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Santa Barbara

Projection and Stereotyping in Pro-Environmental Persuasive Communication

A dissertation submitted in partial satisfaction of the

requirements for the degree Doctor of Philosophy

in Psychological & Brain Sciences

by

Michelle Shteyn Handy

Committee in charge:

Professor David Sherman, Chair

Professor Heejung Kim

Professor Kyle Ratner

Professor Sarah Anderson

December 2021

The dissertation of Michelle Shteyn Handy is approved.

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October 2021

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PUBLICATIONS

Sherman, D. K., Shteyn, M. F., Han, H., & Van Boven, L. (2021). The exchange between citizens and elected officials: A social psychological framework for citizen climate activists. *Behavioural Public Policy, 5*(4), 576-705. doi:10.1017/bpp.2020.41

Sherman, D. K., Updegraff, J. A., Handy, M. S., Eom, K., & Kim, H. S. (2021). Beliefs and social norms as precursors of environmental support: The joint influence of collectivism and socioeconomic status. *Personality & Social Psychology Bulletin.* https://doi.org/10.1177/01461672211007252

MANUSCRIPTS UNDER EDITORAL REVIEW OR IN PREPARATION

Anderson, S.E., Handy, M.S., Gehlbach, H., & Virlar-Knight, D. (in preparation). Psychological distance and the effect of connecting extreme weather events to climate change.

Binning, K.R., Conrique, B.I., Areguin, M., Brick, C., Ehret, P., Handy, M.S., Updegraff, J.A., & Sherman, D. K. (in preparation). Health messaging in a diverse society: Effects of gain and loss frames on health behaviors among latina/os in the U.S.

Handy, M.S., Ehret, P.J., Block, D.M., Kim, H., Knowles, E.D., Mildenberger, M., & Sherman, D.K. (in preparation). Regional extreme weather concern and its relation to support for environmental action. *(Handy and Ehret are joint first authors).

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Shteyn, M.F. (2017, January). *Discussing the Null Effects of Construal Level on Task Persistence*. Poster presentation at the SPSP Self-Regulation Preconference, San Antonio, TX.

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Shteyn, M.F. (2020, February). *Regional Extreme Weather Concern and its Relation to Support for Environmental Action*. Social Psychology Area Meeting presentation, Psychological & Brain Sciences Department, UC Santa Barbara. *(also cited above under Published Conference Abstracts and Presentations)

Shteyn, M.F. (2020, January). *Construal Level and Work Motivation*. Lab meeting presentation, Management and Organization Department, USC Marshall School of Business.

Shteyn, M.F. (2019, May). *Immediacy and Psychological Distance: Effects on Environmental Action*. Graduate student mini-convention presentation, Psychological & Brain Sciences Department, UC Santa Barbara.

Shteyn, M.F. (2016, April). *Examining the Effects of Combined Construal on Task Persistence*. Poster presentation at the Annual Department of Psychology Poster Presentations, University of Maryland, College Park, MD. *(also cited above under Published Conference Abstracts and Presentations)

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ABSTRACT

Projection and Stereotyping in Pro-Environmental Persuasive Communication

by

Michelle Shteyn Handy

This research seeks to understand how communicators' strategy towards determining if an argument would be perceived as persuasive by someone else may be affected by their social judgements of that person. In so doing, this research contributes to our larger understanding of how social categorization processes affect communication by applying a model of mental state inference to the study of persuasion. Using the framework of the similarity-contingency model, I examine how communicators may change their approach to an argument depending on whether they perceive their message target as similar or dissimilar. It was theorized that when people have more in common with a target, they *project*, or rely on their own attitudes when determining which arguments would be most likely to persuade their target to support an initiative; when people have less in common with a target, they *stereotype*, or rely more on what they perceive to be the attitudes of a typical member of their target's group when determining which arguments would be most likely to persuade their target to support an initiative. I tested this question using two different samples of pro-environmental communicators—activists at a federated national climate advocacy organization and college students at a university in the western United States—to explore whether the model would

generalize to explain the communicative decisions of trained communicators and novices in different contexts. In Study 1 (N = 161), I examined if experimentally manipulated similarity of the persuasive target (similar vs. dissimilar) would affect whether environmental activists project or stereotype while ranking the efficacy of various arguments to persuade a local businessman to endorse the Energy Innovation & Carbon Dividend Act. Manipulated similarity was not found to affect whether activists project or stereotype when making choices about which pro-environmental arguments to use on a target. In Study 2 (N = 162), I examined if similarity of the persuasive target (both manipulated and measured via self-report) would affect whether pro-environmental college students in southern California project or stereotype as strategies for choosing which arguments to use to persuade a local businessman to support Carbon Neutrality in Santa Barbara. Although effects were marginal, experimentally manipulated similarity was found to affect students' approach towards persuasive strategy: students in the similarity condition projected more than those in the dissimilarity condition. Analyses with perceived similarity provided converging support: students who perceived the target of persuasion as similar projected more than students who perceived the target of persuasion as dissimilar. Across both studies, communicators displayed a strong general pattern of stereotyping: collapsing across similarity levels, environmentalists engaged in greater stereotyping than projection when evaluating arguments for a businessman. Demonstrated through the present, the similarity-contingency model offers a new perspective and set of tools to the study of how social judgement affects communication. Further, by studying the mindset and the approach of the communicator instead of the message recipient, this research provides a more holistic view of the variables at play during a persuasive exchange.

Keywords: communication, persuasion, social categorization, mental state inference, projection, sustainability, climate change

Projection and Stereotyping in Pro-Environmental Persuasive Communication

Persuading others to adopt an opposing viewpoint is a challenge. The persuasion scenario is often complex, as many variables—including argument quality, source credibility, perceived personal relevance of the topic, and context—may interact to determine how likely an individual is to form or change an attitude (Petty & Wegener, 1998). While a large body of research exists on the processes of attitude change and message reception, less is known about the mindset of the *communicator* during persuasion and the psychological processes they engage in while evaluating different types of arguments. What social judgements do communicators make about their target audiences, and how do these judgements, in turn, affect the arguments they employ? While research has shown that similarity of a target affects whether perceivers engage in projection of their own thoughts when trying to infer their target's attitudes and behavioral intentions (Ames, 2004a; 2004b), work has yet to examine how perceived similarity may translate to *persuasive outcomes* such as decisions about which arguments to use on a target during an interaction.

Perceived similarity in the persuasive context is of theoretical and practical importance to study. Theoretically, this work makes two significant contributions. First, examining how a target's idiosyncratic traits may influence one's persuasive strategy extends our knowledge of how social categorization affects communication. Second, by revealing the ways that incidental context cues may bias one's argument, this work furthers our understanding of persuasion in a real-world setting as compared to a controlled laboratory environment. Of practical importance, shedding light on the biases that people may be susceptible to when forming an argument may inform training programs for wide range of professional communicators. With this knowledge, communicators can be more intentional

about their strategy, remaining vigilant for unessential cues which may detract their focus from crafting the strongest possible argument.

In the present work, I examine how social categorization affects communicators' decision-making about persuasive messages using the focal examples of a) environmental activists and b) university students who are trying to convince a local business owner as to the importance of sponsoring pro-environmental policies. Studying communicative decisions in the context of climate change—one of the most pressing and divisive issues facing society—is a useful way to learn more about people's persuasive strategies. Its practical implications will be articulated in the sections that follow, but first, I will elaborate on how this work fits into the larger picture of how social categorization affects people's communication decisions.

How Social Categorization Affects Basic Communication

Determining whether someone is similar to you or not is a method of socially categorizing them, a process that people rely upon to organize and structure their knowledge about the world (e.g., Bodenhausen et al., 2012). Social categorization is vital to human cognition, allowing individuals to make sense of the vast array of people, objects, and events that they encounter in daily life (e.g., Medin & Smith, 1981). From the Minimal Group Paradigm designed by Henri Tajfel and collaborators (1971), people utilize whatever information they can to categorize people into social groups—even if it is as superficial as one's readiness to perceive certain colors (Tajfel, 1970). Downstream, the process of social categorization can shape a wide range of outcomes in perception, judgement, and behavior (Bodenhausen et al., 2012)—including the way that people choose to communicate with others.

The idea that social categorization affects communication choices is well-established. The Communication Accommodation Theory (CAT) (Giles et al., 1991; Giles et al., 1987; Giles & Ogay, 2007; Giles & Smith, 1979; Giles et al., 1973) maintains that speakers are constantly adjusting their behaviors to attune their communication to their partner, and these behavioral changes are based on different social motivations. People have been shown to modify communication based on both the personal, idiosyncratic characteristics (e.g., whether one feels comfortable speaking about a certain topic) or on the social identity (e.g., race, religion, gender, occupational status, etc.) of their conversation partners. Further, the way people alter their communications depends on their various relational and identity goals (Giles, 1973). For example, speakers may converge, or modify their communicative behaviors to become more like the listener's, to show respect, seek approval, or show affiliation with the other person's group (Soliz & Giles, 2014). Converging to a common linguistic style also improves the effectiveness of the communication, leading to lower interpersonal anxiety and greater mutual understanding (Gudykunst, 1995). Alternatively, people may diverge, or accentuate speech and nonverbal differences, to demonstrate distinctiveness and pride in their social identities (Harwood & Giles, 2005). In this way, Communication Accommodation Theory has advanced understanding of the adjustments that individuals make to decrease or increase distance in their social interactions and provides a framework through which to examine interpersonal and intergroup communications (Soliz & Giles, 2014).

While Communication Accommodation Theory has examined the way that people adjust their communication style to meet relational and identity goals, research on common ground has studied how people rely on social categories to assess the extent of mutual

knowledge they share with their conversation partner. To communicate or to accomplish any collective activity, having common ground—mutual knowledge, mutual beliefs, and mutual assumptions—is essential (Clark & Carlson, 1982; Clark & Marshall, 1981). Previous work has shown that communicators often identify listeners' category memberships and use them to infer what information is already known to them. In one study, pairs of people who were or were not familiar with New York City were asked to work together to arrange New York City landmarks by talking about them. Speakers were able to assess listeners' levels of expertise with New York City immediately and adapt the way they referred to landmarks in conversation accordingly (Isaacs & Clark, 1987). Assumptions of common ground in a conversation are also based on assumptions of other's cultural or personal backgrounds (Schwarz, 2014): for example, it is reasonable to assume that a doctor will be familiar with anatomical terms and that one's colleagues will be familiar with the workplace jargon.

Common ground then has implications for the way that people deliver messages: according to the inclusion/exclusion (IE) model of social judgment (Bless & Schwarz, 2010), communicators strive to deliver messages that are not repetitive or redundant with respect to their audience. For this, they rely on the common ground to determine what is "given" in a social context, then contrast their messages away from the information that is known so that their conversation only covers what is new and relevant. Thus, the body of research on common ground suggests that speakers first rely on social categorization to determine the extent of the mutual knowledge that they possess with their conversation partner (and continue to learn more about their level of common ground as the conversation progresses), then adjust their language so that the communication only covers what is pertinent (Bless & Schwarz, 2010).

Social Categorization in Persuasive Communication

While prior work has examined the role of social categorization in basic communication, where the speaker's goal is to frame their language in a way that is easily understood by their audience (e.g., Isaacs & Clark, 1987) or to increase or decrease social distance with their conversation partner (e.g., Giles & Ogay, 2007), the present research takes a novel approach by examining the role of social categorization in *persuasive* communication. The goal of persuasion goes beyond delivering a clearly understood message: it is to change an audience's attitude about a topic and perhaps ultimately to change their behavior (Petty & Wegener, 1998). Thus, the present research expands knowledge of how social categorization affects communication when the intent is more complex than conveying a clear and coherent message.

Researchers have already considered the impact of group membership on persuasion; however, current knowledge remains within the scope of the message *recipient's* side of the persuasive dyad. In their chapter, Mackie and Queller (1999) argue that shared group membership between source and recipient has an important impact on persuasion and proceed to explore some of the mechanisms by which it increases persuasive effectiveness. While the study of how social factors affect persuasion has long been overlooked in social psychology because group-mediated persuasion was thought to be mere compliance rather than true attitude change caused by careful processing of arguments, argue Mackie and Queller (1999), the study of shared group membership in persuasion can be revived using tools drawn from cognitive approaches. Using those tools, Mackie and her collaborators investigated how source membership might moderate the processing of persuasive appeals.

In one study investigating the impact of receiving an in-group or out-group message on the use of heuristic or systematic processing strategies, undergraduate students were shown arguments supporting two prevalent social issues of the time (i.e., euthanasia and gun control). Further, there were three key manipulations: whether the source of the argument was an in-group or an out-group member; whether the source's position was shown before or after the argument was presented (i.e., in some conditions the source could be relied on as a heuristic while in others it could not); and third, whether the arguments were strong or weak. The findings revealed that private acceptance of in-group messages is routinely heuristic, as in-group arguments were processed more rapidly than out-group arguments when participants knew the source's position on the issue beforehand. However, when the in-group position was not known beforehand, participants engaged in extra processing of the in-group message to try to discern their in-group member's position, and consequently, persuasion was determined mostly by argument quality: although recipients were persuaded by strong arguments from an in-group source, they rejected weak arguments from an in-group source (Mackie et al., 1992). Other experiments provided converging support for the idea that heuristic processing may be the default mode for in-group messages, unless the argument evokes greater scrutiny—by being of central importance to group identity, for example, or if the source's position is not particularly salient at the time the message is conveyed and the recipient engages in greater processing because they are motivated to discern their group member's position (Mackie et al., 1990a; Mackie et al., 1990b).

The above-mentioned program of research investigated the processes through which shared group membership between message source and recipient affects the recipient's acceptance of a persuasive appeal. Yet, it remains to be studied how group membership

affects the communicator's strategy and the resultant argument itself. The present work provides this missing link by studying the communicator's argument strategy in response to the social cues they receive about their message recipient. Reinforcing Mackie and Queller (1999), the impact of group membership on persuasion is critical to study because social categorization is an omni-present factor that affects how people process the vast array of information they encounter in daily life (e.g., Bodenhausen et al., 2012). However, the present work takes a novel perspective towards the study of this topic, suggesting that the picture of how social categorization affects persuasion is not complete before attaining an understanding of communicative processes in addition to the processes that mediate attitude change.

Finally, rather than taking one of the existing theories about communication and applying it to persuasion, this work draws from the body of literature on *theory of mind* and *mental state inference* and applies Ames's (2004a; 2004b) similarity-contingency model to the study of communication. While making assumptions about common ground requires a communicator to infer the listener's mental state (Fussell & Kraus, 1992), the communicator's goal is simply to deduce the other person's level of knowledge about a topic for the purpose of crafting a comprehensible message. However, for persuasion to occur, it is vital to make inferences about another person's *attitudes toward* and *likelihood to act on* different arguments. As the similarity-contingency model (Ames 2004a; 2004b) has previously been applied to contexts where perceivers made inferences about targets' attitudes and behavioral intentions (Ames, 2004b; Ames et al., 2012) (as I will return to shortly), applying it to the persuasion context advances understanding of communicators' decision-

making processes as they aim to develop an argument that will change a target's attitudes and behaviors.

Persuasion in a Real-World Setting

In addition to expanding the literature on social categorization and communication, this work illuminates how persuasion operates in a realistic setting. Whether it is activists in Washington, D.C. aiming to capture a Congressional representative's support for a pro-environmental policy or students walking into their neighborhood coffee shop to convince the owner to sign a letter of support for a local initiative, the places where people make persuasive arguments are social settings. These settings are unavoidably enriched with cues and signals—ranging from the type of baseball cap the message target is wearing to the photographs on the wall—which may influence a communicator's persuasive approach. It is well-established that people are susceptible to priming effects (Bargh et al., 1996; see Bargh & Chartrand, 2014, Dijsterhuis et al., 2014, Higgins & Eitam, 2014, and Molden, 2014 for related reviews): for example, a photograph of a woman winning a race has been shown to increase performance on a brainstorming task (i.e., list uses for a coat hanger) in both academic and organizational settings (Bipp et al., 2017; Shantz & Latham, 2009). Applied to persuasion, communicators may form impressions of their target audience based on arbitrary cues, and these impressions, in turn, have the potential to bias their forthcoming argument. By investigating how the perceived similarity or difference between the communicator and the person they are trying to persuade can bias a communicator's strategy, the present research enhances theoretical knowledge of communication processes through paradigms that aim to capture the complexity of the real world.

Climate Change as a Case Study

From a theoretical standpoint, communication about climate change is a fruitful example to examine persuasive intent and explicit communication strategies concerning a topical issue. Practically, this research is important because climate change requires an immediate, large-scale response (IPCC, 2021) and enacting strong state- and federal-level policies is the most impactful path for society to pursue to enable reaching net-zero carbon emissions by 2050 or sooner (Carter et al., 2020). The support of local businesses, research has shown, is a critical lever through which to influence local, and eventually national, environmental policy (e.g., McKeever et al., 2014; Switzer, 2001; Kraft & Kamieniecki, 2007). Below, I elaborate on the practical significance of this research question within the context of college students and activists who aim to impact climate policy by securing public declarations of support from influential members of their communities: local business owners.

Climate change is a complex phenomenon that is difficult for people to see and understand, which presents challenges for communication. Since it elicits so much uncertainty, persuasive messaging is especially important to help people understand the severity of the situation and to encourage social engagement and action (Moser, 2010). However, research in the areas of morality and environmental attitudes suggests that projection is a significant psychological barrier to effective communication regarding the urgency of climate change, and communication about morally charged issues more broadly.

Specifically investigating the case of why pro-environmental appeals have been greatly unsuccessful among political conservatives, Feinberg and Willer (2013) suggest that individuals tend to craft messages that resonate with their own—not their target audience's—morals, and this dominance of the environmental conversation in terms of liberal morality is

partly what accounts for American polarization on environmental issues (Feinberg & Willer, 2013, 2019). Promisingly, reframing environmental appeals to resonate with the morals of conservatives has been shown to be a simple and effective way to reduce environmental polarization: reframing pro-environmental rhetoric in terms of purity (Feinberg & Willer, 2013) and, in another study by Feygina et al. (2010), reframing pro-environmental behavior as being patriotic and in line with the "American way of life," largely eliminated the difference between liberals' and conservatives' environmental attitudes and behaviors.

Discouragingly, while value reframing has been found to be a highly effective technique for promoting skeptical audiences' pro-environmental support, environmental communicators seldom use this strategy. There may be several reasons for this, posit Feinberg and Willer (2019): first, people might not realize how effective reframing is; second, it is difficult to understand that people hold different morals and values when we hold our own morals so strongly; third, morally reframed arguments sound unnatural and unconvincing; and finally, communicators simply may not want to reinforce ideas that they themselves disagree with. These barriers all share a tendency to project one's internal states onto others when communicating messages, rather than recalibrating those messages to fit the values of the target audience.

