

THESIS

PREDICTORS OF YOUTH CLIMATE COLLECTIVE ACTION:  
EXTENDING THE THEORY OF PLANNED BEHAVIOR FRAMEWORK  
TO EXAMINE IDENTITY AND COMMUNICATION

Submitted by

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## ABSTRACT

### PREDICTORS OF YOUTH CLIMATE COLLECTIVE ACTION: EXTENDING THE THEORY OF PLANNED BEHAVIOR FRAMEWORK TO EXAMINE IDENTITY AND COMMUNICATION

Due to the growing concern of the global climate change crisis and young adults responding to this crisis in large numbers by engaging in public-sphere environmental actions, this study seeks to more deeply understand motivations and barriers of this young population to engage in environmental action.

Using the Theory of Planned Behavior (TPB) framework, which uses attitudes, social norms and perceived behavioral control to predict both behavior and behavioral intention, often in a private-sphere behavioral context, this study aims to extend the TPB by adding additional variables, such as environmental communication, climate change social media use, environmental identity and political identity, that more accurately predict public-sphere collective action. It also examines practical constraints related to time, money and access.

Using an online survey of adults aged 18 to 29, this study found that environmental communication, climate change social media use and environmental identity are all strong and significant predictors for both action intentions and action. It also found that political identity is a significant predictor of intentions but not action. Environmental action intentions are significant predictors towards action. Lastly, this study found that demographics, social norms, perceived behavioral control, attitudes and practical constraints are all not significant predictors of environmental action or intentions for this population. Theoretical and practical implications are discussed.

## ACKNOWLEDGEMENTS

I began my master's degree program in the fall of 2018 around the same time that youth climate activist Greta Thunberg started her weekly school strikes for the climate. I admired the strength and was fascinated by the courage of this 15-year-old Swedish girl, who dropped everything to devote her life to something she believes in. I am honored to be able to research this topic and am deeply grateful to the anyone who fights for a better future and healthier planet.

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## CHAPTER 1. INTRODUCTION

### 1.1 Overviews and Rationales

According to a report published in October 2018 by the Intergovernmental Panel on Climate Change (IPCC), “the Earth will reach the crucial threshold of 1.5 degrees Celsius (2.7 degrees Fahrenheit) above pre-industrial levels as early as 2030, precipitating the risk of extreme drought, wildfires, floods and food shortages for hundreds of millions of people” (IPCC, 2018). The report goes on to say that collective action is the only way to avoid catastrophic impacts and global governments must take unprecedented action in all aspects of society to avoid disaster.

Climate change, along with many societal issues, is classified as a wicked problem, which is a problem that raises questions without clear science-based answers, requires political and societal infrastructures that does not currently exist for public debate on the ethical, legal, economic and social implications, and do not have one best solution (Scheufele, Jamieson, & Kahan, 2017). In dealing with wicked problems that require mass social change, there is a history of global participation in social movements by young people. In the United States, a wave of youth-led movements began in the 1960s with examples such as anti-war protests, environmental activism and fighting for women’s rights.

**Youth Action.** Youth-led movements have reignited in the United States over the last five years, with groups such as *March for Our Lives* working towards ending the gun violence epidemic, the *Black Lives Matter* movement advocating for racial justice, *United We Dream* advocating for the Dream Act, and the *Sunrise Movement*, a youth-led climate change group advocating for the Green New Deal. In the past few decades, young adults have also received more power and potential to enact change than previous generations, largely due to advances in

technology, access to information and increased efforts for inclusion by decision makers (Arnold et al., 2009).

**Youth Environmental Action.** Young adults have been identified as key stakeholders in climate change and environmental issues. Those who are currently within the 18- to 29-year-old age range will likely live within the time period of 2020-2050, which has been specified as the key range for humans to decarbonize and avoid future environmental catastrophe (Corner et al., 2015).

The actions of young adults in relation to climate change are heavily influenced by social and cultural factors (Alves et al., 2018) and many young people believe a key tactic in mitigating climate change is collective organization, such as social protest, to carry out concrete actions (Vargas – Callegas et al., 2018). It has also been found that basic scientific climate-related concepts remain largely unknown to young people (Corner et al., 2015), which shows that there are other more influential factors outside of knowledge that play important roles in motivating young people to take action. However, significant individual, social, political and technological barriers still remain for young adults to participate in such social actions.

A national survey of Americans found that the public often underestimates how many other Americans think global warming is happening, with estimates of only 54% for the general U.S. population and 57% among 18-34-year-olds, when the actual number is 69% (Ballew et al., 2019). A survey of millennials (defined in this study as young people from ages 12-36 in 2017) found that while millennials are less likely than older generations to discuss global warming with those around them, they also worry about it more than older generations (Kuppa, 2018).

Recent research on social movements argues that tweens and teens – especially girls – can convince and influence their parents about the reality of climate change, often better than

journalists or other adult experts (Lawson et al., 2019). Greta Thunberg is a 17-year-old Swedish climate change activist who rose to worldwide prominence in August 2018 at age 15 when she began weekly climate strikes from school. Her actions have since inspired global strikes with an estimated 6 million participants held in at least 185 countries as of September 2019 (Taylor, Watts & Bartlett, 2019). Although Greta is an example of successful and effective youth-led environmental activism, and climate change research has shown that grassroots organizing and citizen activism are some of the most effective ways to achieve emission reduction and education (Roser-Renouf et al. 2014), this type of environmental activism has been slow to reach mainstream numbers within the general United States population.

Greta Thunberg's actions are also an outlier among the general young adult population. Environmental action has been broadly conceptualized in literature and is understood in different ways, ranging from private-sphere individual behaviors that can include recycling and energy usage in homes to public-sphere collective actions such as protesting, joining organizations, participating in conservation efforts and lobbying government officials.

This study uses Alisat and Riemer's (2015: 14) definition of environmental action as "intentional and conscious civic behaviors that are focused on systematic causes of environmental problems and the promotion of environmental sustainability through collective efforts" and is interested in the predictors of public sphere collective actions. A goal of this research is to more fully understand how attitudes, perceptions and inclinations work together to encourage or impede collective and public environmental action amongst a young adult population that spans two generations: millennials and Gen Z.

## 1.2 Goal, Hypotheses and Research Questions

This research seeks to understand why young adults (18 – 29 years old) engage in environmental action and the factors that lead them toward it. It will use the Theory of Planned Behavior (TPB) framework, which measures attitude, social norms and perceived behavioral control, to understand environmental action intentions and environmental action. Additionally, this study aims to extend the TPB framework by including additional predictors such as environmental identity, political identity, environmental communication and climate change social media use and practical constraints such as time money and access to more fully understand how these various factors play a role in predicting action and action intention. To examine these research questions, this project will conduct an online survey. Using a hierarchical linear regression model, this study will test the following hypotheses:

- **H1:** Political conservatives will exhibit lower a) environmental action intentions and b) environmental action.
- **H2:** Females will exhibit higher a) environmental action intentions and b) environmental action.
- **H3:** Those with a self-reported strong environmental identity will exhibit higher a) environmental action intentions and b) environmental action.
- **H4:** Climate change belief certainty will be positively related to environmental action intention and environmental action.
  - a. Belief certainty in human causation of climate change will be positively related to environmental action intention and environmental action.
  - b. Perceptions of climate change risk perceptions will be positively related to environmental action intention and environmental action.

- c. Belief certainty that climate change is solvable will be positively related to environmental action intention and environmental action.
- **H5:** High social norms around environmental action will be positively related to a) environmental action intentions and b) environmental action.
- **H6:** High perceived behavioral control focused on environmental action will be positively related to a) environmental action intentions and b) environmental action.
- **H7:** High use of environmental communication will be positively related to a) environmental action intentions and b) environmental action.
- **H8:** High use of social media for climate change will be positively related to a) environmental action intentions and b) environmental action.
- **H9:** Individuals with high practical constraints will exhibit lower a) environmental action intentions and b) environmental action.
- **H10:** Individuals with environmental action intentions will exhibit higher environmental action.

### **1.3 Organization**

Chapter 2 discusses the theoretical framework of the study, including how the Theory of Planned Behavior provides a framework for examining and predicting environmental action. Chapter 3 is the methods section, which includes background of the method, recruitment and participants, variables and procedures. Chapter 4 shows the results of two hierarchical regression models and Chapter 5 discusses the findings of the study and why the results occurred. Finally, Chapter 6 discusses theoretical and practical implications, limitations and future research ideas.

## CHAPTER 2. LITERATURE REVIEW

Using a Theory of Planned Behavior framework, this study seeks to understand motivations and barriers that young adults encounter when considering and participating in environmental action. It also explains why this study extends beyond the TPB model to include additional factors such as environmental and political identities, communication practices and climate change social media use and how these help further predict environmental action intentions and action.

### **2.1 Environmental Action**

Environmental action has been broadly conceptualized within literature in three major ways, including public-sphere collective actions (active involvement in organizations or demonstrations), public, non-activism individual actions (support for public policies, identification with a movement) and private-sphere individual actions (consumer behavior, recycling, energy-use habits) (Stern, 2000; Vraga, 2017). These are often placed in a hierarchy in terms of impact and intention, with public-sphere collective actions being the most impactful and hardest to participate in and private-sphere individual actions being the least impactful and easiest to complete. This research measures outcomes of public-sphere, high-impact collective environmental actions such as joining organizations, attending events, participating in conservation efforts, participating or organizing protests / strikes / marches, engaging in environmental communication and contacting governmental officials.

Collective action refers to both the process by which voluntary institutions are created and maintained and to the groups that decide to act together, which can result in forms such as voluntary groups to formal organizations that can work at a community level or advocate for political change at a national or global level (Pandolfelli, Meinzen-Dick, Dohrn, 2007).

In fields including psychology, sociology, political science and education, environmental action has been conceptualized as a function of specific behaviors including engaging in collective action to support an environmental movement (Tindall, 2002; Lubell, 2002), identifying as an environmentalist (Stern, 2000) or influencing environmental policy and politics (McFarlane & Hunt, 2006). Earlier research defines environmental action as involving “deliberate decisions, planning, implementation and reflection by a group intended to achieve a specific environmental outcome” (Emmons, 1997, p.35).

To describe action, the terms “behaviors”, “engagement” and “activism” are also conceptually used in literature, sometimes interchangeably, from the fields of environmental psychology (Dono et al., 2010), climate change (Roser-Renouf et al., 2014; Vraga, 2017) environmental politics (Dalton, 2015) and environmental communication (Kassing et al., 2010). This study uses the term environmental action, which is distinguished from environmental behavior, engagement and activism, because the term environmental action focuses on actions that target solutions to the root cause of the problem and are intentional or consciously undertaken (Jensen and Schnack, 1997).

To contrast, *behavior* can sometimes be unconscious, habitual, purposeless or random (Rosenblueth et al., 1943; Schusler and Krasny, 2010) and *engagement* implies a personal state of connection with an issue, which combines cognitive, affective and behavioral elements (Vraga, 2017). Both behavior and engagement are distinct from political action.

*Activism* is the closest conceptual term to action, as activism is described as taking direct action to achieve a political or social goal. The term activism can also contain negative connotations because of how activism and activists are perceived and depicted in the media (Hall, 2018). Research by Cortese (2015) shows that both perceptions of and identification with

being an activist is complex, as many people have clear definitions of what a “good activist” and “bad activist” looks like. The “good activists” fulfill the perfect standard of living the issue, demonstrating relentless dedication and contributing to a sustained effort. People who do not meet the criteria of a ‘selfless leader in the movement for the long-term’ can be painted as “bad activists”, with negative stereotypes of emotional and irrational protestors, having a radical ideology and better-than-thou arrogance (Coretese, 2015).

Based on these conceptual differences, this study uses Alisat and Reimer’s (2015:14) definition of *environmental action*, defined as “intentional and conscious civic behaviors that are focused on systematic causes of environmental problems and the promotion of environmental sustainability through collective efforts”. This study will examine both environmental action intentions and environmental actions, as intentions have been shown within Theory of Planned Behavior literature to be a motivating force towards action. While much of the research using the Theory of Planned Behavior predicts private-sphere, pro-environmental behavioral outcomes, this research measures outcomes of public-sphere collective environmental actions. It’s important to more deeply understand predictors of these types of environmental actions because it has been shown that public-sphere collective actions that are focused on outcomes of systematic change are more powerful ways to mitigate vast environmental ‘wicked’ problems such as climate change.

**2.1.1 Climate Change Action.** While there are many environmental issues that require public attention and action, this research uses the term environmental action to encompass the actions being taken across a variety of industries and geographic locations to mitigate climate change, as this is the most pressing and public overarching environmental topic that is being politically acted on. Responding to climate change requires both awareness of the problem and



demand for significant change through collective action (Vargas-Callejas et al., 2018). Despite high-quality scientific research into the causes and consequences of climate change, conversations about climate change in our lives have remained relatively limited in the digital sphere (Boykoff, 2019), public opinion around climate change remains largely politically polarized and action remains low (Stevenson et al., 2018).

## **2.2 Theoretical Framework: The Theory of Planned Behavior**

The Theory of Planned Behavior (TPB) states that an individual's behavioral intentions and behaviors are shaped by their attitudes, subjective norms and perceived behavioral control (Ajzen, 1991). TPB was developed by Icek Ajzen in 1991 as an extension of the Theory of Reasoned Action to include perceived behavioral control, which originates from self-efficacy theory (Bandura, 1977) and cover non-volitional behaviors for predicting both intentions and actual behavior.

While the concept of behavior can include a wide variety of human actions that can be both conscious and volitional or unconscious and habitual, behavioral intention includes the motivational factors that influence a behavior, i.e. how hard someone is willing to try or how much effort s/he will exert to perform a behavior (Ajzen, 1991). The Theory of Planned Behavior claims that behavioral intention can accurately predict behavior and the more an individual intends to perform a behavior, the more likely the individual is to perform the behavior. This only applies to volitional behavior which is behavior done using one's free will (Ajzen, 1991).

Using the Theory of Planned Behavior, literature from the fields of environmental psychology (Mancha & Yoder, 2015), environmental behavior (Oreg & Katz-Gerro, 2006) and environmental communication (Ho, Liao, & Rosenthal, 2015) suggest that environmental

behaviors and behavioral intentions are most often predicted by three core constructs: attitudes, social norms and perceived behavioral control (Ajzen, 1991). This line of research often finds that these three key factors are the most significant predictors of pro-environmental behavior, some of which include transportation, recycling, green consumerism, purchase of personal and household goods and household waste disposal (Moser, 2015, Ravis et al., 2009, Runyan, Foster, Park, & Ha, 2012).

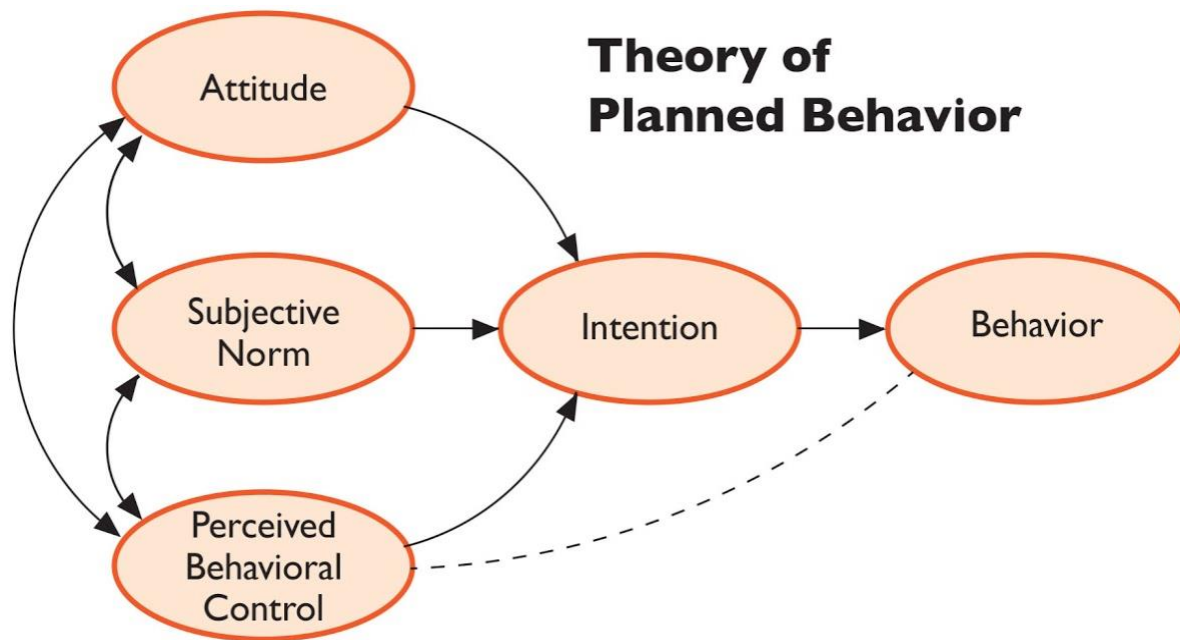


Figure 1: Theory of Planned Behavior Theoretical Framework (Ajzen, 1991).

**2.2.1 Private vs. Public Environmental Behavior.** While literature using the Theory of Planned Behavior has empirically demonstrated these three core constructs often predict private-sphere, pro-environmental behaviors, these factors alone do not predict public-sphere environmental actions (Jensen and Schnack, 1997). Alisat and Riemer (2015) distinguish between environmental action as public-sphere collective environmental actions focused on a specific outcome and personal, private-sphere “pro-environmental behaviors”, such as consumer behavior, transportation activities, personal diet or household energy use (Dono et al., 2010).

The Theory of Planned Behavior framework has traditionally been used in research that looks at predictors of private-sphere environmentalism. This research aims to expand this framework to more deeply understand how it can be used to predict participation in public-sphere collective environmental action.

When considering what predicts public-sphere environmental actions, empirical evidence shows that additional predictors of action include one's inclination to engage in environmental communication (Kassing et al., 2010), one's environmental identity (Clayton, 2003) and one's political beliefs (Kuppa, 2018). For instance, when examining the social networks of environmental groups, Tindall (2002) found that the level of environmental communication within the group had a significant and positive effect on how strongly an individual identified with the group and that having a stronger environmental, social and collective identity predicts one's inclination to participate in a social movement connected to those identities (Schmitt et al., 2019; Snow, 2001).

