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The color and shape of politics*

How does simple visual information affect political attitudes?

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ABSTRACT How do people process politically-relevant visual information? What effects does this information have on negative partisanship? There is a rich intellectual history examining the ways individuals process political information. However, most information these theories consider are complex text-based or audio messages. I argue that these theories overlook important sources of information that we are cognitively hardwired to focus on before other types of information. This dissertation seeks out to examine the role that relatively simple visual information, such as color and shapes, plays in cueing and molding political attitudes. This dissertation expands upon existing models of information processing and presents a snap-judgement model of visual information processing. The snap-judgment model is a general framework for understanding the role that simple and complex information have in shaping our political attitudes.

KEYWORDS information processing; visual information; color

I haven't seen someone that disappointed to
see me since I wore a red baseball cap to a
Planned Parenthood fundraiser.

—Ted Lasso

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Introduction

Imagine we are at the airport and we see a bright red hat with white lettering on it. You have well-trodden neurological paths of what the color red looks like, what a hat looks like, and what a hat with white lettering looks like. You are accessing associative memory to not just imagine what each of these pieces of information look like in isolation, but you likely have seen these features in combination before. So rather than just seeing these details, you likely are filling in other gaps too by relying on memory. You may be thinking to yourself “this is a MAGA hat”. This realization triggers an affectively valenced response; even though you cannot be sure that it is actually a MAGA hat.

This dissertation explains this process and elaborates on the implications of it. Specifically, this dissertation presents an elaboration of two popular models of political information processing, which yields the snap-judgement model, to explain the underlying cognitive processes that drive the connection of simple visual information, such as party branding, to complex political meaning. In doing so, it also explains the cognitive processes that underlie the way in which this simple visual information promotes attitude change or entrenchment.

In the next section, I make a case for the need to understand visual political information as well as engaging in a brief explanation of the two most prominent models of information processing: the online and memory-based models. In doing so, I compare and contrast the models to highlight their weaknesses and strengths as general models for information processing. In the third section, I then outline the snap-judgement model and explain the ways in which it provides expectations about the processing of less complex information and explain how it combines the strengths of the online and memory-based models. In the fourth section I provide an outline of the key empirical

chapters of the dissertation along with providing a description of the research designs that are meant to test parts of the snap-judgement model. In the fifth section I close with a proof-of-concept study which provides preliminary evidence of a number of assertions I make with the model.

Simple visual information and existing theories of information processing

The role that color and symbology play in politics is understudied. Despite this, parties foster their brands. Incentives for political candidates are to win political office (Fenno, 1973; Mayhew, 1974). As voters heuristically use the partisan affiliation of the candidates and policy stances (Campbell et al., 1960; Petersen et al., 2013, Chapter 6) and are largely reluctant to support out-partisan candidates due to affective polarization (Iyengar et al., 2012; Pickup et al., 2020; Utych, 2020), the parties expend significant effort in attempts to distinguish the parties from each other (see Clifford, 2020; Lee, 2009, 2016, as examples).

Politics relies heavily on visual imagery to communicate complex ideas. Since the 2000 Presidential election, news organizations consistently use the association between Democrats and the color blue and Republicans with the color red to reflect won districts (Elving, 2014). The ownership and display of campaign yard signs reflect an expressive form of political participation and evoke affective reactions among neighbors who see the signs (Makse et al., 2019). Exposure to stereotyped cultural differences between Republicans and Democrats act as relatively accurate visual cues - such as the modal car in the driveway - of any given neighborhood to assume the partisan composition of those who live there (Hetherington & Weiler, 2018).

Despite the ubiquity of political symbology, students of political psychology largely focus on text-based information as opposed to simple visual information as sources of cueing and attitude change. There are a number of reasons for this but key among them is the challenges that come with truly interdisciplinary theoretical frameworks. The consequences are that political scientists have yet to take advantage of the theoretical groundwork that neuroscience and psychology provide. In particular, models of political information processing do not examine the role of simple visual information that may undergird attitude development, change, or entrenchment. First, let me elaborate on what the two prominent models do explain and provide dimensions by which we may combine and build on them.

Both the memory and online models of information processing view the mass public as bayesian updaters. The models primarily disagree, however, on the capability of individuals to update their pre-existing views when faced with new and countervailing political information. While the memory-based model views the public as rationally integrating new information with their pre-existing attitudes (see Zaller, 1992), the online model contends that the public affectively encode information and that new information brings to memory this affectively encoded prior information (see Lodge & Taber, 2013). This process implies that new information is integrated based on its relation to these prior attitudes. This often means that motivated reasoning is at play with exposure to new information; which means that individuals strengthen pre-existing paths that suggest that congruent information make one feel good, while incongruent information makes one feel bad (Lodge & Taber, 2013).

These models consider the role that text-based information communicating elites' policy positions have in shaping the attitudes of the public. Tests of both models consider the role that policy proposals have on shaping the attitudes of those receiving it. However, relatively simple in-

formation such as politically-relevant colors and shapes might activate similar cognitive processes.

I argue that incorporating such information into our models is useful. Visual information contains powerful meaning via affect. Visual information such as color contain important affective associations (Cimbalo et al., 1978). Memory associated with affect pass through the limbic system which means that they are often easily and quickly encoded, easier to consolidate by placing it in an associative memory network, and will be easier to retrieve later (Kensinger & Fields, 2022). Simple visual information, like color, are referential in this way (Elliot & Maier, 2012). Republicans report that they prefer “Republican red” more than they do than “Democratic blue” (Schloss & Palmer, 2014); as they are referential, it likely engenders an affective response that is rooted in identity.