Through the frameworks of the similarity-contingency model (Ames, 2004a; 2004b) as well as the broader research on mental state inference, the present work seeks to understand the ways in which communicators make judgments about their target audience, and the impact those judgments have on their choice of pro-environmental argument. In so doing, this research advances theory and applications of communication science and environmental psychology in two important ways. First, it proposes that finding common

ground with someone—a technique highly encouraged for fostering empathy, building trust, and resolving conflicts (e.g., LeBaron & Carstarphen, 1997; Pavlovich & Krahnke, 2012)—may impair a calculated persuasive strategy by biasing communicators' arguments with unessential cues. Second, it extends the findings on perceived similarity and projection from behavioral inferences made in lab experiments to the context of a realistic communicative exchange, examining the conditions under which two diverse samples of environmentalists tend to use projection or stereotyping as their persuasive strategy.

Similarity-Contingency Model

The similarity-contingency model (Ames, 2004a; 2004b) provides a framework for understanding the processes underlying mental state inference in strategic interactions and reveals why climate change communications intended for varied target audiences often reflect the values of the communicator instead. Ames (2004a; 2004b) argues that people may engage in one of the following strategies to infer others' mental states: *Evidence*, which involves analyzing body movements, facial expressions, and behavior to infer a target's intentions; *Projection and perspective-taking*, which involves assuming that others share one's own intentions and imagining oneself in the other's shoes to intuit what they think or want; or *Stereotyping*, which involves using stereotypes about a group to intuit a group member's beliefs or intentions. Further, the *similarity of the target* plays an integral role in the inferential strategy perceivers tend to utilize: through a series of studies involving different similarity cues and different behavioral contexts, participants who perceived themselves as more similar to the target used more projection and less stereotyping when making inferences. Projection and stereotyping were negatively related to one another, suggesting that they may be used as alternative inferential strategies (Ames, 2004a; 2004b).

From these findings, it is inferred that perceivers expect others who initially seem more similar to them to share more of the same values, beliefs, and desires as themselves. If they seem different, they expect their values, beliefs, and desires to be typical of those in the focal group to which they belong. Thus, the similarity-contingency model claims that, in the absence of behavioral cues, an accurate mind reader is one who assesses similarity to the target and uses projection when similarity is high and stereotyping when similarity is low.

Mental State Inference: Past Research

Research on social categorization and mental state inference explains why greater perceived similarity should lead one to project their views on a similar target during persuasion. First, there is wide consensus in the literature that people, and in particular, people from WEIRD cultures (Heine & Lehman, 1997), have an egocentric bias: people tend to think their internal states are more obvious than they actually are (Gilovich et al., 1998), overestimate the extent to which others share their thoughts and feelings (e.g., Ross et al., 1977, Nickerson, 1999), and have difficulty setting aside their own views when trying to understand another person's perspective (e.g., Epley et al., 2004). For example, across four studies, Ross et al. (1977) found support for a "false consensus effect": people categorized their own behavior and judgments as "common" and alternative responses as "odd," implying that they see their own thoughts, feelings, and desires as representative of the normal person while attaching a charged negative label of "odd" to those who express other points of view. More recently, research has provided evidence of the false consensus effect in the domain of public opinion about renewable energy policy, finding that opponents of offshore wind energy underestimated the broader public's level of support for wind energy (Sokoloski et al., 2018).

Transitioning to mental state inference, Nickerson (1999) describes the process of how people try to understand what others know, starting from a *default model* of what they know and then adjusting their model based on evidence of what the other person knows. In the absence of evidence, however, people tend to use their own knowledge as an indicator of what others know. This tendency to use our own knowledge as a basis for social inference can be explained by biases such as the availability heuristic (Tversky & Kahneman, 1973), where the ready availability of one's own perspective leads people to overestimate its prevalence in others. Further investigating projection processes, Epley et al. (2004) tested a model of anchoring and adjustment (Tversky & Kahneman, 1974), finding that people adopt others' perspectives first by anchoring onto their own perspective and then effortfully accounting for differences between themselves and others until an estimate is reached.

Still, more refined models have emerged to explain the boundary conditions of anchoring and adjustment for perspective-taking. Clement et al. (2002) present a social categorization model of how people adjust their default model of "what they know equals what others know," suggesting that people make inferences about other people's mental states based on their *group membership*. This model suggests that people view their ingroup members as similar to them, so they engage in projection, and view outgroup members as different, so they do not project. However, Ames (2004b) argues that social categorization models of projection do not sufficiently explain individual differences in feelings of similarity or dissimilarity to other people: it is perceptions of similarity, not only group membership, that lead people to project. Applying his model to study intergroup relations, Ames and colleagues (2012) examined how Americans' perceptions about Chinese escalatory preferences towards military activity would vary as a function of perceived

similarity. It was found that, when participants thought of themselves as similar to the Chinese, they relied on their own opinions more heavily when gauging Chinese military preferences. However, when participants thought of themselves as different from the Chinese, they relied on stereotypes about Chinese people more heavily when gauging Chinese military preferences.

The Present Research

The research on social categorization, mind-reading and projection is overwhelmingly comprised of experiments that ask participants to estimate the degree to which others share their views and preferences about attitude objects. The present work extends this investigation to the behavioral realm, examining how similarity cues may affect communicators' decisions about which message frames to use on a target. Furthermore, environmental communication—and persuasion generally (Petty & Wegener, 1998)—has predominantly been studied from a perceiver's point of view. For example, studies have examined how message framing of various types (including gain vs. loss (Davis, 1995), approach vs. avoidance (Bertolotti & Catellani, 2014), and intergenerational framing (emphasizing climate change's impacts to current vs. future generations (Davis, 1995; Zaval et al., 2015)) may influence people's attitudes about climate change and their consequent sustainability behaviors. By shifting the focus away from the message recipient and towards the communicator, the present research contributes a new perspective to the study of barriers to persuasive environmental messaging. Understanding how similarity cues may affect communicators' ability to adjust from their egocentric anchors can provide insight to refine persuasive strategy in a wide range of socially significant issues. The present studies thus follow initial work by Sherman et al. (2021) investigating communicator decision-making,

where activists were asked about which psychologically grounded persuasive strategies they utilized most frequently, felt most comfortable using, and perceived as most effective while lobbying in Congress with a range of legislative offices that varied substantially in their support of a climate change policy. Building upon Sherman et al.'s (2021) findings, I investigate the conditions under which two different samples of environmentally-concerned people—climate activists and college students in southern California—tend to project or stereotype while crafting an argument to make on a businessman.

Overview of Samples

In Study 1, I examine how manipulating whether a local business owner happens to have three versus zero attributes in common with a trained environmental activist affects whether the activist relies more on their egocentric anchor or on the values of the typical businessman when ranking different reasons for the business owner to support the Energy Innovation and Carbon Dividend Act. In Study 2, I examine how both manipulated and perceived similarity affect whether college students project or stereotype when ranking different reasons for a local business owner to support Carbon Neutrality in Santa Barbara.

Study 1 was conducted in collaboration with an organization which prepares volunteer activists to lobby U.S. Congress to influence climate policy and to engage in grasstops advocacy as a means of securing endorsements from prominent community leaders (such as business owners) to convey to members of Congress and others. Specifically, this organization aims to bolster support for a revenue-neutral Carbon Fee and Dividend policy—House Resolution 763, the Energy Innovation and Carbon Dividend Act of 2019—which has gained interest globally as an equitable, multi-sector approach to tackling climate change (Shultz & Becker, 2013).

Despite their training in communication, there is reason to suspect that activists' communicative decisions will be predicted by the similarity-contingency model. First, prior research with this organization has revealed that activists' persuasive approaches are highly varied (Sherman et al., 2021: though they participated in the same instruction, in real life, activists used a variety of strategies—ranging from emphasizing pro-environmental social norms to describing how climate change will affect future generations—while lobbying in Congress for a carbon pricing policy. This suggests that, rather than entering their meetings with a "by the book" approach, activists read the context and employ the strategy they feel is most appropriate to use. From this, it may also be inferred that these individuals would subconsciously alter their persuasive strategy in response to the similarity cues they receive about their target.

Second, while these individuals receive instruction on how to communicate with diverse target audiences (e.g., conservatives, progressives, and community leaders), they are not instructed on the ways that context cues can introduce bias to their arguments. Research testing the similarity-contingency model with a variety of samples, behavioral contexts, and similarity cues has consistently demonstrated that perceivers' inferences about their target's mental states are affected by the perceived similarity of their target (Ames, 2004a; Ames, 2004b; Ames et al., 2012). On yet another group of individuals who are not aware of the influence of target similarity on their judgements, this same model should presumably hold.

While Study 1 examines trained activists, Study 2 investigates a sample of students from a large public university in southern California renowned for its commitment to making a positive environmental impact. Conducting Study 2 using a student sample enabled a test of whether the similarity-contingency model explains the communicative decisions of novices

as well as trained communicators. Further, using participants from the local university as compared to an online sample permitted the research team to develop study materials that used familiar rhetoric and reflected the local area's current events, increasing experimental realism and participants' investment in the persuasion scenario.

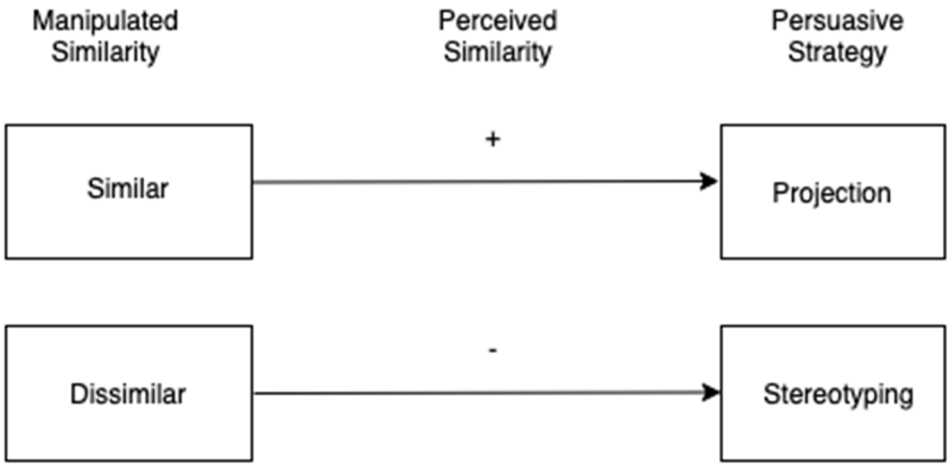
Study 1: Similarity and Projection among Climate Activist Communicators

The major goal of Study 1 is to examine whether manipulating similarity on non-domain-related qualities affects whether communicators engage in projection or stereotyping while evaluating persuasive arguments. It was theorized that when people have more in common with an ambiguous target, they rely more on their own attitudes when ranking which arguments would be most likely to persuade their target to support a pro-environmental initiative. Conversely, when people have less in common with a target, they rely more on what they perceive to be the attitudes of a typical member of their target's group when ranking which arguments would be most likely to persuade their target to support a pro-environmental initiative.

Study 1 tested the hypothesis that experimental condition (similarity vs. dissimilarity) would affect whether environmental activists project or stereotype while ranking the efficacy of various arguments to persuade a local businessman to endorse the Energy Innovation & Carbon Dividend Act (H.R. 763; House of Representatives, 2020). Activists who were randomly assigned to the similarity condition were predicted to project more and stereotype less than those in the dissimilarity condition; the converse was predicted for activists in the dissimilarity condition. See Figure 1 as a conceptual guidepost for these predictions:

Figure 1

Similarity-Contingency Model Applied to the Setting of Persuasive Communication



Method

Open Practices

All materials have been made publicly available via the Open Science Framework and can be accessed at https://osf.io/t38ha/?view_only=057a1b408160494fafcae5ea9ffe9064.

Participants and Design

The present study employs a repeated measures design with a between-subjects factor (experimental condition: similarity vs. dissimilarity). Stereotyping and projection constructs were computed within-participant across items. A power analysis was conducted using G*Power Version 3.1.9.6 (Faul et al., 2009) to examine how many participants were required to obtain 80% power for a mixed-model design using repeated measures ANOVA with an interaction between a between-subjects variable and a within-subjects variable, assuming a small effect size ($f = 0.1$):[1] 200 were determined to be needed.

[1] Consistent with what was found in Ames (2004a) while examining effects of similarity on projection and stereotyping when judging a target's mental states.

5,000 activists were invited, in March 2021, from a mailing list of the organization's members, targeting a sample size of 200.[2] Participants were compensated with a $5 Amazon gift card and were told that their participation will advance research that has the potential to progress training materials at their organization. The study remained open for approximately three weeks until 286 individuals had participated, anticipating incomplete and low-quality data. Data cleaning resulted in a final *N* of 161, as 125 individuals were excluded for unsatisfactory responses based on the following *a priori* criteria: making less than 90% progress on the survey (*n* = 108), completing the survey in less than 5 minutes (*n* = 6), or completing the survey in more than 120 minutes (*n* = 11). There was no heterogeneous attrition across experimental conditions.[3] Participant demographic characteristics are presented in Table 1.

Table 1

Survey Participant Demographic Characteristics, Study 1 (N = 161)

Participant Characteristic		*n*	%
Gender	Male	96	59
	Female	64	40
	Prefer not to answer	1	1
Race / Ethnicity	White / Caucasian	156	96
	Asian	2	1
	Multi-racial ("White & Hispanic")	1	1
	Other ("European")	1	1
Household Income	Under $15,000	4	3
	$15,001 - $25,000	7	4

[2] Because the organization's members include a unique, typically difficult to access population (i.e., conservative environmentalists), for exploratory purposes, participants were preselected to represent both liberal and conservative views on the political spectrum (according to the organization's classification criteria).

[3] The association between experimental condition (similarity vs. dissimilarity) and whether participants were excluded from the study was not statistically significant, $\chi 2(1, N = 184) = 0.70$, $p = .40$.

	$25,001 - $35,000	8	5
	$35,001 - $50,000	18	11
	$50,001 - $75,000	27	17
	$75,001 - $100,000	29	18
	$100,001 - $150,000	22	14
	Over $150,000	39	24
Political Ideology	Very Liberal	32	20
	Liberal	73	45
	Moderate	44	27
	Conservative	7	4
	Not sure	1	1
	Prefer not to answer	4	3
Political Party	Strong Democrat	72	45
	Not Very Strong Democrat	25	16
	Closer to Democratic Party	41	26
	Neither	17	11
	Closer to Republican Party	2	1
	Not Very Strong Republican	3	2
	Strong Republican	1	1

Participant Characteristic	*Mdn*	*SD*	Range
Age	66	16.84	18 - 84
Household income	$50,001 - $75,000		

Procedure

Participants were invited to complete a survey investigating how members at their organization view climate issues and engage in community outreach. After consenting to the study requirements, they completed the Qualtrics survey. This study was approved by the Institutional Review Board at UC Santa Barbara.

In the first part of the survey, participants were asked to imagine being paired up with a local businessman and then persuading him, at some point in the future, to sign on as an endorser to the Energy Innovation & Carbon Dividend Act. The prompt read:

> As you may already know, one of the primary ways that [organization] builds political will is by recruiting community leaders to support their efforts. Through [organization's] grasstops engagement efforts, members like you are equipped with the tools to capture and share endorsements from community leaders to our members of Congress and others. While these endorsements come in many forms, including public position statements and newspaper editorials, the most influential endorsements come when community leaders such as business owners, faith leaders,

> university presidents, mayors, and others are asked to sign on as endorsers to the Energy Innovation & Carbon Dividend Act, because it's a specific piece of legislation that their member of Congress can support to act on climate change.
>
> When [organization] volunteers present these endorsements to their congressional representatives, it has the potential to make a big impact. Beyond this, it is also an opportunity to form a new relationship with community leaders. Previous members have invited these leaders into their congressional meetings to share their message directly with representatives, and it can entirely change the tone of the meeting.
>
> *In this study, you'll be paired up with Robert, a business owner in your district*, and you'll think about how to persuade him to sign on as an endorser to the Energy Innovation & Carbon Dividend Act.

After reading the prompt, participants were asked to indicate the reasons why *they themselves* may support the Energy Innovation & Carbon Dividend Act by ranking eight reasons in order of personal importance. Following the self-ratings, participants were asked to rank those same eight reasons in the order of how likely they would be to persuade the *typical business owner* to sign on as an endorser to the Energy Innovation & Carbon Dividend Act. They were told:

> People care about the environment for different reasons. Now, we want your view on how convinced you think *the typical business owner* would be by each of these reasons to sign on as an endorser to the Energy Innovation & Carbon Dividend Act. We realize you don't have a lot of information to go on, but tell us your views as best you can.

Next, participants received the similarity manipulation, where they filled out six "get-to-know-you" questions and then found out that their partner Robert, the local business owner they are trying to persuade to sign on as an endorser, either shared or did not share their responses to three of those questions. After the similarity manipulation, participants were asked to rank the same eight reasons according to how likely they would be to persuade

Robert to sign on as an endorser to the Energy Innovation & Carbon Dividend Act.[4] Finally, participants completed demographic measures (i.e., race/ethnicity, gender, household income, political ideology, political party) and were debriefed.

Measures and Materials

Independent Variable: Experimental Condition (Similarity vs. Dissimilarity). Similarity was manipulated through an interactive design using display logic in Qualtrics survey software where participants were randomly assigned to either a similarity or dissimilarity condition, and target attributes were produced variably based on each participant's own attributes (consistent with Ames, 2004a).

As part of the manipulation, participants were asked to respond to six Yes/No questions about their hobbies and interests so that they could begin getting acquainted with their partner Robert, a fictional business owner in their local district who supposedly filled out the items in advance. These questions were: "Do you enjoy science fiction novels?"; "Do you prefer relaxing vacations or adventurous vacations?"; "Do you enjoy watching scary movies?"; "Do you enjoy following sports teams?"; "Do you prefer camping or staying in and watching TV shows?"; and "Do you prefer sweet or savory foods?". To increase experimental realism, the manipulation was based on only three out of the six questions. These qualities were chosen because they were expected to vary in the participant population (e.g., some participants would prefer scary movies and some would not) and because they should be orthogonal to the outcome of interest, the arguments being evaluated (e.g.,

[4] The order of ranking for self, for stereotype, and for target is consistent with Ames (2004b, Study 2) and prevents the similarity manipulation from biasing participants' typical group member rankings. When counterbalancing the order of ratings, Ames (2004b, Study 1) found that there were no order effects on projection and stereotyping.

enjoying scary movies should not indicate that one finds economy-related reasons for supporting the Energy Innovation & Carbon Dividend act more persuasive than environment-related reasons). It was assumed that matches on these attributes between self and Robert would lead to greater levels of perceived similarity.

Participants were then told about their partner Robert. Those in the similarity condition were told that Robert shared their responses on all three items. For example, *if the participant reported a preference for relaxing vacations, scary movies, and camping*, the passage would read:

> Robert runs a management consulting business in your local district. He's in his mid-forties and he has two children. He has not indicated his opinion or support (or non-support) for the Energy Innovation & Carbon Dividend Act. On the next page are three responses from Robert's background questionnaire which he said he'd be happy to share:
>
> First, Robert said that he prefers relaxing vacations to adventurous vacations. Second, Robert said that he enjoys watching scary movies. And lastly, Robert said that he prefers camping to staying in and watching TV shows.
>
> *While you and Robert may have some differences, it appears you have at least a few important things in common*.

