25,000 lbs. of CO₂.

Q46 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 30,000 lbs. (15 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 50 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 30,000 lbs. of CO₂.

Q47 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 35,000 lbs. (17.5 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 50 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 35,000 lbs. of CO₂.

Q48 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 40,000 lbs. (20 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 50 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 40,000 lbs. of CO₂.

Q49 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 45,000 lbs. (22.5 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 50 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 45,000 lbs. of CO₂.

Q50 Choose the preferred policy

- Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- Policy B - You will be taxed for the group's overall carbon emissions. You must remain below 50,000 lbs. (25 tons) of CO₂ per year as a group to avoid taxation. The PNR will occur in 50 years. You will be taxed at approximately \$0.03 for each pound the group exceeds 50,000 lbs. of CO₂.

End of Block: Part 5- G

Start of Block: INTRO- I

At this point in time, anthropogenic causes of climate change are resulting in our planet facing increasingly dire circumstances. The Intergovernmental Panel on Climate Change (2019) states that the point of no return can occur within the next 15 years if we continue to make the same environmental decisions we are making now. The point of no return (PNR) is defined as the point in time in which it is too late to act in order to stay below the prescribed threshold of environmentally tolerable CO₂ (carbon dioxide) levels. This will cause a rise in an average global temperature above 1.5°C relative to pre-industrial levels. Due to this, several politicians have proposed new policies to combat the climate change crisis. In general, these policies specify a high tax on carbon emissions (approximately \$60 per ton of carbon), and an increased tax every year until net zero emissions are reached. It should be noted that the average carbon emissions per person within America is 20 tons (40,000 lbs.) per year.

During this survey, you will be presented with several questions where you will decide on which policy you would prefer to be implemented nationwide.

In Policy A, you will have no restrictions on the amount of human created carbon that can be emitted, and the PNR will remain in 15 years.

In Policy B, you will be given a specified number of pounds in carbon emissions in which you must personally remain under in order to delay the PNR. You will be taxed based on the average amount of carbon you personally emitted in the past year. This means your personal effort to decrease emissions will affect the amount you are taxed. For example, Larry has worked hard to cut his emissions in half, but his neighbor Tom has not made an effort to decrease his personal emissions. At the end of the year, Larry will receive a lower carbon tax than Tom, based on his personal efforts.

End of Block: INTRO- I

Start of Block: Part 1- I

Q100

In Policy A, you will have no restrictions on the amount of human created carbon that can be emitted, and the PNR will remain in 15 years.

In Policy B, you will be given a specified number of pounds in carbon emissions in which you must personally remain under in order to delay the PNR. You will be taxed based on the average amount of carbon you personally emitted in the past year. This means your personal effort to decrease emissions will affect the amount you are taxed. For example, Larry has worked hard to cut his emissions in half, but his neighbor Tom has not made an effort to decrease his personal emissions. At the end of the year, Larry will receive a lower carbon tax than Tom, based on his personal efforts.

Q101 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 5,000 lbs. (2.5 tons) of CO₂ per year to avoid taxation. The PNR will occur in 15 years. You will be taxed at approximately \$0.03 for each pound exceeding 5,000 lbs. of CO₂.

Q102 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 10,000 lbs. (5 tons) of CO₂ per year to avoid taxation. The PNR will occur in 15 years. You will be taxed at approximately \$0.03 for each pound exceeding 10,000 lbs. of CO₂.

Q103 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 15,000 lbs. (7.5 tons) of CO₂ per year to avoid taxation. The PNR will occur in 15 years. You will be taxed at approximately \$0.03 for each pound exceeding 15,000 lbs. of CO₂.

Q104 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 20,000 lbs. (10 tons) of CO₂ per year to avoid taxation. The PNR will occur in 15 years. You will be taxed at approximately \$0.03 for each pound exceeding 20,000 lbs. of CO₂.

Q105 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 25,000 lbs. (12.5 tons) of CO₂ per year to avoid taxation. The PNR will occur in 15 years. You will be taxed at approximately \$0.03 for each pound exceeding 25,000 lbs. of CO₂.

Q106 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 30,000 lbs. (15 tons) of CO₂ per year to avoid taxation. The PNR will occur in 15 years. You will be taxed at approximately \$0.03 for each pound exceeding 30,000 lbs. of CO₂.

Q107 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 35,000 lbs. (17.5 tons) of CO₂ per year to avoid taxation. The PNR will occur in 15 years. You will be taxed at approximately \$0.03 for each pound exceeding 35,000 lbs. of CO₂.

Q108 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 40,000 lbs. (20 tons) of CO₂ per year to avoid taxation. The PNR will occur in 15 years. You will be taxed at approximately \$0.03 for each pound exceeding 40,000 lbs. of CO₂.

Q109 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 45,000 lbs. (22.5 tons) of CO₂ per year to avoid taxation. The PNR will occur in 15 years. You will be taxed at approximately \$0.03 for each pound exceeding 45,000 lbs. of CO₂.

Q110 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 50,000 lbs. (25 tons) of CO₂ per year to avoid taxation. The PNR will occur in 15 years. You will be taxed at approximately \$0.03 for each pound exceeding 50,000 lbs. of CO₂.

End of Block: Part 1- I

Start of Block: Part 2- I

Q111

In Policy A, you will have no restrictions on the amount of human created carbon that can be emitted, and the PNR will remain in 15 years.

In Policy B, you will be given a specified number of pounds in carbon emissions in which you must personally remain under in order to delay the PNR. You will be taxed based on the average amount of carbon you personally emitted in the past year. This means your personal effort to decrease emissions will affect the amount you are taxed. For example, Larry has worked hard to cut his emissions in half, but his neighbor Tom has not made an effort to decrease his personal emissions. At the end of the year, Larry will receive a lower carbon tax than Tom, based on his personal efforts.

Q112 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 5,000 lbs. (2.5 tons) of CO₂ per year to avoid taxation. The PNR will occur in 20 years. You will be taxed at approximately \$0.03 for each pound exceeding 5,000 lbs. of CO₂.

Q113 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 10,000 lbs. (5 tons) of CO₂ per year to avoid taxation. The PNR will occur in 20 years. You will be taxed at approximately \$0.03 for each pound exceeding 10,000 lbs. of CO₂.

Q114 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 15,000 lbs. (7.5 tons) of CO₂ per year to avoid taxation. The PNR will occur in 20 years. You will be taxed at approximately \$0.03 for each pound exceeding 15,000 lbs. of CO₂.

Q115 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 20,000 lbs. (10 tons) of CO₂ per year to avoid taxation. The PNR will occur in 20 years. You will be taxed at approximately \$0.03 for each pound exceeding 20,000 lbs. of CO₂.

Q116 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 25,000 lbs. (12.5 tons) of CO₂ per year to avoid taxation. The PNR will occur in 20 years. You will be taxed at approximately \$0.03 for each pound exceeding 25,000 lbs. of CO₂.

Q117 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 30,000 lbs. (15 tons) of CO₂ per year to avoid taxation. The PNR will occur in 20 years. You will be taxed at approximately \$0.03 for each pound exceeding 30,000 lbs. of CO₂.

Q118 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 35,000 lbs. (17.5 tons) of CO₂ per year to avoid taxation. The PNR will occur in 20 years. You will be taxed at approximately \$0.03 for each pound exceeding 35,000 lbs. of CO₂.