While the online model conceptualizes this complex, text-based information processing as affectively-laden, there are not clear expectations about physiological manifestations of an affective reaction to such information nor does it provide a clear set of expectations about the ways in which it may weaken strong affective neurological pathways. The online model argues that information is affectively encoded into long-term memory and that the core process by which retrieval of it and associated memories occur is through the similarity of affect. Similarity of affective responses are not clearly defined by the online model, however. Indeed, there are patterns of neurological function associated with particular affective states, many neuroscientists, however, view a state as the combination of this neurological functioning and the physiological reactions (Ralph & Anderson, 2018; Sander, 2013).

The implication of the online model is that individuals strengthen these associations between affect and content of the information. There does not appear, however, to be a clear set of expectations about the ways in which one may weaken these associations. The online model

suggests that individuals associate some information with negative affect or with positive affect and will continue to do so as it biases the ways in which people engage with new information. The memory-based model argues that there can be such weakening of prior attitudes when given new information, but it neglects to hypothesize about how this occurs when considering motivated cognition.

In summary, existing models of information processing provide a rich outline for a general model that expands the types of new information and its influence on attitudes. As there is a cottage industry among practitioners for political marketing, it is important for scholars to examine the effects it has. Existing models also conceptualize feelings as the emotional state, but can stand an update to be more in line with the way that neuroscientists conceptualize it as a much broader descriptor of an individual's physiological, cognitive, and neurological state (Ralph & Anderson, 2018; Sander, 2013). And finally, the two models disagree about the process by which an affectively-laden model of information processing may weaken these associations between affect and content rather than only strengthen them. The implication is that we should only expect political polarization as the outcome when affect is involved and that we can only detect this affect through the measurement of cognitive function or through self-reported measures of feelings.

Table 1 provides a summary of the memory and online models of information processing. The third column presents the model in focus for this dissertation, the snap-judgement model. As the third column demonstrates, the snap-judgement model builds on and combines the two dominant models of political information processing. In the next section I elaborate on how this model works through the anecdote of the Red hat with white lettering discussed in the opening of this prospectus.

Table 1: Comparison of information processing models

	Memory-based	Online	Snap-judgement
Type of visual information	-Complex, text-based information	-Complex, text-based information	-Simple visual information -Complex visual information -Complex, non-visual information
Pre-conscious processing		YES	YES
Affective memory encoding		YES	YES
Affective physiological response			YES
Political polarization	YES	YES	YES
Political depolarization	YES		YES

The snap-judgement model of information processing

To illustrate the snap-judgement model, let's go back to the example of being in the airport and seeing someone wearing a red hat with white lettering on it. First, let's understand why one might start to fill in extra information about the hat and the wearer of the hat.

Memories are easier to retrieve if they are recent, contiguous (associated with other pieces of

information), similar to the information that made them “hot”, are reinforced, and have primacy over other pieces of information (Kahana et al., 2022). What this means is that the visual information of a red hat with white lettering likely spark memories by which you’ve recently seen a hat with similar features.

Given that you are reading a prospectus for a political scientist’s dissertation, the contextual state you are in may have prompted you to imagine this hat as being related to politics in some way as opposed to belonging to an Arsenal F.C. supporter. Because of its similarity with the “Make America Great Again” hat which have become a characteristic symbol of the Republican party in the post-Trump era, this information may have sparked your brain to access such a memory of what a MAGA hat looks like. This process is aided by the affective encoding of these memories.

An important contextual feature of memory is the affective state by which you associate with it. Memories are enhanced when they are “tagged” with affective information (Kensinger & Fields, 2022). When converting perceived visual information to a memory, emotion moderates the encoding, consolidation, and retrieval stages (Kensinger & Fields, 2022). This means that when you process the visual information of a red hat with white lettering, and you access memories which suggest that it should be a hat representing support for Donald Trump, you retrieve memories that are associated with and trigger a strong autonomic physiological reaction. In response, your brain will contact your limbic system to appraise that particular physiological response and to label it based on memories that associate physiological responses with an affective state (Valentino et al., 2011). Individuals are motivated by their affective state.

The link between affective state and physiological response encourages a corresponding behavioral response (Valentino et al., 2011). If you connect that the hat belongs to a Trump supporter,

you may have a physiological reaction of feeling queasy, an increase in heart rate, and your hands may feel clammy. As these reactions are characteristic of negative affect, you may feel an urge to avoid such a person (Ralph & Anderson, 2018). It is rare, however, that you have complete control over the situations you find yourself in.

It may be the case that when you board your plane, this person may be in the seat next to you. You realize that despite this urge for you to avoid them, you nonetheless will have to exchange a few niceties at the very least. So long as you avoid talking about politics, you might be able to escape without feeling any worse by managing to avoid getting in a disagreement with someone (Carlson & Settle, 2022; Mutz, 2006). Despite your best intentions, they begin talking to you, and they jump right into talking about baseball, your favorite sport! The conversation ends up being an engaging one. Your initial intentions of avoiding them are changing. Your initial negative evaluation of that person dissipates and may even turn into a positive one. This is likely short-lived however (Santoro & Broockman, 2022). This is because the memories associating a negative affective state with a Trump supporter are stronger than a brief conversation with one about a common interest, so that memory is crowded out and eventually purged as time goes on (Kahana et al., 2022). The positive evaluation overriding the negative snap-judgement may be reinforced, however, through efforts to not forget the experience and to store its positive effects within long-term memory.