In contrast, those in the dissimilarity condition were presented with the same preamble but saw that Robert reported different responses from them on all three items. They were also told, "*While you and Robert may have some other things in common, it appears you have at least a few important differences.*" See Figure 2 for an example of the customized experimental manipulation on a survey participant.

Figure 2

Customized Similarity Manipulation

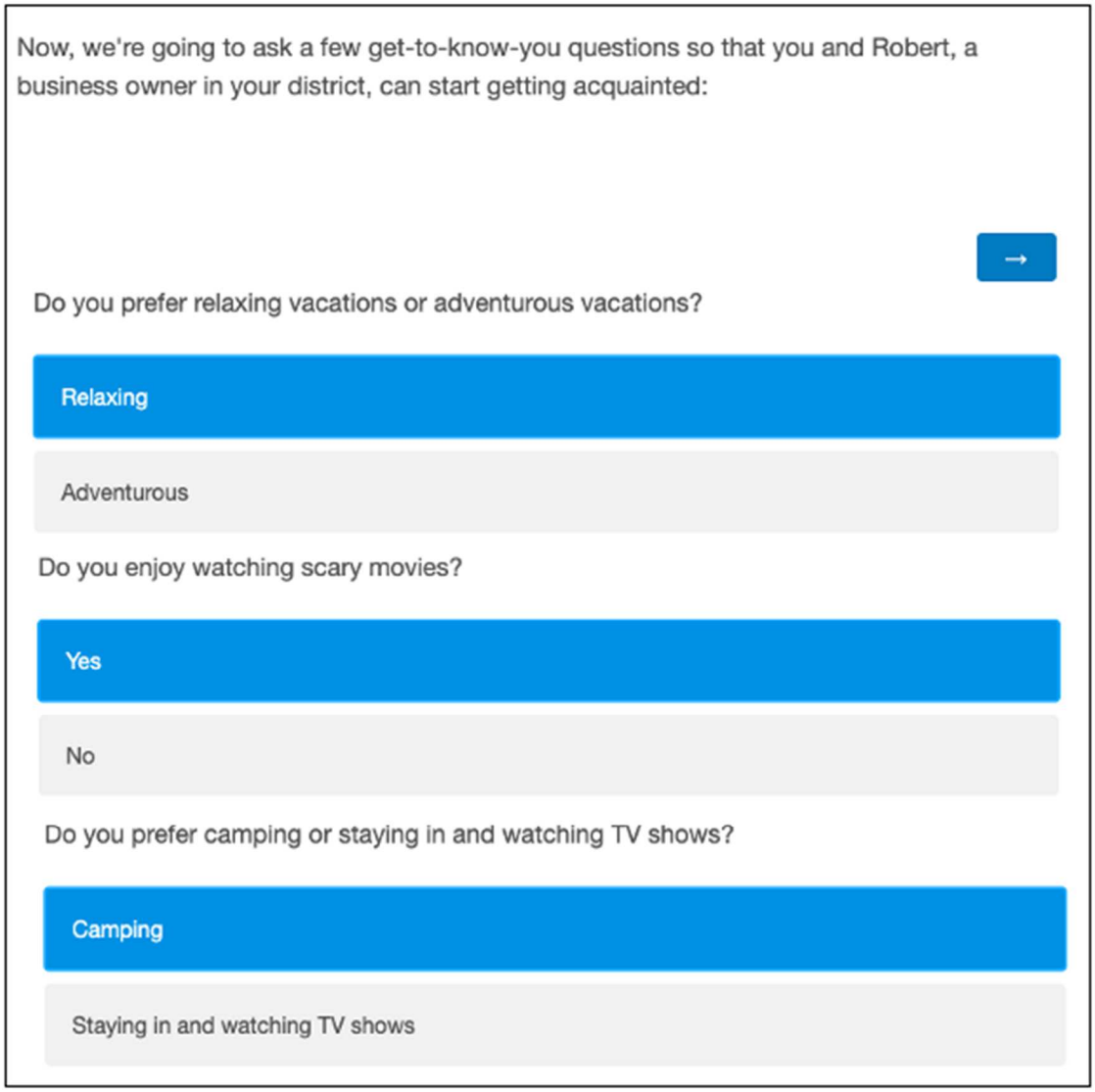
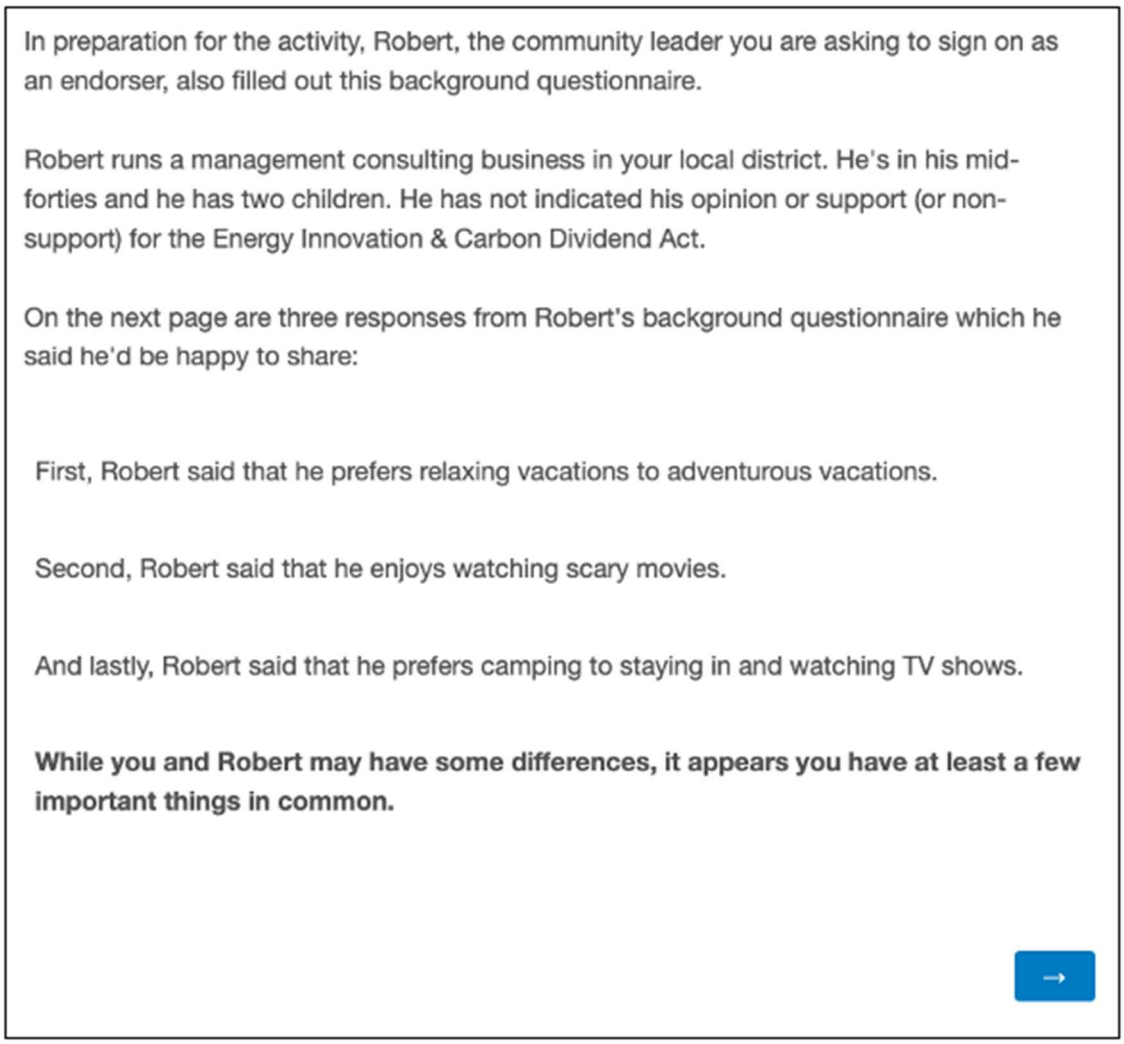


Figure 2 (contd.)



Pretest: Persuasive Arguments for Supporting Environmental Policy. In the survey, participants were asked to evaluate eight different persuasive arguments for supporting the Energy Innovation & Carbon Dividend Act. To generate these arguments, a team of three research assistants and the principal investigator searched the organization's web page about endorsements and examined qualitative data from a prior study with this organization (see Sherman et al., 2021) for the most common reasons mentioned for supporting the Energy Innovation & Carbon Dividend Act, with the aim of presenting a variety of reasons in the

survey that would appeal to both environmental activists and to the stereotypical business owner. Based on themes encountered in the organization's online training materials and in the qualitative data (n = 150),[5] the following four statements were crafted to appeal to reasons that a typical climate activist may have for supporting the Energy Innovation & Carbon Dividend Act: "It will keep the Earth from warming more than 1.5 degrees Celsius above pre-industrial levels, at which point irreversible damages to our planet - including polar ice sheet collapse, disease, and famines - would occur."; "It will greatly improve our air quality, which will prevent hundreds of thousands of future lives lost due to respiratory disease and other illnesses."; "It will ensure that we leave behind a safe and habitable planet for future generations to enjoy."; and, "It will be a crucial step in mitigating the climate crisis that we have caused and therefore have the responsibility to solve." These four reasons relate to biospheric and altruistic motives for supporting the Energy Innovation & Carbon Dividend Act, which should be important to self-identified environmental activists (Snelgar, 2006).

Alternatively, the following four statements, connected to financial and commerce-related motives, were crafted to appeal to reasons that a typical businessman may have for supporting the Energy Innovation & Carbon Dividend Act: "It will drive innovation and put our country on the forefront of a transition to a clean energy economy."; "It will create a demand for local jobs and boost local economies as American families spend their monthly carbon dividends in their communities."; "It will prevent communities and local businesses from losing billions of dollars on damages caused by climate-change related disasters."; and,

[5] Data from a subset of participants who wrote about how they used a 'Long-Term' persuasive strategy (emphasizing future impacts of climate change and enacting policy) while lobbying in Fall 2018 was explored.

"It will protect farmers and small business owners whose livelihoods have been affected by droughts and other negative consequences of a rapidly changing climate." [6]

The survey was piloted by seven research assistants as well as the Research and Education Team at the collaborating organization to achieve consensus that the generated reasons had potential to appeal to both environmentalists and to the stereotypical business owner.

Within-Subjects Variable: Basis of Persuasion (Projection vs. Stereotyping). Measures of projection and stereotyping were computed for each participant using their rankings across the eight reasons to support the Energy Innovation & Carbon Dividend Act for the target Robert, for themselves, and for the typical business owner, adopting the method of Ames (2004a). Participants were asked to rank, using drag and drop, the eight arguments generated above in order of personal importance from 1 (*highest, most important*) to 8 (*lowest, least important*). They were also asked to indicate how likely each of the eight arguments would be to persuade a) the typical business owner and b) their partner Robert to sign on as an endorser to the Energy Innovation & Carbon Dividend Act from 1 (*highest, most persuasive*) to 8 (*lowest, least persuasive*). After data collection, all items were reverse coded such that higher scores reflected greater personal importance and perceived persuasiveness of the arguments, respectively.

Exploratory Variable: Political Ideology. Participants' political ideology was assessed through the following question: "Which of the following best describes your

[6] It is important to note that the eight reasons for supporting the Energy Innovation & Carbon Dividend Act are not mutually exclusive and may have some overlapping content. Thus, participants may find some of the reasons both important to themselves *and* convincing to the typical business owner. However, this overlap should not bias results because the stereotyping and projection constructs are computed item by item within participant.

political views?" (*Very liberal, Liberal, Moderate, Conservative, Very conservative, Not sure, Prefer not to answer*). This was examined as a binary variable: participants were classified as Liberal if they self-identified as "Very liberal" or "Liberal," and as Moderate/conservative[7] if they self-identified as "Moderate," "Conservative," or "Very conservative" (101 liberals, 51 moderates/conservatives).

Results

Variability in Responses to Cue Questions

While the similarity questions were chosen because responses were expected to vary in the participant population, the activists' responses were rather homogeneous: most reported that they prefer adventurous to relaxing vacations (72%), do not enjoy scary movies (82%), and prefer camping to staying in and watching TV shows (71%). 79 participants were randomly assigned to the dissimilarity condition and 82 to the similarity condition.

Variation in Rankings for Persuasive Arguments

As expected, climate activist participants viewed the environmentally framed arguments for supporting the Energy Innovation & Carbon Dividend Act as most important for *themselves*, ranking reasons 7, 8, and 6 (see Table 2 below) as most personally important on average. Conversely, they viewed the financially framed arguments as being most persuasive for both the *typical business owner* and for *Robert*, ranking reasons 2, 3, and 1 as most persuasive to the stereotype and to Robert on average.

Table 2

Descriptive Statistics for Persuasive Argument Rankings (M (SD))

[7] Moderate and conservative activists were grouped into one category because there were only 7 conservative and 0 very conservative activists in this sample, which were not enough to analyze as a separate group.

Reasons to Support Energy Innovation & Carbon Dividend Act	For self	For typical business owner	For Robert
1. It will drive innovation and put our country on the forefront of a transition to a clean energy economy.	4.07 (*2.07*)	5.53 (*1.57*)	4.99 (*1.80*)
2. It will create a demand for local jobs and boost local economies as American families spend their monthly carbon dividends in their communities.	3.22 (*1.79*)	6.83 (*1.50*)	6.22 (*2.03*)
3. It will prevent communities and local businesses from losing billions of dollars on damages caused by climate-change related disasters.	3.56 (*1.87*)	6.22 (*1.66*)	5.76 (*1.73*)
4. It will protect farmers and small business owners whose livelihoods have been affected by droughts and other negative consequences of a rapidly changing climate.	3.14 (*1.47*)	5.52 (*1.49*)	4.70 (*1.97*)
5. It will greatly improve our air quality, which will prevent hundreds of thousands of future lives lost due to respiratory disease and other illnesses.	4.16 (*1.89*)	3.34 (*1.51*)	3.83 (*1.96*)
6. It will ensure that we leave behind a safe and habitable planet for future generations to enjoy.	5.70 (*2.06*)	3.13 (*1.85*)	4.48 (*2.43*)
7. It will keep the Earth from warming more than 1.5 degrees Celsius above pre-industrial levels, at which point irreversible damages to our planet - including polar ice sheet collapse, disease, and famines - would occur.	6.11 (*2.39*)	2.76 (*1.82*)	3.07 (*2.01*)
8. It will be a crucial step in mitigating the climate crisis that we have caused and therefore have the responsibility to solve.	6.06 (*2.11*)	2.68 (*1.85*)	2.96 (*2.11*)

Note. Higher scores indicate greater importance/perceived persuasiveness of that reason.

Calculation of Projection and Stereotyping Constructs

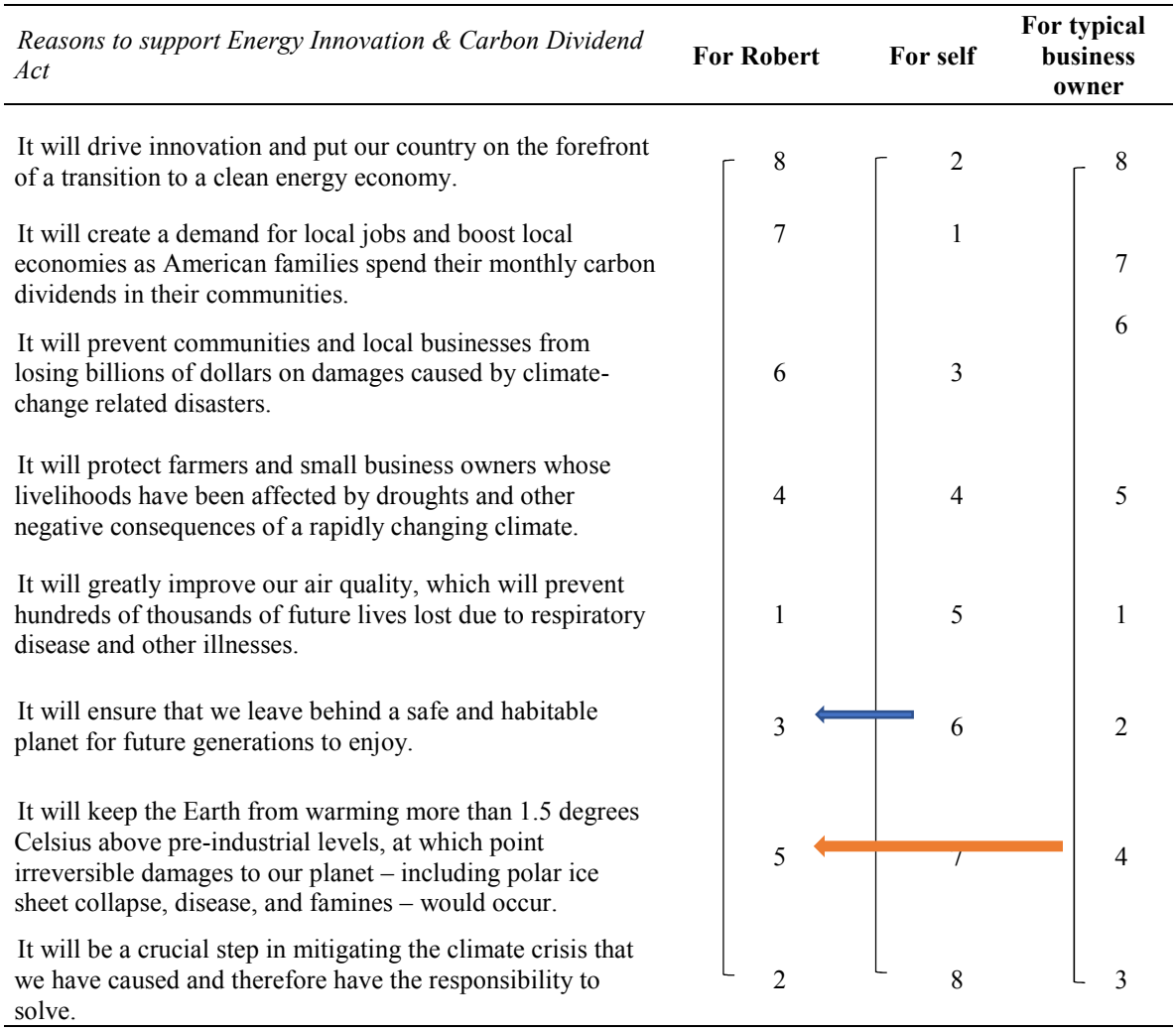
For each participant, measures of projection and stereotyping were computed using their rankings—acquired at three different time points—for the eight arguments to support the Energy Innovation & Carbon Dividend Act. For each argument to support Energy Innovation & Carbon Dividend for each participant, the following multiple regression equation predicting target responses with self-responses and typical businessman responses was computed:

$$\text{Robert Rankings}_i = \beta_0 + \beta_1 \text{Self Rankings}_i + \beta_2 \text{Stereotype Rankings}_i + \varepsilon_{1i}$$

Specifically, the standardized betas for each participant were computed using an iterative for loop process in RStudio Version 1.4.1106 (RStudio Team, 2020), which filtered for one participant at a time, ran the multiple linear regression on that participant, and then saved the betas for projection and stereotyping as values for that participant in two new columns, respectively, repeating this process row by row until the last participant in the dataset was reached. The averaged standardized beta weights were then used as measures of projection (the self-response beta (β_1); $M = 0.09$, $SD = 0.44$) and stereotyping (the typical businessman response beta (β_2); $M = 0.53$, $SD = 0.45$). Thus, the more a participant's self-rankings for each reason to support Energy Innovation & Carbon Dividend predicted their rankings for Robert, the higher their projection score; the more a participant's typical businessman rankings predicted their rankings for Robert, the higher their stereotyping score. See Figure 3 (next page) for a visual representation of how these constructs were computed.