Q119 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 40,000 lbs. (20 tons) of CO₂ per year to avoid taxation. The PNR will occur in 20 years. You will be taxed at approximately \$0.03 for each pound exceeding 40,000 lbs. of CO₂.

Q120 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 45,000 lbs. (22.5 tons) of CO₂ per year to avoid taxation. The PNR will occur in 20 years. You will be taxed at approximately \$0.03 for each pound exceeding 45,000 lbs. of CO₂.

Q121 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 50,000 lbs. (25 tons) of CO₂ per year to avoid taxation. The PNR will occur in 20 years. You will be taxed at approximately \$0.03 for each pound exceeding 50,000 lbs. of CO₂.

End of Block: Part 2- I

Start of Block: Part 3- I

Q122

In Policy A, you will have no restrictions on the amount of human created carbon that can be emitted, and the PNR will remain in 15 years.

In Policy B, you will be given a specified number of pounds in carbon emissions in which you must personally remain under in order to delay the PNR. You will be taxed based on the average amount of carbon you personally emitted in the past year. This means your personal effort to decrease emissions will affect the amount you are taxed. For example, Larry has worked hard to cut his emissions in half, but his neighbor Tom has not made an effort to decrease his personal emissions. At the end of the year, Larry will receive a lower carbon tax than Tom, based on his personal efforts.

Q123 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 5,000 lbs. (2.5 tons) of CO₂ per year to avoid taxation. The PNR will occur in 25 years. You will be taxed at approximately \$0.03 for each pound exceeding 5,000 lbs. of CO₂.

Q124 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 10,000 lbs. (5 tons) of CO₂ per year to avoid taxation. The PNR will occur in 25 years. You will be taxed at approximately \$0.03 for each pound exceeding 10,000 lbs. of CO₂.

Q125 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 15,000 lbs. (7.5 tons) of CO₂ per year to avoid taxation. The PNR will occur in 25 years. You will be taxed at approximately \$0.03 for each pound exceeding 15,000 lbs. of CO₂.

Q126 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 20,000 lbs. (10 tons) of CO₂ per year to avoid taxation. The PNR will occur in 25 years. You will be taxed at approximately \$0.03 for each pound exceeding 20,000 lbs. of CO₂.

Q127 Choose the preferred policy

- Policy A - There are no restrictions on the amount of CO2 emitted. The PNR will occur in 15 years.
- Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 25,000 lbs. (12.5 tons) of CO2 per year to avoid taxation. The PNR will occur in 25 years. You will be taxed at approximately \$0.03 for each pound exceeding 25,000 lbs. of CO2.

Q128 Choose the preferred policy

- Policy A - There are no restrictions on the amount of CO2 emitted. The PNR will occur in 15 years.
- Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 30,000 lbs. (15 tons) of CO2 per year to avoid taxation. The PNR will occur in 25 years. You will be taxed at approximately \$0.03 for each pound exceeding 30,000 lbs. of CO2.

Q129 Choose the preferred policy

- Policy A - There are no restrictions on the amount of CO2 emitted. The PNR will occur in 15 years.
- Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 35,000 lbs. (17.5 tons) of CO2 per year to avoid taxation. The PNR will occur in 25 years. You will be taxed at approximately \$0.03 for each pound exceeding 35,000 lbs. of CO2.

Q130 Choose the preferred policy

- Policy A - There are no restrictions on the amount of CO2 emitted. The PNR will occur in 15 years.
- Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 40,000 lbs. (20 tons) of CO2 per year to avoid taxation. The PNR will occur in 25 years. You will be taxed at approximately \$0.03 for each pound exceeding 40,000 lbs. of CO2.

Q131 Choose the preferred policy

- Policy A - There are no restrictions on the amount of CO2 emitted. The PNR will occur in 15 years.
- Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 45,000 lbs. (22.5 tons) of CO2 per year to avoid taxation. The PNR will occur in 25 years. You will be taxed at approximately \$0.03 for each pound exceeding 45,000 lbs. of CO2.

Q132 Choose the preferred policy

- Policy A - There are no restrictions on the amount of CO2 emitted. The PNR will occur in 15 years.
- Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 50,000 lbs. (25 tons) of CO2 per year to avoid taxation. The PNR will occur in 25 years. You will be taxed at approximately \$0.03 for each pound exceeding 50,000 lbs. of CO2.

End of Block: Part 3- I

Start of Block: Part 4- I

Q133

In Policy A, you will have no restrictions on the amount of human created carbon that can be emitted, and the PNR will remain in 15 years.

In Policy B, you will be given a specified number of pounds in carbon emissions in which you must personally remain under in order to delay the PNR. You will be taxed based on the average amount of carbon you personally emitted in the past year. This means your personal effort to decrease emissions will affect the amount you are taxed.

For example, Larry has worked hard to cut his emissions in half, but his neighbor Tom has not made an effort to decrease his personal emissions. At the end of the year, Larry will receive a lower carbon tax than Tom, based on his personal efforts.

Q134 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 5,000 lbs. (2.5 tons) of CO₂ per year to avoid taxation. The PNR will occur in 35 years. You will be taxed at approximately \$0.03 for each pound exceeding 5,000 lbs. of CO₂.

Q135 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 10,000 lbs. (5 tons) of CO₂ per year to avoid taxation. The PNR will occur in 35 years. You will be taxed at approximately \$0.03 for each pound exceeding 10,000 lbs. of CO₂.

Q136 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 15,000 lbs. (7.5 tons) of CO₂ per year to avoid taxation. The PNR will occur in 35 years. You will be taxed at approximately \$0.03 for each pound exceeding 15,000 lbs. of CO₂.

Q137 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 20,000 lbs. (10 tons) of CO₂ per year to avoid taxation. The PNR will occur in 35 years. You will be taxed at approximately \$0.03 for each pound exceeding 20,000 lbs. of CO₂.

Q138 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 25,000 lbs. (12.5 tons) of CO₂ per year to avoid taxation. The PNR will occur in 35 years. You will be taxed at approximately \$0.03 for each pound exceeding 25,000 lbs. of CO₂.

Q139 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 30,000 lbs. (15 tons) of CO₂ per year to avoid taxation. The PNR will occur in 35 years. You will be taxed at approximately \$0.03 for each pound exceeding 30,000 lbs. of CO₂.

Q140 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 35,000 lbs. (17.5 tons) of CO₂ per year to avoid taxation. The PNR will occur in 35 years. You will be taxed at approximately \$0.03 for each pound exceeding 35,000 lbs. of CO₂.

Q141 Choose the preferred policy

- Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 40,000 lbs. (20 tons) of CO₂ per year to avoid taxation. The PNR will occur in 35 years. You will be taxed at approximately \$0.03 for each pound exceeding 40,000 lbs. of CO₂.

Q142 Choose the preferred policy

- Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 45,000 lbs. (22.5 tons) of CO₂ per year to avoid taxation. The PNR will occur in 35 years. You will be taxed at approximately \$0.03 for each pound exceeding 45,000 lbs. of CO₂.

Q143 Choose the preferred policy

- Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 50,000 lbs. (25 tons) of CO₂ per year to avoid taxation. The PNR will occur in 35 years. You will be taxed at approximately \$0.03 for each pound exceeding 50,000 lbs. of CO₂.