Using the traditional Theory of Planned Behavior framework, which measures attitude, social norms and perceived behavioral control, this study will test an extended TPB framework to include variables relevant for public-sphere actions such as environmental communication, climate change social media use, environmental identity and political identity. Measuring these, this model aims to better predict environmental action intentions and environmental actions (*Figure 2*). This study will also examine control variables such as practical constraints and demographics to more deeply understand the impacts of these additional factors.

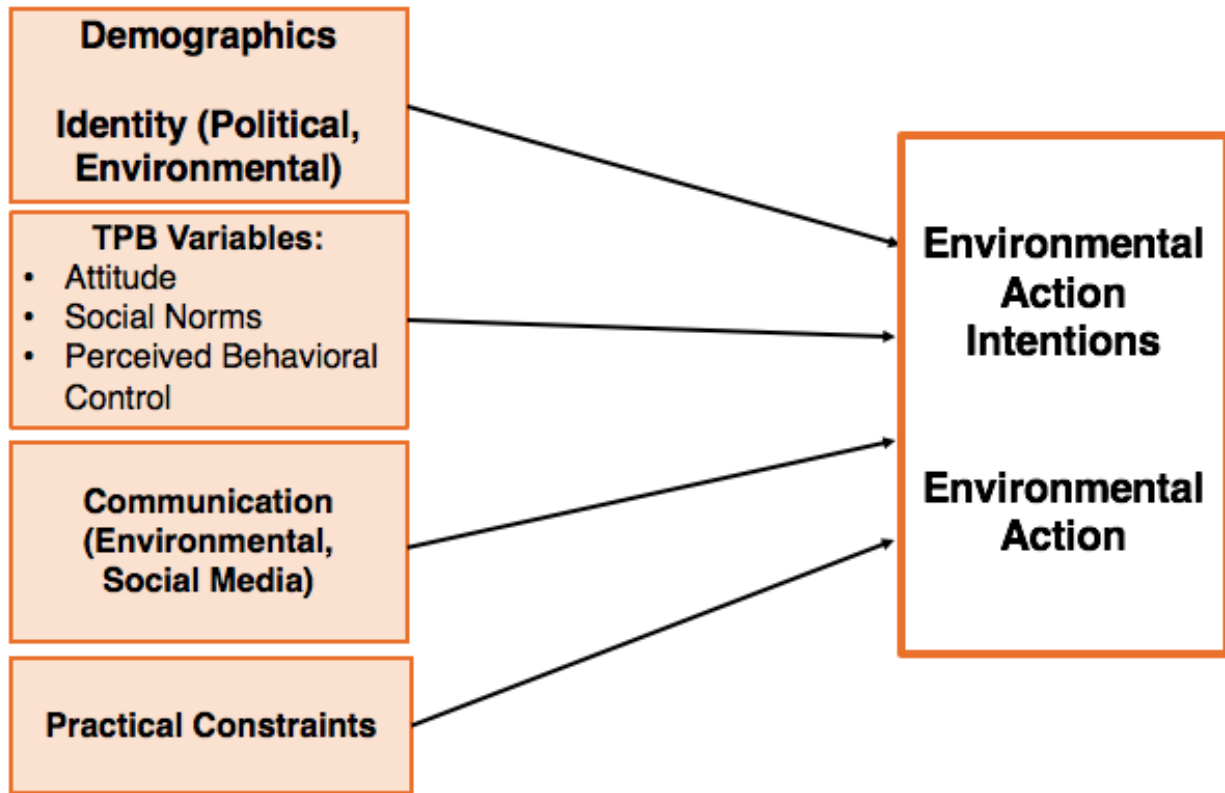


Figure 2: Conceptual Model

## 2.3 Theory of Planned Behavior Constructs

**2.3.1 Attitude / Key Beliefs.** Strong attitudes are more predictive of behavior than weak attitudes (Skitka et al., 2014). While concern for climate change is generally high amongst young adults, it is still often not a top priority, as many issues compete for people's attention (Corner et al., 2015). To measure and illustrate one's attitude towards the environment and climate change issues, this research adapts measures of key beliefs around climate change from Roser-Renouf et al. (2014)'s study on the genesis of climate change activism. Roser-Renouf and her colleagues (2014) found that four key beliefs predict activism: belief certainty regarding the reality of climate change, the belief in human causation of climate change, one's risk perceptions on who is threatened by climate change and the belief that climate change is solvable.

**2.3.2 Social Norms.** Social norms are expectations of how people are supposed to act, think or feel in specific situations (van der Linden, 2015). Social norms play a significant role in human behavior and decision making, as the fields of sociology, communication and psychology have found. This research measures both prescriptive and descriptive social norms. Prescriptive norms measure how much an individual feels social pressure to do an action/adapt an attitude and descriptive social norms refer to the degree to which important people in the respondent's life are taking said action or adopting that attitude (van der Linden, 2015).

Researching social norms in the context of young adults is important because young people may be more susceptible than older adults to changing their behavior due to the pressure of social norms, especially in the context of environmental issues (Arnold et al., 2009). Positive environmental social norms, such as joining collectives to address climate change, can inspire hope, action and a feeling of being part of a larger collective action movement (Nairn, 2019). Negative environmental social norms can be a significant barrier towards action for this population, as actions are likely to be avoided if they conflict with other priorities, are considered inconvenient, or their social groups deem them to be "uncool" (Corner et al., 2015). Research has found there is a positive relationship between descriptive norms, one's view of his or her friends and family's concern and influence over environmental attitude and behavior (Stevenson et al., 2019).

**2.3.3 Perceived Behavioral Control.** Perceived behavioral control (PBC) refers to the perceived ease or difficulty of performing a certain behavior and measuring it can serve as a proxy for actual control and contribute to the prediction of behavior based on how realistic people are in their judgements of a behavior's difficulty (Ajzen, 2002). PBC was added to the Theory of Planned Behavior to deal with situations in which people may lack volition control

over their behavior of interest (Ajzen, 2002). These are behaviors that are dependent on both the original participant and one or more other individuals, which applies to the context of collective public-sphere environmental actions with specific outcomes in mind.

Climate change literature has shown that PBC is a critical factor for those deciding whether or not to engage in action. Because climate change is a global problem, many people believe they can do nothing about it as individuals (Gifford, 2011). Research has found that one's participation often hinges on whether or not one believes that action is effective, easy to do and if his/her individual participation will increase the chances of success for that desired outcome (Roser-Renouf et al., 2014). Efficacy, which often overlaps with the concept of perceived behavioral control, is the perception of one's ability to affect change and has also been found to be a robust predictor of climate change action (Doherty & Weber, 2016; Swim et al., 2019). While there is research that supports the importance of efficacy in environmental action studies (Feldman & Hart, 2016; Lee, Haley, & Yang, 2019) and that efficacy is a related concept to PBC, this study uses the concept of PBC because of its predictive power of actual control and behavior (Armitage & Corner, 2001).

Social media use is an important tool to consider when looking at one's perceived behavioral control, as individuals who communicate frequently about the issue of climate change have greater confidence in their ability to act effectively (Stevenson et al., 2019). Since Americans increasingly rely on new media and online platforms to learn about complex scientific issues such as climate change (Brossard, 2013), social media enables individuals to access and connect online to make friends, share information and receive news on environmental issues (Ngai et al., 2015). The more an individual connects online with others completing the

same actions or working towards the same collective causes, the more their perception of their own control is likely to increase, which helps predict overall action intentions and actions.

## **2.4 Environmental Identity**

A personal identity emerges in a social context and is shaped by one's experiences, with experiences in nature shaping an environmental identity (Clayton, 2003). In considering an individual's environmental identity, this study will measure four dimensions developed in Clayton's (2003) Environmental Identity Scale, including one's sense of belonging in nature, how much one enjoys nature, their appreciation of nature and their level of environmentalism.

Structural characteristics of an organization, community or movement can help define one's environmental self-identity (Lubell, 2002). People often participate in social movements to strengthen their personal identity through membership in a group and derive meaning from the movement's ideology (Klandermans, 2014). This research will consider how an individual's identity is created, influenced and reflected in larger organizations or social movements.

It is particularly important to understand how young adult's environmental identities and realizations of self may affect their intentions towards environmental action, as engaging in environmental action at younger ages can have implications for interest and involvement in this type of behavior throughout the rest of their lives (Arnold et al., 2009). Research has shown that the identities of the young adult population can work as important motivations for environmental action (Matsuba et al., 2012). Within literature on social movements, theorists show that both social networks and identity are important for participation and that one's environmental identity can be necessary for collective environmental action to occur.

Emerging digital communication tools have proven to be powerful for social groups and movements that have been excluded from economic and cultural power, such as youth, to build

collective identities and empower grassroots action around the world in a changing climate (Boykoff, 2020).

**2.4.1 Political Identity.** While identification with nature can predict pro-environmental behavior, a more direct predictor of environmental action is one's politicized environmental identity, where the identification is with a specific group or organization engaged in collective action to create pro-environmental social change (Schmitt et al., 2019). The development of a political identity in adolescence is a key component of the development of personal identity (Marcia, 1993), and there is a strong link between identity and the environment, particularly within communities of activists engaged in environmental action (Matsuba et al., 2012).

Young people's lives are also being shaped by their intensive use of new digital technologies, the extent to which has little precedent. During this critical stage of life, levels of political interest and engagement begin to take shape and can foreshadow how technology will shape their future engagement (Jenkins et al., 2016).

This provides a challenge, as a relatively low percentage of young adults report to be interested in politics. There has been a steep decline in civic engagement in recent decades and many youths avoid tying themselves to a particular political party (Corner et al., 2015). While young people may be turned off by electoral and party politics, a meta-analysis on young people, digital media and engagement by Boulianne & Theocharis (2018) asserts that youth have not lost the willingness or desire to participate in civic life in general. A major issue of concern and research in the past decade is that digital media use can be seen as a remedy to the decline of youth participation in political and civic life. This type of behavior invokes the term "slacktivism", which implies that low-effort, online political activities do not translate to high-effort off-line political activities, but the bulk of studies do not support these claims and actually



show strong correlations between online and offline forms of participation in civic and political life (Boulianne & Theocharis, 2018).

A national survey of young adults by Kuppa (2018) found that political ideology is also a significant predictor of climate change beliefs and worry. Due to the current political climate in the United States, partisan politics have strongly divided citizens on issues and have encouraged individuals to support specific issues based on party endorsements. Because of this, those with more conservative viewpoints are more likely to be skeptical of anthropogenic climate change and those with more liberal viewpoints tend to be more accepting (Stevenson et al., 2018). Research by Fielding and Hornsey (2016) found that some will be drawn to a political party based on their preexisting attitudes towards climate change, while others will draw on their beliefs, attitudes and make action decisions based on the views of their affiliated political party (Nabi et al., 2018).

While there is significantly more literature that connects one's political orientation to their beliefs about climate change than towards their inclination to engage in political action or advocacy, we do know that young people are more likely to be politically active based on specific causes (Soler-i-Martí, 2015) and one's moral conviction and identity with the issue is a significant indicator, regardless of party identification, of one's level of political engagement (Skitka et al., 2014).

**2.4.2 Gender's Role.** Gender refers to the socially determined idea of what it is to be male or female (Reeves and Baden, 2000). There is a significant body of research showing the role of gender in predicting environmental concern, (Stern, Dietz, & Kalof, 1993), environmental knowledge (Schahn & Holzer, 1990) environmental values (Boeve-de Pauw, Jacobs, & Van Petegem, 2014) and likelihood to engage in environmental action (Agarwal, 2000). Stern (1993)

found that women have stronger beliefs than men about consequences for self, other and the biosphere when considering environmental issues. Recent research shows that young girls can often convince and influence their parents about the reality of climate change better than young boys, journalists or other adult experts (Lawson et al., 2019). Agarwal (2000) found that the distinctiveness of women's social networks embody the prior experience needed for successful cooperative, collective action. Gender composition of groups is an important determinant of successful collective action (Pandolfelli et al., 2007).

## **2.5 Environmental Communication**

Environmental communication is a critical factor in creating a public sphere where people can converse, debate, challenge and question environmental issues and concerns. Measuring the degree to which people engage in these communication actions help scholars understand motivations and intentions to act favorably towards the environment (Kassing et al., 2010). The practicing and dismissing dimensions of environmental communication assess “the degree to which people engage in or avoid conversations and media reports about environmental issues” and the confirming dimension assesses people's attitude about how necessary and important they consider communicating about the environment (Kassing et al., 2010). A national survey found that millennials are less likely to discuss global warming with their family or friends, with almost a third having never discussed global warming with those around them (Kuppa, 2018). It's also been found that discussion of climate change with both friends and family amongst adolescents was positively associated with concern about climate change, regardless of perceived acceptance and social norms of the other (Stevenson et al., 2019). Increasing participation through digital communications can help enhance engagement with climate change (Boykoff, 2020).

**2.5.1 Climate Change Social Media Use.** While young adults may not strike up conversations about climate change, they may be increasingly using online tools to share their views. Young adults may have more power than previous generations to create change at both global and local levels due to the ease with which they can exchange information and ideas as a result of newer technology and communication channels (Arnold et al., 2009). Some of the ways young people use digital media are for civic purposes and can include reading online news, joining online political groups, and discussing political issues on social media (Boulianne & Theocharis, 2018).

Social movements are increasingly using the Internet and social media to identify social problems, communicate, organize and bring about change (Ackland & O’Neil, 2011). Social media can also provide a space for sharing climate change knowledge, discussing the issue with others and can be used as a tool to mobilize climate change activists (Anderson, 2017). Exposure to and interaction with social media plays a salient role with young people’s engagement with and identification around environmental topics (Nelms, Allen, Craig, & Riggs, 2017).

Social networks are heavily utilized by activist populations to cope with the lack of formal and reliable systems (Sullivan and Zie, 2009). In particular, student activist groups use social media channels to coordinate political actions, express political views, coordinate issue-based advocacy campaigns and reach those who might not otherwise participate (Velasquez & LaRose, 2015). Once students are mobilized to participate, successful experiences can motivate use of social media for future action. The dynamics of expression on social media about a politicized issue can not only influence political action, but also one’s views of their own political identity and their perceived self-efficacy (Hale et al., 2019).

While a range of environmental actions have been studied in the context of climate change, limited research shows how political participation changes as it moves into the realm of social media (Vraga, 2017). Bimber (2017) argues that using social and digital media channels are seamless parts of many people's lives and everyday experiences and should be understood as a part of the context for action rather than a stand-alone variable. Research shows that online expression and participation increase communication and information sharing amongst people, but these actions can also be seen as ineffective forms of larger influence and collective change, especially compared to voting (Hoffman, Jones & Young, 2013). However, there is some initial evidence that social media can be productive in encouraging environmental actions that can spark activism and behavior to mitigate the effects of climate change (Anderson, 2017).

**2.5.2 Slacktivism.** Recent literature has introduced the concept “slacktivism”, which is a combination of the words “slacker” and “activism” and has been defined as ‘a willingness to perform a relatively costless, token display of support for a social cause, with an accompanying lack of willingness to devote significant effort to enact meaningful change’ (Kristofferson et al., 2014, p. 1149). The term has been used to describe the disconnect between awareness and action, often within the context of social media (Glenn, 2015).

While young adults are often placed within the Disengaged Youth Paradigm, which emphasizes the decline of traditional forms of civic engagement and paints millennials as technology addicts (Twenge, 2017), self-centered and morally lazy (Lane, 2019), there is strong evidence that shows a positive relationship between youth social media use and political engagement (Xenos et al., 2014). Boykoff (2020) argues that digital cultures and communities are useful in both expanding creativity and meeting people where they are, especially with pressing and anxiety-ridden issues like climate change. There is actually little evidence that

online engagement has displaced physical civic engagement and that digital activism actually catalyzes off-line political and social actions (Boulianne & Theocharis, 2018).

## **2.6 Practical Constraints**

The availability of resources enhances the likelihood of collective action, either online or offline, including resources such as human time, effort, prior knowledge/experience and money (Edwards & McCarthy, 2004). Alisat & Reimer (2015) claim that these types of practical constraints, such as lack of resources, can be significant barriers towards action, even when attitudes, beliefs and intentions are present. While many young people are aware that less convenient collective political actions, such as attending a demonstration, are likely to be more effective actions in mitigating a global problem like climate change, many still tend to engage in behaviors that do not inconvenience them and that can be done individually (Corner et al, 2015). In considering practical constraints, civic skills and political interest are strong predictors of action that require time commitment but not money (Brady et al., 1995). Biel and Thøgersen (2007) found that attitudes and social norms have more effect on behaviors that are easy to perform or are relatively inexpensive. To measure and control for these practical constraints towards action, this researcher looked at three dimensions: time, money, and local access.

**2.6.1 Access.** According to Merriam-Webster, the definition of access is “permission, liberty or the ability to enter, approach or pass to and from and place or to approach or communication with a person or thing” (Definition of Access, n.d.). binderkrantz et al. (2017) argue that gaining access is a crucial step towards gaining political influence and the understanding of this concept rests more on an intuitive understanding than an explicit definition. They go on to define access as “instances where a group has entered a political arena, passing a threshold controlled by relevant gatekeepers” (pg. 306).

When considering the concept of access within the context of environmental action, it should be noted that there are differences in levels of access, especially at a local community scale. Limited access would be not having physical or local access to resources / organizations. Moderate access is access to these resources in a local community but not having the knowledge or awareness to access them. Restricted access is when individuals or communities experience the inequalities of power and access, usually due to systemic problems, whether these resources exist within their community or not.

It's clear that these types of inequalities due to restricted power and access, which exist both in online spaces, offline communities and because of a changing climate, disadvantage and often most greatly affect those that will be the most impacted by climate change and often have the least influential voices in public spaces (Boykoff, 2020). One key reason to understand both youth's social media communication and use patterns, as well as one's perceived behavioral control when it comes to engaging with climate information while online is that digital media can be an extremely important tool for those who lack access to formal political institutions (e.g., political parties) and institutionalized methods of participation (e.g., voting) (Jenkins et al., 2016).