The snap-judgement model highlights a subsystem of information processing. Once an individual forms a snap-judgement, their priors will take over and the affective reaction will activate a particular behavioral response. However, when incorrect appraisals or an intervening factor that attenuates the cognitive disengagement occurs, it may act as a valuable learning lesson that might have an opposite effect. As affective tagging of information can occur later (Kensinger & Fields,

2022), a positive experience, despite a negative snap-judgement, may weaken the association of a visual object with a negative affective response. Some evidence suggests that such a mechanism is plausible (Santoro & Broockman, 2022). As evidence suggests these depolarizing effects tend to be short-term (Santoro & Broockman, 2022), the snap-judgement model suggests that this is due to the case that such interactions are not often reinforced. Without reinforcement, those memories are purged and the dampening effects are removed (see Kahana et al., 2022). It may be the case, however, that these are not all too common as individuals tend to avoid engaging with an object representing ideologically incongruent positions (see Klar & Krupnikov, 2016; Mutz, 2006).

Figure 1 presents a summary of the snap-judgement model. This dissertation will examine snap-judgments as prompted by a number of different types of visual information. The first empirical chapter examines the speed at which individuals process such simple visual information by examining their attention to information like color on political yard signs. The second empirical chapter will examine this process in a more complicated, deliberative setting; much like the one of the illustrative example of the MAGA hat. The third and final empirical chapter will examine this process by asking participants to form snap judgments of a neighborhood with varying characteristics.

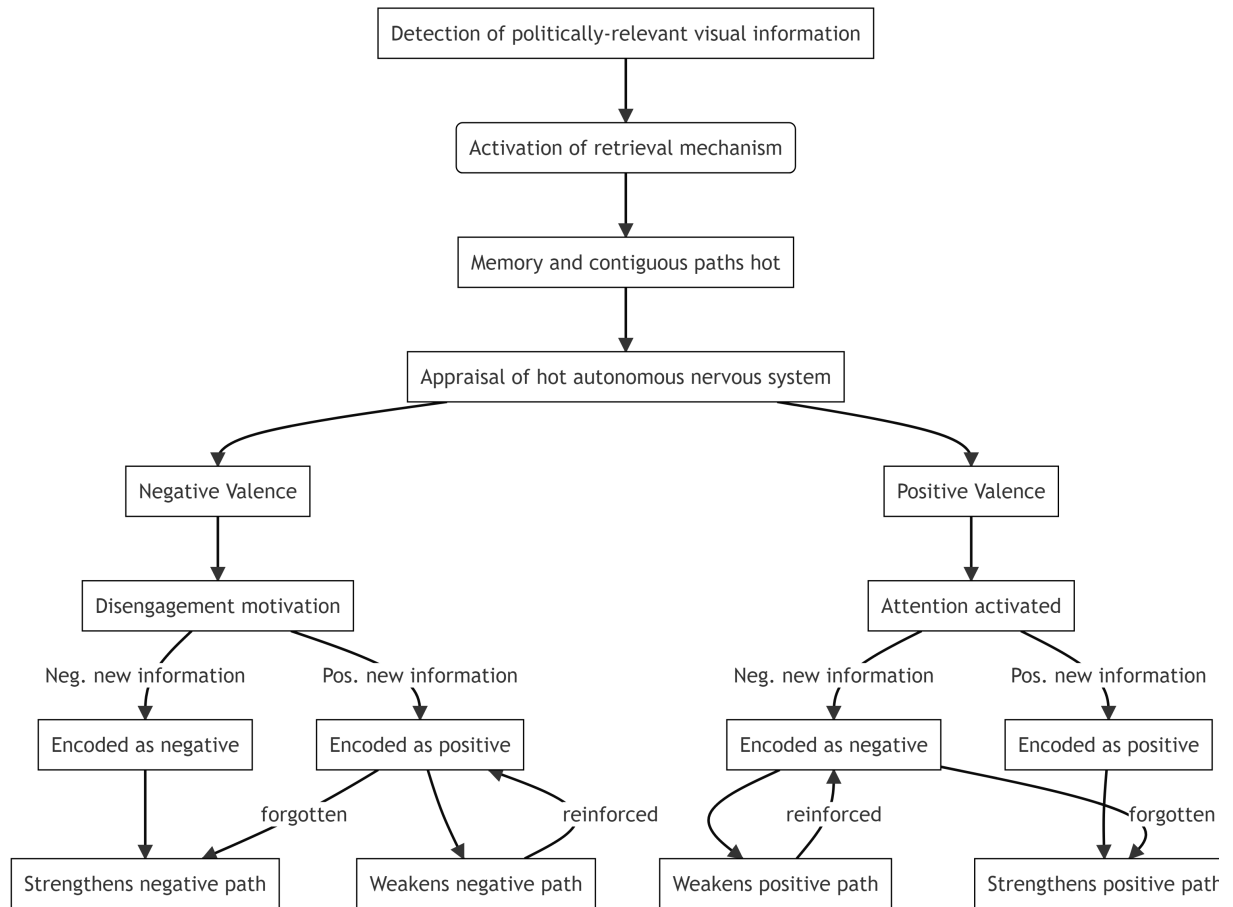


Figure 1: Snap-judgement model

Outline of empirical chapters

Empirical chapter 1

Argument

Can something as simple as color influence a campaign or even one's political attitudes? The starting position of the snap-judgement model is that simple visual information can. Political scientists largely miss accounting for such simple visual information despite their focus on party branding and communication strategies. Besides the challenges of interdisciplinary work, one potential reason for this being is that the literature still largely disagrees over whether campaigns, on the whole, matter for shaping electoral outcomes and the attitudes of voters (Broockman & Kalla, 2022). I argue, however, that though color may not determine electoral outcomes, it may still be an important piece of visual information that encourages learning by voters. I also test whether it influences how people respond to political surveys as they are often used for polls which are a cottage industry partially as a result of the popularity of election forecasting.