End of Block: Part 4- I

Start of Block: Part 5- I

Q144

In Policy A, you will have no restrictions on the amount of human created carbon that can be emitted, and the PNR will remain in 15 years.

In Policy B, you will be given a specified number of pounds in carbon emissions in which you must personally remain under in order to delay the PNR. You will be taxed based on the average amount of carbon you personally emitted in the past year. This means your personal effort to decrease emissions will affect the amount you are taxed. For example, Larry has worked hard to cut his emissions in half, but his neighbor Tom has not made an effort to decrease his personal emissions. At the end of the year, Larry will receive a lower carbon tax than Tom, based on his personal efforts.

Q145 Choose the preferred policy

- Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 5,000 lbs. (2.5 tons) of CO₂ per year to avoid taxation. The PNR will occur in 50 years. You will be taxed at approximately \$0.03 for each pound exceeding 5,000 lbs. of CO₂.

Q146 Choose the preferred policy

- Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 10,000 lbs. (5 tons) of CO₂ per year to avoid taxation. The PNR will occur in 50 years. You will be taxed at approximately \$0.03 for each pound exceeding 10,000 lbs. of CO₂.

Q147 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 15,000 lbs. (7.5 tons) of CO₂ per year to avoid taxation. The PNR will occur in 50 years. You will be taxed at approximately \$0.03 for each pound exceeding 15,000 lbs. of CO₂.

Q148 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 20,000 lbs. (10 tons) of CO₂ per year to avoid taxation. The PNR will occur in 50 years. You will be taxed at approximately \$0.03 for each pound exceeding 20,000 lbs. of CO₂.

Q149 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 25,000 lbs. (12.5 tons) of CO₂ per year to avoid taxation. The PNR will occur in 50 years. You will be taxed at approximately \$0.03 for each pound exceeding 25,000 lbs. of CO₂.

Q150 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 30,000 lbs. (15 tons) of CO₂ per year to avoid taxation. The PNR will occur in 50 years. You will be taxed at approximately \$0.03 for each pound exceeding 30,000 lbs. of CO₂.

Q151 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 35,000 lbs. (17.5 tons) of CO₂ per year to avoid taxation. The PNR will occur in 50 years. You will be taxed at approximately \$0.03 for each pound exceeding 35,000 lbs. of CO₂.

Q152 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 40,000 lbs. (20 tons) of CO₂ per year to avoid taxation. The PNR will occur in 50 years. You will be taxed at approximately \$0.03 for each pound exceeding 40,000 lbs. of CO₂.

Q153 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 45,000 lbs. (22.5 tons) of CO₂ per year to avoid taxation. The PNR will occur in 50 years. You will be taxed at approximately \$0.03 for each pound exceeding 45,000 lbs. of CO₂.

Q154 Choose the preferred policy

- ☐ Policy A - There are no restrictions on the amount of CO₂ emitted. The PNR will occur in 15 years.
- ☐ Policy B - You will be individually taxed for your personal carbon emissions. You must remain below 50,000 lbs. (25 tons) of CO₂ per year to avoid taxation. The PNR will occur in 50 years. You will be taxed at approximately \$0.03 for each pound exceeding 50,000 lbs. of CO₂.

End of Block: Part 5- I

Appendix C. Main Thesis Study Survey

Geographic Discounting Study

Start of Block: Demographic Form

Q1 What is your Major?

Q2 What year are you at Missouri State University?

- ☐ Freshman
- ☐ Sophomore
- ☐ Junior (3)
- ☐ Senior (4)

Q3 What is your sex?

- ☐ Female
- ☐ Male

Q4 What is your age range?

- ☐ 18-21
- ☐ 22-25
- ☐ 26-29 (3)
- ☐ 30+ (4)

End of Block: Demographic Form

Start of Block: Introduction

At this point in time, anthropogenic causes of climate change are resulting in our planet facing increasingly dire circumstances. The Intergovernmental Panel on Climate Change (2019) states that the point of no return can occur within the next 15 years if we continue to make the same environmental decisions we are currently making. The point of no return is defined as the point in time in which it is too late to act in order to stay below the prescribed threshold of environmentally tolerable CO₂ (carbon dioxide) levels.

During this survey, you will be presented with several questions where you will decide on which policy you would prefer to be implemented nationwide regarding a tax on car emissions.

In Policy A, you will have no restrictions on the number of miles you can drive every month, and the point of no return will follow in 15 years.

In Policy B, you will be given a specified number of miles in which you must personally remain under in order to delay the point of no return. You will be taxed based on the average amount of miles you have personally accumulated in the past month. This means your personal effort to decrease the number of miles will affect the amount you are taxed. Half of the tax revenue accumulated will be distributed into the U.S. government, while the other half will be redistributed to one of the four geographic locations specified. For example, Larry has worked

hard to cut his average monthly miles in half, but his neighbor Tom has not made that effort. At the end of the month, Larry will receive a lower car emissions tax than Tom, based on his personal efforts.

Answer the following question with one sentence:

Q1 What is the point of no return?

Q2 Define "anthropogenic"

Q3 How is the tax revenue being redistributed?

- ☐ All taxes staying in the US government
- ☐ Half of taxes distributed to US government, half redistributed to one of the four locations identified
- ☐ All taxes being redistributed to locations other than the US government (3)
- ☐ All taxes being redistributed to one of the four locations identified (4)

* You may continue to the survey after 90 seconds has passed. Please make sure you have read and understand the information on this page before continuing. *

Page Break



*Please notice area of geographic distance. Click arrow to continue survey.

End of Block: Introduction

Start of Block: Geo 1 - Part 1

In Policy A, you will have no restrictions on the amount of miles you can drive every month, and the point of no return will follow in 15 years.

In Policy B, you will be given a specified number of miles in which you must personally remain under in order to delay the point of no return. You will be taxed based on the average amount of miles you have personally accumulated in the past month. This means your personal effort to decrease the amount of miles will affect the amount you are taxed. Half of the tax revenue accumulated will be distributed into the U.S. government, while the other half will be redistributed to one of the four geographic locations specified. For example, Larry has worked hard to cut his average monthly miles in half, but his neighbor Tom has not made that effort. At the end of the month, Larry will receive a lower car emissions tax than Tom, based on his personal efforts.

Q1 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 1,300 miles per month in order to avoid taxation. The point of no return will occur in 15 years. You will be taxed at approximately \$0.10 for each mile exceeding the 1,300 mile threshold. Half of the tax revenue will be redistributed to geographic location #1 (Missouri).

Q2 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 1,100 miles per month in order to avoid taxation. The point of no return will occur in 15 years. You will be taxed at approximately \$0.10 for each mile exceeding the 1,100 mile threshold. Half of the tax revenue will be redistributed to geographic location #1 (Missouri).

Q3 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 900 miles per month in order to avoid taxation. The point of no return will occur in 15 years. You will be taxed at approximately \$0.10 for each mile exceeding the 900 mile threshold. Half of the tax revenue will be redistributed to geographic location #1 (Missouri).

Q4 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 700 miles per month in order to avoid taxation. The point of no return will occur in 15 years. You will be taxed at approximately \$0.10 for each mile exceeding the 700 mile threshold. Half of the tax revenue will be redistributed to geographic location #1 (Missouri).