**2.6.2 Local Context: Fort Collins, Colorado.** As this research looks at a number of societal and psychological factors, it's important to provide context on geographic location and demographics of the sample. This study was conducted in the Northern Colorado city of Fort Collins, whose population was near 167,000 as of July 2018 and has grown almost 16% since July 2010. According to the U.S. Census Bureau, residents of Fort Collins are 88.9% white, 96.5% have a high school diploma, 54.5% have a bachelor's degree and the median household income is over \$62,000. To be more specific, the sample from this study are students at Colorado

State University (CSU) within Fort Collins, enrolled in courses within the Journalism and Media Communication department in the College of Liberal Arts. According to CSU's Factbook, of the 34,166 total students enrolled at CSU during the 2019-2020 school year, 5,285 students are within the College of Liberal Arts. Of these in the College of Liberal Arts, 55% are female and 45% are male, 1,149 are classified minority students (21.7%) and 3,112 qualified as residents of Colorado (59%).

A meta-analysis by Boulianne & Theocharis (2018) shows that studies looking at young people, digital media and engagement most often use university student samples, ranging from ages 18 – 29 years old. The student status of participants introduces another set of questions about how the role of education and age effects digital media use and participation in civic / political life, as compared to other non-student 18 – 29 year olds (Boulianne & Theocharis, 2018).

## **2.7 Study Purpose**

The purpose of this study is to examine young adult's environmental action by examining how the core components of Theory of Planned Behavior (attitude, social norms and perceived behavioral control) work together with communication practices, environmental identities and political identities to predict both their environmental action intentions and environmental action. TPB has been used to predict private-sphere pro-environmental behavior but there is still research needed on the predictors of public-sphere environmental action and how communication and identity play a role. This study aims to expand the TPB model to include these factors in the context of young adults.

## 2.8 Hypotheses

Based on the literature and purpose of the study, I hypothesize that environmental action – both actual and intended – is predicted by seven variables: the three TPB variables of environmental attitudes and key beliefs, social norms, perceived behavioral control, and four extended TPB variables including environmental communication, climate change social media use, environmental identity, and political identity. I also propose that an additional barrier, practical constraints, will affect actual environmental action. To examine these predictors, this project will conduct an online survey. Using a hierarchical linear regression model, I will test the following hypotheses:

- **H1:** Political conservatives will exhibit lower a) environmental action intentions and b) environmental action.
- **H2:** Females will exhibit higher a) environmental action intentions and b) environmental action.
- **H3:** Those with a self-reported strong environmental identity will exhibit higher a) environmental action intentions and b) environmental action.
- **H4:** Climate change belief certainty will be positively related to environmental action intention and environmental action.
  - a. Belief certainty in human causation of climate change will be positively related to environmental action intention and environmental action.
  - b. Perceptions of climate change risk perceptions will be positively related to environmental action intention and environmental action.
  - c. Belief certainty that climate change is solvable will be positively related to environmental action intention and environmental action.



- **H5:** High social norms around environmental action will be positively related to a) environmental action intentions and b) environmental action.
- **H6:** High perceived behavioral control focused on environmental action will be positively related to a) environmental action intentions and b) environmental action.
- **H7:** High use of environmental communication will be positively related to a) environmental action intentions and b) environmental action.
- **H8:** High use of social media for climate change will be positively related to a) environmental action intentions and b) environmental action.
- **H9:** Individuals with high practical constraints will exhibit lower a) environmental action intentions and b) environmental action.
- **H10:** Individuals with environmental action intentions will exhibit higher environmental action.

## CHAPTER 3. METHODS

To most effectively test the hypotheses and answer the research questions, this study deployed a self-guided online survey to American young adults (18 – 29 years old). The survey first measured factors within the Theory of Planned Behavior framework, including attitudes, social norms and perceived behavioral control regarding climate change and environmental action. Next, the study measured the degree to which people engage in environmental communication, generally and on social media, their environmental identity and how often they have engaged in environmental action behaviors in the past and plan to in the future. Lastly, questions measured practical constraints, levels of political identity and demographics.

### **3.1 Theoretical Framework of the Method**

Surveys are a common method to assess attitudes and behavioral intentions of specific populations within the fields of environmental communication, psychology, politics and sociology. The Yale Program on Climate Change Communication, a prominent research group in this field, often uses the survey method to assess differing audiences' beliefs and attitudes on climate change, behaviors and actions, or how various messaging is interpreted and understood (“Yale Program on Climate Change Communication Publications”, 2004 – 2020).

**3.1.1 Survey mode and limitations.** Using the survey method is an effective way to answer the research questions and hypotheses laid out in this study because surveys gather data to compare the relationship between variables and can measure naturally occurring and enduring correlations (Dillman, Smyth & Christian, 2014). Survey data can illustrate directional predictions between variables, enabling the researcher to test the hypotheses. An online, self-guided survey is the most effective tool for this research for many reasons, including the target population's familiarity of the format, convenience at which they can access the survey and the

ability to control for interviewer effects, as often seen in phone or in-person surveys (Dillman et al., 2014). Limitations of using an online survey include the ease with which a respondent can prematurely quit the survey, skip questions or complete the survey too quickly. Measures were taken to mitigate these factors, such as using the “request response” validation option embedded in Qualtrics and using reverse survey questions.

## **3.2 Sample and Recruitment**

**3.2.1 Population.** The global youth climate strikes in September 2019 drew over six million people to publicly protest and demand action and was organized by young adults who mainly promoted this movement and specific local events through grassroots social media campaigns (Taylor et al., 2019). Data from Pew Research Center reports that 20% of 18-29-year-old Americans voted in the 2018 midterms elections (Pew, 2018a) compared to 15% in the 2014 midterms, showing political engagement is on the rise for this age group. The Pew Research Center also reports that young adults (18-29 years old) use social media platforms like YouTube (90%), Facebook (79%), Instagram (67%) and Snapchat (62%) dramatically more than those 30 years and older in 2019 (Pew, 2019b). Since this study investigates environmental action behaviors and intentions of young people, college students are a logical population to sample from, especially as these environmental calls to action from the global youth climate strikes are both being catalyzed by and directed at young people.

**3.2.2 Sampling method and limitations.** This study used a convenience sample of 214 undergraduate and graduate students enrolled at Colorado State University (CSU) to complete an online survey implemented on the Qualtrics platform. The sample was from a population of 1,076 undergraduate and graduate students, whose professors opted their Journalism and Media Communication classes into the SONA system, which is software that manages student

participation in research projects for extra credit. The entire population was invited to participate in this study over a three-week period between February 10<sup>th</sup> – March 1<sup>st</sup>, 2020 and received three reminder emails to their Colorado State University email addresses. Of the 1,076 in the pool, 220 responded, which results in a 20% participation rate. Two incomplete responses were removed. To keep the sample within the 18 – 29-year-old age range, the researcher excluded four respondents who reported an age over 29. The total number of respondents removed was 6. Respondents were required to first confirm that they are over the age of 18 and consent to participate in the study when checking a box on the Informed Consent Form (Appendix D).

**3.2.3 Criteria.** Sampling criteria was young adults between ages 18 – 29 years old and currently enrolled as an undergraduate or graduate student at Colorado State University. This study used a college-enrolled pool to sample from as an appropriate subpopulation of young adults, as it has been used in previous survey, environmental, youth activism and social media literature (Alisat and Riemer, 2015; Narin, 2019; Pew Research Center, 2019) and there is no universally agreed definition of ‘youth’ (Corner et al., 2015).

**3.2.4 Recruitment.** Participants were volunteers and enrolled in a course whose lead instructor had opted-in their course to be listed in the SONA System. SONA is cloud-based participant management software that enables universities to set up studies, create surveys, manage schedules and prescreen participants (SONA, 2019). Once the survey was completed in Qualtrics, the researcher sent the survey link, along with a description of the study and promotional copy to the SONA coordinator who published the study and sent an email reminder to all students enrolled in the system that the study was available.

In conjunction with course instructors, the SONA coordinator and other graduate teaching assistants in the Journalism and Media Communication department, additional

reminders were communicated in the form of PowerPoint slides within lecture and emails sent out over Canvas, an online course management system. This also helped reach students who may have not received or read the initial SONA recruitment message. Potential participants of this survey received extra credit in their course as incentive to participate in the study, at the discretion of the course instructor. If students did not wish to participate in this study, alternative extra credit opportunities were made available to students.

### 3.3 Instruments and Variables

This study looks at directional and bi-directional relationships between multiple variables to more accurately predict environmental action amongst youth. The data gathered from this survey will effectively answer the research questions and hypotheses because it uses existing scale items that have been empirically tested and found to be valid ways to operationalize and measure these concepts. Below are details on each variable and scale. The following table summarizes key variables in the survey and the instruments used to measure them, indicating independent (IV) or dependent (DV) variables:

**Table 1: Variables**

Variable	Data measurement instrument	Scale Author
Attitude: Climate change belief certainty (IV)	Survey responses	Roser-Renouf et al. (2014)
Attitude: Climate change risk perception (IV)	Survey responses	van der Linden (2015)
Attitude: Belief in human causation (IV)	Survey responses	Roser-Renouf et al. (2014)
Attitude: Climate change collective efficacy (IV)	Survey responses	Roser-Renouf et al. (2014)
Social norms (IV)	Survey responses	van der Linden (2015)
Perceived Behavioral Control (IV)	Survey responses	Ho et al. (2015)

Environmental Identity Scale (IV)	Survey responses	Clayton (2003)
Environmental Communication Scale (IV)	Survey responses	Kassing et al. (2010)
Climate Change Social Media Use (IV)	Survey responses	Velasquez Perilla (2013)
Environmental Action Intention (DV)	Survey responses	Alisat & Riemer (2015)
Environmental Action Scale (DV)	Survey responses	Alisat & Riemer (2015)
Practical Constraints – Time and Money (IV)	Survey responses	Alisat & Reimer (2015)
Political Beliefs (IV)	Survey responses	Pew Research Center (2014)
Demographics (IV)	Survey responses	

### 3.4 Independent variables.

**3.4.1 Climate Change Attitudes / Key Beliefs.** The measurement of one’s attitudes towards the environment and climate change is assessed using scale items from Roser-Renouf et al.’s (2014) research on predicting climate change activism from one’s key gateway beliefs. The researchers operationalized this concept using four different constructs.

The first measured one’s *belief certainty that climate change is happening*, with a yes/no/not sure option response. Based on one’s response, s/he are then asked to assess how sure s/he is, using a 5-point scale. These are combined into a single 9-point scale of belief certainty ( $M = 8.87, SD = 1.64$ ). When asked about belief certainty of climate change, 48.6% are extremely sure that climate change is happening ( $N=104$ ), 22.4% are very sure ( $N=48$ ), 17.3% are moderately sure ( $N=37$ ), and 6% are slightly sure ( $N=13$ ). 2.8% do not know if climate change is happening ( $N=6$ ), 0.5% were slightly sure climate change is not happening ( $N=1$ ) and 2.3% were moderately sure that climate change is not happening ( $N=5$ ).

The second measured *risk perception of climate change* using scale items adapted from van der Linden's (2015) eight-measure holistic assessment, which considers both personal risk and global risk. All questions were asked on a 5-point Likert Scale from (1) extremely unlikely or not concerned / not serious to (5), extremely likely, very concerned or very serious. The eight items were combined into a mean index ( $M = 4.05$ ,  $SD = 0.68$ ,  $\alpha = 0.89$ ).

The third construct measured *belief in human causation of climate change* and was asked as a dichotomy: *yes, no* or *not sure*. 81.3% responded that it is human caused ( $N=174$ ) and 18.7% responded it is caused by natural changes in the environment ( $N=40$ ). A dummy variable was created by combining the “no” and “not sure” responses to use in the linear regression models.

Lastly, the *belief that climate change is solvable* was assessed using a 5-point scale including (1) *climate change isn't happening* (2) *climate change is not solvable* (3) *climate change is likely not solvable* (4) *climate change is likely solvable* (5) *climate change is solvable and will be done so successfully*. 0.5% believe that climate change “isn't happening” ( $N=1$ ), 1.9% believe climate change is “not solvable” ( $N=4$ ), 17.8% believe it is “likely not solvable” ( $N=38$ ), 68.2% believe climate change is “likely solvable” ( $N=146$ ), 5.6% believe climate change is “solvable and will be done successfully” ( $N=12$ ). 6.1% answered as unsure ( $N=13$ ) and these were taken out of the scale and categorized as “system missing” ( $M = 3.95$ ,  $SD = 0.77$ ).

**3.4.2 Social Norms.** The measurement of one's *social norms* towards environmental action is assessed using scale items from van der Linden's (2015) research on the social-psychological determinants of climate change risk perceptions. The research operationalized this concept using two different constructs of social norms: descriptive and prescriptive. To measure descriptive norms, which are established by assessing if important people in the respondent's life

are taking particular actions, respondents were asked three items on how likely their friends/family are to take action towards climate change using a 5-point Likert Scale ( $\alpha = 0.73$ ).

To measure prescriptive norms, which are established through how much an individual feels social pressure to do an action, respondents were asked three items on how likely their friends/family would support them taking actions to help reduce climate change using a 5-point Likert Scale ( $\alpha = 0.882$ ). Descriptive and prescriptive variables were found to be significantly correlated  $r(1) = .362, p < .001$  and these six items were combined into a mean index ( $M = 3.32, SD = 0.53$ ).

**3.4.3 Perceived Behavioral Control.** Three *perceived behavioral control* (PBC) statements were adopted from research by Ho et al. (2015), where respondents were asked how much they agree or disagree with a statement such as “*It is up to me whether I participate in actions that mitigate climate change*”, using a 5-point Likert Scale. These three items were modified from statements about environmental action generally to climate change specifically and combined into a mean index ( $M = 4.01, SD = 0.66, \alpha = 0.75$ ).

PBC was also measured for the social media context using items adopted Velasquez Perilla’s (2013) online political self-efficacy scale and adapted to be about climate change issues. Respondents were asked four items to rate how confident they were using a 5-point Likert scale to do specific social media actions, such as “*Keep informed about climate issues you care about using online social media sites*” or “*Influence others online regarding a climate issue*”. These were combined into a mean index ( $M = 3.60, SD = 0.81, \alpha = 0.69$ ). The Cronbach’s alpha for this scale is 0.69, but because this is very close to 0.70 and other studies have reliability used this scale to measure this construct (Ho et al., 2015), this researcher chose to continue to use this variable in this study.



**3.4.4 Environmental Identity.** The measurement of one's *environmental identity* is assessed using 12 items from Clayton's (2003) Environmental Identity Scale (EIS) ( $M = 3.83$ ,  $SD = 0.69$ ,  $\alpha = 0.87$ ). Each statement is rated on a 5-point scale, from 1 (not true of me at all) to 5 (completely true of me). Identity is measured in four dimensions: sense of belonging in nature, enjoying nature, appreciation of nature and environmentalism. As the original scale is 24 items, this researcher chose three items at random from each of the four dimensions to measure each construct, resulting in 12 items. This construct measures a broader environmental identity, as opposed to a specific climate change or activist identity, because identifying as an activist has been shown to be a significant barrier towards participating in action (Roser-Renouf et al., 2014).

**3.4.5 Political Identity.** This research aims to understand the relationship between political identity, belief in climate change and how these may influence the other measured dimensions. To do so, this survey measured political identity identification using a 7-point scale developed by Pew Research Center (2014) with responses ranging from 1 (*consistently conservative*) to 7 (*consistently liberal*) and combined into a mean index ( $M = 4.57$ ,  $SD = 1.76$ ).

**3.4.6 Environmental Communication.** To assess the degree to which people engage in *environmental communication*, this study uses the Environmental Communication Scale (ECS) developed by Kassing et al. (2010). This scale assesses environmental communication along three dimensions: practicing, dismissing and confirming. The scale has 20 items, so the researcher randomly selected three items from each of the three dimensions for this study for a total of 9. Scale items were measured using a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree) and combined into a mean index ( $M = 3.17$ ,  $SD = 0.38$ ,  $\alpha = 0.90$ ).

Practicing dimensions measure the degree to which people engage in discussions about the environment, such as "*I make it a point to discuss concerns about climate change*". The

dismissing dimensions measures the degree to which people avoid conversations about the environment, such as “*I ignore people who talk about climate change*”. The confirming dimension measures if people believe communicating about the environment is important and necessary, such as “*Discussing climate change is important*”. Each scale items were modified for this study to be more specifically about climate change issues than broad environmental issues, such as “*Conversations about climate change can make a difference*”.

**3.4.7 Climate Change Social Media Use.** Since few scale items on ECS refer to online materials, this researcher wanted to specifically measure communication practices and attitudes in *social media* contexts. Using four items from Velasquez Perilla’s (2013) scale, participants are asked how often they talk about climate change using social media channels. These four items were measured using a 5-point scale from 0 (never) through 2 (sometimes) to 4 (frequently) and combined into a mean index ( $M = 1.96$ ,  $SD = 1.03$ ,  $\alpha = 0.89$ ). When asked about often on average an individual performs the following activities, example items include... “*Share climate change related content with my friends on social media*” or “*Comment on someone else’s social media post about climate change*”.

### **3.5 Dependent Variables.**

Alisat and Reimer’s (2015) 18-item *Environmental Action Scale* (EAS) measures one’s engagement in civic actions designed to have a collective impact on climate change. This scale was adapted to contain climate change-specific measures from more broad environmental action measures. This self-reported behavior is measured through frequency of engagement and is broken into two dimensions: participatory actions and leadership actions. Items are measured using a 5-point scale from 0 (never) through 2 (sometimes) to 4 (frequently). Ten of the 18 items on the scale measure participatory actions (e.g., “*Became involved with an environmental group*

or political party”) and eight-measure leadership actions (e.g., “Took part in a protest/rally about climate change” or “Used traditional methods (letters to the editor, articles) to raise awareness about climate change”). The researcher randomly selected six participatory items and four leadership items to reduce the total number of items for this survey, for a total of 10 items. Two participatory items were later removed (“Talked with others about climate change issues” and “Used online tools to raise awareness about climate change”) because they too closely resembled items from the environmental communication and the climate change social media use survey measures.

First, to measure past environmental action behavior, respondents were asked “In the last six months, how often, if at all, have you engaged in the following actions?”. Eight environmental action items were combined into a mean index ( $M = 1.72$ ,  $SD = 0.80$ ,  $\alpha = 0.91$ ). Second, to measure future environmental action intention, respondents were asked “In the next six months, how often, if at all, do you plan to engage in the following actions?”. These eight behavioral intention items were combined into a mean index ( $M = 2.13$ ,  $SD = 0.99$ ,  $\alpha = 0.94$ ).