Figure 3

Example Responses of One Participant to Illustrate Computation of Projection and Stereotyping Constructs



Analytic Plan

First, projection and stereotyping constructs were computed following Ames's (2004a) method, where standardized beta weights represented participants' degree of

projection and stereotyping. Next, these betas were treated as the dependent variable that was analyzed through a 2 x 2 ANOVA with one between-subjects variable (experimental condition: similarity vs. dissimilarity) and the within-subjects variable (basis of persuasion: projection vs. stereotyping). The primary test was the mixed-model ANOVA which examined main effects and the interaction, which was followed up with planned comparisons to examine stereotyping and projection separately using Tukey post-hoc within the overall models.

Effects of Experimental Condition on Projection and Stereotyping

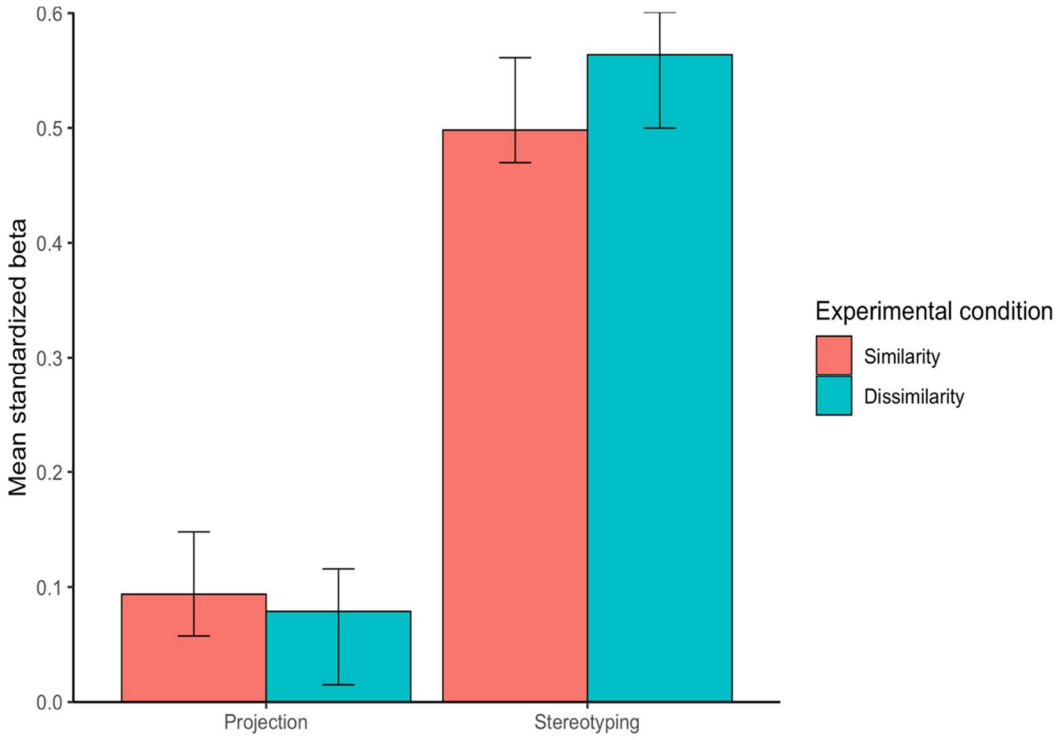
A two-way mixed ANOVA was conducted to examine the effects of experimental condition (similarity vs. dissimilarity), basis of persuasion (projection vs. stereotyping), and their interaction on projection and stereotyping scores. There was no main effect of experimental condition on projection and stereotyping scores, $F(1,159) = 0.23$, $p = .63$. However, there was a main effect of basis of persuasion, $F(1,158) = 85.30$, $p < .0001$, as overall, everyone stereotyped more ($M = 0.53$, $SD = 0.45$) than they projected ($M = 0.09$, $SD = 0.44$).[8] Lastly, testing the central hypothesis, there was no significant interaction between experimental condition and basis of persuasion on projection and stereotyping scores, $F(1,158) = 0.68$, $p = .41$. Although the interaction was not significant, focused t-tests were conducted nonetheless to examine the prediction that projection would be higher in the similarity than in the dissimilarity condition, whereas stereotyping would be higher in the dissimilarity than in the similarity condition. The predictions derived from the similarity-contingency model were not supported: participants in the similarity condition neither

[8] The main effect of basis of persuasion is only reported once per each study since it does not change throughout the course of a study (unless the data is divided into subgroups).

showed significantly greater projection (M = 0.09, SD = 0.45) than those in the dissimilarity condition (M = 0.08, SD = 0.43), $t(159) = 0.21$, p = .83, nor significantly less stereotyping (M = 0.50, SD = 0.47) than those in the dissimilarity condition (M = 0.56 , SD = 0.43), $t(158) = -0.92$, p = .36. See Figure 4 for a visual representation of the null experimental effects.

Figure 4

Projection and Stereotyping as a function of Experimental Condition



Note. Error bars show +/- 1 standard error.

Exploratory Analyses

Similarity Proxies. As experimentally manipulated similarity had no effect on projection and stereotyping, it was inferred that the manipulation may not have been effective in inducing differences in perceived similarity to Robert. I next transitioned to replicating the primary analysis with two quasi-experimental proxies for similarity: gender (binary; male vs.

female) and political ideology (binary; liberal vs. moderate/conservative). Although Study 1 did not contain a measure of self-reported similarity, I reasoned that males should feel more similar to Robert than females because of their shared gender, and moderates/conservatives should feel more similar to Robert (i.e., a businessman) than liberals because of their ideological focus on maintaining a strong economy (e.g., Swedlow, 2008). Thus, these variables served as substitutes for the experimental condition variable in two separate mixed-model ANOVAs that examined the interaction between naturalistic similarity (similar vs. dissimilar) and the within-subjects variable (basis of persuasion) on projection and stereotyping.

Political Ideology. A two-way mixed ANOVA was conducted to examine the effects of political ideology (liberal vs. moderate/conservative), basis of persuasion (projection vs. stereotyping), and their interaction on projection and stereotyping scores. There was no main effect of political ideology on projection and stereotyping scores, $F(1,154) = 1.01$, $p = .32$. Furthermore, there was no significant interaction between political ideology and basis of persuasion on projection and stereotyping scores, $F(1,153) = 0.49$, $p = .49$. That is, liberals and moderates/conservatives did not differ in the degree to which they used projection or stereotyping as strategies for evaluating persuasive pro-environmental persuasive arguments.

Gender. Next, a two-way mixed ANOVA was conducted to examine the effects of gender (male vs. female), basis of persuasion (projection vs. stereotyping), and their interaction on projection and stereotyping scores. There was no main effect of gender on projection and stereotyping scores, $F(1,158) = 1.35$, $p = .25$. Next, there was no significant interaction between gender and basis of persuasion on projection and stereotyping scores, $F(1,157) = 1.22$, $p = .27$. That is, males and females did not differ in the degree to which they

used projection or stereotyping as strategies for evaluating persuasive pro-environmental persuasive arguments.

In sum, the similarity proxies of gender and political ideology, when interacting with the repeated-measures variable, had no effects on participants' levels of projection and stereotyping.

Similarity Proxies and Experimental Manipulation. Next, it was examined whether people who naturalistically differed in similarity to Robert would respond differently to the experimental manipulation. For individuals more similar to Robert at baseline (i.e., males and moderates/conservatives), the experimental manipulation may be less likely to affect them. Four analyses were conducted to examine if the predicted pattern of means would be different for groups of people who varied in naturalistic similarity to Robert. For each similarity proxy (gender and political ideology), the data was split into two subgroups (i.e., males and females; liberals and moderates/conservatives). Then, the primary 2 x 2 mixed-model ANOVA was conducted separately on each of these subgroups to examine if the interaction between the experimental condition (similarity vs. dissimilarity) and the repeated-measures variable (basis of persuasion) would result in significant differences in projection and stereotyping.

Political Ideology. Two 2 x 2 mixed ANOVAs were conducted to examine whether the interaction between experimental condition (similarity vs. dissimilarity) and basis of persuasion (projection vs. stereotyping) would result in significant differences in projection and stereotyping, separately for liberals and moderates/conservatives.

For liberals, there was no main effect of experimental condition on projection and stereotyping scores, $p = .86$; however, there was a main effect of basis of persuasion,

$F(1,102) = 76.86$, $p < .0001$, as overall, liberals stereotyped more ($M = 0.53$, $SD = 0.43$) than they projected ($M = 0.05$, $SD = 0.45$). Finally, there was a significant interaction between experimental condition and the within-subjects factor on projection and stereotyping scores, $F(1,102) = 5.68$, $p = .02$. This was a small effect, $\eta 2 = .02$. Although the contrasts when comparing similarity conditions within each level of the within-subjects factor were not significant (projection: $p = .17$; stereotyping: $p = .10$), the observed means provide modest evidence for the similarity-contingency model: liberals in the similarity condition projected (non-significantly) more ($M = 0.11$, $SD = 0.45$) than those in the dissimilarity condition ($M = -0.01$, $SD = 0.45$), and stereotyped (non-significantly) less ($M = 0.47$, $SD = 0.46$) than those in the dissimilarity condition ($M = 0.62$, $SD = 0.37$).

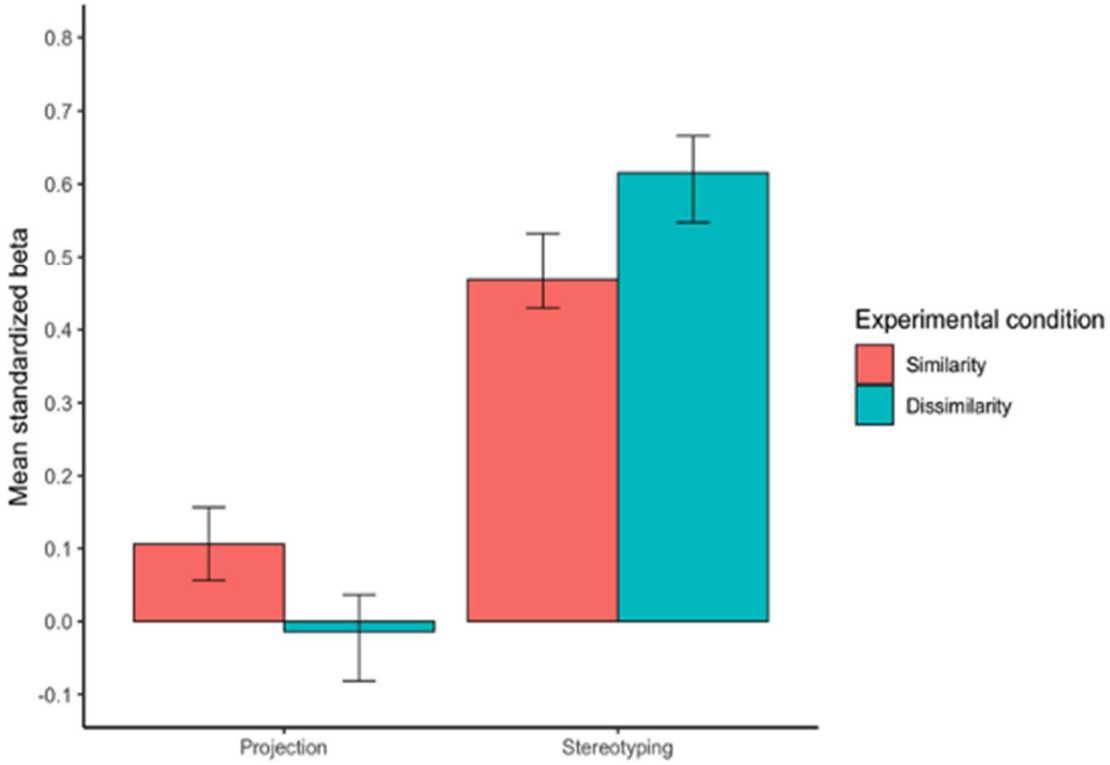
For moderates/conservatives, there was no main effect of experimental condition on projection and stereotyping scores, $p = .99$; however, there was a main effect of basis of persuasion, $F(1,49) = 20.01$, $p < .0001$, as overall, moderates/conservatives stereotyped more ($M = 0.55$, $SD = 0.49$) than they projected ($M = 0.15$, $SD = 0.43$). Lastly, there was no significant interaction between experimental condition and the within-subjects factor on projection and stereotyping scores, $p = .14$. Although these results are marginal, the pattern observed may illustrate that liberals who were manipulated to see themselves as similar to Robert had a stronger relationship between their own views for supporting policy and Robert's views than did moderates/conservatives.

Thus, the predicted pattern of means occurred for liberals but not for moderates/conservatives. While these analyses were conducted on an exploratory basis and the interaction might not be complete, this pattern suggests that the experimental

manipulation may have worked better for people who were more dissimilar to the target in the first place. See Figure 5 for a visual representation.

Figure 5

Liberals Show Expected Pattern of Means in Response to Experimental Manipulation



Gender. Lastly, the primary 2 x 2 mixed-model ANOVA was conducted separately on males and females. For males, there was no significant main effect of experimental condition on projection and stereotyping scores, $p = .99$; however, there was a main effect of basis of persuasion, $F(1,93) = 37.12$, $p < .0001$, as overall, males stereotyped more ($M = 0.54$, $SD = 0.47$) than they projected ($M = 0.13$, $SD = 0.45$). Finally, there was no significant interaction between experimental condition and the within-subjects factor on males' projection and stereotyping scores, $p = .62$.

For females, there was no significant main effect of experimental condition on projection and stereotyping scores, $p = .47$; however, there was a main effect of basis of persuasion, $F(1,62) = 65.60$, $p < .0001$, as overall, females stereotyped more ($M = 0.53$, $SD = 0.42$) than they projected ($M = 0.02$, $SD = 0.44$). Finally, there was no significant interaction between experimental condition and the within-subjects factor on females' projection and stereotyping scores, $p = .60$.

Discussion

Study 1 tested the similarity-contingency model (Ames 2004a; 2004b) within the context of experienced communicators thinking about how they would persuade a local businessman to support a pro-environmental policy. Results did not provide support for the central hypothesis: no significant interaction between the experimental manipulation and the basis of persuasion on projection and stereotyping beta scores was found. Since the experimental manipulation was not effective, it was also examined whether a more naturalistic type of similarity would induce differences in projection or stereotyping. Although no self-reported measure of similarity was included, it was speculated that gender and political ideology could serve as proxies because males may feel more similar to Robert than females, and moderates/conservatives may feel more similar to Robert than liberals. These analyses also yielded null results, as no significant interactions between gender or political ideology and basis of persuasion on projection and stereotyping were found.

Finally, it was tested on an exploratory basis if naturalistic and manipulated similarity would interact. For people already more similar to Robert, such as males and moderates/conservatives, perhaps the manipulation would be less likely to have an effect on them. When examining the interaction of experimental condition and the repeated-measures

factor on each of these groups separately, people who differed in political ideology responded differently to the experimental manipulation. For liberals, there was a significant interaction between experimental condition and the repeated-measures factor on their stereotyping and projection scores. Post-hoc contrasts, while not statistically significant, revealed that liberals responded in the predicted way to the manipulation, projecting more and stereotyping less in the similarity condition than in the dissimilarity condition. For moderates/conservatives, the experiment did not have any effect on the degree to which they projected or stereotyped while ranking persuasive arguments. As these results are based on marginal effects, the conclusions one can draw from them are limited;[9] however, they suggest that the experimental manipulation may have worked better on people who were more different from Robert initially. In Study 2, which examines a college student sample, all the subjects are more dissimilar to Robert to begin with, potentially enabling a cleaner manipulation. In all these analyses, collapsing across similarity levels (whether experimental or naturalistic), basis of persuasion had a significant main effect on participants' standardized beta scores, as overall, participants stereotyped more than they projected. This suggests that, while manipulating similarity may increase individual differences in how similar communicators perceive their target to be to themselves, perceived group membership still explains much of the tendency to project or stereotype, as people may engage in greater stereotyping for a target of a more distant social category (Clement & Krueger, 2002).

Study 1 contained several limitations which may have contributed to the null effects of the experimental manipulation on the dependent variables. First, the sample was majority

[9] Also, people who differed in gender did not respond differently to the experimental manipulation.

(97%) white and second, the activists' responses to the cue questions were uniform. This lack of heterogeneity in the sample's composition may have undermined the efficacy of the experimental manipulation in that having everyone feel similarity about these traits might diminish its impact. That is, if it is the group norm among environmental activists to enjoy camping, then finding out that a stranger also likes camping should not have been surprising to participants because they would already *expect* others to share that preference; a sense of similarity may be more successfully induced by discovering that someone shares a preference for something more obscure (such as a painting by Paul Klee over one by Wassily Kandinsky (see Ames, 2004a, Study 3)).

Another limitation of the similarity manipulation is that two of the cue questions ("Do you prefer relaxing vacations or adventurous vacations?" and "Do you prefer camping or staying in and watching TV shows?") communicated information about being outdoorsy (or not), which may have signaled to participants that Robert would be more persuaded by certain arguments. 'Outdoorsy' is one of the most frequent traits that people use to describe the 'typical' environmentalist (Bashir et al., 2013): thus, it is possible that participants who discovered that Robert preferred camping or adventurous vacations, for example, would be more likely to believe that Robert would be convinced by environmentally framed (vs. financially framed) arguments. However, as Study 1 did not include either a measure of self-reported similarity or measures gauging how outdoorsy or environmentalist participants perceived Robert to be, the reasons why the experimental manipulation had no effect on the processes of projection and stereotyping can only be inferred.

Furthermore, Study 1 was conducted on experienced communicators (i.e., activists with formal training through their organization) who, because of this training, may have been

less likely to focus on the incidental cues that were manipulated and more likely to focus on what is important to emphasize in an argument for a businessperson. Hence, the experimental manipulation may have been less impactful on activist communicators than on a less experienced group.

Besides the experimental manipulation not being as robust as intended, a different threat to internal validity in Study 1 was that experimental power was less than what I set out to achieve. The *a priori* power analysis indicated that 200 subjects were needed to obtain 80% power for the current experimental design, assuming a small effect size ($f = 0.1$). However, although 286 individuals took the final survey, there was greater data attrition than was anticipated and data cleaning resulted in a final N of 161. Nevertheless, the first analysis which tested the central hypothesis yielded clearly null results: there was a non-significant interaction between experimental condition and basis of persuasion on participants' projection and stereotyping beta scores, $F(1,158) = 0.68$, $p = .41$. To denote a statistically significant effect, the critical F value for df (1,158) for the $\alpha = .05$ significance level would need to be at least 3.91 (e.g., Purdue University, 2021). As the F value of 0.68 obtained does not approach 3.91, it is highly unlikely that a Type II error has occurred.