Q5 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 500 miles per month in order to avoid taxation. The point of no return will occur in 15 years. You will be taxed at approximately \$0.10 for each mile exceeding the 500 mile threshold. Half of the tax revenue will be redistributed to geographic location #1 (Missouri).

Q6 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 300 miles per month in order to avoid taxation. The point of no return will occur in 15 years. You will be taxed at approximately \$0.10 for each mile exceeding the 300 mile threshold. Half of the tax revenue will be redistributed to geographic location #1 (Missouri).

Q7 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 100 miles per month in order to avoid taxation. The point of no return will occur in 15 years. You will be taxed at approximately \$0.10 for each mile exceeding the 100 mile threshold. Half of the tax revenue will be redistributed to geographic location #1 (Missouri).

End of Block: Geo 1 - Part 1

Start of Block: Geo 1 - Part 2

Q8 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 1,300 miles per month in order to avoid taxation. The point of no return will occur in 25 years. You will be taxed at approximately \$0.10 for each mile exceeding the 1,300 mile threshold. Half of the tax revenue will be redistributed to geographic location #1 (Missouri).

Q9 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 1,100 miles per month in order to avoid taxation. The point of no return will occur in 25 years. You will be taxed at approximately \$0.10 for each mile exceeding the 1,100 mile threshold. Half of the tax revenue will be redistributed to geographic location #1 (Missouri).

Q10 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 900 miles per month in order to avoid taxation. The point of no return will occur in 25 years. You will be taxed at approximately \$0.10 for each mile exceeding the 900 mile threshold. Half of the tax revenue will be redistributed to geographic location #1 (Missouri).

Q11 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 700 miles per month in order to avoid taxation. The point of no return will occur in 25 years. You will be taxed at approximately \$0.10 for each mile exceeding the 700 mile threshold. Half of the tax revenue will be redistributed to geographic location #1 (Missouri).

Q12 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 500 miles per month in order to avoid taxation. The point of no return will occur in 25 years. You will be taxed at approximately \$0.10 for each mile exceeding the 500 mile threshold. Half of the tax revenue will be redistributed to geographic location #1 (Missouri).

Q13 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 300 miles per month in order to avoid taxation. The point of no return will occur in 25 years. You will be taxed at approximately \$0.10 for each mile exceeding the 300 mile threshold. Half of the tax revenue will be redistributed to geographic location #1 (Missouri).

Q14 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 100 miles per month in order to avoid taxation. The point of no return will occur in 25 years. You will be taxed at approximately \$0.10 for each mile exceeding the 100 mile threshold. Half of the tax revenue will be redistributed to geographic location #1 (Missouri).

End of Block: Geo 1 - Part 2

Start of Block: Geo 1 - Part 3

Q15 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 1,300 miles per month in order to avoid taxation. The point of no return will occur in 35 years. You will be taxed at approximately \$0.10 for each mile exceeding the 1,300 mile threshold. Half of the tax revenue will be redistributed to geographic location #1 (Missouri).

Q16 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 1,100 miles per month in order to avoid taxation. The point of no return will occur in 35 years. You will be taxed at approximately \$0.10 for each mile exceeding the 1,100 mile threshold. Half of the tax revenue will be redistributed to geographic location #1 (Missouri).

Q17 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 900 miles per month in order to avoid taxation. The point of no return will occur in 35 years. You will be taxed at approximately \$0.10 for each mile exceeding the 900 mile threshold. Half of the tax revenue will be redistributed to geographic location #1 (Missouri).

Q18 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 700 miles per month in order to avoid taxation. The point of no return will occur in 35 years. You will be taxed at approximately \$0.10 for each mile exceeding the 700 mile threshold. Half of the tax revenue will be redistributed to geographic location #1 (Missouri).

Q19 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 500 miles per month in order to avoid taxation. The point of no return will occur in 35 years. You will be taxed at approximately \$0.10 for each mile exceeding the 500 mile threshold. Half of the tax revenue will be redistributed to geographic location #1 (Missouri).

Q20 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 300 miles per month in order to avoid taxation. The point of no return will occur in 35 years. You will be taxed at approximately \$0.10 for each mile exceeding the 300 mile threshold. Half of the tax revenue will be redistributed to geographic location #1 (Missouri).

Q21 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 100 miles per month in order to avoid taxation. The point of no return will occur in 35 years. You will be taxed at approximately \$0.10 for each mile exceeding the 100 mile threshold. Half of the tax revenue will be redistributed to geographic location #1 (Missouri).

End of Block: Geo 1 - Part 3

Start of Block: Geo 1 - Part 4

Q22 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 1,300 miles per month in order to avoid taxation. The point of no return will occur in 50 years. You will be taxed at approximately \$0.10 for each mile exceeding the 1,300 mile threshold. Half of the tax revenue will be redistributed to geographic location #1 (Missouri).

Q23 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 1,100 miles per month in order to avoid taxation. The point of no return will occur in 50 years. You will be taxed at approximately \$0.10 for each mile exceeding the 1,100 mile threshold. Half of the tax revenue will be redistributed to geographic location #1 (Missouri).

Q24 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 900 miles per month in order to avoid taxation. The point of no return will occur in 50 years. You will be taxed at approximately \$0.10 for each mile exceeding the 900 mile threshold. Half of the tax revenue will be redistributed to geographic location #1 (Missouri).

Q25 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 700 miles per month in order to avoid taxation. The point of no return will occur in 50 years. You will be taxed at approximately \$0.10 for each mile exceeding the 700 mile threshold. Half of the tax revenue will be redistributed to geographic location #1 (Missouri).

Q26 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 500 miles per month in order to avoid taxation. The point of no return will occur in 50 years. You will be taxed at approximately \$0.10 for each mile exceeding the 500 mile threshold. Half of the tax revenue will be redistributed to geographic location #1 (Missouri).

Q27 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 300 miles per month in order to avoid taxation. The point of no return will occur in 50 years. You will be taxed at approximately \$0.10 for each mile exceeding the 300 mile threshold. Half of the tax revenue will be redistributed to geographic location #1 (Missouri).