**3.5.1 Control variables.** The Environmental Action Scale claims that *practical constraints* can be significant barriers towards action, even when attitudes, beliefs and intentions are present (Alisat & Reimer, 2015). To measure these constraints, the researcher looked at multiple dimensions of resources that may be strained: human time, effort and money (Edwards and McCarthy, 2004).

To measure time constraints, participants were asked how many hours a week, on average, they spend on various activities and time commitments such as school, work and volunteering on a 6-point scale, with (1) being 1-10 hours, (2) measuring 11-15 hours, (3) measuring 16-20 hours, (4) measuring 21 – 35 hours, (5) measuring 36-40 hours and (6)

measuring 40+ hours a week. Participants reported spending the most time on school-related activities ( $M = 4.21$ ,  $SD = 1.08$ ), with 34.6% spending 21-30 hours/week, 27.4% spending 31-40 hours/week and 12.6% spend 40+ hours/week. Participants reported spending less time on work-related activities ( $M = 2.56$ ,  $SD = 1.16$ ), with 78% of participants spending less than 20 hours/week. 78.1% also spent less than 10 hours/week on volunteer activities ( $M = 2.15$ ,  $SD = 0.91$ ). Participants were then asked if they believe that they have the time or money to engage in environmental action. These two items significantly correlated  $r(1) = .529$ ,  $p < .001$  and were combined into a single-scale item, with 1 = strongly disagree and 5 = strongly agree ( $M = 2.74$ ,  $SD = 1.11$ ).

Lastly, to measure access constraints, participants were asked to agree or disagree using a 5-point Likert Scale whether or not there are environmental organizations and environmental events on campus or within their community that they can join. When asked if participants believe they have access to environmental organizations and events in their local area, with 1 = strongly disagree and 5 = strongly agree, the mean was 3.91 ( $SD = 0.62$ ).

**3.5.2 Demographic variables.** After completing the survey, respondents were asked three demographic questions. First, they were asked to enter their age as a continuous, open-ended variable and to confirm eligibility for this study. 5.6% were 18 years old ( $N=12$ ), 21% were 19 years old ( $N=45$ ), 31.8% were 20 years old ( $N=68$ ), 22.9% were 21 years old ( $N=49$ ), 9.2% were 22 years old ( $N=20$ ) and the remaining 9.4% participants were between 23-29 years old ( $N = 17$ ) ( $M = 20.53$ ,  $SD = 1.84$ ). Next, respondents were asked what their gender identity is, with 63.6% of participants female ( $N=136$ ) and 36.4% male ( $N=78$ ). Lastly, this survey asked what best represents respondents' ethnic heritage, giving a multi-choice check list to account for multi-racial individuals and an "other", open-ended option, in the event that a category is

missing. The majority of participants identified as Non-Hispanic White or Euro-American at 70.1% ( $N=150$ ), 7.9% as Latino or Hispanic American ( $N=17$ ), 6.5% as East Asian or Asian American ( $N=14$ ), and 9.9% as Mixed/Bi-Racial ( $N=24$ ).

**Table 2: Means, Standard Deviations for each variable measured using a scale**

	<i>N</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Mean</i>	<i>Std. Deviation</i>
Attitude - Risk	214	1.50	5.00	4.05	0.68
Social Norm	213	1.86	4.71	3.32	0.53
PBC	214	2.33	5.00	4.01	0.66
PBC - Social Media	214	1.00	5.00	3.60	0.81
Environmental Identity	213	1.83	5.00	3.83	0.69
Environmental Communication	214	1.78	5.00	3.17	0.38
Climate Change Social Media Use	214	1.00	5.00	1.96	1.03
Environmental Action (DV)	214	1.00	5.00	1.92	0.78
Action Intention (DV)	214	1.00	5.00	2.29	0.98
Valid N (listwise)	214				

### 3.6 Data Collection

After a participant found this survey in SONA and they clicked the link to participate, s/he was taken to an informed consent form within Qualtrics. Each participant must have first agreed to voluntarily take the study and proclaimed s/he is over the age of 18 years old. Once s/he gave consent, survey questions appeared on the screen. S/he could skip any question that s/he did not feel comfortable answering. The entire survey took around 10 minutes. To gain the number of desired respondents, three additional reminders were sent to students via email from

the SONA system. To entice respondents to choose this survey from a number of surveys, the researcher wrote a persuasive and enticing informative paragraph to give potential respondents more information about what the survey would entail. The researcher also removed the words “climate change” and “environment” from the title and description of the survey to prevent subject matter bias.

**3.6.1 Data Management.** After a respondent completed the survey, s/he was redirected back to the SONA website and immediately granted credit for completing the survey within the SONA system. The survey responses were stored within the researcher’s Qualtrics account, which is username- and password-protected. After the desired number of respondents completed the survey, this researcher exported the data as SPSS and Excel files, which are stored on the researcher’s computer on a password-protected drive.

**3.6.2 Pilot Study.** Prior to collecting data for this study, a pilot study was conducted during a two-week period in November 2019 with 80 respondents to test the instrument, questions, constructs, scale items, approach and overall idea. Conducting a pilot study ensured that the survey was comprehensible by participants, a length that the target population can and would complete and allowed for the measurement the concepts that the researcher is attempting to measure.

### **3.7 Validity and Reliability**

**3.7.1 Reliability.** Several steps were taken to ensure the reliability of this study. First, each variable was measured using a multi-item, empirically tested, reliable scale. The majority of the scales used are from fairly recent literature, with one exception. Table 2 shows the reliability of each scale used in this study. Second, each participant will receive an identical survey. Lastly, running a pilot study allowed for testing of each question to ensure they are measuring what the

researcher aims to measure and that there are no major problems with any specific question. All scales were reported reliable with a Cronbach's  $\alpha$  of greater than 0.7 and proven to be reliable measures of each construct. The exception was the Cronbach's alpha for the scale measuring perceived behavioral control at 0.69. Because this is very close to 0.70 and other studies have reliability used this scale to measure this construct (Ho et al., 2015), this researcher chose to continue to use this variable in this study.

**Table 3: Scale Reliabilities**

Scale	Reliability
Attitude: Climate Change Risk Perception (IV)	$\alpha = 0.89$
Climate Change Social Norms (IV): Prescriptive	$\alpha = 0.73$
Climate Change Social Norms (IV): Descriptive	$\alpha = 0.88$
Perceived Behavioral Control – Climate Change (IV)	$\alpha = 0.69$
Perceived Behavioral Control – Social Media (IV)	$\alpha = 0.75$
Environmental Identity Scale (IV)	$\alpha = 0.87$
Environmental Communication Scale (IV)	$\alpha = 0.90$
Climate Change Social Media Use (IV)	$\alpha = 0.89$
Environmental Action Scale (DV) - Action	$\alpha = 0.90$
Environmental Action Scale (DV) - Intention	$\alpha = 0.94$

**3.7.2 Internal Validity.** Several measures were taken to maintain internal validity of this study. First, this study measured multiple potential control variables, such as demographics and other practical constraints towards action. Second, the sample used in this study was a relatively homogenous group, improving the generalizability. The generalizability of this study is limited to target population due to a relatively small sample size, limited recruitment population and use of a non-random sample, but it should still provide typical results of 18 to 29-year old American young adults. While the age and education levels are similar, there are still variations in terms of gender, political beliefs, environmental beliefs, identity and background, providing a variety of

results. This study utilized a convenience sample and there is no way to identify each respondent, which allows participants' responses to remain anonymous. Third, the survey was designed in a way that is consistent with how people are used to taking online surveys, so no questions or instructions should be confusing or hard to understand. Lastly, the majority of questions asked provide specific examples so that the meaning of terms was clear to minimize misinterpretation.

**3.7.3 External Validity.** To maintain external validity, this study was designed on an online survey platform in a way that the majority of respondents were familiar with. All recruitment communication and reminders will come from the CSU SONA platform, which participants will recognize as a legitimate source.

**3.7.4 Ecological Validity.** Each of the concepts were measured using multi-item scales that have been tested and proven to be both reliable and valid. Almost all scales used were also created within the past five years, so the examples used in each scale item closely resemble concepts that reflect the real world, especially concerning the environmental action dependent variable. All language used in the survey questions avoids jargon or technical words, allowing people of all backgrounds and educational abilities to understand each question and complete the survey.

### **3.8 Data Analysis**

As this study is interested in understanding which variables predict environmental action intention and environmental action, it used a hierarchical multiple regression analysis because this enables the researcher to predict the future based on the predictor variables (Field, 2013). Hierarchical regression is a statistical method of exploring relationships among a dependent variable and several independent variables. It uses a model-building technique that allows the researcher to build successive linear regression models, with each step adding more predictors.



These models aim to show if each block of independent variables can explain a statistically significant amount of variance in each dependent variable's model (Kim, 2016). This study aims to find out whether adding one or more predictors as a set to another set can increase the explained variance, indicated by a change in  $R^2$  (Cheung, Chan, & Wong, 1999).

Using a hierarchical multiple regression, the researcher decides the order to enter the predictors into the model, with known predictors entered first in their order of importance in predicting the outcome (Field, 2013). This type of analysis is also the most commonly used analytical tools for Theory of Planned Behavior studies (Cheung et al., 1999). Therefore, using a hierarchical linear regression will provide answers to the question this study seeks to answer.

This study employed two hierarchical linear regression models with environmental action intention and environmental action as the dependent variables. The independent variables were entered into the model in five different blocks for environmental action intention and six different blocks for environmental action, based on their assumed causality. After testing each model, support for the hypotheses would mean that the proposed extended TPB variables help explain additional predictors of both environmental action intention and environmental action. Using a hierarchical linear regression model helps the researcher understand how multiple variables work together in sets and can increased the explained variance.

The blocks are the same for each model except an additional block of environmental action intention was added to the environmental action model. Block 1 contains variables related to stable characteristics such as demographics, political identity and environmental identity. Block 2 contains specific variables related to the Theory of Planned behavior, including attitude and key beliefs surrounding climate change. Block 3 contains the two additional TPB variables, perceived behavioral control and social norms. Block 4 contains environmental communication

variables, which include characteristics and actions related to beliefs and engagement in environmental communication and climate change social media use. Block 5 contains practical constraints, including time, money and access.

**Table 4. Model 1: Predictors of Environmental Action Intention**

<b>Blocks</b>	<b>Hypotheses</b>	<b>Variables</b>
<b>Block 1:</b> Demographics, Political Identity, Environmental Identity	<ul style="list-style-type: none"> <li>▪ Hypothesis 1</li> <li>▪ Hypothesis 2</li> <li>▪ Hypothesis 3</li> </ul>	<ul style="list-style-type: none"> <li>▪ Demographics</li> <li>▪ Political Identity</li> <li>▪ Environmental Identity</li> </ul>
<b>Block 2:</b> Climate Change Beliefs	<ul style="list-style-type: none"> <li>▪ Hypothesis 4</li> </ul>	<ul style="list-style-type: none"> <li>▪ Attitude/Beliefs</li> </ul>
<b>Block 3:</b> Theory of Planned Behavior Variables	<ul style="list-style-type: none"> <li>▪ Hypothesis 5</li> <li>▪ Hypothesis 6</li> </ul>	<ul style="list-style-type: none"> <li>▪ Social Norms</li> <li>▪ Perceived Behavioral Control</li> </ul>
<b>Block 4:</b> Environmental Communication and Climate Change Social Media Use	<ul style="list-style-type: none"> <li>▪ Hypothesis 7</li> <li>▪ Hypothesis 8</li> </ul>	<ul style="list-style-type: none"> <li>▪ Environmental Communication</li> <li>▪ Climate Change Social Media Use</li> </ul>
<b>Block 5:</b> Practical constraints	<ul style="list-style-type: none"> <li>▪ Hypothesis 9</li> </ul>	<ul style="list-style-type: none"> <li>▪ Practical constraints</li> </ul>

**Table 5. Model 2: Predictors of Environmental Action**

<b>Blocks</b>	<b>Hypotheses</b>	<b>Variables</b>
<b>Block 1:</b> Demographics, Political Identity, Environmental Identity	<ul style="list-style-type: none"> <li>▪ Hypothesis 1</li> <li>▪ Hypothesis 2</li> <li>▪ Hypothesis 3</li> </ul>	<ul style="list-style-type: none"> <li>▪ Demographics</li> <li>▪ Political Identity</li> <li>▪ Environmental Identity</li> </ul>
<b>Block 2:</b> Climate Change Beliefs	<ul style="list-style-type: none"> <li>▪ Hypothesis 4</li> </ul>	<ul style="list-style-type: none"> <li>▪ Attitude/Beliefs</li> </ul>
<b>Block 3:</b> Theory of Planned Behavior Variables	<ul style="list-style-type: none"> <li>▪ Hypothesis 5</li> <li>▪ Hypothesis 6</li> </ul>	<ul style="list-style-type: none"> <li>▪ Social Norms</li> <li>▪ Perceived Behavioral Control</li> </ul>
<b>Block 4:</b> Environmental Communication and Climate Change Social Media Use	<ul style="list-style-type: none"> <li>▪ Hypothesis 7</li> <li>▪ Hypothesis 8</li> </ul>	<ul style="list-style-type: none"> <li>▪ Environmental Communication</li> <li>▪ Climate Change Social Media Use</li> </ul>
<b>Block 5:</b> Practical constraints	<ul style="list-style-type: none"> <li>▪ Hypothesis 9</li> </ul>	<ul style="list-style-type: none"> <li>▪ Practical constraints</li> </ul>
<b>Block 6:</b> Behavioral Intentions	<ul style="list-style-type: none"> <li>▪ Hypothesis 10</li> </ul>	<ul style="list-style-type: none"> <li>▪ Environmental Action Intentions</li> </ul>

## CHAPTER 4. RESULTS

**4.1.1. Model 1 Results.** The first block of the regression reveals significant relationships between identity and environmental action intention, with the variables in this block accounting for 29.6% of the variance,  $F(5,166) = 13.932, p = .001$ . Political identity is significantly related to environmental action intentions, ( $\beta = .230, p = .001$ ), confirming H1a, and environmental identity is significantly related on environmental action intentions, ( $\beta = .450, p < .001$ ), confirming H3a. This indicates that those who are more consistently politically liberal and have a stronger environmental identity, measured by a sense of belonging, appreciation and enjoyment of nature, are more likely to have intentions to engage in environmental action.

Of the demographic variables, gender was not significantly related, which does not confirm H2a ( $\beta = .035, p = .614$ ). Age was not significantly related with intentions to engage in environmental actions.

The second block of the regression, which includes variables on climate change attitudes and beliefs, only increased the explained variance of environmental action intentions by 1.2%,  $F(4,162) = .714, p = 0.583$ . Belief certainty in climate change, perceptions of climate change risk, belief in human causation of climate change and belief certainty that climate change is solvable were not significantly related to environmental action intention. Hypothesis 4a-c were not supported.

The third block of the regression, which includes the additional TPB social norms and perceived behavioral control variables, accounted for 2% of the variance in environmental action intentions,  $F(3,159) = 1.537, p = 0.207$ . Social norms and perceived behavioral control were not significantly related to environmental action intention, although the relationships were in the expected direction. Hypotheses H5a and H6a were not supported.

**Table 6: Hierarchical Regression Analysis in Predicting Environmental Action Intention**

<b>Variable</b>	<i>B</i>	$\beta$	<b>R<sub>2</sub></b>	$\Delta R_2$
<i>Prediction of intention</i>				
<b>Step 1: Identity</b>				
Age	-.029	-.054		
Gender	.074	.035		
Ethnicity	-.175	-.076		
Political Identity	.133**	.230**		
Environmental Identity	.662***	.450***		
R <sub>2</sub>			.296	.296
<b>Step 2: Climate Change Beliefs</b>				
Attitude: Belief	.073	.115		
Attitude: Risk	-.032	-.021		
Attitude: Causation	-.102	-.037		
Attitude: Efficacy	.105	.074		
R <sub>2</sub>			.308	.012
<b>Step 3: Norms &amp; PBC</b>				
Social Norms	.120	.062		
PBC	.120	.076		
PBC – Social Media	.120	.097		
R <sub>2</sub>			.327	.020
<b>Step 4: Communication</b>				
Env. Communication	.498***	.194***		
Climate Social Media Use	.587***	.598***		
R <sub>2</sub>			.631	.304
<b>Step 5: Practical Constraints</b>				
Access	.030	.018		
Beliefs	.068	.062		
School Time	.064	.068		
Adjusted R <sub>2</sub>			.599	.008

**Note:** *B* = unstandardized regression coefficient;  $\beta$  = standardized coefficient  
\*\*\**p* < .001, \*\**p* < .01, \**p* < .05

The fourth block of the regression, which includes the addition of environmental communication and climate change social media use accounted for an additional 30.4% of the explained variance in environmental action intentions,  $F(2,157) = 64.674, p < .001$ . Environmental communication was significantly related to environmental action intentions, ( $\beta = .194, p = .001$ ), confirming H7a. Climate change social media use also was significantly related to environmental action intentions, ( $\beta = .589, p < .001$ ), confirming H8a. Therefore, individuals who practice environmental communication, which includes confirming that it's important and not dismissing it when they encounter it, are more likely to have higher environmental action intentions. Those who use social media for climate change communication, such as commenting, liking and sharing, are also more likely to have stronger intentions.

The final block which includes the practical constraints of access ( $\beta = .018, p = .744$ ), beliefs ( $\beta = .062, p = .255$ ) and time ( $\beta = .068, p = .189$ ) did not have a significant effect on environmental action intentions, which does not confirm H9a. The variables in this block only accounted for 0.8% of the variance in environmental action intentions. This shows that these types of constraints are not related to one's intentions to engage in environmental actions.

When all the variables were in the equation, of the significant predictors, climate change social media use had the largest beta weight, followed by environmental identity and political identity. The total  $R^2$  for the regression is .639, which indicates the model explains 63.9% of the variance in "environmental action intentions".

## 4.2 Model 2: Predictors of Environmental Action

This model features the same blocks and same order of the first model but additionally tests Block 6 for environmental action intention behaviors and uses environmental action as the dependent variable.

**4.2.1 Model 2 Results.** The first block of the regression reveals some significant relationships between identity and environmental actions, with the variables in this block accounting for 12.2% of the variance,  $F(5,166) = 4.610, p < .001$ . While political identity was not significantly related to environmental action, ( $\beta = .064, p = .400$ ), environmental identity was significantly related to environmental action, ( $\beta = .325, p < .001$ ). Therefore, H1b was not supported and H3b was supported. Of the demographic variables, gender was not significantly related to environmental action, which does not confirm H2b. Age and ethnicity were also not significantly related.