Besides reduced experimental power presenting a threat to internal validity, a threat to external validity is the extent to which Study 1 results can generalize to the larger population of experienced environmental communicators. In the study, there was a mere 3% completion rate, as the data of 161 individuals were analyzed from a mailing list of 5,000 of the organization's members. While this is a common survey response rate for political elites (e.g., Vis & Stolwijk, 2021), it is possible that self-selection bias exists in the current data. When comparing Study 1's participants to the rest of the climate organization's members on

the demographics they were able to disclose, the individuals who participated in this study were older (median age of 66 years old, as compared to a median of 40 in the larger organization) and whiter (96% of study participants identified as White/Caucasian, as compared to 75% in the larger organization). Taken together, the low response rate and demographic differences between the study sample and organization population may limit the external validity of Study 1.

Study 2 built on Study 1 in several ways. First, it added a methodological change: operationalizing similarity in two different ways—experimentally as in Study 1, and through a self-reported measure of perceived similarity to Robert—with the aim of providing converging evidence to support my model of applying the similarity-contingency framework to the communication context. Second, Study 2 was conducted on a different sample—college students with no formal training in persuasive strategy—to examine if the similarity-contingency model would generalize to explain the decisions of novice communicators. College students might have to stereotype or project more in response to similarity cues because they have no prior experience in tailoring communications to a target audience, leaving them to rely on heuristics to aid them in selecting persuasive arguments. Further, in Study 2, all the participants began the study as much more dissimilar to the target than in in Study 1, potentially enabling the experimental manipulation to have a greater impact on their behavior. Lastly, conducting a second study allowed testing whether results remained consistent across different persuasion environments and focal issues.

Study 2: Similarity and Projection among College Student Communicators

The major goal of Study 2 is to examine whether the similarity-contingency model, when used as a means for understanding communication decisions, would generalize to a

new context: college students in southern California aiming to persuade a local businessman to support Carbon Neutrality. It was hypothesized that level of similarity—operationalized both experimentally and through a self-reported measure—would affect whether students engage in projection or stereotyping while ranking various reasons for a local businessman to endorse Carbon Neutrality in Santa Barbara. I predicted that students who were randomly assigned to the similarity condition (and/or who perceived the local businessman as similar) would engage in greater projection and less stereotyping than those in the dissimilarity condition, and I predicted the converse for students in the dissimilarity condition (and/or low perceived similarity).

Method

Participants and Design

The present study employs a repeated measures design with a between-subjects factor (level of similarity: similar vs. dissimilar). Stereotyping and projection constructs were computed within-participant across items. As in Study 1, a power analysis indicated that 200 participants were needed to obtain a small effect.

200 pro-environmental psychology students were targeted to take part in a study on student perceptions of environmental issues. Students received either 0.5 SONA credit (n = 169) or a $5 Amazon gift card ($n$ = 55) for participating in the 15-minute study. To confirm study eligibility, the following question was included at the end of the survey: "I support Carbon Neutrality in Santa Barbara by 2035" from (1-*Strongly disagree* to 7-*Strongly agree*). To ensure that respondents were sufficiently invested in Study 2's hypothetical persuasion scenario, only the data of those who reported 4 or higher on this item were analyzed. 224 individuals participated in the study, and 62 individuals were excluded for unsatisfactory

responses based on the following criteria: scoring 3 or below on support for Carbon Neutrality (n = 2), making less than 90% progress on the survey (n = 6), completing the survey in less than 5 minutes (n = 49), or completing the survey in more than 120 minutes (n = 2). 4 individuals asked that their data be removed from the study. There was no heterogeneous attrition across experimental conditions.[10] All analyses were run on the remaining 162 participants. Participant demographic characteristics are presented in Table 3.

Table 3

Survey Participant Demographic Characteristics, Study 2 (N = 162)

Participant Characteristic		*n*	%
Gender	Male	46	28
	Female	113	70
	Non-binary	1	1
	Prefer not to answer	2	1
Race / Ethnicity	White / Caucasian	55	34
	Asian	48	30
	Hispanic or Latino/a	40	25
	Multi-racial	11	7
	Black or African-American	4	3
	Middle Eastern or North African	3	2
	Other	1	1
Household Income	Under $15,000	9	6
	$15,001 - $25,000	15	9
	$25,001 - $35,000	14	9
	$35,001 - $50,000	17	11
	$50,001 - $75,000	21	13
	$75,001 - $100,000	30	19
	$100,001 - $150,000	24	15
	Over $150,000	32	20
Political Ideology	Very Liberal	34	21
	Liberal	71	44
	Moderate	36	22
	Conservative	2	1
	Very Conservative	1	1

[10] The association between experimental condition and whether participants were excluded from the study was not statistically significant, $\chi 2(1, N = 219) = 1.62$, $p = .20$.

	Not sure		14	9
	Prefer not to answer		4	3
Political Party Strong	Democrat		52	32
	Not Very Strong Democrat		58	36
	Closer to Democratic Party		24	15
	Neither		14	9
	Closer to Republican Party		5	3
	Not Very Strong Republican		7	4
	Strong Republican		2	1
Participant Characteristic		*Mdn*	*SD*	Range
	Age	19	1.17	18 - 24
	Household income	$50,001 - $75,000		

Procedure

Participants were invited to complete a survey investigating how students at their university view environmental initiatives that may affect Santa Barbara. After consenting to the study requirements, they completed the Qualtrics survey. This study was approved by the Institutional Review Board at UC Santa Barbara.

In the first part of the survey, participants were asked to imagine being paired up with a local businessman and then persuading him, at some point in the future, to provide his public endorsement for Carbon Neutrality. The prompt read:

> The City of Santa Barbara aims to achieve Carbon Neutrality by 2035 and [University] students want to be a part of this movement! In this survey, you will have the chance to voice your support for Carbon Neutrality in Santa Barbara by 2035.
>
> To provide some background, other [University] students wish to help advocate for Carbon Neutrality, and they're trying to secure endorsements (or public declarations of support) from members of the local community. The Community Environmental Council (CEC) is working to pair college students up with local business leaders to have their voices heard.
>
> *In this study, you'll be paired up with Robert, a businessman in downtown Santa Barbara*, and you'll think about how to persuade him to provide his public endorsement for Carbon Neutrality in your shared community.

After reading the prompt, participants were asked to indicate the reasons why they themselves may support Carbon Neutrality by ranking eight reasons in order of personal importance. Following the self-ratings, participants were asked to rank those same eight reasons in order of how likely they would be to persuade the typical Santa Barbara businessman to support Carbon Neutrality. They were told,

> People care about the environment for different reasons. Now, we want your view on how convinced you think *the typical Santa Barbara businessman* would be by each of these reasons to publicly support Carbon Neutrality. We realize you don't have a lot of information to go on, but tell us your views as best you can.

Next, participants received the similarity manipulation, where they filled out the same six "get-to-know-you" questions as they did in Study 1 and then found out that their partner Robert, the local businessman they are trying to persuade to support Carbon Neutrality, either shared or did not share their responses on three of those questions.

After the similarity manipulation, participants were asked to rank the same eight reasons according to how likely they would be to persuade Robert to provide his endorsement for Carbon Neutrality in Santa Barbara. Next, participants answered three questions which assessed how similar they perceived themselves to be to Robert and then indicated their level of support for Carbon Neutrality in Santa Barbara by 2035.

Finally, participants completed demographic measures and were debriefed.

Measures and Materials

Independent Variable: Experimental Condition (Similarity vs. Dissimilarity). The same method as in Study 1 was used to manipulate similarity or dissimilarity. First, participants filled out six "get-to-know" you questions about their hobbies and interests. Participants were then told about their partner Robert, a local businessman that they are asking to sign on as a supporter to the Carbon Neutrality initiative, who supposedly filled out

these questions in advance. Using customized display logic in Qualtrics which generated a unique page depending on each participant's responses to the cue questions, those in the similarity condition were shown that Robert shared their responses on three of the questions, whereas those in the dissimilarity condition were shown that Robert did not share their responses on three of the questions.

Self-Reported Similarity. Participants' perceived similarity to Robert was assessed via two self-report items: "I'm similar to Robert" from 1 (*Strongly disagree*) to 7 (*Strongly agree*) and "I believe I have a lot in common with Robert" from 1 (*Not at all*) to 7 (*Definitely*). These two items were highly intercorrelated (r = .71) and thus were averaged into a composite measure of perceived similarity (M = 3.36, SD = 1.13, α = .82).

Pretest: Persuasive Arguments for Supporting Environmental Policy. In the survey, participants were asked to evaluate eight different persuasive arguments for supporting Carbon Neutrality in Santa Barbara. To generate these arguments, a team of three research assistants and the principal investigator searched Santa Barbara news media (e.g., Community Environmental Council Santa Barbara (CECSB).org; SantaBarbaraCA.gov) for the most common reasons articulated for supporting Carbon Neutrality locally, with the aim of presenting a variety of reasons in the survey that would appeal to both local university students and to the stereotypical Santa Barbara businessman. The following four statements were crafted to appeal to reasons that a typical local student may have for supporting Carbon Neutrality: "It will bring forward-thinking companies and purpose-driven careers to the Santa Barbara area because a net-zero emissions future will create a huge need for jobs."; "It will greatly reduce monthly utility bills for residents and make Santa Barbara a more affordable place to live."; "It will improve our air quality, which will prevent thousands of future lives

lost due to respiratory disease and other illnesses."; and, "It will help to combat social inequality by reducing the negative impacts of climate change on low-income communities." These relate to biospheric, social justice, and professional development-related motives for supporting Carbon Neutrality (i.e., values identified as important to students in both the university's mission statement (General Catalog, 2015) and in focus groups with undergraduate research assistants (N = 7)).

Alternatively, the following three statements, connected to financial motives, were crafted to appeal to reasons that a typical businessman may have for supporting Carbon Neutrality: "It will quickly increase Santa Barbara's prestige by making it the example in green energy for other communities to follow."; "It will reduce the negative effects of climate change on Santa Barbara's local economy, which relies on fisheries, tourism, and recreation."; and "It will prevent millions of dollars in damage to the community and local businesses, as we saw in the aftermath of the Thomas Fire and Montecito mudslides, from future climate-change related disasters." These types of values were articulated on Santa Barbara city websites (e.g., SantaBarbaraCA.gov) and thus are representative of local concerns.

The remaining item was thought to appeal to both groups: "It will be a crucial step in mitigating the climate crisis that we have caused and therefore have the responsibility to solve."

Within-Subjects Variable: Basis of Persuasion (Projection vs. Stereotyping). Measures of projection and stereotyping were computed for each participant using their rankings across the eight arguments for supporting Carbon Neutrality in Santa Barbara for the target Robert, for themselves, and for the typical business owner. Participants were asked

to rank, using drag and drop, the eight arguments generated above in order of personal importance from 1 (*highest, most important*) to 8 (*lowest, least important*). They were also asked to indicate how likely each of the eight arguments would be to persuade a) the typical Santa Barbara businessman and b) their partner Robert to support Carbon Neutrality in Santa Barbara from 1 (*highest, most persuasive*) to 8 (*lowest, least persuasive*). After data collection, all items were reverse coded such that higher scores reflected greater personal importance and perceived persuasiveness of the arguments, respectively.

Results

Manipulation Check

86 participants were randomly assigned to the similarity condition and 76 to the dissimilarity condition. As expected, participants in the similarity condition reported greater similarity to Robert ($M = 3.74$, $SD = 1.95$) than those in the dissimilarity condition ($M = 2.92$, $SD = 1.06$), $t(160) = -4.95$, $p < .0001$, 95% CI [-1.15, -0.49].

Variability in Responses to Cue Questions

Participants' own responses to the cue questions revealed expected levels of variance in the participant population: 43% indicated preferring relaxing to adventurous vacations, 53% indicated enjoying scary movies, and 41% indicated preferring camping to staying in and watching TV shows.

Variation in Rankings for Persuasive Arguments

As expected, pro-environmental college student participants viewed the environmentally framed arguments for supporting Carbon Neutrality in Santa Barbara as most important for themselves, ranking reasons 4 and 7 as most personally important on average (see Table 4). They were also concerned about Santa Barbara's local commerce,

rating reason 5 as third most important personally. Conversely, they viewed the financially framed arguments as being most persuasive for both the typical business owner and for Robert, ranking reasons 8, 1, and 5 as most persuasive to the stereotype and to Robert on average.

Table 4

Descriptive Statistics for Persuasive Argument Rankings (M (SD))

Reasons to Support Carbon Neutrality in Santa Barbara	For self	For typical business owner	For Robert
1. It will bring forward-thinking companies and purpose-driven careers to the Santa Barbara area because a net-zero emissions future will create a huge need for jobs.	3.22 (*1.57*)	6.50 (*1.52*)	5.32 (*1.98*)
2. It will greatly reduce monthly utility bills for residents and make Santa Barbara a more affordable place to live.	3.67 (*1.96*)	4.31 (*1.86*)	4.31 (*2.08*)
3. It will quickly increase Santa Barbara's prestige by making it the example in green energy for other communities to follow.	1.99 (*1.61*)	4.93 (*1.70*)	3.93 (*2.00*)
4. It will be a crucial step in mitigating the climate crisis that we have caused and therefore have the responsibility to solve.	6.72 (*2.00*)	2.40 (*1.58*)	3.16 (*2.07*)
5. It will reduce the negative effects of climate change on Santa Barbara's local economy, which relies on fisheries, tourism, and recreation.	4.99 (*1.85*)	5.56 (*1.65*)	5.67 (*2.01*)
6. It will help to combat social inequality by reducing the negative impacts of climate change on low-income communities.	4.91 (*1.95*)	2.36 (*1.36*)	2.51 (*1.62*)
7. It will improve our air quality, which will prevent thousands of future lives lost due to respiratory disease and other illnesses.	5.91 (*1.72*)	3.06 (*1.53*)	4.88 (*2.10*)
8. It will prevent millions of dollars in damage to the community and local businesses, as we saw in the aftermath of the Thomas fire and Montecito mudslides, from future climate change related disasters.	4.60 (*1.76*)	6.88 (*1.39*)	6.22 (*1.82*)

Calculation of Projection and Stereotyping Constructs

The same method as in Study 1 was used to calculate measures of projection and stereotyping. For each reason to support Carbon Neutrality for each participant, a multiple regression predicting target responses with self-responses and typical Santa Barbara businessman responses was computed. The standardized beta weights were then used as measures of projection (the self-response beta; $M = 0.16$, $SD = 0.44$) and stereotyping (the typical businessman response beta; $M = 0.52$, $SD = 0.45$).

Analytic Plan

As in Study 1, the standardized betas of projection and stereotyping were treated as the dependent variable that was analyzed through two 2 x 2 ANOVAs (testing both operationalizations of similarity) with one between-subjects variable (similarity level: similar vs. dissimilar) and the within-subjects variable (basis of persuasion: projection vs. stereotyping). The primary test was the mixed-model ANOVA which examined main effects and the interaction, which was followed up with planned comparisons to examine projection and stereotyping separately using Tukey post-hoc within the overall models.

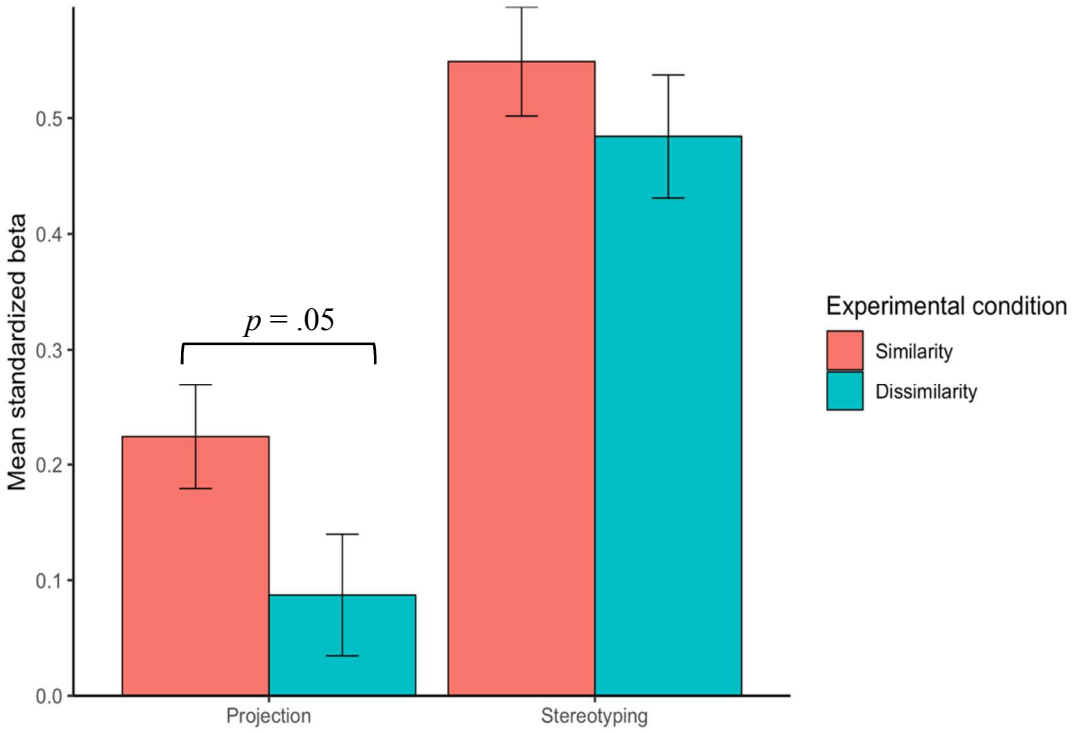
Effects of Experimental Condition on Projection and Stereotyping

A two-way mixed ANOVA was conducted to examine the effects of experimental condition (similarity vs. dissimilarity), basis of persuasion (projection vs. stereotyping), and their interaction on projection and stereotyping scores. First, there was a main effect of experimental condition on projection and stereotyping scores, $F(1,160) = 3.95$, $p = .05$: collapsing across both levels of the basis of persuasion factor, participants in the similarity condition had higher standardized beta scores overall ($M = 0.39$, $SD = 0.46$) than participants in the dissimilarity condition ($M = 0.29$, $SD = 0.50$). Second, there was a main effect of basis

of persuasion on projection and stereotyping scores, $F(1,160) = 56.44$, $p < .0001$: overall, participants stereotyped more ($M = 0.52$, $SD = 0.49$) than they projected ($M = 0.16$, $SD = 0.44$). Testing the main hypothesis, there was no significant interaction between experimental condition and basis of persuasion on projection and stereotyping scores, $F(1,160) = 0.57$, $p = .45$. Although the interaction was not significant, focused t-tests were nevertheless conducted to examine the prediction that projection would be higher in the similarity than in the dissimilarity condition, whereas stereotyping would be higher in the dissimilarity than in the similarity condition. As predicted, participants in the similarity condition engaged in significantly greater projection ($M = 0.22$, $SD = 0.41$) than those in the dissimilarity condition ($M = 0.09$, $SD = 0.46$), $t(160) = 1.97$, $p = .05$ (though, with a p of .05, this should be interpreted with caution). However, stereotyping scores did not significantly differ across experimental conditions, $p = .36$. See Figure 6 (next page) for a visual representation of these effects.