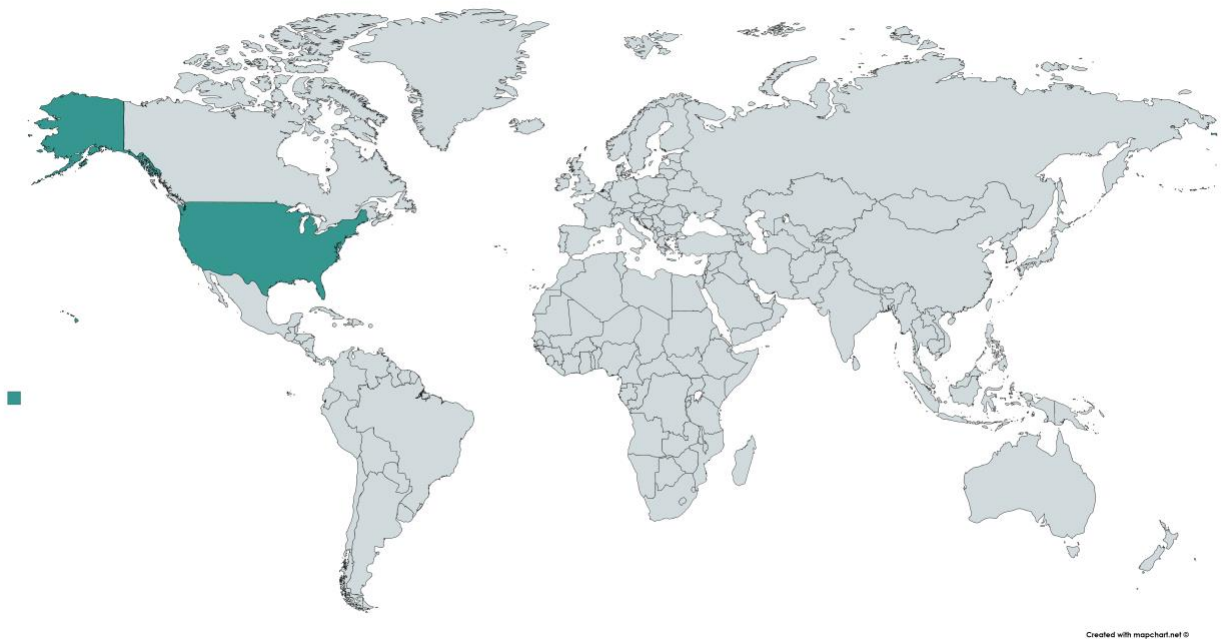
Q28 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 100 miles per month in order to avoid taxation. The point of no return will occur in 35 years. You will be taxed at approximately \$0.10 for each mile exceeding the 100 mile threshold. Half of the tax revenue will be redistributed to geographic location #1 (Missouri).

END OF BLOCK

End of Block: Geo 1 - Part 4

Start of Block: Geo 2 - Part 1



*Please notice change of geographic distance. Click arrow to continue survey.

In Policy A, you will have no restrictions on the amount of miles you can drive every month, and the point of no return will follow in 15 years.

In Policy B, you will be given a specified number of miles in which you must personally remain under in order to delay the point of no return. You will be taxed based on the average amount of miles you have personally accumulated in the past month. This means your personal effort to decrease the amount of miles will affect the amount you are taxed. Half of the tax revenue accumulated will be distributed into the U.S. government, while the other half will be redistributed to one of the four geographic locations specified. For example, Larry has worked hard to cut his average monthly miles in half, but his neighbor Tom has not made that effort. At the end of the month, Larry will receive a lower car emissions tax than Tom, based on his personal efforts.

Q29 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 1,300 miles per month in order to avoid taxation. The point of no return will occur in 15 years. You will be taxed at approximately \$0.10 for each mile exceeding the 1,300 mile threshold. Half of the tax revenue will be redistributed to geographic location #2 (The United States of America).

Q30 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 1,100 miles per month in order to avoid taxation. The point of no return will occur in 15 years. You will be taxed at approximately \$0.10 for each mile exceeding the 1,100 mile threshold. Half of the tax revenue will be redistributed to geographic location #2 (The United States of America).

Q31 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 900 miles per month in order to avoid taxation. The point of no return will occur in 15 years. You will be taxed at approximately \$0.10 for each mile exceeding the 900 mile threshold. Half of the tax revenue will be redistributed to geographic location #2 (The United States of America).

Q32 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 700 miles per month in order to avoid taxation. The point of no return will occur in 15 years. You will be taxed at approximately \$0.10 for each mile exceeding the 700 mile threshold. Half of the tax revenue will be redistributed to geographic location #2 (The United States of America).

Q33 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 500 miles per month in order to avoid taxation. The point of no return will occur in 15 years. You will be taxed at approximately \$0.10 for each mile exceeding the 500 mile threshold. Half of the tax revenue will be redistributed to geographic location #2 (The United States of America).

Q34 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 300 miles per month in order to avoid taxation. The point of no return will occur in 15 years. You will be taxed at approximately \$0.10 for each mile exceeding the 300 mile threshold. Half of the tax revenue will be redistributed to geographic location #2 (The United States of America).

Q35 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 100 miles per month in order to avoid taxation. The point of no return will occur in 15 years. You will be taxed at approximately \$0.10 for each mile exceeding the 100 mile threshold. Half of the tax revenue will be redistributed to geographic location #2 (The United States of America).

End of Block: Geo 2 - Part 1

Start of Block: Geo 2 - Part 2

Q36 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 1,300 miles per month in order to avoid taxation. The point of no return will occur in 25 years. You will be taxed at approximately \$0.10 for each mile exceeding the 1,300 mile threshold. Half of the tax revenue will be redistributed to geographic location #2 (The United States of America).

Q37 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 1,100 miles per month in order to avoid taxation. The point of no return will occur in 25 years. You will be taxed at approximately \$0.10 for each mile exceeding the 1,100 mile threshold. Half of the tax revenue will be redistributed to geographic location #2 (The United States of America).

Q38 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 900 miles per month in order to avoid taxation. The point of no return will occur in 25 years. You will be taxed at approximately \$0.10 for each mile exceeding the 900 mile threshold. Half of the tax revenue will be redistributed to geographic location #2 (The United States of America).

☐

Q39 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 700 miles per month in order to avoid taxation. The point of no return will occur in 25 years. You will be taxed at approximately \$0.10 for each mile exceeding the 700 mile threshold. Half of the tax revenue will be redistributed to geographic location #2 (The United States of America).

Q40 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 500 miles per month in order to avoid taxation. The point of no return will occur in 25 years. You will be taxed at approximately \$0.10 for each mile exceeding the 500 mile threshold. Half of the tax revenue will be redistributed to geographic location #2 (The United States of America).

Q41 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 300 miles per month in order to avoid taxation. The point of no return will occur in 25 years. You will be taxed at approximately \$0.10 for each mile exceeding the 300 mile threshold. Half of the tax revenue will be redistributed to geographic location #2 (The United States of America).

Q42 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 100 miles per month in order to avoid taxation. The point of no return will occur in 25 years. You will be taxed at approximately \$0.10 for each mile exceeding the 100 mile threshold. Half of the tax revenue will be redistributed to geographic location #2 (The United States of America).

End of Block: Geo 2 - Part 2

Start of Block: Geo 2 - Part 3

Q43 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 1,300 miles per month in order to avoid taxation. The point of no return will occur in 35 years. You will be taxed at approximately \$0.10 for each mile exceeding the 1,300 mile threshold. Half of the tax revenue will be redistributed to geographic location #2 (The United States of America).

Q44 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 1,100 miles per month in order to avoid taxation. The point of no return will occur in 35 years. You will be taxed at approximately \$0.10 for each mile exceeding the 1,100 mile threshold. Half of the tax revenue will be redistributed to geographic location #2 (The United States of America).

Q45 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 900 miles per month in order to avoid taxation. The point of no return will occur in 35 years. You will be taxed at approximately \$0.10 for each mile exceeding the 900 mile threshold. Half of the tax revenue will be redistributed to geographic location #2 (The United States of America).

Q46 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 700 miles per month in order to avoid taxation. The point of no return will occur in 35 years. You will be taxed at approximately \$0.10 for each mile exceeding the 700 mile threshold. Half of the tax revenue will be redistributed to geographic location #2 (The United States of America).