The second block of the regression, which includes variables on climate change attitudes and beliefs only increased the variance of environmental action by 2.3%,  $F(4,162) = 1.076, p < 0.370$ . Belief certainty in climate change was positively and significantly related to environmental actions, confirming H4a ( $\beta = .205, p < .047$ ). Perceptions of climate risk and belief certainty that climate change is solvable were not significantly related to environmental actions, which does not support H4b or H4c.

The third block of the regression, which includes the additional TPB social norms and perceived behavioral control variables accounted for 0.4% of the variance,  $F(3,159) = 0.254, p = 0.858$ . Social norms was not significantly to environmental action. Therefore, H5b was not supported. Perceived behavioral control was not significantly related to environmental action, which does not confirm H6b.

**Table 7: Hierarchical Multiple Regression Analysis in Predicting Environmental Action**

<b>Variable</b>	<i>B</i>	$\beta$	<b>R<sub>2</sub></b>	<b><math>\Delta R_2</math></b>
<i>Prediction of intention</i>				
<b>Step 1: Identity</b>				
Age	-.010	-.032		
Gender	-.093	-.057		
Ethnicity	-.223	-.125		
Political Identity	.029	.064		
Environmental Identity	.469***	.325***		
R <sub>2</sub>			.122	.122
<b>Step 2: Climate Change Beliefs</b>				
Attitude: Belief	.102*	.205*		
Attitude: Risk	-.154	-.131		
Attitude: Causation	-.081	-.038		
Attitude: Efficacy	-.008	-.007		
R <sub>2</sub>			.145	.023
<b>Step 3: Norms &amp; PBC</b>				
Social Norms	.107	.071		
PBC	-.023	-.018		
PBC – Social Media	-.023	-.024		
R <sub>2</sub>			.149	.004
<b>Step 4: Communication</b>				
Environmental Communication	.489***	.246***		
CC Social Media Use	.437***	.569***		
R <sub>2</sub>			.463	.314
<b>Step 5: Practical Constraints</b>				
PC - Access	.062	.048		
PC - Beliefs	.002	.003		
PC – School Time	.053	.074		
R <sub>2</sub>			.470	.007
<b>Step 6: Intentions</b>				
Env. Action Intentions	.582***	.742***		
Adjusted R <sub>2</sub>			.591	.164

**Note:** *B* = unstandardized regression coefficient;  $\beta$  = standardized coefficient  
 \*\*\**p* < .001, \*\**p* < .01, \**p* < .05

The fourth block of the regression, which includes the addition of environmental communication and climate change social media use accounted for a further 31.4% of the variance in environmental action,  $F(2,157) = 45.896, p < .001$ . Environmental communication was significantly related to environmental action, ( $\beta = .246, p = .001$ ), confirming H7b. Social media use for climate change was also significantly related to environmental action, ( $\beta = .569, p < .001$ ), confirming H8b. Therefore, individuals who practice environmental communication, which includes confirmation that it's important and the absence of dismissing it when they encounter it, are more likely to have strong environmental actions. Those who perform actions on social media regarding climate change, such as commenting, liking and sharing, are also more likely to engage in environmental action.

The fifth block shows that practical constraints of access, beliefs and time were not significantly related to environmental action, which does not confirm H9b. The variables in this block only accounted for 0.7% of the variance in environmental action.

The final block, environmental action intentions, accounted for a further 16.4% of the variance,  $F(1,153) = 68/380, p < .001$ . Environmental action intentions are significantly related to environmental action, ( $\beta = .742, p < .001$ ), which confirms H10.

When all the variables were included in the model, of the significant predictors, environmental action intentions had the largest beta weight, followed by climate change social media use and environmental identity. The total  $R^2$  for the regression is .634, which indicates the model explains 63.4% of the variance in "environmental action".

In sum, this study found that being a young, female or white individual is not significantly related to either environmental action intentions or actions. Individuals who are consistently liberal are more likely to have environmental action intentions, but not necessarily



engage in action. Those with higher levels of belief certainty in climate change are more likely to engage in environmental action, while risk perceptions, efficacy and causation are not significantly related to either intentions or actions. Environmental identities and climate change communication behaviors both offline and on social media are the strongest indicators of environmental action intentions and environmental actions. Lastly, this study found that environmental action intentions is strong indicator of environmental actions.

## CHAPTER 5. DISCUSSION

Young adults have been identified as key stakeholders in climate change and environmental issues and many young people believe a key tactic in mitigating climate change is collective organization, such as social protest, to carry out concrete actions (Vargas-Callegas et al., 2018). Due to the growing concern of the global climate crisis and young adults responding to this crisis in large numbers by engaging in public-sphere environmental actions, youth climate action is an important and pressing topic to research. This study sought to more deeply understand the motivations and barriers of young adults (18 – 29 year olds) to have environmental action intentions and engage in environmental action.

This study used the Theory of Planned Behavior framework, which measures attitudes, social norms and perceived behavioral control, to understand predictors of environmental action intentions and environmental action. Additionally, this study extended the TPB framework by including the additional predictors of environmental communication practices, climate change social media use, environmental identity and political identity, as well as barriers such as the practical constraints of time, money and access, to more fully understand how these various factors play a role in predicting action intention and action.

While there is a significant amount of literature that looks at predictors of private-sphere behavior, this research contributes to the literature by examining how the additional variables of environmental communication, climate change social media use and political identity further predict motivations or barriers towards public-sphere, collective action. To examine the proposed hypotheses, this project conducted an online survey and used a hierarchical multiple regression to examine predictors of both environmental action and environmental action intention. Overall, the measured variables both significantly predicted environmental action at 63.4% of the variance and action intention at 63.9% of the variance, which are both high percentages.

**5.1 Demographics.** The survey found that demographics of age, gender and ethnicity do not play a major role in predicting environmental action intentions or action. While past research shows that females are more likely to have higher concern about climate change and environmental issues in North American and European countries (Xiao & McCright, 2012; Boeve-de Pauw et al., 2014), gender did not account for much variance in either environmental action intentions or environmental action models of this study.

One reason could be due to the unequal sample of participants in this study, with 64% female and 36% male. Since we know gender composition of groups is an important determinant of successful collective action (Pandolfelli et al., 2007) and females tend to have more distinct networks that are built for engaging in collective action (Argarwal, 2000), it would be interesting to see how the variance may change in each model if the sample contained an equal gender representation. It would also be interesting to run each model with gender-specific samples to see if that might yield different results as to which predictors are the strongest.

While several social-cultural variables such as age, gender and levels of education have been associated with value orientations and attitudes towards the environment, the literature is less consistent on the effect of age, education, and sex on participation in environmental activism (Mohai, 1992; McFarlane & Hunt, 2006). Research by Tindall et al. (2003) argues that while women may be more concerned about environmental issues and committed to environmentalism, there are personal constraints that present barriers to participation in activism, such as lack of time due to 'double day' paid and domestic work. These personal constraints are likely more applicable to older female participants than college-aged females. Research by Klar & Kasser (2009) measures the role of activism in one's psychological well-being and shows that being politically active expresses a basic human motive for well-being. They go on to show that

feelings of generativity, the desire to care about something better than the self and to foster the welfare of future generations, are more prominent with individuals in midlife than with college-aged individuals.

While the sample from this study contains participants from ages 18 – 29 years old, 77% of respondents were 19 – 21 years old ( $M = 20.53$ ,  $SD = 1.84$ ), providing a relatively homogenous group. Thus, age was not a significant predictor in either model of this study. A 2018 Gallup analysis found that while 70% of adults aged 18 to 34 say they worry about global warming, compared to 56% of those aged 55 or older, another study shows that younger generations exhibit less civic engagement on environmental issues (Ballew et al., 2019). Sampling from outside of this age range (younger, 13-17 or older, 30 – 65+) or from a more evenly dispersed range within the 18 – 29 years old group might find age to be a more significant predictor.

**5.2 Theory of Planned Behavior.** This study found that those with higher levels of belief certainty in climate change are more likely to engage in environmental action, while risk perceptions, efficacy and causation are not significantly related to either intentions or actions. It also found that the Theory of Planned Behavior variables of social norms and perceived behavioral control were not significant predictors in either model.

While a past meta-analysis showed that the TPB variables can predict approximately 39% of the variance for behavior intention and 27% of the variance in behavior (Armitage & Corner, 2001) this study demonstrated that these variables only accounted for 3.2% of the variance for environmental action intentions and 2.7% of the variance for environmental action. While a considerable amount of literature successfully applies the Theory of Planned Behavior to young adult's health behaviors (Hackman & Knowlden, 2014; Milton & Mullan, 2012) it is not as

common to apply the TPB to the outcome of environmental actions. A more common research trajectory when considering climate change for this age group has been to measure attitudes, beliefs and perceptions. When considering social norms and perceived behavioral control, past research shows that one's participation often hinges on whether or not one believes that his/her individual participation will increase the chances of success for that desired outcome (Roser-Renouf et al., 2014). Research has also found there is a positive relationship between descriptive social norms, one's view of his or her friends and family's concern, and influence over their environmental attitudes (Stevenson et al., 2019).

This study shows that, while there is a significant body of literature that shows the TPB variables as strong predictors when examining private-sphere individual environmental behavior, other variables such as identity and environmental communication are *stronger* predictors when examining the dependent variable of public-sphere collective environmental action. As the Theory of Planned Behavior is not commonly applied to this type of public-sphere collective action, this study provides evidence that it may not be the most significant framework to do so.

**5.3 Environmental Identity.** This study shows that an individual's strong environmental identity is a significant predictor of their environmental action intentions and environmental actions. Environmental identity had a strong standardized beta weight in predicting both environmental action intentions (0.450) and environmental action (0.325), although there were other variables that were stronger in predicting action, such as behavioral intentions (0.742) and climate change social media use (0.569).

Considering the population of this study, it's not surprising that identity would play a significant role in both action intentions and actions. Past research shows that the identities of the young adult population work as important motivations for environmental action (Matsuba et al.,

2012). Environmental movements engaged in collective action are typically motivated by their participants' shared identity or concern about environmental issues (Brulle and Rootes, 2015) and especially within the age of heavy social media use and networked communities, identity is a critical factor for building social movements and mobilizing online audiences around specific issues (Nelms et al., 2017).

This study used Clayton's (2003) Environmental Identity Scale to test multiple psychological dimensions of one's environmental identity, including their sense of belonging in nature, enjoyment of nature, appreciation of nature and environmentalism. This was one of the few scales used in this study that did not mention climate change specifically, but rather focused on the individual participant's personality, behaviors and beliefs surrounding the environment. One could speculate that in the year 2020, if an individual already has a strongly developed environmental identity that it is inherently related to climate change, as climate change is often framed by politicians, institutions, environmental groups and other high-profile environmentalist thought leaders as the most important and pressing environmental issue of the time.

Recent research also shows that a strong predictor of environmental action is one's *politicized* environmental identity, where the identification is not only individualized, psychological or focused on one's personality and beliefs, but the identification is with a group or organization engaged in collective action with the goal of create pro-environmental political and social change (Schmitt et al., 2019).

**5.4 Political Identity.** This study found that political identity can play a significant role, as our results show that individuals who are consistently liberal are more likely to have strong environmental action intentions, but not necessarily engage in environment action.

While a survey from 2010 showed that younger adults appeared to be less engaged in climate action than older adults (Feldman, Nisbet, Leiserowitz & Maibach, 2010), recent surveys found that younger generations are more likely than older adults to express a willingness or intention to engage in climate activism through actions like contacting government officials about global warming (Ballew et al., 2019). However, when it comes to actually contacting government officials to urge them to take action, only 13% of Millennials, 12% of Baby Boomers and 8% of Generation X have reported actually doing so (Ballew et al., 2019).

When it comes to generational differences in generations by political ideologies, research by the Yale Program on Climate Change Communication found that the gap between conservative and liberal views on global warming is smaller for Millennials than for older generations, indicating that there is less political polarization over this issue for younger Americans (Ballew et al., 2019). The study from Ballew et al. (2019) also shows that Millennial conservatives are more likely to hold higher belief certainty in and worry about global warming than older conservatives.

While about half of Americans (53%) support climate activists who urge elected officials to take action to reduce global warming, only 38% percent of Americans identify with climate activists, with most identifying “a little” at 22% or “not at all” at 39%. Those who identify as liberal (69%) identify a “great deal”, while fewer Independents (41%) or people who identify as conservative (9%) do (Leiserowitz et al., 2019). Only about one in five Americans (17%) outright oppose climate activists.

Research shows that it is common for individuals to associate their environmental stance with politics and commonly define environmental issues through political associations such as references to liberalism or a need for government mediation (Ross, 2013). Past literature shows

that individuals are more likely to become politically active if they identify with the underlying cause or topic and identification with nature can predict pro-environmental behavior (Soler-i-Martí, 2015). Other research on the concepts of volunteering and community feeling aspirations suggest that political activism might be motivating in and of itself, but this motivation usually develops most prominently in midlife adults (Ryan & Deci, 2001).

This evidence may point to the fact that with this young adult age group, especially with the bulk of this study's participants between ages 19-21 years old, political identity isn't as important as it becomes later in life and these young adults might not have fully developed their political identities yet. This study's sample also did not strongly identify with membership to traditional U.S. political parties, as more than 50% of respondents either identified as an "independent", "don't know", or "prefer not to say".

Being a college student is typically a time when students are exposed to new ideas, ideologies and ways of thinking. Until then, an individual is most commonly politically socialized by their parent's political views (Beck & Jennings, 1975). An important contextual caveat is that this research took place using a convenience college student sample in Fort Collins, Colorado at Colorado State University (CSU), where 84% of new students enrolled in the Fall of 2019 were Colorado residents. While Fort Collins and college campuses are generally more liberal than the average American city or total U.S population, Colorado is considered a "purple" state, which means that there is a more even distribution of "red" conservative and "blue" liberal political ideological beliefs and party affiliations across the state.

Research also shows that the link between political ideology and climate change is more heavily portrayed in the media than other forms of communication (Feldman et al., 2017). Since college students are less likely to consume more traditional forms of media and this type of



media consumption tends to increase later in life (Bachmann et al., 2010), we can speculate that one's political identity and their propensity to engage in environmental action would strengthen as an individual gets older.

**5.5 Environmental Communication and Climate Change Social Media Use.** This study found that individuals who engage in communication behaviors both offline and on social media are the strongest indicators of environmental action intentions and environmental actions. Environmental communication and climate change social media use accounted for more variance in both models than shown in previous environmental communication studies, particularly within the environmental action at 31.4%. This finding provides further evidence for past research that shows environmental communication as a critical factor in creating a public sphere where people can converse, debate, challenge and question environmental issues (Kassing et al., 2010).

This is a particularly important finding when considering the age group of this study. Social media and communication were found to be two of the most significant variables for describing environmental action for Generation Z, which are less commonly measured in more traditional frameworks for action. This is also an important finding when considering social media use for climate change communication. While initial evidence shows that social media can be productive in encouraging environmental actions that spark activism and behavior to mitigate the effects of climate change (Anderson, 2017), this study helps solidify those findings, showing social media as a powerful tool for this generation and that increasing participation through digital communications can help enhance engagement with climate change (Boykoff, 2020).

Numerous past studies are skeptical of the effects of social media on political participation or activism, particularly with youth populations (Glenn, 2015). While term 'slacktivism' is often associated with youth populations, which refers to the concept of one

feeling like they are contributing by doing actions that are in reality not impactful to a movement or cause's overall goals, this study provides additional evidence of a strong positive relationship between youth, social media use, and climate change, which past research has shown (Xenos et al., 2014; Boulianne & Theocharis, 2018; Boykoff, 2020).

While these findings can't speak other phenomena associated with social media's potential for motivating or creating barriers towards public-sphere environmental actions, this study points towards important next steps of research to look at interactive effects of these phenomena. Other phenomena include online social norms and peer pressure, the effects of personalized newsfeeds, the effects of increased media coverage of global youth climate strikes, or the desire to showcase one's environmental and political identity online through posting content related to engaging in climate action.

**5.6 Practical Constraints.** The practical constraints measured in this study (time, money and access) did not contribute greatly to the variance of either model. While on a practical level, these factors might situationally contribute to being either a motivation or barrier towards action, they do not seem to hold theoretical weight in these models.

The city of Fort Collins, Colorado is generally considered to be an environmentally active community but compared to larger and more environmentally active cities like Denver or Boulder, Fort Collins, whose population is 167,830 as of 2018, is still a midsize college town that houses less active environmental organizations or events. The environmental organizations that do have local chapters in Fort Collins are less youth-oriented than other in cities, such as the Sierra Club, 350.org, Extinction Rebellion, the Climate Reality Project or task forces created by the local city government.

A February 2020 article by the Rocky Mountain Collegian, the CSU student newspaper, wrote an article featuring the grassroots groups behind Fort Collins climate action, but only featured organizations on the Community Advisory Committee to the Climate Action Plan led by the city of Fort Collins, including groups such as the Northern Colorado Partners for Clean Energy, the Fort Collins Sustainability Group and Sierra Club (Ye, 2020). While each of these groups have decades long legacies in this community for environmental and climate action, they are not specifically geared towards student population membership, participation or issues that students specifically care about.

The youth-oriented organization Sunrise Movement has a local chapter in Fort Collins that is presently organized by high school students, which further produces a gap for college students to join an organization that they might feel are more age and issue appropriate. These factors may limit the overall opportunity and access for college aged populations to engage in public-sphere environmental actions while residing in the city of Fort Collins. One thing to consider is since this study found social media use for climate change to be a significant factor, on-the-ground organization's activities might not be as critical as their online presence. Improving an organization's digital engagement strategy could be a key tactic to employ if are seeking to recruit more college-age participants.

**5.7 Intentions Lead to Action.** Lastly, one's environmental action intentions are strong indicators of their environmental actions. The variable of environmental action intentions was added to the environmental action model as a predictor and it accounted for 16.4% of the total variance, increasing this model to 63.4% total explained variance, which is high. The standardized beta weight of action intentions was also the strongest predictor of action at .742. It

does make sense that one's action intentions would predict engagement in environmental action, as intentions directly predict to action in the Theory of Planned Behavior model.