Since the 2000 election cycle, it is now commonplace for political candidates to rely on the colors red and blue as part of their campaign branding strategy. The use of the colors red and blue to distinguish between Republicans and Democrats on electoral maps became more common place starting in the 1970's (Elving, 2014). Outside of this, the literature connecting simple visual information and color is relatively sparse; however, I do reference some of this literature later in this section. I attribute this to the tendency for most studies used in political psychology as focusing on the generalizability of their treatments and for the theories to focus on text-based and complex textual information.

The snap-judgement model offers predictions about how individuals should process simple

visual information such as colors. Colors are first perceived as a particular set of wavelengths which trigger particular sensory receptors in the back of one's eye. This is converted into an electrochemical message that goes to the thalamus and into the primary visual cortex in the back of the brain. To make sense of this information, our brain accesses memories containing similar information which are affectively encoded (Cimbalo et al., 1978). Beyond the connection between particular colors and affect, the use of colors to distinguish political parties are so common-place that individuals likely access affectively encoded referential memories as well.

In non-political settings, we may unconsciously associate colors, (see Mehta & Zhu, 2009), such as blue with “happy” and pleasure and red as “sad” (D’Andrade & Egan, 1974), arousing (Elliot & Maier, 2012; Mehta & Zhu, 2009; Valdez & Mehrabian, 1994), and angry (Elliot & Maier, 2012; Epps & Kaya, 2004). Indeed, in a political context, such visual information activates pre-conscious processes that may diverge from that. These colors hold important meaning beyond the raw affect they engender. Republicans report that they prefer the “Republican red” more than they do the “Democrat blue” (Schloss & Palmer, 2014). That is, the colors red and blue in a political context are likely to make the neural pathways related to one’s partisanship “hot”. Some evidence suggests that there is indeed a strong link between ideology and color (Casiraghi et al., 2022), and that these associations are stronger in Western European countries and for parties that are relatively well-established. As simple visual information such as color is processed at remarkable speeds, it likely occurs even faster as primes of group identity speed up pre-conscious processing of information (Lodge & Taber, 2013).

Once these politically-laden neurological pathways are active, the affect associated with these nodes along the path are appraised by the body and will encourage a particular physiological reaction; which are themselves associated with particular behavioral outcomes. Where these

colors activate associations with the out-group, an individual is likely to have a physiological response encouraging the disengagement motivation. Where the color activate associations with the in-group, an individual will experience a physiological response encouraging an approach motivation.

As this is pre-conscious processing, it will put an individual in a “mental framework” or in a cognitive state that encourages biased information processing, both pre-consciously and consciously (Lodge & Taber, 2013). However, this is continually updated with more information. Where new information comes in such as context, or a conversation, or just new and relatively more complex visual information, the mental state that the snap-judgement put one in, will update with this information; it will either strengthen the path initiated by the snap-judgement, or it will attenuate the strength of the path. As this experience is forgotten, the effects of strengthening or attenuating the strength of the path will dissipate. If it is reinforced, then the effects will hold and may even strengthen. This chapter examines the pre-conscious processing component of this process.

In line with the snap-judgement model, some evidence suggests that the use of red and blue in political messages activate partisan biases in Spanish samples (Maestre & Medero, 2022). As the colors red and blue hold important meaning in political contexts, these colors pre-consciously activate pathways that associate those colors with particular partisan or ideological groups. These associations are stronger the more established the party is (Casiraghi et al., 2022). That is to say that these associative networks are stronger and easier to access in pre-conscious processing.

Applying the snap-judgement model to such a case yields a handful of expectations: Individuals associate the color red with Republicans and the color blue with Democrats (H_1). When exposed to stimuli containing a political message and colors with political meaning, individuals will process

the color before the message (H_2). When engaging with the colors red and blue, they will experience cognitive and physiological changes to their affective states in response to such stimuli as the result of the identity-based meaning associated with the stimuli (H_3). These affective responses activate behavioral motivations of either avoidance or approach. In electoral settings, this reflects a desire to either pay more or less attention to the campaign and to express a desire to vote or not vote in the election (H_4).

Research Design

It is important to first establish whether individuals associate particular colors with groups. Studies that associate color with parties are largely focused on European samples (see Casiraghi et al., 2022; Maestre & Medero, 2022). It is unclear, however, how engrained these associations are among Americans. I conduct four studies in this first chapter: (1) an online survey, (2 & 3) two online survey experiments, (4) and a experiment in a lab with a convenience sample.