Q47 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 500 miles per month in order to avoid taxation. The point of no return will occur in 35 years. You will be taxed at approximately \$0.10 for each mile exceeding the 500 mile threshold. Half of the tax revenue will be redistributed to geographic location #2 (The United States of America).

Q48 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 300 miles per month in order to avoid taxation. The point of no return will occur in 35 years. You will be taxed at approximately \$0.10 for each mile exceeding the 300 mile threshold. Half of the tax revenue will be redistributed to geographic location #2 (The United States of America).

Q49 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 100 miles per month in order to avoid taxation. The point of no return will occur in 35 years. You will be taxed at approximately \$0.10 for each mile exceeding the 100 mile threshold. Half of the tax revenue will be redistributed to geographic location #2 (The United States of America).

End of Block: Geo 2 - Part 3

Start of Block: Geo 2 - Part 4

Q50 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 1,300 miles per month in order to avoid taxation. The point of no return will occur in 50 years. You will be taxed at approximately \$0.10 for each mile exceeding the 1,300 mile threshold. Half of the tax revenue will be redistributed to geographic location #2 (The United States of America).

Q51 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 1,100 miles per month in order to avoid taxation. The point of no return will occur in 50 years. You will be taxed at approximately \$0.10 for each mile exceeding the 1,100 mile threshold. Half of the tax revenue will be redistributed to geographic location #2 (The United States of America).

Q52 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 900 miles per month in order to avoid taxation. The point of no return will occur in 50 years. You will be taxed at approximately \$0.10 for each mile exceeding the 900 mile threshold. Half of the tax revenue will be redistributed to geographic location #2 (The United States of America).

Q53 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 700 miles per month in order to avoid taxation. The point of no return will occur in 50 years. You will be taxed at approximately \$0.10 for each mile exceeding the 700 mile threshold. Half of the tax revenue will be redistributed to geographic location #2 (The United States of America).

Q54 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 500 miles per month in order to avoid taxation. The point of no return will occur in 50 years. You will be taxed at approximately \$0.10 for each mile exceeding the 500 mile threshold. Half of the tax revenue will be redistributed to geographic location #2 (The United States of America).

Q55 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 300 miles per month in order to avoid taxation. The point of no return will occur in 50 years. You will be taxed at approximately \$0.10 for each mile exceeding the 300 mile threshold. Half of the tax revenue will be redistributed to geographic location #2 (The United States of America).

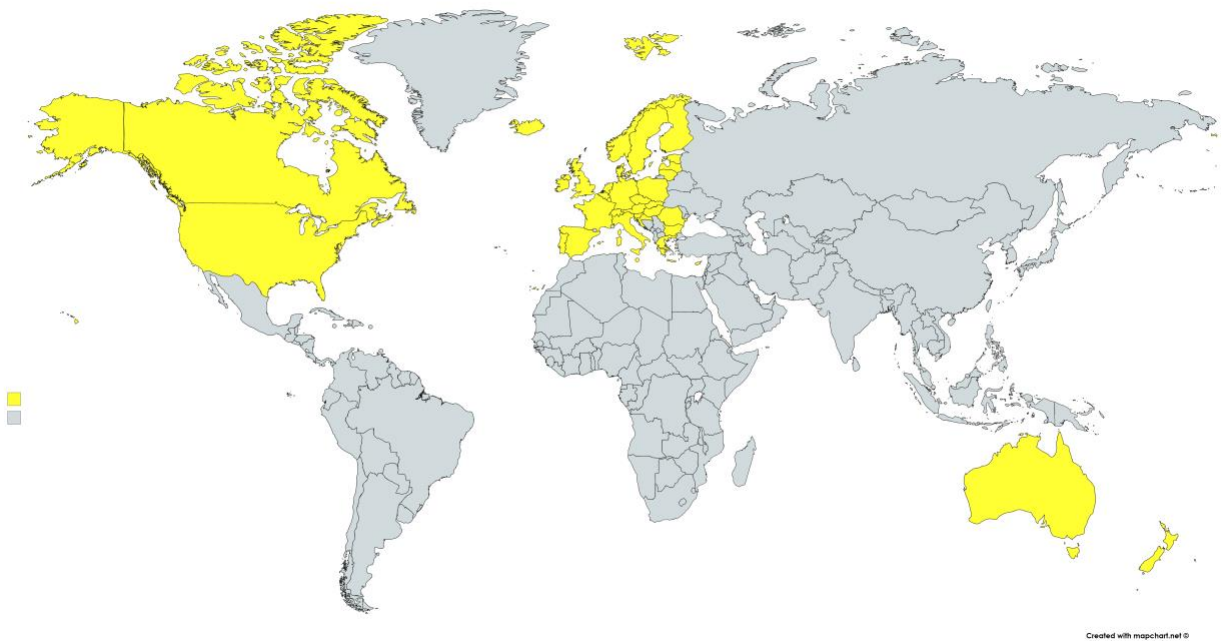
Q56 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 100 miles per month in order to avoid taxation. The point of no return will occur in 50 years. You will be taxed at approximately \$0.10 for each mile exceeding the 100 mile threshold. Half of the tax revenue will be redistributed to geographic location #2 (The United States of America).

END OF BLOCK

End of Block: Geo 2 - Part 4

Start of Block: Geo 3 - Part 1



*Please notice change of geographic distance. Click arrow to continue survey.

Page Break

In Policy A, you will have no restrictions on the amount of miles you can drive every month, and the point of no return will follow in 15 years.

In Policy B, you will be given a specified number of miles in which you must personally remain under in order to delay the point of no return. You will be taxed based on the average amount of miles you have personally

accumulated in the past month. This means your personal effort to decrease the amount of miles will affect the amount you are taxed. Half of the tax revenue accumulated will be distributed into the U.S. government, while the other half will be redistributed to one of the four geographic locations specified. For example, Larry has worked hard to cut his average monthly miles in half, but his neighbor Tom has not made that effort. At the end of the month, Larry will receive a lower car emissions tax than Tom, based on his personal efforts.

Q57 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 1,300 miles per month in order to avoid taxation. The point of no return will occur in 15 years. You will be taxed at approximately \$0.10 for each mile exceeding the 1,300 mile threshold. Half of the tax revenue will be redistributed to geographic location #3 (The Western World).

Q58 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 1,100 miles per month in order to avoid taxation. The point of no return will occur in 15 years. You will be taxed at approximately \$0.10 for each mile exceeding the 1,100 mile threshold. Half of the tax revenue will be redistributed to geographic location #3 (The Western World).

Q59 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 900 miles per month in order to avoid taxation. The point of no return will occur in 15 years. You will be taxed at approximately \$0.10 for each mile exceeding the 900 mile threshold. Half of the tax revenue will be redistributed to geographic location #3 (The Western World).

Q60 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 700 miles per month in order to avoid taxation. The point of no return will occur in 15 years. You will be taxed at approximately \$0.10 for each mile exceeding the 700 mile threshold. Half of the tax revenue will be redistributed to geographic location #3 (The Western World).

Q61 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 500 miles per month in order to avoid taxation. The point of no return will occur in 15 years. You will be taxed at approximately \$0.10 for each mile exceeding the 500 mile threshold. Half of the tax revenue will be redistributed to geographic location #3 (The Western World).