**5.8 Environmental Action Behavioral Proxy.** This study also measured an environmental action behavioral proxy as a dependent variable. This proxy was measured by giving participants three scenarios where they were asked if they would be willing to complete certain behaviors following the survey. They did not actually require participants to engage in these activities, which participants were debriefed on following the questions. This was added to this study to discover if different action orientations would change or cause any of the significant predictive variables to change for this population.

Participants were first asked if they would like to sign a petition in support of new regulations for renewable energy, then asked if they would like to join a campaign to change the energy industry's practices and be opted into weekly emails, and lastly were asked if they would like to spend 5 minutes reading a webpage on this topic. When these three behavioral proxies were summed into an index, 33.2% would not be willing to do any of the three activities, 29.4% would do one, 22.4% would do two and 15% would do all three activities ( $M = 1.19$ ,  $SD = 1.05$ ).

In a post-hoc analysis, we found that the variables only accounted for 20.8% of the total variance and only political identity was a significant predictor. This shows that the significant findings of environmental and political identity, environmental communication, social media use for climate change and environmental action intentions only hold when the dependent variable are specific environmental action behaviors and do not hold with other types of behavioral proxies. This could be for multiple reasons but a likely one could be the development of action intentions typically precedes actions, so putting participants on the spot to engage in action might not be a natural progression.

## CHAPTER 6: CONCLUSIONS

Understanding young adult's motivations and barriers towards participating in environmental action is both a pressing and important topic to study as climate change becomes a more pressing environmental issue globally and young people are prominently engaging in public-sphere environmental actions such as climate strikes around the world. While there is a significant amount of literature that looks at predictors of private-sphere behavior, this research contributes to the literature by further examining how the additional variables of environmental identity, environmental communication, climate change social media use and political identity lead towards public-sphere, collective environmental action intentions and actions.

### **6.1 Theoretical Implications**

This study found that the additional predictor variables of environmental identity, political identity, environmental communication and climate change social media use were significant and helped explained the overall variance in the predictive models of environmental action and environmental action intention. It also found that the Theory of Planned Behavior variables of attitudes/beliefs, social norms and perceived behavioral control were not significant for predicting these types of public-sphere collection actions for this young adult age group.

While the Theory of Planned Behavior framework has been successfully applied to a variety of behavioral studies, this research shows that it may not be the best framework for understanding motivations towards public-sphere environmental action. It's important to realize that external facing variables such as communication practices and climate change social media use are potentially better predictors and are likely influenced by internal variables such as one's environmental and political identity for this young adult population.

## **6.2 Practical Implications**

A significant finding from this study revealed that identity is a critical factor for this age group. Since young adults are key stakeholders that will create and influence future public policies, technological innovations, research, communication campaigns and voting behavior, understanding that one's environmental identity is an important factor when young adults are evaluating whether or not to get involved and perform public-sphere action. An environmental identity is created through a sense of belonging and appreciation of nature, as well as having a positive view of what it means to be labeled as an "environmentalist". Individuals have to consider if these type of public actions map on to their existing persona and public identities, a large part of which is publicly constructed through their personal social media accounts.

This is where another significant finding from this study, that social media use for climate change is a significant predictor of both action intentions and actions, becomes extremely important. Individuals not only have to evaluate if engaging in this type of communication online is aligned with their existing identities, but also if the online communication behaviors of prospective collective action-oriented organizations map on to that identity as well. A recommendation for organizations that want to engage younger audiences and recruit young adults as members need to target their social media and communication, as these channels are extremely valuable entry points for action.

## **6.3 Limitations**

With any self-reported system of measuring, there are limitations. In asking respondents to both recall their environmental actions for the past six months and then predict their environmental actions for the following six months, the survey risks recording information that

might not be remembered or predicted correctly. Ideally, giving each respondent enough examples and clear descriptions of the actions helped each individual respond accurately.

Using an online survey inherently asks for a certain skill level in using digital technology. Because the respondents were recruited from a pool of university students, the researcher made the assumption that each potential respondent had the knowledge to participate, but this is not necessarily true and could have limited the variety of people willing and able to participate.

There is a general limitation of using a convenience sample. Surveying from a wider and more diverse range of 18-29-year-olds could yield different results. This study also made the assumption that one's political identity affects inclination towards environmental action. While this has shown to be true in past research, due to the tumultuous current political landscape and this population's changing identity, it's hard to fully explain how political identity impacted results.

#### **6.4 Future Research**

As this study found the significance of identity and communication practices on environmental action intentions and action, a next step of research would be to further parse out the dimensions of each of these concepts to understand how they interact on a deeper level. For instance, this study measured a psychological approach to environmental identity, but this construct has also been operationalized using "socio-cultural environmental identity" (Stapleton, 2015) or a "connectedness to nature scale" (Olivos et al., 2011). The New Ecological Paradigm (NEP) scale measures one's ecological worldview and could be interesting to compare identity and worldview (Dunlap and Van Liere, 2002). The communication practices also focused on beliefs towards communication's value, as well as a few specific online actions, but these areas

could be significantly expanded with more specific survey items, parsed out by media channel, action type or beliefs on the idea of social media ‘slacktivism’.

While this study focused on public-sphere collective environmental actions, there are a variety of ways to either further specify types of actions such as actions that individuals can take versus actions that can only be facilitated by a collective group. This study also uses the term “climate change” as an all-encompassing environmental issue, but future research could focus on more specific areas that fall within a climate change umbrella such as energy production, agriculture and food production, transportation, clothing and merchandise production, climate social justice issues, individual lifestyle decisions or education and family planning for women, among others.

Taking a mixed method approach to future studies and adding a qualitative component could provide greater nuance and understanding of one’s environmental and political identity that survey items might miss, a better understanding of the decision making process when considering engaging in public-sphere environmental actions, or by providing more of the narrative of what an individual hopes to gain or achieve through public collective action.



## REFERENCES

- Ackland, R., & O'Neil, M. (2011). Online collective identity: The case of the environmental movement. *Social Networks*, 33(3), 177–190. <https://doi.org/10.1016/j.socnet.2011.03.001>
- Agarwal, B. (2000). Conceptualizing environmental collective action: Why gender matters. *Cambridge Journal of Economics*, 24(3), 283–310. <https://doi.org/10.1093/cje/24.3.283>
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Ajzen, I. (2002). Perceived behavioral control, self-efficacy, locus of control, and the Theory of Planned Behavior. *Journal of Applied Social Psychology*, 32(4), 665–683. <https://doi.org/10.1111/j.1559-1816.2002.tb00236.x>
- Alisat, S., & Riemer, M. (2015). The environmental action scale: Development and psychometric evaluation. *Journal of Environmental Psychology*, 43, 13–23. <https://doi.org/10.1016/j.jenvp.2015.05.006>
- Alves, F., Nicolau, L. B., Lima, D., Azeiteiro, U. M., & Nicolau, P. B. (2018). University student's perceptions about climate change: The case of Interior Design and Architecture students of a Brazilian University. In W. Leal Filho, E. Manolas, A. M. Azul, U. M. Azeiteiro, & H. McGhie (Eds.), *Handbook of Climate Change Communication: Vol. 2: Practice of Climate Change Communication* (pp. 183–203). [https://doi.org/10.1007/978-3-319-70066-3\\_13](https://doi.org/10.1007/978-3-319-70066-3_13)
- Anderson, A. A. (2017). Effects of social media use on climate change opinion, knowledge, and behavior. *Oxford Research Encyclopedia of Climate Science*. <https://doi.org/10.1093/acrefore/9780190228620.013.369>
- Armitage, C. J., & Conner, M. (2001). Efficacy of the theory of planned behavior: A meta-analytic review. *British Journal of Social Psychology*, 40, 471–499.
- Arnold, H. E., Cohen, F. G., & Warner, A. (2009). Youth and environmental action: Perspectives of young environmental leaders on their formative influences. *The Journal of Environmental Education*, 40(3), 27–36. <https://doi.org/10.3200/JOEE.40.3.27-36>
- Bachmann, I., Kaufhold, K., Lewis, S. C., & de Zúñiga, H. G. (2010). News platform preference: Advancing the effects of age and media consumption on political participation. *International Journal of Internet Science*, 5(1), 34–47.
- Ballew, M., Gustafson, A., Bergquist, P., Goldberg, M., Rosenthal, S., Kotcher, J., Maibach, E., & Leiserowitz, A. (2019). *Americans underestimate how many others in the U.S. think global warming is happening*. Yale University and George Mason University. New Haven, CT: Yale Program on Climate Change Communication.

- Ballew, M., Marlon, J., Rosenthal, S., Gustafson, A., Kotcher, J., Maibach, E., & Leiserowitz, A. (2019). *Do younger generations care more about global warming?* Yale University and George Mason University. New Haven, CT: Yale Program on Climate Change Communication.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 191–215.
- Beck, P. A., & Jennings, M. K. (1975). Parents as “Middlepersons” in Political Socialization. *The Journal of Politics*, 37(1), 83–107. <https://doi.org/10.2307/2128892>
- Biel, A., & Thøgersen, J. (2007). Activation of social norms in social dilemmas: A review of the evidence and reflections on the implications for environmental behavior. *Journal of Economic Psychology*, 28(1), 93–112. <https://doi.org/10.1016/j.joep.2006.03.003>
- Bimber, B. (2017). Three prompts for collective action in the context of digital media. *Political Communication*, 34(1), 6–20. <https://doi.org/10.1080/10584609.2016.1223772>
- binderkrantz, a.s., pedersen, h. h., & beyers, j. (2017). what is access? A discussion of the definition and measurement of interest group access. *European Political Science*, 16(3), 306–321. <https://doi.org/10.1057/eps.2016.17>
- Boeve-de Pauw, J., Jacobs, K., & Van Petegem, P. (2014). Gender differences in environmental values: An issue of measurement? *Environment and Behavior*, 46(3), 373–397. <https://doi.org/10.1177/0013916512460761>
- Boulianne, S., & Theocharis, Y. (2018). Young People, Digital Media, and Engagement: A Meta-Analysis of Research. *Social Science Computer Review*, 0894439318814190. <https://doi.org/10.1177/0894439318814190>
- Boykoff, M. (2019), *Creative (Climate) Communications: Productive Pathways in Science, Policy and Society*, Cambridge: Cambridge University Press.
- Boykoff, M. (2020). Digital cultures and climate change: ‘Here and now.’ *Journal of Environmental Media*, 1(1), 21–25. [https://doi.org/10.1386/jem\\_00003\\_1](https://doi.org/10.1386/jem_00003_1)
- Brady, H. E., Verba, S., & Schlozman, K. L. (1995). Beyond Ses: A resource model of political participation. *The American Political Science Review*, 89(2), 271–294. <https://doi.org/10.2307/2082425>
- Brossard, D. (2013). New media landscapes and the science information consumer. *Proceedings of the National Academy of Sciences*, 110(Supplement\_3), 14096–14101. <https://doi.org/10.1073/pnas.1212744110>

- Brulle, R. J., & Rootes, C. (2015). Environmental Movements. In *International Encyclopedia of the Social & Behavioral Sciences* (pp. 763–768). Elsevier. <https://doi.org/10.1016/B978-0-08-097086-8.91016-X>
- Cheung, S. F., Chan, D. K.S., & Wong, Z. S.Y. (1999). Re-examining the Theory of Planned Behavior in understanding wastepaper recycling. *Environment and Behavior*, 31(5), 587–612. <https://doi.org/10.1177/00139169921972254>
- Christensen, H. S., & Bengtsson, Å. (2011). The political competence of internet participants. *Information, Communication & Society*, 14(6), 896–916. <https://doi.org/10.1080/1369118X.2011.566931>
- Clayton, S. (2003). Environmental identity: A conceptual and an operational definition. In S. Clayton, & S. Opatow (Eds.), *Identity and the Natural Environment* (pp. 45e65). Cambridge, MA: MIT Press.
- Colorado State University Factbook (2020, January 29): PDF Files 2019-2020, Student Section Only. Retrieved from: [http://irpe-reports.colostate.edu/pdf/fbk/1920/1-Student\\_Section\\_Only.pdf](http://irpe-reports.colostate.edu/pdf/fbk/1920/1-Student_Section_Only.pdf)
- Corner, A., Roberts, O., Chiari, S., Völler, S., Mayrhuber, E. S., Mandl, S., & Monson, K. (2015). How do young people engage with climate change? The role of knowledge, values, message framing, and trusted communicators. *Wiley Interdisciplinary Reviews: Climate Change*, 6(5), 523–534. <https://doi.org/10.1002/wcc.353>
- Cortese, D. K. (2015). I’m a “good” activist, you’re a “bad” activist, and everything I do is activism: Parsing the different types of “activist” identities in LBGTQ organizing. *Interface: a journal for and about social movements*. 7(1), 215 – 246.
- Dalton, R. J. (2015). Waxing or waning? The changing patterns of environmental activism. *Environmental Politics*, 24(4), 530–552. <https://doi.org/10.1080/09644016.2015.1023576>
- Definition of ACCESS*. (n.d.). Merriam-Webster dictionary. Retrieved January 29, 2020, from <https://www.merriam-webster.com/dictionary/access>
- Dillman, D., Smyth, J., & Christian, L. (2014). *Internet, phone, mail, and mixed-mode surveys: the tailored design method* (Fourth edition.). Hoboken, New Jersey: Wiley.
- Doherty, K. L., and Webler, T. N. (2016). Social norms and efficacy beliefs drive the Alarmed segment’s public-sphere climate actions. *Nature Climate Change*. 6, 879–884. <https://doi:10.1038/nclimate3025>
- Dono, J., Webb, J., & Richardson, B. (2010). The relationship between environmental activism, pro-environmental behavior and social identity. *Journal of Environmental Psychology*, 30(2), 178–186. <https://doi.org/10.1016/j.jenvp.2009.11.006>

- Dunlap, R. E., Liere, K. D. V., Mertig, A. G., & Jones, R. E. (2000). New Trends in Measuring Environmental Attitudes: Measuring Endorsement of the New Ecological Paradigm: A Revised NEP Scale. *Journal of Social Issues*, 56(3), 425–442.  
<https://doi.org/10.1111/0022-4537.00176>
- Emmons, K. M. (1997). Perspectives on environmental action: Reflection and revision through practical experience. *The Journal of Environmental Education*, 29, 34–44.
- Edwards, B. and McCarthy, J.D. (2004). “Resources and Social Movement Mobilization.” Pp. 116–52 in *The Blackwell Companion to Social Movements*, edited by D. A. Snow, S. A. Soule, and H. Kriesi. Oxford, UK: Blackwell Publishing.
- Feldman, L., & Hart, P. S. (2016). Using political efficacy messages to increase climate activism: The mediating role of emotions. *Science Communication*, 38(1), 99–127.  
<https://doi.org/10.1177/1075547015617941>
- Feldman, L., Hart, P. S., Leiserowitz, A., Maibach, E., & Roser-Renouf, C. (2017). Do Hostile Media Perceptions Lead to Action? The Role of Hostile Media Perceptions, Political Efficacy, and Ideology in Predicting Climate Change Activism. *Communication Research*, 44(8), 1099–1124. <https://doi.org/10.1177/0093650214565914>
- Feldman L., Nisbet M.C., Leiserowitz A., Maibach E. (2010). *The Climate Change Generation? Survey Analysis of the Perceptions and Beliefs of Young Americans*. Joint report of American University's School of Communication, The Yale Project on Climate Change, and George Mason University's Center for Climate Change Communication.
- Field, A. (2013). *Discovering statistics using IBM SPSS statistics: and sex and drugs and rock “n” roll* (4th edition.). Los Angeles: Sage.
- Fielding, K. S., & Hornsey, M. J. (2016). A social identity analysis of climate change and environmental attitudes and behaviors: insights and opportunities. *Frontiers in Psychology*, 7. <https://doi.org/10.3389/fpsyg.2016.00121>
- Gifford, R. (2011). The dragons of inaction: psychological barriers that limit climate change mitigation and adaptation. *The American Psychologist*, 66(4), 290–302.  
<https://doi.org/10.1037/a0023566>
- Glenn, C. L. (2015). Activism or “Slacktivism?”: Digital Media and Organizing for Social Change. *Communication Teacher*, 29(2), 81–85.  
<https://doi.org/10.1080/17404622.2014.1003310>
- Glenza, J. (2019, March 15). Climate strikes held around the world – as they happened. The Guardian. Retrieved from <https://www.theguardian.com/environment/live/2019/mar/15/climate-strikes-2019-live-latest-climate-change-global-warming>

- Hackman, C. L., & Knowlden, A. P. (2014). Theory of reasoned action and theory of planned behavior-based dietary interventions in adolescents and young adults: A systematic review. *Adolescent Health, Medicine and Therapeutics*, 5, 101–114. <https://doi.org/10.2147/AHMT.S56207>
- Hall, S. (2018, March 6.). Advocacy versus Activism: What is the difference? | Ruminating. Retrieved from <https://ruminating.org/news/advocacy-versus-activism-what-is-the-difference/>
- Ho, S. S., Liao, Y., & Rosenthal, S. (2015). Applying the Theory of Planned Behavior and Media Dependency Theory: Predictors of public pro-environmental behavioral intentions in Singapore. *Environmental Communication*, 9(1), 77–99. <https://doi.org/10.1080/17524032.2014.932819>
- Hoffman, L. H., Jones, P. E., & Young, D. G. (2013). Does my comment count? Perceptions of political participation in an online environment. *Computers in Human Behavior*, 29, 2248–2256.
- Intergovernmental Panel on Climate Change (IPCC) (2019, October 8). Summary for Policymakers of IPCC Special Report on Global Warming of 1.5 degrees C approved by governments. Retrieved from: <https://www.ipcc.ch/2018/10/08/summary-for-policymakers-of-ipcc-special-report-on-global-warming-of-1-5c-approved-by-governments/>
- Jenkins, H., Ito, M., & boyd, D. (2016). Participatory culture in a networked era. Malden, MA: Polity Press.
- Jensen, B. B. & Schnack, K. (1997). The action competence approach in environmental education. *Environmental Education Research*, 3, 163–178.
- Kalkbrenner, B. J., & Roosen, J. (2016). Citizens' willingness to participate in local renewable energy projects: The role of community and trust in Germany. *Energy Research & Social Science*, 13, 60–70. <https://doi.org/10.1016/j.erss.2015.12.006>
- Kassing, J.W., Johnson, H.S., Kloeber, D.N., & Wentzel, B.R. (2010). Development and validation of the Environmental Communication Scale. *Environmental Communication*, 4(1), 1–21. <https://doi.org/10.1080/17524030903509725>
- Kim, B. (2016). Hierarchical Linear Regression | University of Virginia Library Research Data Services + Sciences. Retrieved March 20, 2020, from <https://data.library.virginia.edu/hierarchical-linear-regression/>
- Klandermans, P. G. (2014). Identity politics and politicized identities: Identity processes and the dynamics of protest. *Political Psychology*, 35(1), 1–22. <https://doi.org/10.1111/pops.12167>