Figure 6

Projection and Stereotyping as a function of Experimental Condition



Effects of Self-Reported Similarity on Projection and Stereotyping

To supplement the primary analysis which tested the effect of manipulated similarity on projection and stereotyping, a secondary analysis was conducted treating the measure of self-reported similarity as a quasi-independent variable. First, a dichotomization was performed to categorize respondents as either low or high in perceived similarity to Robert (M = 3.36, range = 1 to 6; scores 1 through 3.5 were categorized as "Dissimilar"; scores 4 (those who reported Neutral) were excluded; scores 4.5 through 6 were categorized as "Similar". While the method of dichotomization was utilized to simplify interpretation and presentation of results by enabling comparison of groups of individuals with high or low values of perceived similarity, it should be acknowledged that there can be negative

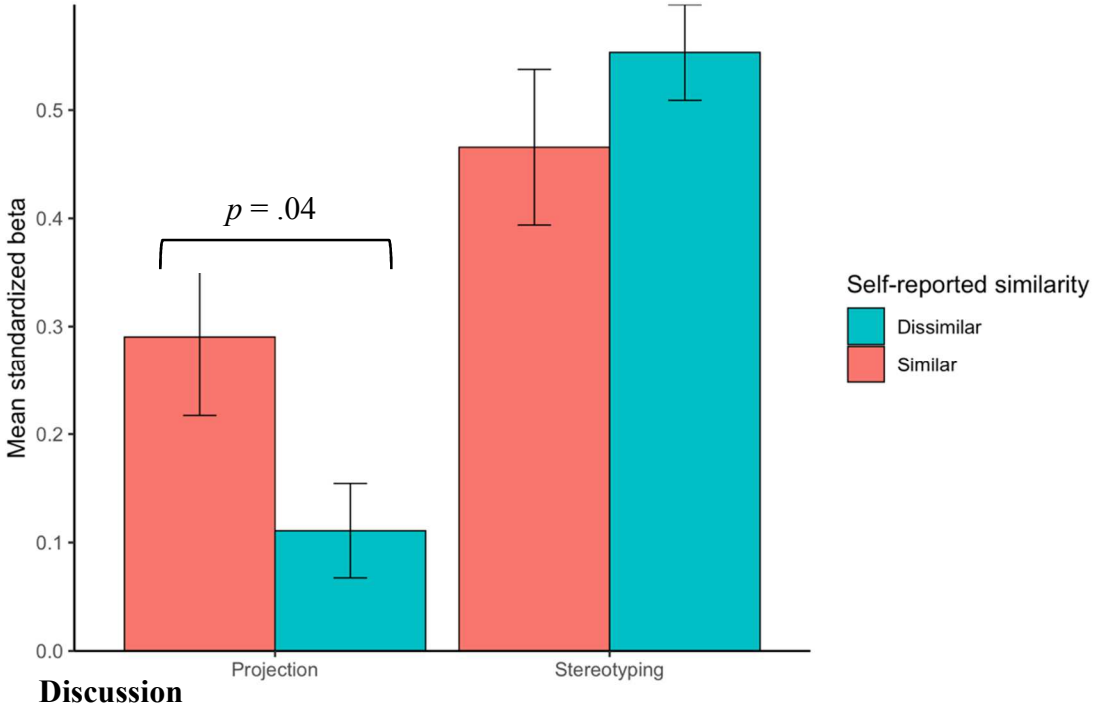
consequences from dichotomizing continuous predictors (MacCallum et al., 2002; Royston et al., 2006). The most obvious disadvantage of dichotomizing is loss of information about individual differences, but others include loss of effect size and power in bivariate relationships; increased probability of false positive results; increased risk of missing non-linear relationships; and loss of measurement reliability (MacCallum et al., 2002; Royston et al., 2006).

Next, a two-way mixed ANOVA was conducted to examine the effects of self-reported similarity (similar vs. dissimilar), the within-subjects factor (basis of persuasion), and their interaction on participants' levels of projection and stereotyping. There was no main effect of self-reported similarity on projection and stereotyping, $F(1,137) = 0.54$, $p = .46$. As noted in the first analysis, there was a significant main effect of basis of persuasion, $p < .0001$, where overall, participants stereotyped more than they projected. To test the main hypothesis, there was a significant interaction between self-reported similarity and the repeated-measures factor, $F(1,137) = 5.36$, $p = .02$. This was a small effect, $\eta 2 = .02$.[11] Next, focused contrasts indicated that participants high in perceived similarity to Robert projected significantly more ($M = 0.29$, $SD = 0.44$) than those low in perceived similarity ($M = 0.11$, $SD = 0.44$), $t(137) = 2.11$, $p = .04$. However, there were no significant differences in stereotyping between participants who perceived Robert as similar or dissimilar, $p = .30$. See Figure 7 for a visual representation.

Figure 7

[11] As a robustness check, the correlations between perceived similarity as a continuous measure and the betas of projection and stereotyping, respectively, were examined. The relationships between perceived similarity and projection ($r = .19$, $p = .03$) and between perceived similarity and stereotyping ($r = -.14$, $p = .11$) were consistent with predictions from the similarity-contingency model and the relationships observed by Ames (2004a).

Projection and Stereotyping as a function of Perceived Similarity



Discussion

Study 2 tested my predictions within the context of college students preparing to convince a businessman to support a pro-environmental initiative in their city. Study 2 built upon Study 1 in several ways. First, while Study 1 assessed the effects of similarity on communication strategy through an experimental manipulation, Study 2 added a secondary measure of self-reported similarity to bolster any effects observed from the experimental manipulation on projection and stereotyping. Second, it tested if my proposed hypotheses would generalize to explain communication decisions in a sample of untrained, rather than trained, communicators, college students instead of activists. Essentially, Study 1 investigated the experienced communicator while Study 2 investigated the layperson.

Moreover, Study 2's sample had greater variability than Study 1's in terms of both their racial composition (they were majority (66%) non-white) and their responses to the cue questions. This means that while both studies employed the same experimental paradigm, the

manipulation was likely more effective in Study 2 at producing the desired level of variability in perceived similarity to Robert between experimental conditions.

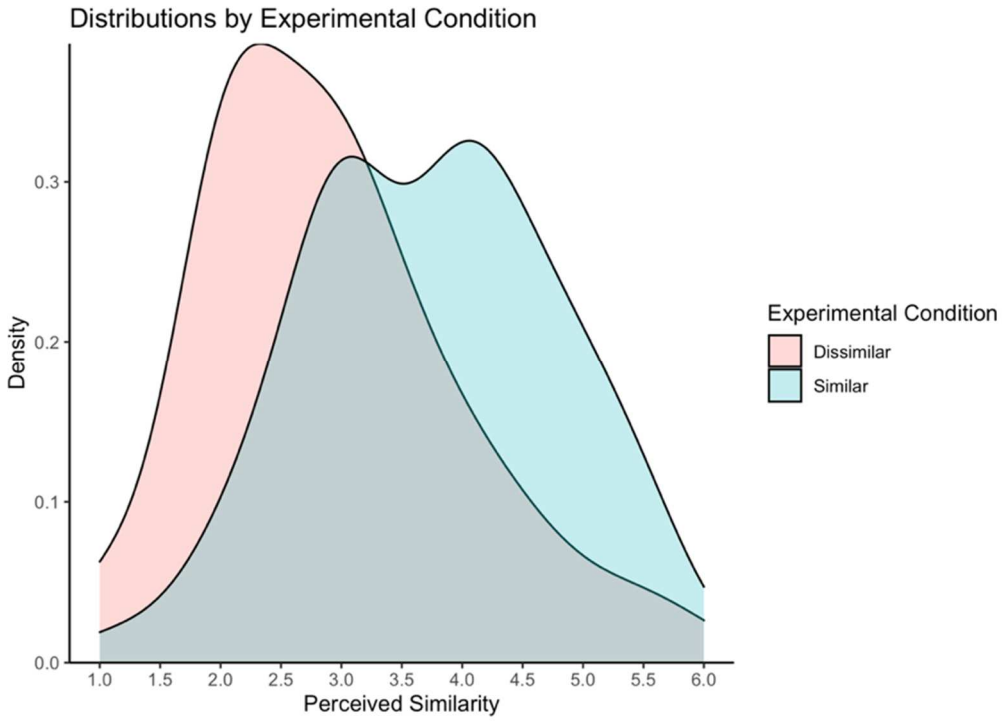
Across the two operationalizations of similarity, results of Study 2 did not provide convincing evidence to suggest that the similarity-contingency model predicts communicative decisions. First, a test of the central hypothesis revealed that there was no significant interaction between experimental condition and basis of persuasion on participants' standardized beta scores. Although focused t-tests within the ANOVA model indicated that there was a significant contrast within the projection level of the basis of persuasion factor - such that participants in the similarity condition projected more than those in the dissimilarity condition - this effect was only marginal ($p = .05$), and there was no significant contrast for stereotyping. When examining perceived similarity, the results again were inconclusive: while there was a significant interaction between perceived similarity and basis of persuasion on participants' standardized beta scores, the contrast for projection between the low versus high similarity levels was only marginally significant ($p = .04$), and there was no significant contrast for stereotyping.

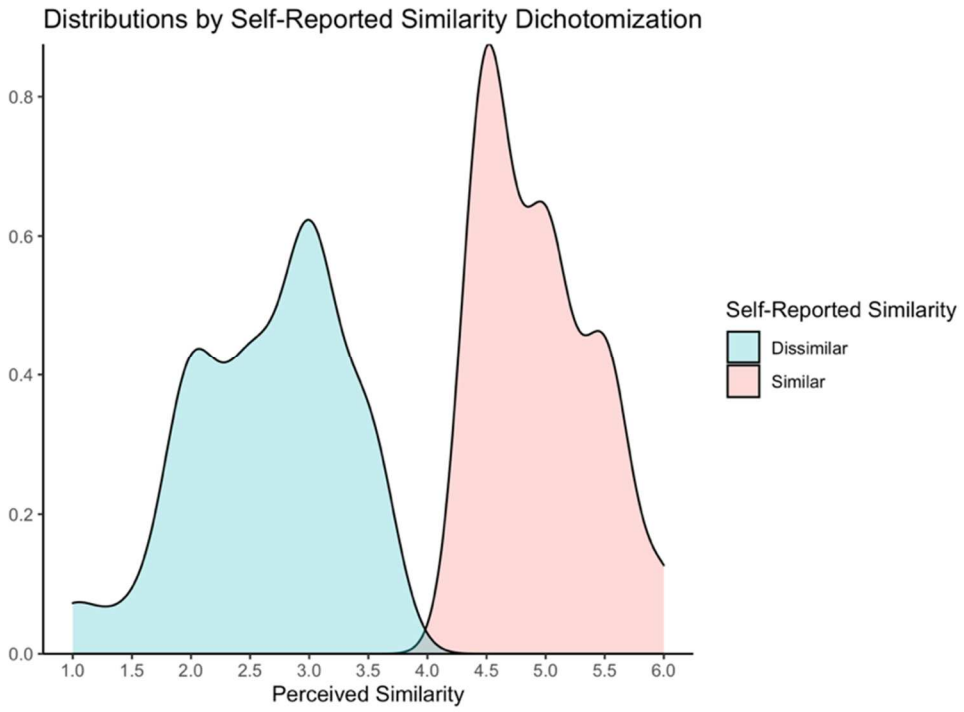
Further, the findings observed after testing my model using the measured operationalization of similarity were more robust than after testing it using the manipulated operationalization: that is, the interaction between perceived similarity and the repeated measures factor on participants' beta scores was significant, while the interaction between experimental condition and the repeated measures factor on scores was not. A potential explanation for this is that the measure of perceived similarity enabled a more direct test of the similarity-contingency model: while the experimental cues in Study 2 functioned as intended, leading to significant differences in perceived similarity between experimental

groups, it is possible that there were individuals in the similarity condition who felt dissimilar to Robert (and individuals in the dissimilarity condition who felt similar to Robert). Dichotomizing perceived similarity provided more certainty that the individuals in the low and high groups would perceive Robert as similar versus dissimilar, respectively, thus increasing the strength of the independent variable. Bolstering this claim through data visualization, there exists great overlap in the distributions of perceived similarity by experimental condition; however, after dichotomizing, the distributions of perceived similarity are more likely to reflect groups from two different populations.

Figure 8

Density Plots to Show Differences in Distributions of Perceived Similarity





Finally, participants displayed a strong general pattern of stereotyping, consistent with Study 1: collapsing across similarity conditions and levels of self-reported similarity, the basis of persuasion factor had a significant main effect on participants' standardized beta scores, as overall, participants stereotyped more than they projected when evaluating arguments for Robert.

As in Study 1, experimental power in Study 2 was reduced because there was more attrition than anticipated. While 200 participants were indicated by the *a priori* power analysis to be needed, the final sample size for analyses after data cleaning was $N = 162$, as more respondents failed the quality control checks for their data than were expected to. Knowing that power was reduced and that Study 2's results were marginally significant, the conclusions that one can draw from these findings before collecting additional data are compromised.

Self-selection bias and limits to external validity are also present in Study 2. While the demographics of the current sample are comparable to the larger population of students at this university in terms of age (both median of 19 years old) and race/ethnicity (e.g., 34% White, 30% Asian, 25% Hispanic or Latino/a in the current sample vs. 35 % White, 29% Asian/Pacific Islander, 28% Chicano/Latino in the larger population), the individuals who participated in this study were more likely to identify as female (70%, as compared to 53% of undergraduates at the university). Further, while Study 2's participants were recruited from the psychology department's research subject pool, only 10% of undergraduate students at the university are psychology majors. Taken together, the ability for the results of Study 2 to generalize to other undergraduates at this university are questionable.

General Discussion

Persuading another person that they should do something—whether it is to change their attitude, take a public stance on a social issue, or enact a certain behavior—is a uniquely complex challenge. While much is known about what elements of a message will make it more persuasive to a target audience (e.g., Hovland et al., 1953; Petty & Cacioppo, 1986; Petty & Wegener, 1998), little research exists about the mindset of a communicator as they formulate a persuasive argument, and how their strategy may be influenced by incidental cues such as the similarity of their audience on attributes that are unrelated to the argument's domain. Understanding how perceived similarity of a message recipient can bias a speaker's strategy provides a more rounded approach to the study of persuasion by elucidating the factors which may change the argument itself. Using the focal example of communicators aiming to convince a local business owner as to the importance of sponsoring pro-environmental policy, I examined how social categorization affects individuals' decision-

making about persuasive messages. The present research tested the hypothesis that when communicators have more in common with an ambiguous target, they project, or anchor on their *own attitudes*, to determine which arguments would be most likely to persuade their target to support a pro-environmental initiative. Alternatively, when communicators have less in common with a target, they stereotype, or anchor on what they perceive to be the attitudes of the *typical member of their target's group*, to determine which arguments would be most likely to persuade their target to support a pro-environmental initiative.

In Study 1, I sought to examine how manipulated similarity affects the argument strategy of trained communicators: activists who are experts on the economics of climate change policy. There was no significant interaction between experimental condition (similarity vs. dissimilarity) and the repeated-measures factor (basis of persuasion: projection vs. stereotyping) on activists' levels of projection or stereotyping. In Study 2, I made a methodological change by including a second operationalization of similarity: a self-reported measure. I also tested whether my predictions would generalize to a sample of untrained communicators: college students at a public university in southern California. In Study 2, there was no significant interaction between experimental condition and basis of persuasion on participants' standardized beta scores. However, there was a significant contrast within the ANOVA model when comparing projection scores across experimental conditions: participants in the similarity condition projected more than those in the dissimilarity condition. When examining self-reported similarity, the results were more supportive of the central hypothesis, though they, too, should be interpreted cautiously. There was a significant interaction between perceived similarity (similar vs. dissimilar) and basis of persuasion on participants' beta scores, and furthermore, participants who perceived the message target as

similar projected significantly more than participants who perceived the message target as dissimilar. However, there were no significant differences in stereotyping scores for people who perceived themselves as similar versus dissimilar to the target of persuasion. In both studies, there was a pronounced main effect of basis of persuasion on participants' beta scores: when environmentalists in Studies 1 and 2 made estimates about the persuasiveness of various arguments for a businessman, they stereotyped more than they projected.

Comparison of Studies 1 and 2

Taken together, this pattern of results only weakly supports the proposed theoretical model. In both studies, the experimental manipulation did not interact with the repeated-measures factor on projection and stereotyping. In Study 2, while effects were marginal across the two analyses conducted, the results were more consistent with my initial predictions than they were in Study 1: both the primary analysis with experimentally manipulated similarity and the secondary analysis with self-reported similarity revealed a significant contrast within the projection level of the basis of persuasion factor, such that participants who were higher in similarity to Robert projected more than those who were lower in similarity.

Conceptual Differences Between Samples

Level of Experience. One potential reason for the discrepant findings in Studies 1 and 2 is that conceptual differences exist between trained and novice communicators, and these differences may have influenced results. Study 1 was conducted on activist communicators with formal training through their organization. At this organization, new volunteers are directed to online "Core Volunteer Trainings" where relevant topics include "Grassroots Outreach Basics," "Engaging Community Leaders," "Communicating with

Conservatives," and "Communicating with Progressives." Through these video-based workshops, activists receive extensive preparation on argument strategy, learning how important it is to educate oneself on the topic of the argument, to know one's audience and understand their values, to practice anticipating key questions and challenging situations, and to practice explaining one's message in terms of benefits to the audience. Moreover, activists reinforce their newfound knowledge by interacting with other volunteers about the training content in online forums, where they are encouraged to discuss the strategies that they have so far found effective when conveying these messages to different leaders in their network.

In this way, these activists are well-equipped to form arguments that directly target the values of their specific audience and have already anticipated some of the challenging situations that may arise. Further, they are practiced in communicating with business owners as a specific sub-group and have been provided with example arguments that they could leverage to emphasize the economic benefits of the Energy Innovation & Carbon Dividend Act. When reflecting upon how participants in Study 1 responded to the similarity manipulation, their training may have prepared them to deflect the incidental cues that were manipulated and to stay focused on what is important to emphasize in an argument for a businessperson.

In contrast, novice communicators in Study 2 may have been more likely to behave in a way that was consistent with my predictions of how people make choices when they are interacting with someone who is similar or dissimilar to them. In new and uncertain situations, people are more likely to rely on heuristics to guide their behavior (e.g., Mousavi & Gigenzer, 2014). As individuals who had no prior training in how to construct a persuasive environmental strategy, perhaps the best strategy that they were able to use was to rely on

perceived similarity to deduce the attitudes and/or priorities of a person who is similar versus different to them (Ames, 2004a; 2004b) and then construct their persuasive arguments based on those inferences.