Q62 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 300 miles per month in order to avoid taxation. The point of no return will occur in 15 years. You will be taxed at approximately \$0.10 for each mile exceeding the 300 mile threshold. Half of the tax revenue will be redistributed to geographic location #3 (The Western World).

Q63 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 100 miles per month in order to avoid taxation. The point of no return will occur in 15 years. You will be taxed at approximately \$0.10 for each mile exceeding the 100 mile threshold. Half of the tax revenue will be redistributed to geographic location #3 (The Western World).

End of Block: Geo 3 - Part 1

Start of Block: Geo 3 - Part 2

Q64 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 1,300 miles per month in order to avoid taxation. The point of no return will occur in 25 years. You will be taxed at approximately \$0.10 for each mile exceeding the 1,300 mile threshold. Half of the tax revenue will be redistributed to geographic location #3 (The Western World).

Q65 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 1,100 miles per month in order to avoid taxation. The point of no return will occur in 25 years. You will be taxed at approximately \$0.10 for each mile exceeding the 1,100 mile threshold. Half of the tax revenue will be redistributed to geographic location #3 (The Western World).

Q66 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 900 miles per month in order to avoid taxation. The point of no return will occur in 25 years. You will be taxed at approximately \$0.10 for each mile exceeding the 900 mile threshold. Half of the tax revenue will be redistributed to geographic location #3 (The Western World).

Q67 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 700 miles per month in order to avoid taxation. The point of no return will occur in 25 years. You will be taxed at approximately \$0.10 for each mile exceeding the 700 mile threshold. Half of the tax revenue will be redistributed to geographic location #3 (The Western World).

Q68 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 500 miles per month in order to avoid taxation. The point of no return will occur in 25 years. You will be taxed at approximately \$0.10 for each mile exceeding the 500 mile threshold. Half of the tax revenue will be redistributed to geographic location #3 (The Western World).

Q69 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 300 miles per month in order to avoid taxation. The point of no return will occur in 25 years. You will be taxed at approximately \$0.10 for each mile exceeding the 300 mile threshold. Half of the tax revenue will be redistributed to geographic location #3 (The Western World).

Q70 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 100 miles per month in order to avoid taxation. The point of no return will occur in 25 years. You will be taxed at approximately \$0.10 for each mile exceeding the 100 mile threshold. Half of the tax revenue will be redistributed to geographic location #3 (The Western World).

End of Block: Geo 3 - Part 2

Start of Block: Geo 3 - Part 3

Q71 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 1,300 miles per month in order to avoid taxation. The point of no return will occur in 35 years. You will be taxed at approximately \$0.10 for each mile exceeding the 1,300 mile threshold. Half of the tax revenue will be redistributed to geographic location #3 (The Western World).

Q72 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 1,100 miles per month in order to avoid taxation. The point of no return will occur in 35 years. You will be taxed at approximately \$0.10 for each mile exceeding the 1,100 mile threshold. Half of the tax revenue will be redistributed to geographic location #3 (The Western World).

Q73 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 900 miles per month in order to avoid taxation. The point of no return will occur in 35 years. You will be taxed at approximately \$0.10 for each mile exceeding the 900 mile threshold. Half of the tax revenue will be redistributed to geographic location #3 (The Western World).

Q74 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 700 miles per month in order to avoid taxation. The point of no return will occur in 35 years. You will be taxed at approximately \$0.10 for each mile exceeding the 700 mile threshold. Half of the tax revenue will be redistributed to geographic location #3 (The Western World).

Q75 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 500 miles per month in order to avoid taxation. The point of no return will occur in 35 years. You will be taxed at approximately \$0.10 for each mile exceeding the 500 mile threshold. Half of the tax revenue will be redistributed to geographic location #3 (The Western World).

Q76 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 300 miles per month in order to avoid taxation. The point of no return will occur in 35 years. You will be taxed at approximately \$0.10 for each mile exceeding the 300 mile threshold. Half of the tax revenue will be redistributed to geographic location #3 (The Western World).

Q77 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 100 miles per month in order to avoid taxation. The point of no return will occur in 35 years. You will be taxed at approximately \$0.10 for each mile exceeding the 100 mile threshold. Half of the tax revenue will be redistributed to geographic location #3 (The Western World).

End of Block: Geo 3 - Part 3

Start of Block: Geo 3 - Part 4

Q78 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 1,300 miles per month in order to avoid taxation. The point of no return will occur in 50 years. You will be taxed at approximately \$0.10 for each mile exceeding the 1,300 mile threshold. Half of the tax revenue will be redistributed to geographic location #3 (The Western World).

Q79 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 1,100 miles per month in order to avoid taxation. The point of no return will occur in 50 years. You will be taxed at approximately \$0.10 for each mile exceeding the 1,100 mile threshold. Half of the tax revenue will be redistributed to geographic location #3 (The Western World).

Q80 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 900 miles per month in order to avoid taxation. The point of no return will occur in 50 years. You will be taxed at approximately \$0.10 for each mile exceeding the 900 mile threshold. Half of the tax revenue will be redistributed to geographic location #3 (The Western World).

Q81 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 700 miles per month in order to avoid taxation. The point of no return will occur in 50 years. You will be taxed at approximately \$0.10 for each mile exceeding the 700 mile threshold. Half of the tax revenue will be redistributed to geographic location #3 (The Western World).

Q82 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 500 miles per month in order to avoid taxation. The point of no return will occur in 50 years. You will be taxed at approximately \$0.10 for each mile exceeding the 500 mile threshold. Half of the tax revenue will be redistributed to geographic location #3 (The Western World).

Q83 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 300 miles per month in order to avoid taxation. The point of no return will occur in 50 years. You will be taxed at approximately \$0.10 for each mile exceeding the 300 mile threshold. Half of the tax revenue will be redistributed to geographic location #3 (The Western World).

Q84 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 100 miles per month in order to avoid taxation. The point of no return will occur in 50 years. You will be taxed at approximately \$0.10 for each mile exceeding the 100 mile threshold. Half of the tax revenue will be redistributed to geographic location #3 (The Western World).

END OF BLOCK

End of Block: Geo 3 - Part 4

Start of Block: Geo 4 - Part 1



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*Please notice change of geographic distance. Click arrow to continue survey.

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In Policy A, you will have no restrictions on the amount of miles you can drive every month, and the point of no return will follow in 15 years.

In Policy B, you will be given a specified number of miles in which you must personally remain under in order to delay the point of no return. You will be taxed based on the average amount of miles you have personally accumulated in the past month. This means your personal effort to decrease the amount of miles will affect the amount you are taxed. Half of the tax revenue accumulated will be distributed into the U.S. government, while the other half will be redistributed to one of the four geographic locations specified. For example, Larry has worked hard to cut his average monthly miles in half, but his neighbor Tom has not made that effort. At the end of the month, Larry will receive a lower car emissions tax than Tom, based on his personal efforts.

Q85 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 1,300 miles per month in order to avoid taxation. The point of no return will occur in 15 years. You will be taxed at approximately \$0.10 for each mile exceeding the 1,300 mile threshold. Half of the tax revenue will be redistributed to geographic location #4 (The Whole World).