- Klar, M., & Kasser, T. (2009). Some benefits of being an activist: Measuring activism and its role in psychological well-being. *Political Psychology*, 30(5), 755–777. <https://doi.org/10.1111/j.1467-9221.2009.00724.x>
- Kristofferson, K., White, K., & Peloza, J. (2014). The nature of slacktivism: How the social observability of an initial act of token support affects subsequent prosocial action. *Journal of Consumer Research*, 40(6), 1149–1166. doi:10.1086/674137
- Kuppa, S. (2018). Do millennials see climate change as more than just a meme?. Washington, DC: Johns Hopkins University, Energy Policy and Climate Program.
- Lane, D. S., & Cin, S. D. (2018). Sharing beyond Slacktivism: The effect of socially observable prosocial media sharing on subsequent offline helping behavior. *Information, Communication & Society*, 21(11), 1523–1540. <https://doi.org/10.1080/1369118X.2017.1340496>
- Lane, D. S., Lee, S. S., Liang, F., Kim, D. H., Shen, L., Weeks, B. E., & Kwak, N. (2019). Social media expression and the political self. *Journal of Communication*, 69(1), 49–72. <https://doi.org/10.1093/joc/jqy064>
- Lawson, D. F., Stevenson, K. T., Peterson, M. N., Carrier, S. J., L. Strand, R., & Seekamp, E. (2019). Children can foster climate change concern among their parents. *Nature Climate Change*. <https://doi.org/10.1038/s41558-019-0463-3>
- Lee, Y.-J., Haley, E., & Yang, K. (2019). The role of organizational perception, perceived consumer effectiveness and self-efficacy in recycling advocacy advertising effectiveness. *Environmental Communication*, 13(2), 239–254. <https://doi.org/10.1080/17524032.2017.1308407>
- Leiserowitz, A., Maibach, E., Rosenthal, S., Kotcher, J., Bergquist, P., Gustafson, A., Ballew, M., & Goldberg, M. (2019). Climate Activism: Beliefs, Attitudes, and Behaviors, November 2019. Yale University and George Mason University. New Haven, CT: Yale Program on Climate Change Communication.
- Lubell, M. (2002). Environmental activism as collective action. *Environment and Behavior*, 34(4), 431–454. <https://doi.org/10.1177/00116502034004002>
- Mancha, R. M., & Yoder, C. Y. (2015). Cultural antecedents of green behavioral intent: An environmental theory of planned behavior. *Journal of Environmental Psychology*, 43, 145–154. <https://doi.org/10.1016/j.jenvp.2015.06.005>
- Marcia, J. E. (1993). The status of the statuses: Research review. In J. E. Marcia, A. S. Waterman, D. R. Matteson, S. L. Archer, & J. Orlofsky (Eds.), *Ego identity: A handbook for psychosocial research* (pp. 22–41). New York: Springer-Verlag

- Matsuba, M. K., Pratt, M. W., Norris, J. E., Mohle, E., Alisat, S., & McAdams, D. P. (2012). Environmentalism as a context for expressing identity and generativity: Patterns among activists and uninvolved youth and midlife adults. *Journal of Personality, 80*(4), 1091–1115. <https://doi.org/10.1111/j.1467-6494.2012.00765.x>
- McFarlane, B. C., & Hunt, L. M. (2006). Environmental activism in the forest sector: social psychological, social-cultural and contextual effects. *Environment and Behavior, 38*, 266–285.
- Milton, A. C., & Mullan, B. A. (2012). An application of the theory of planned behavior—A randomized controlled food safety pilot intervention for young adults. *Health Psychology, 31*(2), 250–259. <https://doi.org/10.1037/a0025852>
- Mohai, P. (1992). Men, women, and the environment: An examination of the gender gap in environmental concern and activism. *Society & Natural Resources, 5*(1), 1–19. <https://doi.org/10.1080/08941929209380772>
- Moser, A. K. (2015). Thinking green, buying green? Drivers of pro-environmental purchasing behavior. *Journal of Consumer Marketing, 32*(10), 1179–1190. <https://doi.org/10.1108/JCM-10-2014-1179>
- Nabi, R. L., Gustafson, A., & Jensen, R. (2018). Framing climate change: Exploring the role of emotion in generating advocacy behavior. *Science Communication, 40*(1), 1–27. <https://doi.org/10.1177/1075547017739111>
- Nairn, K. (2019). Learning from young people engaged in climate activism: The potential of collectivizing despair and hope. *YOUNG, 27*(5), 435–450. <https://doi.org/10.1177/1103308818817603>
- Ngai, E. W. T., Tao, S. S. C., & Moon, K. K. L. (2015). Social media research: Theories, constructs, and conceptual frameworks. *International Journal of Information Management, 35*(1), 33–44. <https://doi.org/10.1016/j.ijinfomgt.2014.09.004>
- Nelms, C., Allen, M. W., Craig, C. A., & Riggs, S. (2017). Who is the adolescent environmentalist? Environmental attitudes, identity, media usage and communication orientation. *Environmental Communication, 11*(4), 537–553. <https://doi.org/10.1080/17524032.2016.1275733>
- Olivos, P., & Aragonés, J.-I. (2011). Psychometric properties of the Environmental Identity Scale (EID). *Psychology, 2*(1), 65–74. <https://doi.org/10.1174/217119711794394653>
- Oreg, S., & Katz-Gerro, T. (2006). Predicting pro-environmental behavior cross-nationally: values, the theory of planned behavior, and value-belief-norm theory. *Environment and Behavior, 38*(4), 462–483. <https://doi.org/10.1177/0013916505286012>
- Pandolfelli, L., Meinen-Dick, R., Dohrn, S. (2007) Gender and collective action: A conceptual framework for analysis. CAPRI Working Paper, *International Food and Policy Research Institute*. <https://doi.org/10.2499/CAPRIWP64>

- Pew Research Center (June, 2014) “Beyond Red vs. Blue: The Political Typology. Section 1: The political typology, identity and attitudes”. Retrieved from: <https://www.people-press.org/2014/06/26/section-1-the-political-typology-identity-and-attitudes/>
- Pew Research Center (June, 2018). “Younger generations make up a majority of the electorate but may not be a majority of voters this November”. Retrieved from: <https://www.pewresearch.org/fact-tank/2018/06/14/younger-generations-make-up-a-majority-of-the-electorate-but-may-not-be-a-majority-of-voters-this-november/>
- Pew Research Center (April, 2019). “Share of U.S. adults using social media, including Facebook, is mostly unchanged since 2018”. Retrieved from: <https://www.pewresearch.org/fact-tank/2019/04/10/share-of-u-s-adults-using-social-media-including-facebook-is-mostly-unchanged-since-2018/>
- Reeves H. and S. Baden. 2000. Gender and development: frequently asked questions. BRIDGE Report No. 57. Brighton, UK: Institute of Development Studies.
- Rivis, A., Sheeran, P., & Armitage, C. J. (2009). Expanding the affective and normative components of the Theory of Planned Behavior: A meta-analysis of anticipated affect and moral norms. *Journal of Applied Social Psychology*, 39(12), 2985–3019. <https://doi.org/10.1111/j.1559-1816.2009.00558.x>
- Rosenblueth, A., Wiener, N., & Bigelow, J. (1943). Behavior, purpose and teleology. *Philosophy of Science*, 10(1), 18–24. Retrieved from JSTOR.
- Roser-Renouf, C., Maibach, E. W., Leiserowitz, A., & Zhao, X. (2014). The genesis of climate change activism: From key beliefs to political action. *Climatic Change*, 125(2), 163–178. <https://doi.org/10.1007/s10584-014-1173-5>
- Ross, D. G. (2013). Common Topics and Commonplaces of Environmental Rhetoric. *Written Communication*, 30(1), 91–131. <https://doi.org/10.1177/0741088312465376>
- Runyan, R. C., Foster, I. M., Park, J., & Ha, S. (2012). Understanding pro-environmental behavior. *International Journal of Retail & Distribution Management*. <https://doi.org/10.1108/09590551211222367>
- Schahn, J., & Holzer, E. (1990). Studies of individual environmental concern: The role of knowledge, gender, and background variables. *Environment and Behavior*, 22(6), 767–786. <https://doi.org/10.1177/0013916590226003>
- Scheufele, D. A., Jamieson, K. H., & Kahan, D. M. (2017). Conclusion—On the Horizon: The Changing Science Communication Environment. *The Oxford Handbook of the Science of Science Communication*. 461–467. <https://doi.org/10.1093/oxfordhb/9780190497620.013.49>



- Schmitt, M. T., Mackay, C. M. L., Droogendyk, L. M., & Payne, D. (2019). What predicts environmental activism? The roles of identification with nature and politicized environmental identity. *Journal of Environmental Psychology, 61*, 20–29. <https://doi.org/10.1016/j.jenvp.2018.11.003>
- Schusler, T. M., & Krasny, M. E. (2010). Environmental action as context for youth development. *The Journal of Environmental Education, 41*(4), 208–223. <https://doi.org/10.1080/00958960903479803>
- Skitka, L. J., Morgan, G. S., Wisneski, D. C. (2014). Political orientation and moral conviction: A conservative advantage or an equal opportunity motivator of political engagement? In Forgas, J., Crano, W., Fiedler, K. (Eds.), *Social psychology and politics* (pp. 57-74). New York, NY: Psychology Press.
- Snow, D. (2001). *Collective Identity and Expressive Forms*. Retrieved from <https://escholarship.org/uc/item/2zn1t7bj>
- Stapleton, S. R. (2015). Environmental Identity Development Through Social Interactions, Action, and Recognition. *The Journal of Environmental Education, 46*(2), 94–113. <https://doi.org/10.1080/00958964.2014.1000813>
- Stern, P. C., Dietz, T., & Kalof, L. (1993). Value orientations, gender, and environmental concern. *Environment and Behavior, 25*(5), 322–348. <https://doi.org/10.1177/0013916593255002>
- Stern, P. C. (2000). Theory of environmentally significant behavior. *Journal of Social Issues, 56*, 407–424.
- Stevenson, K. T., King, T. L., Selm, K. R., Peterson, M. N., & Monroe, M. C. (2018). Framing climate change communication to prompt individual and collective action among adolescents from agricultural communities. *Environmental Education Research, 24*(3), 365–377. <https://doi.org/10.1080/13504622.2017.1318114>
- Stevenson, K. T., Peterson, M. N., & Bondell, H. D. (2019). The influence of personal beliefs, friends, and family in building climate change concern among adolescents. *Environmental Education Research, 25*(6), 832–845. <https://doi.org/10.1080/13504622.2016.1177712>
- Soler-i-Martí, R. (2015). Youth political involvement update: Measuring the role of cause-oriented political interest in young people’s activism. *Journal of Youth Studies, 18*(3), 396–416. <https://doi.org/10.1080/13676261.2014.963538>
- SONA Systems (2019) Homepage. Retrieved: <https://www.sona-systems.com/default.aspx>
- Sullivan, J., & Xie, L. (2009). Environmental activism, social networks and the internet. *The China Quarterly, (198)*, 422–432. Retrieved from JSTOR.

- Swim, J. K., Geiger, N., & Lengieza, M. L. (2019). Climate change marches as motivators for bystander collective action. *Frontiers in Communication*, 4. <https://doi.org/10.3389/fcomm.2019.00004>
- Taylor, M., Watts, J., Bartlett, J. (2019, September 27). Climate crisis: 6 million people join in latest wave of global protests. The Guardian. Retrieved from <https://www.theguardian.com/environment/2019/sep/27/climate-crisis-6-million-people-join-latest-wave-of-worldwide-protests>
- Tindall, D. B. (2002). Social networks, identification and participation in an environmental movement: Low-medium cost activism within the British Columbia Wilderness Preservation movement. *Canadian Review of Sociology/Revue Canadienne de Sociologie*, 39(4), 413–452. <https://doi.org/10.1111/j.1755-618X.2002.tb00628.x>
- Tindall, D. B., Davies, S., & Mauboules, C. (2003). Activism and Conservation Behavior in an Environmental Movement: The Contradictory Effects of Gender. *Society & Natural Resources*, 16(10), 909–932. <https://doi.org/10.1080/716100620>
- Twenge, J. M. (2017). *iGen: Why today’s super-connected kids are growing up less rebellious, more tolerant, less happy—And completely unprepared for adulthood*. New York, NY: Atria Books.
- U.S. Census Bureau (2020, January 29) QuickFacts, City of Fort Collins, Colorado. Retrieved from: <https://www.census.gov/quickfacts/fortcollinscitycolorado>
- van der Linden, S. (2015). The social-psychological determinants of climate change risk perceptions: Towards a comprehensive model. *Journal of Environmental Psychology*, 41, 112–124. <https://doi.org/10.1016/j.jenvp.2014.11.012>
- Vargas-Callejas, G., M. Barba-Núñez, A. Carvalho, M. Vicente-Mariño, M. Arto-Blanco & P. A. Meira-Carrea (2018) ‘How do university students perceive and evaluate responses to climate change?’, *The International Journal on Climate Change: Impacts and Responses*, 10 (2), 1-19. DOI: <https://doi.org/10.18848/1835-7156/CGP/v10i02/1-19>
- Velasquez, A., & LaRose, R. (2015). Social media for social change: Social media political efficacy and activism in student activist groups. *Journal of Broadcasting & Electronic Media*, 59(3), 456–474. <https://doi.org/10.1080/08838151.2015.1054998>
- Velasquez Perilla, A. A. (2013). Social media and individual and collective activism: The role of interdependence and online political efficacy (ProQuest, Ann Arbor MI). Retrieved from <http://search.proquest.com/docview/1520318941/abstract/B1D3AA5455A94141PQ/1>
- Vraga, E. K. (2017). Political Participation and Voting Relevant to Climate Change. *Oxford Research Encyclopedia of Climate Science*. <https://doi.org/10.1093/acrefore/9780190228620.013.339>

Xenos, M., Vromen, A., & Loader, B. D. (2014). The great equalizer? Patterns of social media use and youth political engagement in three advanced democracies. *Information, Communication & Society*, 17(2), 151–167. doi:10.1080/1369118X.2013.871318

Xiao, C., & McCright, A. M. (2012). Explaining Gender Differences in Concern about Environmental Problems in the United States. *Society & Natural Resources*, 25(11), 1067–1084. <https://doi.org/10.1080/08941920.2011.651191>

“Yale Program on Climate Change Communication Publications” (2004 – 2019). Retrieved from: [https://climatecommunication.yale.edu/publications/?\\_sft\\_ra-format=article](https://climatecommunication.yale.edu/publications/?_sft_ra-format=article)

Ye, S. (2020, February 27). *Meet the grassroots groups behind Fort Collins’ climate action*. The Rocky Mountain Collegian. <https://collegian.com/2020/02/category-news-meet-the-grassroots-groups-behind-fort-collins-climate-action/>

## APPENDICES

- A. Social Media Use Questions from Survey
- B. Mass SONA Email Survey Invitation Notification
- C. SONA Reminder Mass Email
- D. Informed Consent
- E. Survey Flow and Questions

## Appendix A

### Social Media Use Question

Two questions on social media use, including which channels one has a profile with and which channels are used daily, were asked in this survey but not ultimately added to the model. Here are the results of those questions.

88.6% of respondents have an Instagram profile and 75.9% use it daily. 88.6% of respondents have a Snapchat account and 78.6% use it daily. 76.4% have a Facebook profile but only 41.8% use it daily. 59.2% have a YouTube account and only 38.6% use it daily. 52.7% have a Twitter account and only 30% use it daily. 74.1% have a LinkedIn account and only 6.4% use it daily. 48.2% have a Pinterest account and only 7.3% use it daily. The other social media channels mentioned for both having a profile and using it daily were Reddit, TikTok, Tumblr, WeChat and WhatsApp.

## Appendix B

### Mass SONA Survey Invitation Email

Hello,

If you are receiving this message, it is because your instructor, in one or more of your classes housed in the Journalism & Media Communication Department, has registered you for the opportunity to participate in research studies to earn extra credit through SONA.

Currently, there is 1 new research studies in the system. By participating in one or more of these studies, you are eligible to receive extra credit in your JMC class.

**Title:** Attitude on a random topic

**Online Survey:** [0.5] SONA credit; Open until February 29, 2020

**Description:** This survey will ask questions about your attitude towards a random topic. It will take less than 10 minutes and is both anonymous and voluntary.

Please remember that study participation is on a first come, first serve basis. If you are having any technical difficulties, please contact the SONA coordinator, Zoey Rosen (zoey.rosen@colostate.edu).

## Appendix C

### Mass SONA Reminder Email

Hello,

If you are receiving this message, it is because your instructor, in one or more of your classes housed in the Journalism & Media Communication Department, has registered you for the opportunity to participate in research studies to earn extra credit through SONA. Currently, there is 1 remaining research studies in the system that will be ending soon. By participating in one or more of these (or future) studies, you are eligible to receive extra credit in your JMC class.

**Title:** Attitude on a random topic

**Online Survey:** [0.5] SONA credit; Open until February 29, 2020

**Description:** This survey will ask questions about your attitude towards a random topic. It will take less than 10 minutes and is both anonymous and voluntary.

Please remember that study participation is on a first come, first serve basis. If you are having any technical difficulties, please contact the SONA coordinator, Zoey Rosen (zoey.rosen@colostate.edu).

## Appendix D

### Informed Consent Form

#### Welcome to the research study!

We are interested in understanding your thoughts about a certain topic. You will be asked to answer questions on this topic. Your responses will be kept completely confidential.