Demographics and Responses to Cue Questions. Still, several other differences existed between the samples with potential to affect the outcome of the experiment. In Study 1, participants were majority (96%) white, male (60%), and were an older group of individuals (median age = 66 years), while in Study 2, participants were majority (66%) non-white, female (70%), and their median age was 19 years. These demographic differences may have influenced results because the similarity manipulation seemed to have a greater impact on people who began as more different from the target of persuasion initially (as shown in the analysis with the subgroup of liberals in Study 1). In Study 1, the subjects (mostly older white males) may have perceived themselves as having more in common with Robert—as the name Robert likely signaled that the target is white (e.g., Bertrand & Mullainathan, 2004) and it was told to participants that he was in his 40s (i.e., being closer in age to the average activist than to the average Study 2 college student participant)—thereby reducing the impact that the similarity manipulation may have had on them.

Moreover, in Study 1, most activists responded similarly to the experimental cue questions, which may have diminished the experiment's ability to induce differences in perceived similarity to Robert. In Study 2, there was greater variability in subjects' responses to the cue questions, which may explain why the similarity manipulation was ultimately more capable of inducing differences in subjects' levels of projection.

Methodological Issues and Limitations

Additionally, Study 1 was limited in that it did not contain a self-reported measure of perceived similarity, which would have enabled both a) conducting a robustness check of the theoretical model using a secondary operationalization of similarity and b) conducting a manipulation check to provide greater clarity as to why the experiment was not effective. In Study 2, a measure of self-reported similarity was included, and indeed, the results with this measure provided stronger support for the similarity-contingency model than with the analysis of experimentally manipulated similarity. However, perceived similarity scores were dichotomized, a methodology which contains its own set of limitations (MacCallum et al., 2002; Royston et al., 2006).

While both studies utilized the same experimental manipulation, it contained several shortcomings: two of the cue questions may have communicated information about Robert being outdoorsy, which may have signaled that he would be more persuaded by environmentally framed reasons over commerce framed reasons (Bashir et al., 2013). This may have biased results because it is possible that communicators selected environmental arguments for Robert because they were influenced by the cue questions, rather than because they felt similar to Robert and subsequently engaged in projection. As mentioned previously, experimental power was reduced in both studies, as fewer participants were included in the final sample than were indicated to be necessary by the power analysis because there was more attrition than anticipated. With several of the analyses in Study 2 yielding marginal effects, the conclusions one can draw from them before collecting additional data are limited.

Stereotyping in Persuasive Communication

Yet, what remained persistent across both studies and is worthy of discussion was a clear pattern of stereotyping. In both studies where environmentalists made estimates about

the persuasiveness of various arguments for a businessman, collapsed across similarity conditions (or naturalistic similarity proxies, levels of perceived similarity), the standardized betas for stereotyping (*M*'s = 0.53 and 0.52 for Studies 1 and 2) were significantly higher than the standardized betas for projection (*M*'s = 0.09 and 0.16). This result does not necessarily contradict the similarity-contingency model, which acknowledges the importance of group membership in explaining the strategies perceivers take to infer their target's mental states (lending support to prior models of social categorization and false consensus; Clement & Krueger, 2002). Further, the strong pattern of stereotyping is consistent with prior work on mental state inference, where more distant social categories seemed to invoke less projection and more stereotyping. Specifically, undergraduate student participants projected more when making estimates for other undergraduates than when making estimates for MBA students and suburban adolescents; likewise, they stereotyped less when making estimates for other undergraduates than MBA students and adolescents (Ames, 2004a).

Yet, the similarity-contingency model argues that perceived similarity should mediate some or all the effects of social categorization on projection (Ames, 2004a; 2004b), and in prior work, perceived similarity did account for a large share of individual differences in projection and stereotyping for both in-groups and outgroups (Ames, 2004a). While the patterns of means in the present studies also indicated that there were minor differences in projection and stereotyping between levels of perceived similarity or between similarity conditions in Study 2, they were negligible compared to communicators' overwhelming tendency to stereotype. This implies that, in the absence of other knowledge about a message target (such as their prior attitudes about an issue, or in-real-life behavioral cues like facial

expressions), communicators view stereotyping as an accurate heuristic for determining which arguments they should employ to persuade another person to take an action.

However, message targets from the communicators' ingroups that were likely to be salient within the study context (e.g., fellow activists or college students) were not included in the present research for comparison. Future research involving targets of persuasion from both communicators' in-groups and out-groups is needed to investigate whether it is the default mode for communicators to engage in stereotyping as a persuasive strategy, or if they employ this strategy only if the target of persuasion is of a sufficiently distant social category. Furthermore, as results from the present work are inconclusive, it is still possible that that similarity-contingency model can serve as a framework for understanding communication decisions following study replications with greater experimental power and a more robust similarity manipulation. In the domain of communication, future research is needed to investigate the contribution that perceived similarity—in conjunction with group categorization—may have on communicators' inferential processes as they evaluate persuasive messages for both in-group and out-group members.

Reconciling Findings with Research on Moral Reframing. Findings of my research—that environmentalist communicators displayed a strong general pattern of *stereotyping*—directly conflict with the prior research on morality and environmental attitudes, which has theorized that projection is a significant barrier to successful pro-environmental communication (Feinberg & Willer, 2013, 2019).

A closer examination of Feinberg and Willer's work may help to resolve the dissonance between the present findings and the earlier theorizing. Feinberg and Willer (2013) posited that people may not use morally reframed arguments for several reasons.

First, people may experience their moral convictions as objective truths about the world (Skitka et al., 2005), making it difficult to recognize that there are also other "truths" people believe in (Ditto & Koleva, 2011; Kovacheff et al., 2018). Second, people may know how to craft morally reframed messages but refuse to do so on principle, as making arguments that appeal to moral values that one does not strongly endorse may feel unethical (Tetlock, 2003). Third, people might be averse to morally reframing arguments because they do not want to reinforce values they disagree with (Lakoff, 2004). Taken together, these predictions suggest that communicators are somewhat egocentric, believing that message recipients should find the same arguments convincing as they themselves do.

Yet, in studies conducted to test why so many communicators do not take advantage of the benefits of moral reframing, the results suggest that projection may not emerge as the barrier as previously thought. When asked to write arguments aimed at persuading their political counterparts, it was indeed shown that fewer than 10% of liberal or conservative participants wrote morally reframed appeals, despite being offered a cash prize for doing so (Feinberg & Willer, 2015). However, when investigating why most of those individuals did not use moral reframing, the data were surprising. When asked directly to identify whether a typical argument or a morally reframed argument would be more persuasive to an individual from the opposite political group, a majority of both liberal and conservative participants selected the morally reframed argument (Feinberg & Willer, 2015). Even though they did not spontaneously employ those arguments, this finding suggests that subjects were able to recognize the persuasive appeal of the morally reframed arguments. Furthermore, when subjects were given the specific task of choosing an argument to utilize to persuade a member of the rival political group, a majority of both liberal and conservative participants

chose to send the morally reframed argument, suggesting that *people are not unwilling to use the arguments on principle* (Feinberg & Willer, 2015).

Thus, as communicators did tend to recognize the persuasive power of morally reframed arguments, Feinberg and Willer's (2015) findings suggest that projection may not be the primary barrier to their usage, thus converging more closely to the present work. More likely, the reasons why so few communicators employ moral reframing, posit Feinberg and Willer (2015), are that a) people do not think to use the reframed arguments or b) they do not know how to use them (rather than being opposed to using them on principle). However, future work is needed to clarify why so few people use morally reframed arguments. Moreover, the difference in methods between the moral reframing research and the present two studies makes it difficult to make strong claims that would completely dismiss projection as a barrier to persuasive communication.

Reflecting upon the methods employed in the present two studies, it is now more evident why projection was not so prevalent. In both studies, instead of being asked to spontaneously generate an argument for a businessman, communicators were *directly asked which arguments they thought would be persuasive*, and consistent with Feinberg and Willer (2015), they chose the argument that targeted the values of their target's stereotypical group member (i.e., a reframed argument). This reinforces the idea that projection may be more likely to emerge when communicators are asked to *spontaneously generate arguments* but are not directly provided with arguments that they can compare against one another. Further, in the present work, with an elaborate introduction preceding the main dependent variable (i.e., the story that participants would be meeting with a local businessman and trying to persuade him to support a pro-environmental initiative), communicators were specifically

primed with the goal of being persuasive (as compared to simply being asked to generate an argument that another person would read). Fostering a persuasion-focused mindset may have influenced participants' subsequent argument choices through goal priming mechanisms such as greater cognitive accessibility (Förster et al., 2007).

Broader Theoretical Contributions

Besides illustrating a strong general pattern of stereotyping among persuasive communicators, this research makes broader theoretical contributions to the study of social categorization and communication by providing new tools and ways of operationalizing communicative changes, and by applying a model of mental state inference to the study of communication.

Social Categorization and Communication

To begin, the similarity-contingency model newly applies a theory of mental state inference to the study of communication. While research on common ground suggests that speakers try to make inferences about the listener's level of knowledge about a topic or familiarity with different referring expressions (e.g., Fussell & Kraus, 1992; Isaacs & Clark, 1987), the present work suggests that communicators who specifically have the intent of changing their target's attitude or behaviors (i.e., *persuasive* communicators) need to make inferences about their target's values and beliefs as a precursor to developing an argument that would compel them to agree with the communication or to take action. Furthermore, the similarity-contingency model offers a new way of operationalizing communicative changes in response to social categorization: through standardized betas which represent the degree to which communicators employed either projection or stereotyping as persuasive strategies. By examining the strength of the relationship between the arguments that the speaker chooses

for themselves and for the target (i.e., projection) and between the arguments that the speaker chooses for the stereotypical group member and for the target (i.e., stereotyping), one can see both the persuasive strategy that communicator employed and the consequent argument that resulted.

Therefore, the present research contributes to the larger body of work on how social categorization affects communication. One of the most prominent perspectives on this subject—Communication Accommodation Theory (CAT) (Giles et al., 1991; Giles et al., 1987; Giles & Ogay, 2007; Giles & Smith, 1979; Giles et al., 1973)—is focused on understanding the linguistic adaptations speakers make in interactions, and how these vary depending on relational and social identity motives. Another framework for understanding social categorization's role in communication is through research on common ground (Clark & Brennan, 1991; Clark & Carlson, 1982; Clark & Marshall, 1981). The process of establishing mutual knowledge in conversation is thought to be essential to communication, and one of the ways that speakers determine the extent of common ground they share with the listener is to make assumptions about their listener's cultural and personal background (e.g., Fussell & Krauss, 1994, Schwarz, 2014).

Previous research through the frameworks of CAT and grounding have primarily operationalized communicative changes by examining individuals' speech patterns. For example, research on linguistic accommodation has studied the linguistic patterns of dyads who differ in socioeconomic status, examining when speakers accommodate their speech rate and/or accent to the listener's (Thakerar et al., 1982). In research on grounding, studies have examined how the amount of information the communicator provides in a referring expression may vary depending on their perceptions of common knowledge with the listener

(Fussell & Krauss, 1992). Demonstrated through the present work, the similarity-contingency model (Ames 2004a; 2004b) offers a new perspective and set of tools to the study of how social judgement affects communication.

Rethinking the Persuasion Challenge: Climate Change and Future Directions

Climate change is a domain in which studying persuasive communication is especially important. From an applied perspective, climate change is an urgent issue which requires drastic collective action within the next few years (IPCC, 2021). To encourage actions to mitigate climate change, clear and persuasive communication is vital (Moser, 2010). From a theoretical perspective, communication about climate change is an ideal example to examine persuasive intent and explicit communication strategies concerning a socially relevant and contentious issue. By studying two different samples of pro-environmental communicators, this research illuminated how individuals who were highly invested in the outcome of their argument[12] may be affected by incidental cues. Further, it enabled simulating two realistic paradigms where the pro-environmental arguments were specifically tailored to sound authentic to the two different samples. In sum, this focal example enabled studying how enthusiastic communicators in a realistic setting would respond to similarity cues.

This research provides a deeper perspective to the study of climate change communication by studying persuasion from the communicator's side (following work by Sherman et al., 2021). Prior work on climate change communication has studied how different types of message framing affects people's pro-environmental support (Bertolotti &

[12] Study 1 targeted activist communicators who volunteer their time to fight climate change; Study 2 targeted pro-environmental college students who supported Carbon Neutrality in Santa Barbara.

Catellani, 2014; Davis, 1995; Zaval et al., 2015), yet research is limited about the mindset of communicators themselves. Knowing what can bias the persuasive argument is an important step in ensuring that climate change communications are directly designed to change behavior.

While it was not within the scope of the current work, a key point worth noting is that, while results from Studies 1 and 2 enhance knowledge of how communicators' persuasive message strategy can be biased by the similarity of their target, it is not possible to determine which of these strategies—projection or stereotyping—would be more *effective* at changing a target's behavior following a persuasive exchange. Future work is needed to determine the conditions under which projection or stereotyping are more effective strategies towards persuasive communication. To directly follow up on these two studies, a between-subjects experiment on a sample of businessmen could inform whether businessmen find an argument based off environmentalist communicators' most highly rated personal arguments (i.e., a projected argument) versus their most highly rated arguments for the typical businessman (i.e., a stereotyped argument) more persuasive. Background characteristics of the businessman should be assessed to examine if the degree to which the message target matches the stereotype of their group moderates the extent to which they prefer the stereotypical argument. While the materials for climate activists' and Santa Barbara college students' projected and stereotyped arguments can be generated immediately from the present data, these types of studies may be conducted with various target audiences to identify when projected or stereotyped messages are more likely to persuade people to behave in a certain way.

Conclusion

The goal of this dissertation is to understand the psychological processes through which communicators form persuasive arguments, and how these processes can be affected by similarity cues from their target audience. Current knowledge of the persuasive context primarily consists of what factors make a message more likely to change the audience's attitude, but less is known about the mindset of the communicator. Moreover, while social categorization frameworks of mental state inference have been utilized to understand the ways that perceivers infer their target's thoughts and intentions, these models have not been leveraged to understand how social judgement affects a communicator's assessments of whether certain arguments would be persuasive to another person. I aimed to fill these gaps in knowledge by investigating how perceived similarity of a target audience affects communicators' decision-making about persuasive messages.

These research findings are the first to apply a model of mental state inference to the study of decisions about communication. Furthermore, they underscore that expert and novice communicators are differentially sensitive to context cues regarding their persuasive approach, and that these groups should be distinguished conceptually when studying the way that people anticipate and form their arguments. Importantly, the present findings raise the question of whether perceived similarity of a target of persuasion leads communicators to alter their persuasive strategy to a meaningful degree, or whether communicators resort to stereotyping as the default strategy, relying on cues about their target's category membership instead of their general sense of perceived similarity to the person to determine which argument would persuade them. Future work testing the similarity-contingency model on communicators who anticipate persuading both in-group and out-group targets is needed to determine the extent to which perceived similarity, jointly with in-group/out-group status,

would explain additional individual differences in the tendency to project or stereotype. Not only does this work make a substantial theoretical contribution by broadening the application of mental state inference models, but it also furthers knowledge about climate change communication by revealing specific arguments that two groups of environmentalists themselves found persuasive, in contrast to the arguments that they perceived to be persuasive to the typical business owner (the type of decision maker that may help to influence environmental policy; e.g., McKeever et al., 2014; Switzer, 2001; Kraft & Kamieniecki, 2007). Additional research may investigate the efficacy of both projected and stereotyped arguments for persuading business owners to change their attitudes about an environmental policy or to engage in various pro-environmental actions.

We must make inferences about others' mindsets in our day-to-day lives, from tasks that range from buying a birthday present for a friend to interpreting the intent behind an ambiguous comment. When we aim to persuade others to adopt a new attitude or, beyond that, to change their behavior, the tools of mental state inference allow us to place ourselves into the other person's shoes and intuit which arguments would resonate best with their values. The present research suggests that stereotyping is one strategy that communicators use to arrive at those judgements, but there are surely other tools in their social cognitive persuasive arsenal. When those tools are activated – and the effectiveness of their utilization – is likely due to a combination of personal and situational factors – an important topic for future research. This dissertation began the journey to better understand the roles that perceived similarity and group membership of the persuasive target jointly play in communicators' decision-making processes as they determine which arguments they believe would persuade another person to act.

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Appendix A

Study 1: Similarity and Projection among Climate Activist Communicators

I. Intro Text

Thank you for helping with [organization's] goals and the research of Ph.D. Candidate Michelle Handy. You were selected for this survey because you are an active member of [organization].

As you may already know, one of the primary ways that [organization] builds political will is by recruiting community leaders to support their efforts. Through [organization's] grasstops engagement efforts, members like you are equipped with the tools to capture and share endorsements from community leaders to our members of Congress and others. While these endorsements come in many forms, including public position statements and newspaper editorials, the most influential endorsements come when community leaders such as business owners, faith leaders, university presidents, mayors, and others are asked to sign on as endorsers to the Energy Innovation & Carbon Dividend Act, because it's a specific piece of legislation that their member of Congress can support to act on climate change. When [organization] volunteers present these endorsements to their congressional representatives, it has the potential to make a big impact. Beyond this, it is also an opportunity to form a new relationship with community leaders. Previous members have invited these leaders into their congressional meetings to share their message directly with representatives, and it can entirely change the tone of the meeting.

In this study, you'll be paired up with Robert, a business owner in your district, and you'll think about how to persuade him to sign on as an endorser to the Energy Innovation & Carbon Dividend Act.

II. Rank Self

Before we pair you up with your partner Robert, we're interested in learning more about the reasons why you may support the Energy Innovation & Carbon Dividend Act. **First, please carefully read and consider the reasons below to support the Energy Innovation & Carbon Dividend Act.**

Then, drag and drop the following 8 reasons in terms of how important they are to you with 1 (most important) to 8 (least important). You can move each reason with your cursor until it is in the order of personal importance with #1 (highest) being the most important and #8 (lowest) being the least important.

It will create a demand for local jobs and boost local economies as American families spend their monthly carbon dividends in their communities.

It will protect farmers and small business owners whose livelihoods have been affected by droughts and other negative consequences of a rapidly changing climate.

It will be a crucial step in mitigating the climate crisis that we have caused and therefore have the responsibility to solve.

It will ensure that we leave behind a safe and habitable planet for future generations to enjoy.

It will greatly improve our air quality, which will prevent hundreds of thousands of future lives lost due to respiratory disease and other illnesses.

It will keep the Earth from warming more than 1.5 degrees Celsius above pre-industrial levels, at which point irreversible damages to our planet - including polar ice sheet collapse, disease, and famines - would occur.

It will drive innovation and put our country on the forefront of a transition to a clean energy economy.

It will prevent communities and local businesses from losing billions of dollars on damages caused by climate-change related disasters.

III. Rank Stereotype

People care about the environment for different reasons. Now, we want your view on how convinced you think **the typical business owner** would be by each of these reasons to sign on as an endorser to the Energy Innovation & Carbon Dividend Act. We realize you don't have a lot of information to go on, but tell us your views as best you can.