To examine H_1 , I propose conducting an online survey where I ask respondents to match visual information they associate with different political groups. These visual groups include the parties: Republicans and Democrats, but also prominent political interest groups such as the Sierra Club, the Proud Boys, and anarchists. They are asked to match the group to complex visual imagery using logos such as an elephant - associated with the Republican party, a donkey - associated with the Democratic party, trees - associated with the sierra club, the rooster symbol - associated with the proud boys, the characteristic A associated with anarchists. These images are monochrome to isolate the effects of the image. In a second round of matching, the respondents are asked to match simple visual information to the groups, the color their branding tends to use: Red and white - associated with Republicans, Blue and white - associated with Democrats, green and white - associated with the sierra club, black and yellow - associated with the proud boys, and

red and black - associated with anarchists.

To study H_3 , I need to examine whether people experience affectively valenced reactions to colors in both political and apolitical settings. It is important to examine whether these responses are different depending on context as it establishes whether consuming such visual information in different contexts activate different neurological paths. To do this, I conduct a online survey experiment where I randomly assign experimental participants into different conditions.

In the political context condition, participants start the experiment by responding to a political attitudes questionnaire; a battery that asks them a number of questions prompting them to express their political views on policy issues. In the apolitical conditions, participants skip the political attitudes questionnaire and experience the treatment.

The treatment is a square box with the color red, blue, or grey. The treatment asks participants to also report whether it is a positive or negative color. The computer records how long it took for participants to report the valence. Like the implicit attitudes test, the goal of this is to examine immediate valenced affective reactions to the treatment. There are a number of burn-in rounds where participants see other colors such as orange, grey, and yellow as a way to get a baseline - this is important given the individual-level heterogeneity in speed that may come about from unobserved factors such as the use of a laptop, monitor specifications, the use of a mouse and trackpad or arrows on the keyboard, etcetera.

After the burn-in rounds and a few rounds with the treatment, participants are asked to provide responses to about five open-ended questions asking about what they had for their most recent meal, what their last vacation was, what was the last item they bought, what day of the week elections tend to be held on in the United States, and what was the last bit of news they had heard about American politics. The point of these questions is for detecting insincere

responses. As experiments suffer mightily from inattentive subjects, from those who are indeed American citizens, and from trained bots, evidence suggests that - beyond the use of attention checks, identifying duplicate IP addresses, and identifying “speeders” and “turtles” - the use of open-ended responses are an effective way at identifying subjects providing insincere data points (Kennedy et al., 2021).

To establish another critical assumption of the model is whether people do pick up on this simple visual information faster than messages, H_2 . Though the psychology literature suggests that may be the case, this is still an untested assumption in political settings. As political messages communicate identity-based information, messages may go through the pre-conscious process faster than simple visual information.

To test whether this assumption holds up, I first ask participants a series of questions in a political attitudes questionnaire. In the questionnaire, participants are asked about their partisan identification. This should prompt them to think of their in-group, what partisan group they belong to. As primes related to one’s in-group yield faster responses to messages shared by the in-group, I use this information to conduct a blocked three-arm experimental design.

Participants are randomly assigned into one of three conditions. In each of these three conditions, they see a box with a color background and in the foreground a message to vote for either Joe Biden or Donald Trump. For those who reported that they were Republicans, they receive a message to “Vote for Trump”. If the subject self-identifies as a Democrat, they receive a message to “Vote for Biden”. The conditions vary in which color is in the background of this message. The three conditions are that the background uses either the color red, blue, or grey. Like I did in the other study, participants are asked on the same screen to report the valence of the image and the length of time it takes for the subject to respond is recorded. They only do one round with

the treatment to reduce introducing bias captured by participants realizing it is the same message but with a different color background. Before the treatment, they receive the same burn-in practice to establish a baseline for the participants speed. After the treatment, participants are prompted to respond to the same five open-ended questions as participants in the other study. Additionally, to examine the plausibility of H_4 , they are asked whether they now want to follow the 2024 presidential election more closely, and whether they intend to participate in the election by voting.

I intend to also replicate the third study by conducting another study in a lab setting with undergraduates using eye-tracking software. I have *a priori* beliefs that a convenience sample of undergraduate students on its own would provide results that are not generalizable to the population. These concerns about the sample are not due entirely to the relative lack of heterogeneity in ascriptive characteristics of the population I sample from, but my concerns stem from differences in an undergraduate's capabilities to process politically-laden visual information relative to the population's. As I expect that the sample would respond differently than the population (see Krupnikov et al., 2021), I should be concerned with the over-reliance of a convenience sample to establish support for H_3 . Though I try to mitigate some of the problems with the implicit attitudes test by first establishing a baseline response time among respondents, these baseline conditions are not political and I expect that the baseline may be somewhat inaccurate. I also am not able to establish that the order of foci for respondents is on simple visual information and then on the more complex visual information. Experiments that take advantage of eye-tracking software have efficacy for addressing both concerns with the first set of studies.

Empirical chapter 2

Argument

The previous chapter establishes the snap-judgement model in simple situations. It demonstrates that simple visual information is referential, affectively-laden, and that it does encourage behavioral change. It does not establish, however, the way in which common interventions influence the snap-judgments one draws from simple visual information and the resulting behavioral motivations.

The goal of the second empirical chapter is to examine how the snap-judgement model performs in more complex settings. Specifically, for this chapter, I examine the snap-judgement model's ability to inform inter-personal political conversations and to encourage polarization or de-polarization.

An implication of the snap-judgement model is whether interventions might moderate the effect of the snap-judgments that individuals derive from their prior beliefs; that is, the snap-judgement model suggests that attitude change is possible. One such intervention may come in the form of an informal conversation.