- **PROCEDURES FOR THE STUDY:** If you agree to be in the study, you will be asked about this topic using a computer-based survey format. The study should take around 10 minutes to complete.
- **COURSE EXTRA CREDIT:** As a Colorado State University student, you will receive extra credit for participating in this study via SONA. Each participant will receive 0.5 credits upon completion. Should you choose to exit the survey before completion, you will not receive credit in SONA. Credits will be granted in SONA immediately upon completion of the survey in Qualtrics.
- **VOLUNTARY NATURE OF THIS STUDY:** Your participation in this research is voluntary. You have the right to withdraw at any point during the study, for any reason, and without any prejudice.
- **CONTACTS FOR QUESTIONS OR PROBLEMS:** Contact the CSU IRB at [RICRO\\_IRB@mail.colostate.edu](mailto:RICRO_IRB@mail.colostate.edu) or 970-491-1553.

**If you do NOT volunteer to participate in the survey and/or are under 17 years or younger in age, please exit this window to close the survey.**

- I have read the procedure described above and I voluntarily agree to participate in the survey. I also verify that I am 18 years or older in age.



## Appendix E

### Survey Flow and Questions

Block: Informed Consent (1 Question) Block: Environmental Attitude - Belief (1 Question)
Branch: New Branch If EnvironmentalAttitude-ClimateBelief_1 No Is Selected
Standard: EA_Belief_NO (1 Question)
Branch: New Branch If EnvironmentalAttitude-ClimateBelief_1 Yes Is Selected
Standard: EA_Belief_YES (1 Question)
Group: Theory of Planned Behavior Elements
Block: Environmental Attitude - Risk Perception (4 Questions) Block: Environmental Attitude - Belief in Human Causation (1 Question) Block: Environmental Attitudes - Collective Efficacy (1 Question) Block: Social Norms - Prescriptive (1 Question) Block: Social Norms - Descriptive (3 Questions) Block: Perceived Behavioral Control (2 Questions)
Group: EC + EI
Standard: Environmental Identity Scale (5 Questions) Block: Environmental Communication (3 Questions) Block: Environmental Communication - Social Media (3 Questions)
Standard: Climate Change Action (4 Questions) Standard: Climate Change Action Intention (4 Questions) Standard: Environmental Action Proxy Behaviors: Petition, join campaign, web page (3 Questions) Standard: BehaviorProxy_Debrief (1 Question) Standard: Practical Constraints (4 Questions) Standard: Political Identity (1 Question)
Branch: New Branch If POL_Open1 Slightly Conservative Is Selected Or POL_Open1 Mostly Conservative Is Selected Or POL_Open1 Consistently Conservative Is Selected
Standard: POL-Identity_Conservative (1 Question)
Branch: New Branch If POL_Open1 Consistently Liberal Is Selected Or POL_Open1 Mostly Liberal Is Selected Or POL_Open1 Slightly Liberal Is Selected
Standard: POL-Identity_Liberal (1 Question)
Branch: New Branch If POL_Open1 Mixed Is Selected
Block: POL-Identity_Mixed (1 Question)
Standard: Political Party (1 Question) Standard: Demographics (3 Questions)

## Start of Block: Environmental Attitude - Belief

### EA-Belief\_1

Recently, you may have noticed that climate change has been getting some attention in the news. Climate change refers to **the idea** that the world's average temperature has been increasing over the past 160 years, may be increasing more in the future, and that the world's climate may change as a result.

What do you think: Is **climate change is happening, or not?** If you're not sure, just let us know.

1. Yes
2. No
3. Not sure

## End of Block: Environmental Attitude - Belief

---

### Start of Block: EA\_Belief\_NO

#### EA-Belief\_No

How **sure** are you that climate change **is not happening?**

1. Not at all sure
2. Slightly sure
3. Moderately sure
4. Very sure
5. Extremely sure

## End of Block: EA\_Belief\_NO

---

### Start of Block: EA\_Belief\_YES

#### EA-Belief\_Yes

How **sure** are you that climate change **is happening?**

1. Not at all sure
2. Slightly sure
3. Moderately sure
4. Very sure
5. Extremely sure

## End of Block: EA\_Belief\_YES

---

## Start of Block: Environmental Attitude - Risk Perception

### EA\_Risk\_1

How **concerned** are you about climate change?

1. Not concerned
2. Moderately not concerned
3. Neither concerned nor not concerned
4. Moderately concerned
5. Very concerned

### EA\_Risk\_2-3

In your judgment, how **likely** do you think it is that...

You will experience serious threats to your health or overall well-being as a result of climate change?

1. Extremely unlikely
2. Moderately unlikely
3. Neither likely nor unlikely
4. Moderately likely
5. Extremely likely

Climate change will have very harmful, long-term impacts on our society?

1. Extremely unlikely
2. Moderately unlikely
3. Neither likely nor unlikely
4. Moderately likely
5. Extremely likely

### EA\_Risk\_4-7

How **serious** of a threat do you think climate change is to....

The natural environment?

You personally?

The united states?

The world?

1. Not serious at all
2. Moderately not serious
3. Neither serious nor not serious
4. Moderately serious
5. Very serious

### **EA\_Risk\_8**

How often do you **worry** about the potentially negative consequences of climate change?

1. Never
2. Annually
3. Monthly
4. Weekly
5. Daily

End of Block: Environmental Attitude - Risk Perception

Start of Block: Environmental Attitude - Belief in Human Causation

### **EA\_Humans**

Which of the following statements do you agree with **more**?

1. Climate change is caused mostly by **human activities**.
2. Climate change is caused mostly by **natural changes in the environment**.
3. Not sure

End of Block: Environmental Attitude - Belief in Human Causation

Start of Block: Environmental Attitudes - Collective Efficacy

### **EA\_ColEff**

Do you believe climate change is **solvable**?

1. Climate change is not happening.
  2. Climate change is not solvable.
  3. Climate change is likely not solvable.
  4. Climate change is likely solvable.
  5. Climate change is solvable and will be done successfully.
  6. Not sure
-

## Start of Block: Social Norms – Prescriptive

### SN-P\_1-4

*Rate your level of agreement with the following statements:*

People that are important to me, would support me if I decided to help reduce climate change.

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

People whose opinion I value think that I should personally act to reduce climate change.

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

It is generally expected of me that I should do my best to help reduce the risk of climate change.

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

I feel that helping to tackle climate change is something that is NOT expected of me.

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

## End of Block: Social Norms – Prescriptive

Start of Block: Social Norms - Descriptive

**SN-D\_2**

**SN-D\_1**

How **likely** do you think it is that **people close to you** are taking personal action to address climate change?

1. Extremely unlikely
2. Moderately unlikely
3. Neither likely nor unlikely
4. Moderately likely
5. Extremely likely

*Rate your **level of agreement** with the following statements:*

**Most people** who are important to me are doing something to help reduce the risk of climate change.

6. Strongly disagree
7. Disagree
8. Neither agree nor disagree
9. Agree
10. Strongly agree

**SN-D\_3**

**Most people** I care about are doing their part to help slow climate change.

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

End of Block: Social Norms - Descriptive

---

## Start of Block: Perceived Behavioral Control

### PBC\_SM\_1-3

Please rate how **confident** you are that you can do the following things:

Keep **informed** about climate change issues you care about using online social media sites.

**Influence others** online regarding a climate change issue.

Use relevant information online to **express your views** on climate change issues.

1. Not confident at all
2. Not very confident
3. Neither confident nor not confidence
4. Moderately confident
5. Very confident

### PBC\_1-3

Rate your level of agreement with the following statements:

**It is up to me** whether I participate in actions that help mitigate climate change.

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

I believe I have **complete control** over participating in actions that help mitigate climate change.

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

I have the **financial ability** to participate in actions that help mitigate climate change.

6. Strongly disagree
7. Disagree
8. Neither agree nor disagree
9. Agree
10. Strongly agree

End of Block: Perceived Behavioral Control

---

## Start of Block: Environmental Identity Scale

*The next set of questions is related to your personal feelings about the environment.*

### **EI\_1**

*Rate the following statements based on **how true they are of you**:*

In general, **being part of the natural world** is an important part of my self-image.

I think of myself as **part of nature**, not separate from it.

Being a **part of the ecosystem** is an important part of who I am.

1. Not true of me at all
2. Somewhat untrue of me
3. Neither true nor untrue of me
4. Somewhat true of me
5. Very true of me

### **EI\_2**

*Rate the following statements based on how true they are of you:*

**I spend a lot of time in natural settings** (woods, mountains, desert, lakes, ocean).

I really **enjoy camping/hiking** outdoors.

I take pride in the fact that **I could survive outdoors on my own** for a few days.

1. Not true of me at all
2. Somewhat untrue of me
3. Neither true nor untrue of me
4. Somewhat true of me
5. Very true of me

### **EI\_3**

*Rate the following statements based on how true they are of you:*

Sometimes I feel like parts of nature - certain trees, or storms, or mountains - **have a personality of their own**.

I feel that **I have roots to a particular geographic location** that had a significant impact on my development.

I would rather live in a **small room or house with a nice view** than a bigger room or house with a view of other buildings.

1. Not true of me at all
2. Somewhat untrue of me
3. Neither true nor untrue of me
4. Somewhat true of me
5. Very true of me



#### EI\_4

*Rate the following statements based on how true they are of you:*

**If I had enough time or money**, I would work for environmental causes.

**Engaging in environmental behaviors** is important to me.

I have **a lot in common with environmentalists** as a group.

1. Not true of me at all
2. Somewhat untrue of me
3. Neither true nor untrue of me
4. Somewhat true of me
5. Very true of me

#### End of Block: Environmental Identity Scale

---

#### Start of Block: Environmental Communication

#### EC\_PD

*Rate your level of agreement with the following statements about your communication practices:*

I **enjoy** listening to discussions about climate change.

I make it a point to **discuss** my climate change concerns.

I **pay attention** to televised news reports about climate change.

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

#### EC\_DD

*Rate your level of agreement with the following statements:*

I **ignore** people who talk about climate change.

I **skip over** news stories about climate change

It **bores me** to hear others discuss climate change.

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

EC\_CD

Rate your level of agreement with the following statements:

Discussing climate change is **important**.

Conversations about climate change can **make a difference**.

I usually **learn something** when I listen to others talking about climate change.

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

End of Block: Environmental Communication

---

Start of Block: Environmental Communication – Social Media

EC\_SM\_Platforms

Which **social media** platforms **do you have a profile** with? (*Check all that apply*).

- Facebook
- Instagram
- Snapchat
- YouTube
- Twitter
- LinkedIn
- Pinterest
- Other (please specify):

EC\_SM\_PLATFORMS\_USE

Which **social media** platforms do you use **daily**? (*Check all that apply*).

- Facebook
- Instagram
- Snapchat
- YouTube
- Twitter
- LinkedIn
- Pinterest
- Other (please specify):

## EC\_SM\_1-4

How often, on average, do you perform the following activities on social media?

- **Post** content on social media that supports climate change.
- **Share** climate change related content with my friends on social media.
- **Seek out** useful information on social media that supports climate change.
- **Comment** on someone else's social media post about climate change.

1. Never
2. Occasionally
3. Sometimes
4. Often
5. Frequently

End of Block: Environmental Communication – Social Media

---

Start of Block: Environmental Action

## EAS\_Intro

It should only take you another **five minutes** to complete the survey.

The next set of questions asks you about your **past** environmental actions towards climate change. After these, we'll have some questions about your future plans.

## EAS\_PA\_1

**In the last year**, how often, if at all, **have you engaged** in the following actions?

- **Talked** with others about climate change issues (e.g., spouse, partner, parent(s), children, friends, etc.). – *\*Removed from final scale measure*
- **Used online tools** (e.g., YouTube, Instagram, Snapchat, Twitter, Facebook, Wikipedia, Email, Blogs, etc.) to raise awareness about climate change. *\*Removed from final scale measure*
- **Participated** in a community event which focused on climate change awareness.

1. Never
2. Occasionally
3. Sometimes
4. Often
5. Frequently

---

## EAS\_PA\_2

In the last year, how often, if at all, have you engaged in the following actions?

- **Participated** in nature conservation efforts (e.g., planting trees, restoration of waterways).
- Become involved with an **environmental group or political party** (e.g., volunteer, part-time job, etc.).
- Spent time working with a group/organization that deals with the connection of the **environment to other societal issues such as justice or poverty**.

1. Never
2. Occasionally
3. Sometimes
4. Often
5. Frequently

## EAS\_LA

In the last year, how often, if at all, have you engaged in the following actions?

- **Used traditional methods** (e.g., letters to the editor, articles) to raise awareness about climate change.
- Personally **wrote to or called a politician/government official** about climate change.
- **Took part in a protest/rally** about climate change.
- Helped to **organize a protest/rally** about climate change.

1. Never
2. Occasionally
3. Sometimes
4. Often
5. Frequently

## Start of Block: Environmental Action Intention

### EA\_IN\_Intro

This next set of questions asks you about your **future plans** for action regarding climate change.

### EA\_IN\_PA\_1

**In the next year**, how often, if at all, do you plan to engage in the following actions?

- **Talk** with others about climate change (e.g., spouse, partner, parent(s), children, friends, etc). *\*Removed from final scale measure*
- **Use online tools** (e.g., YouTube, Instagram, Snapchat, Twitter, Facebook, Wikipedia, Email, Blogs, etc.) to raise awareness about climate change. *\*Removed from final scale measure*
- **Participate** in a community event which focused on climate change awareness.

1. Never
2. Occasionally
3. Sometimes
4. Often
5. Frequently

### EA\_IN\_PA\_2

**In the next year**, how often, if at all, do you plan to engage in the following actions?

**Participate** in nature conservation efforts (e.g., planting trees, restoration of waterways). Become involved with an **environmental group or political party** (e.g., volunteer, part-time job, etc.).

Spend time working with a group/organization that deals with the connection of the **environment to other societal issues such as justice or poverty.**

1. Never
2. Occasionally
3. Sometimes
4. Often
5. Frequently

## EA\_IN\_LA

**In the next year**, how often, if at all, do you plan to engage in the following actions?

**Use traditional methods** (e.g., letters to the editor, articles) to raise awareness about climate change.

Personally **write to or call a politician/government official** about climate change.

**Take part in a protest/rally** about climate change.

Help **organize a climate change protest/rally**.

1. Never
2. Occasionally
3. Sometimes
4. Often
5. Frequently

End of Block: Environmental Action Intention

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Start of Block: Environmental Action Proxy Behaviors: Petition, join campaign, web page

### EAS\_Proxy\_Petition

Would you like to sign a petition in support of new regulations for the energy industry that would promote the use of wind, solar and other forms of renewable energy to help lower carbon emissions?

Clicking "yes" will open a window at the end of the survey with the petition for you to sign.

1. Yes
  2. No
-

## **EAS\_Proxy\_Campaign**

Would you like to join a campaign to change the energy industry's practices? This campaign seeks to promote the use of wind, solar and other forms of renewable energy to help lower carbon emissions.

Clicking "yes" will opt you into weekly emails about the campaign and how you can get involved.

1. Yes
  2. No
- 

## **EAS\_Proxy\_WebPage**

Would you be interested in spending 5 minutes reading a web page about new forms of renewable energy to help lower carbon emissions?

Clicking "yes" will open a window at the end of the survey with more information.

1. Yes
2. No

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**End of Block: Environmental Action Proxy Behaviors: Petition, join campaign, web page**

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**Start of Block: BehaviorProxy\_Debrief**

### **Debrief**

The last few questions you answered were only to understand your potential behaviors. They were for research purposes only. You will not be enrolled in any campaigns, receive any emails, or have posts made to social media.

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**End of Block: BehaviorProxy\_Debrief**

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**Start of Block: Practical Constraints**

### PC\_Time\_1-3

How many **hours a week**, on average, do you spend on the following activities?

**School-related activities** (including classes, studying, homework, etc.)?

**Employment-related activities** that you are compensated for (this does not include classes, homework, studying or other school-related activities)?

**Volunteer/extracurricular activities** that are you not compensated for (this can include school-related activities but excludes classes/studying)?

1. 0
  2. 1-10
  3. 11-20
  4. 21-30
  5. 31-40
  6. 40+
- 

### PC\_Time\_4

*Please indicate how strongly you agree or disagree with each of the following statements.*

I have **the time** needed to be involved in action regarding climate change.

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

### PC\_Money\_1

I have **the money** needed to be involved in action regarding climate change.

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



PC\_Access\_1-4

*Please rate your level of agreement with the following statements:*

There are climate change focused organizations **in my city** that I can join.  
There are climate change focused organizations **on my campus** that I can join.  
There are climate change focused events **in my city** that I can join.  
There are climate change focused events **on my campus** that I can join.

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

**End of Block: Practical Constraints**

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**Start of Block: Political Beliefs**

**POL\_1**

In considering your **political beliefs**, how do you identify?

1. Consistently Liberal
2. Mostly Liberal
3. Slightly Liberal
4. Mixed
5. Slightly Conservative
6. Mostly Conservative
7. Consistently Conservative
8. Don't know
9. Prefer not to answer

**End of Block: Political Beliefs**

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**Start of Block: POL\_Conservative**

## **POL\_Conservative**

How strongly do you identify as **conservative**?

1. Extremely conservative
2. Strongly conservative
3. Mostly conservative
4. Somewhat conservative
5. Moderate

End of Block: POL\_Conservative

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Start of Block: POL\_Liberal

## **POL\_Liberal**

How strongly do you identify as **liberal**?

1. Extremely liberal
2. Strongly liberal
3. Mostly liberal
4. Somewhat liberal
5. Moderate

End of Block: POL\_Liberal

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Start of Block: POL-Identity\_Mixed

If you identify as **mixed**, do you lean more conservative or liberal?

1. Conservative
2. Liberal
3. Prefer not to say

End of Block: POL-Identity\_Mixed

Start of Block: Politicized Party

**POL\_2**

What **political party** do you affiliate with?

1. Democratic
  2. Republican
  3. Independent
  4. Green
  5. Don't know
  6. Prefer not to answer
- 

End of Block: Political Party

Start of Block: Demographics

**Age**

What is your age? (*Please enter years old*):

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**Gender**

What is your gender identity?

1. Female
2. Male
3. Gender non-conforming
4. Prefer not to say
5. Prefer to self-describe: \_\_\_\_\_

**Ethnicity**

Which of the following best represents your ethnic heritage? Choose all that apply.

- Black, Afro-Caribbean, or African American
- East Asian or Asian American
- Latino or Hispanic American
- Middle Eastern or Arab American
- Native American or Alaskan Native
- Non-Hispanic White or Euro-American
- South Asian or Indian American
- Prefer to self-describe: \_\_\_\_\_