Please drag and drop the following 8 reasons in terms of how likely they would be to persuade the **typical business owner** to sign on as an endorser to the Energy Innovation & Carbon Dividend Act, with 1 (most persuasive) to 8 (least persuasive). You can move each reason with your cursor until it is in the order of persuasiveness with #1 (highest) being the most persuasive and #8 (lowest) being the least persuasive.

It will ensure that we leave behind a safe and habitable planet for future generations to enjoy.

It will drive innovation and put our country on the forefront of a transition to a clean energy economy.

It will be a crucial step in mitigating the climate crisis that we have caused and therefore have the responsibility to solve.

It will create a demand for local jobs and boost local economies as American families spend their monthly carbon dividends in their communities.

It will protect farmers and small business owners whose livelihoods have been affected by droughts and other negative consequences of a rapidly changing climate.

It will prevent communities and local businesses from losing billions of dollars on damages caused by climate-change related disasters.

It will keep the Earth from warming more than 1.5 degrees Celsius above pre-industrial levels, at which point irreversible damages to our planet - including polar ice sheet collapse, disease, and famines - would occur.

It will greatly improve our air quality, which will prevent hundreds of thousands of future lives lost due to respiratory disease and other illnesses.

IV. Personal Questions

Now, we're going to ask a few get-to-know-you questions so that you and Robert, a business owner in your district, can start getting acquainted:

Do you enjoy science fiction novels?

- ○ Yes
- ○ No

Do you prefer relaxing vacations or adventurous vacations?

- ○ Relaxing
- ○ Adventurous

Do you enjoy watching scary movies?

- ○ Yes
- ○ No

Do you enjoy following sports teams?

- ○ Yes
- ○ No

Do you prefer camping or staying in and watching TV shows?

- ○ Camping
- ○ Staying in and watching TV shows

Do you prefer sweet or savory foods?

- ○ Sweet
- ○ Savory

V. Similarity Manipulation

In preparation for the activity, Robert, the community leader you are asking to sign on as an endorser, also filled out this background questionnaire. Robert runs a management consulting business in your local district. He's in his mid-forties and he has two children. He has not indicated his opinion or support (or nonsupport) for the Energy Innovation & Carbon Dividend Act.

On the next page are three responses from Robert's background questionnaire which he said he'd be happy to share:

First, Robert said that he prefers adventurous vacations to relaxing vacations.

First, Robert said that he prefers relaxing vacations to adventurous vacations.

Second, Robert said that he enjoys watching scary movies.

Second, Robert said that he does not enjoy watching scary movies.

And lastly, Robert said that he prefers camping to staying in and watching TV shows.

And lastly, Robert said that he prefers staying in and watching TV shows to camping.

While you and Robert may have some differences, it appears you have at least a few important things in common.

OR

While you and Robert may have some other things in common, it appears you have at least a few important differences.

VI. Rank Robert

Now, we would like you to imagine that you are trying to persuade your partner Robert, a business owner in your district, to sign on as an endorser to the Energy Innovation & Carbon Dividend Act. How convinced do you think Robert would be by each of the reasons that you've read about in this survey?

Please drag and drop the following 8 reasons in terms of how likely they would be to persuade Robert to sign on as an endorser to the Energy Innovation & Carbon Dividend Act, with 1 (most persuasive) to 8 (least persuasive).

It will protect farmers and small business owners whose livelihoods have been affected by droughts and other negative consequences of a rapidly changing climate.

It will drive innovation and put our country on the forefront of a transition to a clean energy economy.

It will be a crucial step in mitigating the climate crisis that we have caused, and therefore have the responsibility to solve.

It will prevent communities and local businesses from losing billions of dollars on damages caused by climate-change related disasters.

It will keep the Earth from warming more than 1.5 degrees Celsius above pre-industrial levels, at which point irreversible damages to our planet--including polar ice sheet collapse, disease, and famines--would occur.

It will ensure that we leave behind a safe and habitable planet for future generations to enjoy.

It will create a demand for local jobs and boost local economies as American families spend their monthly carbon dividends in their communities.

It will greatly improve our air quality, which will prevent hundreds of thousands of future lives lost due to respiratory disease and other illnesses.

VII. Organization Questions

Now, we are going to ask you some questions about your environmental attitudes and about your experience volunteering with [organization].

How important is the issue of global warming to you personally?

Not at all important	Not too important	Somewhat important	Very important	Extremely important
○	○	○	○	○

How worried are you about global warming?

Not at all worried	Not very worried	Somewhat worried	Very worried
○	○	○	○

How much do you think global warming will harm you personally?

Not at all	Only a little	A moderate amount	A great deal	Don't know
○	○	○	○	○

How much do you think global warming will harm future generations of people?

Not at all	Only a little	A moderate amount	A great deal	Don't know
○	○	○	○	○

Why did you get involved with climate advocacy? What were the factors that led you to get involved with [redacted]?

What feedback do you have about your experience volunteering with [redacted]? Is it a welcoming space for you as a volunteer?

VIII. Demographics

We're almost finished! On the final few pages, we are going to ask you several questions to learn more about who is taking part in our research.

What is your age? (please enter a number)

Please indicate your current household income in U.S. dollars.

- ○ Under $15,000
- ○ $15,001 - $25,000
- ○ $25,001 - $35,000
- ○ $35,001 - $50,000
- ○ $50,001 - $75,000
- ○ $75,001 - $100,000
- ○ $100,001 - $150,000
- ○ Over $150,000

Which of the following best describes you?

- Male
- Female
- Non-binary
- Prefer not to answer
- Prefer to self-describe

Which of the following best describes you?

- American-Indian or Alaska Native
- Asian
- Pacific Islander
- Black or African-American
- Hispanic or Latino/a
- White / Caucasian
- Middle Eastern or North African
- Multi-racial (please specify)
- Other (please specify)

Which of the following best describes your political views?

- Very liberal
- Liberal
- Moderate
- Conservative
- Very conservative
- Not sure
- Prefer not to answer

Generally speaking, do you usually think of yourself as a Democrat, a Republican, an Independent, or other?

- Democrat
- Republican
- Independent
- Other (please specify)

Do you think of yourself as closer to the Republican Party or closer to the Democratic Party?

- ○ Closer to Democratic Party
- ○ Closer to Republican Party
- ○ Neither

IX. Debrief

Thank you for participating in this study. The goals were to understand how citizen volunteers communicate with business people about endorsing climate action, and if speaking with someone who seems more similar to oneself affects the way that one goes about trying to persuade that person.

Participants were randomly assigned to either find out that they have 3 things in common or 3 things that are different with a hypothetical local businessman, Robert. Then, they thought about reasons which may be important to themselves, to a typical businessman, and to a hypothetical local businessman, Robert, for supporting climate action. We were interested in whether people who felt more similar to Robert would use different messages to try to persuade him to support the pro-environmental initiative.

There were parts of the study that we couldn't fully explain from the beginning - that Robert was hypothetical and that you would be given elements of his biography that were similar or different to your own, and that you would actually be meeting with Robert at some point in the future. We did this so that we could capture your natural reaction to the situation, but now that the study is over, we wanted to communicate to you the actual nature of the study - that Robert was hypothetical and you were either given information about Robert that was similar or different to your own.

We will use the data from this survey to better understand the process of how communicators make decisions about messages they would present to different target audiences. Your information will only be presented in aggregate form and we will share this aggregated information with [organization] as part of our ongoing collaboration to understand climate communication.

We appreciate your participation in this study. Please do not discuss this survey with anyone else, as we are still continuing to recruit people to take our survey.

If you have any questions about this research project or if you think you may have been injured as a result of your participation, please contact:

Michelle Handy, University of California, Santa Barbara, michellehandy@ucsb.edu

David Sherman, University of California, Santa Barbara, sherman@ucsb.edu

If you have any questions regarding your rights and participation as a research subject, please contact the Human Subjects Committee at (805) 893-3807 or hsc@research.ucsb.edu. Or write to the University of California, Human Subjects Committee, Office of Research, Santa Barbara, CA 93106-2050.

Appendix B

Study 2: Similarity and Projection among College Student Communicators

I. Intro Text

The City of Santa Barbara aims to achieve Carbon Neutrality by 2035 and [University] students want to be a part of this movement! In this survey, you will have the chance to voice your support for Carbon Neutrality in Santa Barbara by 2035.

To provide some background, other [University] students wish to help advocate for Carbon Neutrality, and they're trying to secure endorsements (or public declarations of support) from members of the local community. The Community Environmental Council (CEC) is working to pair college students up with local business leaders to have their voices heard.

In this study, you'll be paired up with Robert, a businessman in downtown Santa Barbara, and you'll think about how to persuade him to provide his public endorsement for Carbon Neutrality in your shared community.

II. Rank Self

Before we pair you up with your partner Robert, we're interested in learning more about the **reasons why you may support Carbon Neutrality**.

First, please carefully read and consider the reasons below to support Carbon Neutrality.

Then, drag and drop the following 8 reasons in terms of **how important they are to you** with 1 (most important) to 8 (least important). You can move each reason with your cursor until it is in the order of personal importance with #1 (highest) being the most important and #8 (lowest) being the least important.

It will prevent millions of dollars in damage to the community and local businesses, as we saw in the aftermath of the Thomas Fire and Montecito mudslides, from future climate change related disasters.

It will greatly reduce monthly utility bills for residents and make Santa Barbara a more affordable place to live.

It will help to combat social inequality by reducing the negative impacts of climate change on low-income communities.

It will reduce the negative effects of climate change on Santa Barbara's local economy, which relies on fisheries, tourism, and recreation.

It will bring forward-thinking companies and purpose-driven careers to the Santa Barbara area because a net-zero emissions future will create a huge need for jobs.

It will be a crucial step in mitigating the climate crisis that we have caused and therefore have the responsibility to solve.

It will improve our air quality, which will prevent thousands of future lives lost due to respiratory disease and other illnesses.

It will quickly increase Santa Barbara's prestige by making it the example in green energy for other communities to follow.

III. Rank Stereotype

People care about the environment for different reasons. Now, we want your view on how convinced you think the **typical Santa Barbara businessman** would be by each of these reasons to publicly support Carbon Neutrality.

We realize you don't have a lot of information to go on, but tell us your views as best you can.

Please drag and drop the following 8 reasons in terms of how likely they would be to persuade the **typical Santa Barbara businessman** to provide his endorsement for Carbon Neutrality, with 1 (most persuasive) to 8 (least persuasive). You can move each reason with your cursor until it is in the order of persuasiveness with #1 (highest) being the most persuasive and #8 (lowest) being the least persuasive.

It will prevent millions of dollars in damage to the community and local businesses, as we saw in the aftermath of the Thomas Fire and Montecito mudslides, from future climate change related disasters.

It will improve our air quality, which will prevent thousands of future lives lost due to respiratory disease and other illnesses.

It will greatly reduce monthly utility bills for residents and make Santa Barbara a more affordable place to live.

It will bring forward-thinking companies and purpose-driven careers to the Santa Barbara area because a net-zero emissions future will create a huge need for jobs.

It will quickly increase Santa Barbara's prestige by making it the example in green energy for other communities to follow.

It will reduce the negative effects of climate change on Santa Barbara's local economy, which relies on fisheries, tourism, and recreation.

It will be a crucial step in mitigating the climate crisis that we have caused and therefore have the responsibility to solve.

It will help to combat social inequality by reducing the negative impacts of climate change on low-income communities.

IV. Personal Questions

Now, we're going to ask a few get-to-know-you questions so that you and Robert, a business owner in Santa Barbara, can start getting acquainted:

Do you enjoy science fiction novels?

- ○ Yes
- ○ No

Do you prefer relaxing vacations or adventurous vacations?

- ○ Relaxing
- ○ Adventurous

Do you enjoy watching scary movies?

- ○ Yes
- ○ No

Do you enjoy following sports teams?

- ○ Yes
- ○ No

Do you prefer camping or staying in and watching TV shows?

- ○ Camping
- ○ Staying in and watching TV shows

Do you prefer sweet or savory foods?

- ○ Sweet
- ○ Savory

V. Similarity Manipulation

In preparation for the activity, your partner Robert, the businessman you are asking to sign on as a supporter, also filled out these get-to-know-you questions.

Robert runs a management consulting business in downtown Santa Barbara. He's in his mid-forties and he has two children. He has not indicated his opinion or support (or nonsupport) for Carbon Neutrality in Santa Barbara.

On the next page are three responses from Robert's background questionnaire which he said he'd be happy to share:

First, Robert said that he prefers adventurous vacations to relaxing vacations.

First, Robert said that he prefers relaxing vacations to adventurous vacations.

Second, Robert said that he enjoys watching scary movies.

Second, Robert said that he does not enjoy watching scary movies.

And lastly, Robert said that he prefers camping to staying in and watching TV shows.

And lastly, Robert said that he prefers staying in and watching TV shows to camping.

While you and Robert may have some differences, it appears you have at least a few important things in common.

OR

While you and Robert may have some other things in common, it appears you have at least a few important differences.

VI. Rank Robert

Now, we would like you to imagine that you are trying to persuade your partner Robert to provide his endorsement (or public statement of support) for Carbon Neutrality in Santa Barbara.

How convinced do you think Robert would be by each of the reasons that you've read about in this survey?

Please drag and drop the following 8 reasons in terms of how likely they would be to persuade **Robert** to provide his endorsement for Carbon Neutrality, with 1 (most persuasive) to 8 (least persuasive).

It will prevent millions of dollars in damage to the community and local businesses, as we saw in the aftermath of the Thomas Fire and Montecito mudslides, from future climate change related disasters.

It will improve our air quality, which will prevent thousands of future lives lost due to respiratory disease and other illnesses.

It will greatly reduce monthly utility bills for residents and make Santa Barbara a more affordable place to live.

It will bring forward-thinking companies and purpose-driven careers to the Santa Barbara area because a net-zero emissions future will create a huge need for jobs.

It will quickly increase Santa Barbara's prestige by making it the example in green energy for other communities to follow.

It will reduce the negative effects of climate change on Santa Barbara's local economy, which relies on fisheries, tourism, and recreation.

It will be a crucial step in mitigating the climate crisis that we have caused and therefore have the responsibility to solve.

It will help to combat social inequality by reducing the negative impacts of climate change on low-income communities.

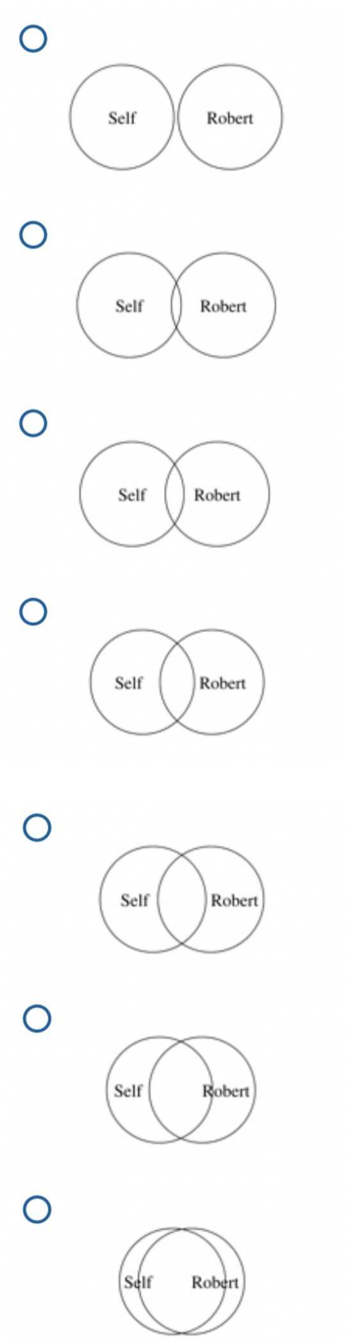
VII. Perceived Similarity to Robert

Please indicate your agreement with the following statement: "I'm similar to Robert."

Please indicate your agreement with the following statement: "I believe I have a lot in common with Robert."

VIII. Modified Inclusion of Other (IOS) Scale

Please select the picture that best describes how similar you see yourself to be with Robert:



IX. Demographics

We're almost finished! On the final few pages, we are going to ask you several questions to learn more about who is taking part in our research.

What is your age? (please enter a number)

Please indicate your parental family income in U.S. dollars.

- ○ Under $15,000
- ○ $15,001 - $25,000
- ○ $25,001 - $35,000
- ○ $35,001 - $50,000
- ○ $50,001 - $75,000
- ○ $75,001 - $100,000
- ○ $100,001 - $150,000
- ○ Over $150,000

Which of the following best describes you?

- ○ Male
- ○ Female
- ○ Non-binary
- ○ Prefer not to answer
- ○ Prefer to self-describe

Which of the following best describes you?

- ○ American-Indian or Alaska Native
- ○ Asian
- ○ Pacific Islander
- ○ Black or African-American
- ○ Hispanic or Latino/a
- ○ White / Caucasian
- ○ Middle Eastern or North African
- ○ Multi-racial (please specify)
- ○ Other (please specify)

Which of the following best describes your political views?

- ○ Very liberal
- ○ Liberal
- ○ Moderate
- ○ Conservative
- ○ Very conservative
- ○ Not sure
- ○ Prefer not to answer

Generally speaking, do you usually think of yourself as a Democrat, a Republican, an Independent, or other?

- ○ Democrat
- ○ Republican
- ○ Independent
- ○ [ ] Other (please specify)

Would you call yourself a strong Democrat or a not very strong Democrat?

- ○ Strong Democrat
- ○ Not Very Strong Democrat

Would you call yourself a strong Republican or a not very strong Republican?

- ○ Strong Republican
- ○ Not Very Strong Republican

Do you think of yourself as closer to the Republican Party or closer to the Democratic Party?

- ○ Closer to Democratic Party
- ○ Closer to Republican Party
- ○ Neither

Please indicate your agreement with the following statement: "I support Carbon Neutrality in Santa Barbara by 2035."

Strongly disagree	Disagree	Slightly disagree	Neither disagree nor agree	Slightly agree	Agree	Strongly agree
○	○	○	○	○	○	○

X. Debrief

Thank you for participating in this study. The goals were to understand how college students communicate with business people about endorsing climate action, and if speaking with someone who seems more similar to oneself affects the way that one goes about trying to persuade that person.

Participants were randomly assigned to either find out that they have 3 things in common or 3 things that are different with a hypothetical local businessman, Robert. Then, they thought about reasons which may be important to themselves, to a typical businessman, and to a hypothetical local businessman, Robert, for supporting climate action. We were interested in whether people who felt more similar to Robert would use different messages to try to persuade him to support the pro-environmental initiative.

There were parts of the study that we couldn't fully explain from the beginning - that Robert was hypothetical and that you would be given elements of his biography that were similar or different to your own, and that you would actually be meeting with Robert at some point in the future. We did this so that we could capture your natural reaction to the situation, but now that the study is over, we wanted to communicate to you the actual nature of the study - that Robert was hypothetical and you were either given information about Robert that was similar or different to your own.

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We appreciate your participation in this study. Please do not discuss this survey with anyone else, as we are still continuing to recruit people to take our survey.

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Michelle Handy, University of California, Santa Barbara, michellehandy@ucsb.edu

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