Conversing with others about politics is thought to reduce informational costs and to provide other benefits for Democracy (Huckfeldt, [2007](#)). Such sources of information are efficacious for shaping attitudes, even when compared with more formal sources of social influence (Beck et al., [2002](#)). That is, informal political conversations may act as an intervention by providing more information that shapes an initial snap-judgement gleaned from simple visual information such as the color of the t-shirt the individual is wearing or whether they are wearing a hat that looks like a MAGA hat.

The snap-judgement model suggests that individuals are likely to avoid further information with an individual providing simple visual information that induces a negative affective response. Though the provided reasons for individuals avoiding such interactions are rooted in social identity theory and are based on more complicated information than that covered in the snap-judgement model, the literature on network heterogeneity seems to support such an expectation (see Butters & Hare, 2022; Carlson & Settle, 2022; Mutz, 2006).

As the snap-judgement model suggests, however, these interventions are not necessarily avoidable. We often are unable to avoid all conversations with those who hold opposing views (Carlson & Settle, 2022; Huckfeldt & Sprague, 1987; Huckfeldt et al., 2004). There are a number of reasons for this such as this conversation occurring with a family member over the holidays, with a neighbor at a neighborhood party, or a coworker in the hallway. In such situations, some suggest that individuals do experience affective reactions that motivate a desire to end a conversation with someone we believe we will disagree with (Carlson & Settle, 2022). However, it is relatively common for individuals to find themselves in conversations that they do not want to be part of due to factors like physical ability to leave the conversation, as the result of an interaction between personality traits and a desire to adhere to social norms, or to preserve the pre-existing relationship that you have with the person you might disagree with (Carlson & Settle, 2022)

Informal conversations, when they occur, whether one wants them to or not, provides information that we learn from. For conversations that we have with individuals that we agree with, we not only feel that our views are supported (Shapiro et al., 2020), but they also encourage a feeling of belonging to the partisan group (Carlson & Settle, 2022). For conversations that with those that we disagree with, we still learn something even if motivated reasoning processes are at play. Some evidence suggests that informal political conversations with those who hold opposing

views reduces political polarization (Levendusky & Stecula, 2021), though these effects appear to be short-lived (Santoro & Broockman, 2022).

The snap-judgement model would suggest that the effects of this intervention may be short-lived when they are in conflict with previously held views and when the information from such intervention is forgotten. That is, we might expect the effects on de-polarization by Santoro and Broockman (2022) may last longer if such information is reinforced.

As outlined throughout this section, the snap-judgement model provides a number of expectations about the effects of informal political deliberation, which I summarize here: Individuals form snap-judgments about an individual they suspect they will have a conversation with based on simple visual information and when they are primed to believe such visual information may have political meaning (H_1). Such visual information will encourage either a motivation to avoid engaging in conversation with individuals one perceives to hold conflicting political views or to be more willing to have a conversation with individuals one perceives to hold similar political views (H_2). When one learns more information about the individual, one might express more positive or negatively valenced opinions of the individual, be more or less willing to engage in a conversation, and may report lower levels of political polarization than they had relative to when they formed their snap-judgement (H_3). Finally, the effects of the intervention last longer when the information from the intervention is reinforced (H_4).

Research Design

Table 2: Visualization of 3×3 factorial design

	Immediate	\sim immediate, \sim reinforced	\sim immediate, reinforced
Blue	1	2	3
Red	4	5	6
White	7	8	9

The previous chapter establishes whether simple visual information is efficacious to encourage changes to one’s affective state. The goal of this study in Chapter 2 is to examine the applicability of the snap-judgement model on informal political deliberation and to demonstrate the model’s ability to explain a number of conclusions drawn by scholars about deliberation’s effects on attitudes, polarization, and network composition.

Subjects participate in a 3×3 experimental design as depicted in Table 2. Once subjects arrive to the lab, they are prompted to respond to a political attitudes questionnaire and to provide information about their demographic characteristics. Participants are randomly assigned to one of three conditions where they are prompted to form a snap-judgement about a potential discussion partner wearing a red shirt, blue shirt, or a white shirt. Once participants have formed a snap-judgement and have reported whether they are willing to engage in discussion with this fictional discussion partner, they are randomly assigned to either an immediacy condition, not immediate and not reinforced condition, or a not immediate but reinforced condition.

In the **immediacy** condition, once subjects form their snap-judgments, they are immediately prompted with new complex visual information (the key chains with the party logos or no new information) of the fictional discussion partner. They are then asked whether they are willing to

reconsider having a conversation with this discussion partner.

In the **~immediate and ~reinforced condition**, once participants have formed a snap-judgement and are presented with the complex visual information, they are then told to return in a week. When they return, participants are then asked to reconsider their initial choice of engaging in a conversation with the individual.

In the **~immediate but reinforced condition**, once participants have formed their snap-judgement and are presented with the complex visual information, they are asked to return one week later, but that the researchers will be in touch. Each day over the course of that week, subjects receive an email reminding them that they have a potential discussion partner with the same image from the complex visual information stage of the study and that when they return they will make a final decision about whether to engage in that conversation.

When the participants in the **~immediate and not reinforced** and the **~immediate but reinforced conditions** return to the lab, they are asked to reconsider whether or not to engage in the conversation. Participants can then report whether or not they would like to and the study will then end and participants are then informed that the other participant dropped out of the study so there was no match made.