Q86 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 1,100 miles per month in order to avoid taxation. The point of no return will occur in 15 years. You will be taxed at approximately \$0.10 for each mile exceeding the 1,100 mile threshold. Half of the tax revenue will be redistributed to geographic location #4 (The Whole World).

Q87 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 900 miles per month in order to avoid taxation. The point of no return will occur in 15 years. You will be taxed at approximately \$0.10 for each mile exceeding the 900 mile threshold. Half of the tax revenue will be redistributed to geographic location #4 (The Whole World).

Q88 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 700 miles per month in order to avoid taxation. The point of no return will occur in 15 years. You will be taxed at approximately \$0.10 for each mile exceeding the 700 mile threshold. Half of the tax revenue will be redistributed to geographic location #4 (The Whole World).

Q89 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 500 miles per month in order to avoid taxation. The point of no return will occur in 15 years. You will be taxed at approximately \$0.10 for each mile exceeding the 500 mile threshold. Half of the tax revenue will be redistributed to geographic location #4 (The Whole World).

Q90 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 300 miles per month in order to avoid taxation. The point of no return will occur in 15 years. You will be taxed at approximately \$0.10 for each mile exceeding the 300 mile threshold. Half of the tax revenue will be redistributed to geographic location #4 (The Whole World).

Q91 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 100 miles per month in order to avoid taxation. The point of no return will occur in 15 years. You will be taxed at approximately \$0.10 for each mile exceeding the 100 mile threshold. Half of the tax revenue will be redistributed to geographic location #4 (The Whole World).

End of Block: Geo 4 - Part 1

Start of Block: Geo 4 - Part 2

Q92 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 1,300 miles per month in order to avoid taxation. The point of no return will occur in 25 years. You will be taxed at approximately \$0.10 for each mile exceeding the 1,300 mile threshold. Half of the tax revenue will be redistributed to geographic location #4 (The Whole World).

Q93 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 1,100 miles per month in order to avoid taxation. The point of no return will occur in 25 years. You will be taxed at approximately \$0.10 for each mile exceeding the 1,100 mile threshold. Half of the tax revenue will be redistributed to geographic location #4 (The Whole World).

Q94 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 900 miles per month in order to avoid taxation. The point of no return will occur in 25 years. You will be taxed at approximately \$0.10 for each mile exceeding the 900 mile threshold. Half of the tax revenue will be redistributed to geographic location #4 (The Whole World).

Q95 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 700 miles per month in order to avoid taxation. The point of no return will occur in 25 years. You will be taxed at approximately \$0.10 for each mile exceeding the 700 mile threshold. Half of the tax revenue will be redistributed to geographic location #4 (The Whole World).

Q96 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 500 miles per month in order to avoid taxation. The point of no return will occur in 25 years. You will be taxed at approximately \$0.10 for each mile exceeding the 500 mile threshold. Half of the tax revenue will be redistributed to geographic location #4 (The Whole World).

Q97 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 300 miles per month in order to avoid taxation. The point of no return will occur in 25 years. You will be taxed at approximately \$0.10 for each mile exceeding the 300 mile threshold. Half of the tax revenue will be redistributed to geographic location #4 (The Whole World).

Q98 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 100 miles per month in order to avoid taxation. The point of no return will occur in 25 years. You will be taxed at approximately \$0.10 for each mile exceeding the 100 mile threshold. Half of the tax revenue will be redistributed to geographic location #4 (The Whole World).

End of Block: Geo 4 - Part 2

Start of Block: Geo 4 - Part 3

Q99 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 1,300 miles per month in order to avoid taxation. The point of no return will occur in 35 years. You will be taxed at approximately \$0.10 for each mile exceeding the 1,300 mile threshold. Half of the tax revenue will be redistributed to geographic location #4 (The Whole World).

Q100 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 1,100 miles per month in order to avoid taxation. The point of no return will occur in 35 years. You will be taxed at approximately \$0.10 for each mile exceeding the 1,100 mile threshold. Half of the tax revenue will be redistributed to geographic location #4 (The Whole World).

Q101 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 900 miles per month in order to avoid taxation. The point of no return will occur in 35 years. You will be taxed at approximately \$0.10 for each mile exceeding the 900 mile threshold. Half of the tax revenue will be redistributed to geographic location #4 (The Whole World).

Q102 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 700 miles per month in order to avoid taxation. The point of no return will occur in 35 years. You will be taxed at approximately \$0.10 for each mile exceeding the 700 mile threshold. Half of the tax revenue will be redistributed to geographic location #4 (The Whole World).

Q103 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 500 miles per month in order to avoid taxation. The point of no return will occur in 35 years. You will be taxed at approximately \$0.10 for each mile exceeding the 500 mile threshold. Half of the tax revenue will be redistributed to geographic location #4 (The Whole World).

Q104 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 300 miles per month in order to avoid taxation. The point of no return will occur in 35 years. You will be taxed at approximately \$0.10 for each mile exceeding the 300 mile threshold. Half of the tax revenue will be redistributed to geographic location #4 (The Whole World).

Q105 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 100 miles per month in order to avoid taxation. The point of no return will occur in 35 years. You will be taxed at approximately \$0.10 for each mile exceeding the 100 mile threshold. Half of the tax revenue will be redistributed to geographic location #4 (The Whole World).

End of Block: Geo 4 - Part 3

Start of Block: Geo 4 - Part 4

Q106 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 1,300 miles per month in order to avoid taxation. The point of no return will occur in 50 years. You will be taxed at approximately \$0.10 for each mile exceeding the 1,300 mile threshold. Half of the tax revenue will be redistributed to geographic location #4 (The Whole World).

Q107 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 1,100 miles per month in order to avoid taxation. The point of no return will occur in 50 years. You will be taxed at approximately \$0.10 for each mile exceeding the 1,100 mile threshold. Half of the tax revenue will be redistributed to geographic location #4 (The Whole World).

Q108 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 900 miles per month in order to avoid taxation. The point of no return will occur in 50 years. You will be taxed at approximately \$0.10 for each mile exceeding the 900 mile threshold. Half of the tax revenue will be redistributed to geographic location #4 (The Whole World).

Q109 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 700 miles per month in order to avoid taxation. The point of no return will occur in 50 years. You will be taxed at approximately \$0.10 for each mile exceeding the 700 mile threshold. Half of the tax revenue will be redistributed to geographic location #4 (The Whole World).

Q110 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 500 miles per month in order to avoid taxation. The point of no return will occur in 50 years. You will be taxed at approximately \$0.10 for each mile exceeding the 500 mile threshold. Half of the tax revenue will be redistributed to geographic location #4 (The Whole World).

Q111 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 300 miles per month in order to avoid taxation. The point of no return will occur in 50 years. You will be taxed at approximately \$0.10 for each mile exceeding the 300 mile threshold. Half of the tax revenue will be redistributed to geographic location #4 (The Whole World).

Q112 Choose the preferred policy:

- ☐ Policy A – There are no restrictions on the amount of miles you can drive every month. The point of no return will occur in 15 years.
- ☐ Policy B – You must remain below 100 miles per month in order to avoid taxation. The point of no return will occur in 50 years. You will be taxed at approximately \$0.10 for each mile exceeding the 100 mile threshold. Half of the tax revenue will be redistributed to geographic location #4 (The Whole World).

END OF SURVEY. THANK YOU!

End of Block: Geo 4 - Part 4