In all three conditions, after participants receive the treatment, they are then prompted with a number of questions. The first is a feeling thermometer which prompts subjects to report how positively or negatively they evaluate the potential discussion partner. Finally, following the advice of Druckman and Levendusky (2019), subjects are then prompted to respond to the social distancing measure of affective polarization to capture polarization directed toward out-partisans relative to in-partisan members of the public.

Empirical chapter 3

Argument

Does visual information from a neighborhood moderate a snap-judgement? I argue with the previous chapter that additional information about potential discussion partners may act as moderators on initial snap-judgements individuals may make about others' political views. The proposed study suggests that this information can be as simple and as explicit as party logos. What do we make of information that is not so clear about betraying the political attitudes of others? This chapter sets out to examine the role of visual information gleaned from a neighborhood and how that may moderate initial snap-judgements about the political views that live in the neighborhood.

Conceptualized as a social identity (Campbell et al., 1960), partisanship represents more than just one's political attitudes but it also represents how one sees themselves fit in with others in society. There are plenty of social identities that individuals may take on (e.g., race, gender, sexuality, religiosity) and these social identities represent how one is like some but also, importantly, how they see themselves as different than others (Huddy, 2001). Partisans undertake considerable effort to differentiate themselves from others (Iyengar et al., 2012) and to make it clear how they fit in with other partisans (Huddy et al., 2015). Political elites do this as well (Dietrich, 2021; Enders, 2021).

Partisanship is a central social identity that individuals use to evaluate others. While there are many social identities individuals might take on, an endogenous cocktail of psychology and institutions cause partisanship to act as a "mega-identity" by which other social identities are wrapped up in one's partisan identity (Mason, 2018). The implication is that there are a number

of stereotypes that individuals pick up on such as how one evaluates potential dating partners (Nicholson et al., 2016) and political candidates who “look” like a Republican or Democrat (Olivola et al., 2012).

These partisan stereotypes inform more than one’s belief about another individual’s partisanship, but they also inform beliefs about the partisan composition of a neighborhood. These stereotypes do not need to be explicit like what political yard signs or flags are outside the houses, but it can be as simple as the modal car parked in the driveways. Individuals assume that neighborhoods that are more rural or suburban and contain a higher proportion of trucks has a higher proportion of Republicans than neighborhoods that have more sedans, and have more dense housing (Hetherington & Weiler, 2018). Not only are individuals making assumptions about the political views of those who live there, but the correlation for these stereotypes to be accurate is strong enough that researchers train computers to predict electoral outcomes using Google StreetView images that contain these features (Gebru et al., 2017).

That is, partisanship as a social identity comes with stereotypes about the group and are informative enough that the public and researchers rely on such information associated with these stereotypes to come to conclusions about an entire neighborhood’s political views. Again, this information need not be explicit. While the presence of yard signs do shape the perception of the partisan composition of the neighborhood (Makse et al., 2019), information this explicit is not a necessary condition.

Individuals that come to a snap-judgement may use such contextual information, such as the space they are in, to re-evaluate this initial snap-judgement. As the snap-judgement model posits, this snap-judgement is strongly informed by prior experiences and the affective tagging of these experiences to inform an individual’s reaction to simple visual information. However, intervening

information adds new data that may encourage an individual to re-evaluate it. Considering a neighborhood, the space one is in, as this contextual information, the snap-judgement model would suggest: implicit and explicit contextual information are both successful at moderating a snap-judgement (H_1), this visual information about the neighborhood can shape conclusions one might draw about an individual based on the yard sign in front of their house (H_2) and it can shape how one feels about having a conversation with an individual that they may meet while out on a walk in the neighborhood (H_3).

Research Design

To examine the plausibility of these hypotheses, I propose conducting three separate studies. The goal of the first study is to examine whether, relative to a placebo, individuals come to similar beliefs about the partisan composition of residents in a neighborhood relying on explicitly partisan visual information (i.e., a flag with a political message) or with implicitly political visual information (i.e., the modal car in the driveways). The goal of the second study is to examine whether once this snap-judgement about the neighborhoods partisan composition is moderated by a yard sign. The goal of the third is much like the second: to examine whether the prospect of a conversation with someone wearing partisan branded clothing moderates a snap-judgement about the political composition of the neighborhood.

In the first study, I will use a block design based on partisan identification to randomly assign subjects into one of three conditions after responding to demographic and political attitude questionnaires. Using election data, I will choose a handful of neighborhoods that were split between a Democratic and Republican candidate in a recent election. I will then use google streetview images for each of these neighborhoods. To select a neighborhood for the study, I will use MTURK workers to determine which ones are most, on their own, perceived to be mixed in partisan com-

position. I will then “manipulate” the image to create a placebo, an implicit, and an explicit condition. In the placebo condition, I will add cars and flags to the driveways of the houses that represent an ideological mix. In the explicit condition, I will add a Blue Lives Matter flag to the front of the house. In the implicit condition, I will add a number of Trucks to the driveways of the houses. In the two primary conditions, I keep the Republican-stereotyped information about the neighborhood consistent as the treatment may be heterogeneous depending on the subjects congruency with political views. I additionally use the same neighborhood for all three conditions but manipulate a couple of features out of concern with equivalency between the treatments. Furthermore, the neighborhood without these manipulations should appear “independent” as a way to ensure that the placebo is not itself an implicit treatment. After treatment, I will prompt subjects to provide their thoughts about the racial, class, and partisan composition of the neighborhood.

For a randomly selected half of those assigned to the placebo and the explicit condition, I will include a second treatment. For this second treatment, I inform them that the researcher took an image later in the week and there will be a second house with a yard sign and it will either be white and blurred out, red and blurred out, or blue and blurred out. I will then prompt subjects to provide their same thoughts about the racial, class, and partisan composition of the neighborhood. H_2 suggests that participants should adjust their snap-judgement about the partisan composition of the neighborhood with such new information.

For the other randomly selected half of those assigned into the placebo and the implicit condition, I will include a second treatment. For this second treatment, I inform them that the researcher identified a resident of the neighborhood that might be willing to talk to someone about their neighborhood. It will then display an image of this fictional prospective discussion partner. This discussion partner will either be wearing a white shirt, red shirt, or a blue shirt. I will then

prompt subjects to provide their thoughts about the racial, class, and partisan composition of the neighborhood. Once they have done so, subjects are then informed that at the last minute the discussion partner is unavailable to talk at this time. H_3 suggests that the snap-judgement that subjects come to about the neighborhood from the first treatment should change in response to this new information about a potential discussion partner. This particular design of course does not consider how the content of a conversation itself may act as an intervention on the snap-judgement. The content of a conversation undoubtedly moderates the effect of a conversation on one's affective state (Carlson & Settle, 2022).

Proof-of-concept

I conducted a pre-test in November 2019 with a sample of over 400 undergraduate students at a medium-sized University in the northwestern region of the United States. Students were recruited if they were enrolled in a political science course and were offered extra credit for their participation in the study. The study asked participants to participate in 5 survey experiments administered by those affiliated with the university's college-level unit. These other survey experiments were focused on capturing local policy issues around urban design, criminal justice, and probing participants about political participation in local and national-level elections. Participants were asked to participate in my survey experiment after one that examined their levels of political participation in local, state, and national elections.

Table 3 presents the descriptive characteristics of the sample. The sample is primarily White with over 80% self-reporting that they are White(coded as: 0 = non-White, 1 = White). The sample also skews slightly female on sex with about 60% of the sample reporting that they are female (coded as: 0 = Male, 1 = Female). The sample also, unsurprisingly, skews young with the

average respondent reporting an age of about 22 years old. The average respondent also appears to be an independent but leans Republican (coded as: -3 = strong Democrat, -2 = Democrat, -1 = leans Democrat, 0 = Independent, 1 = leans Republican, 2 = Republican, 3 = strong Republican).

I randomly assign participants into three conditions. The conditions prompt subjects to “Imagine that [they] are driving along a road and see this yard sign” with the same message “Vote for Riley”. The conditions vary on the color of the background for the image¹. In the control condition, the background was white. Then I had a red yard sign and blue yard sign condition. On a separate screen participants were asked a series of questions acting as outcomes of interest.

To provide a preliminary test of [Empirical chapter 1](#)’s H_1 , I ask participants to report whether the candidate was a “Republican, Democrat or Independent”. Though it does not capture pre-conscious processes, I also wanted to capture the valence the presumed out-or-co-partisan yard sign evokes for subjects. To do this, I ask respondents whether they would “seek out more information about the candidate”, “avoid the candidate”, “or vote for the candidate”. Subjects could respond to one of three questions with a “yes” or “no” response.

I then combine these questions into a single measure of the subject’s valenced response directed toward the candidate. Those that reported they would vote for the candidate or seek out more information, were coded as 1. Those who reported that they would avoid the candidate were coded as -1. Those who reported some combination that represents mixed views or some degree of ambivalence were coded as 0.

I also wanted to examine whether these valenced reactions to the yard sign are directed toward the presumed neighbor who displays the yard sign. I asked participants to respond “yes” or “no”

¹The images used for the treatments and the particular wording for the dependent variables are included in the Appendix

to whether when “imagining this yard sign on a neighbor’s lawn” whether the subject would want to “talk to the neighbor to seek out more information about the candidate”, “tell the neighbor that you want to vote for the candidate”, or to “avoid the neighbor”. As I did with my outcome of valenced response directed toward the candidate, I also combined these three questions. Those who reported that they would want to avoid the neighbor were coded as a 0 and those who indicated that they would want to interact with the neighbor are coded as a 1.

I test whether participants presumed that the candidate was of a particular partisan persuasion based only on the color choice of the yard sign alone and whether this is moderated by the partisanship of the participant and what influence it has on valenced reactions directed toward the owner of the sign and a neighbor displaying the sign. I create two indicator variables of the treatment the subjects received: whether or not they had the blue or red yard sign treatment. The control condition is treated as the baseline condition when including both indicator variables in the model.

To examine whether subjects presumed that the fictional candidate is affiliated with a particular political party, I fit a model using a cumulative link function from the logistic distribution and specify a prior location of R^2 - which represents the proportion of variance the model explains for the discretized latent variable - with an average R^2 of 0.3 when the predictors are at their sample means (see Gelman et al., 2021, Chapter 15). I assume this about the R^2 as I recognize that color is not going to explain all of the variation in the subjects’ ability to detect partisanship, however, my theory suggests that it should have a meaningful impact. Therefore, I choose an expected value of 0.3, representing that I expect that my treatments should predict about 30% of the variation. I also assume that my errors are normally distributed with a mean of zero. The model is fitted using 6 chains and about 2000 iterations. The results are presented as the average

marginal effects for representative values in Figure 2².

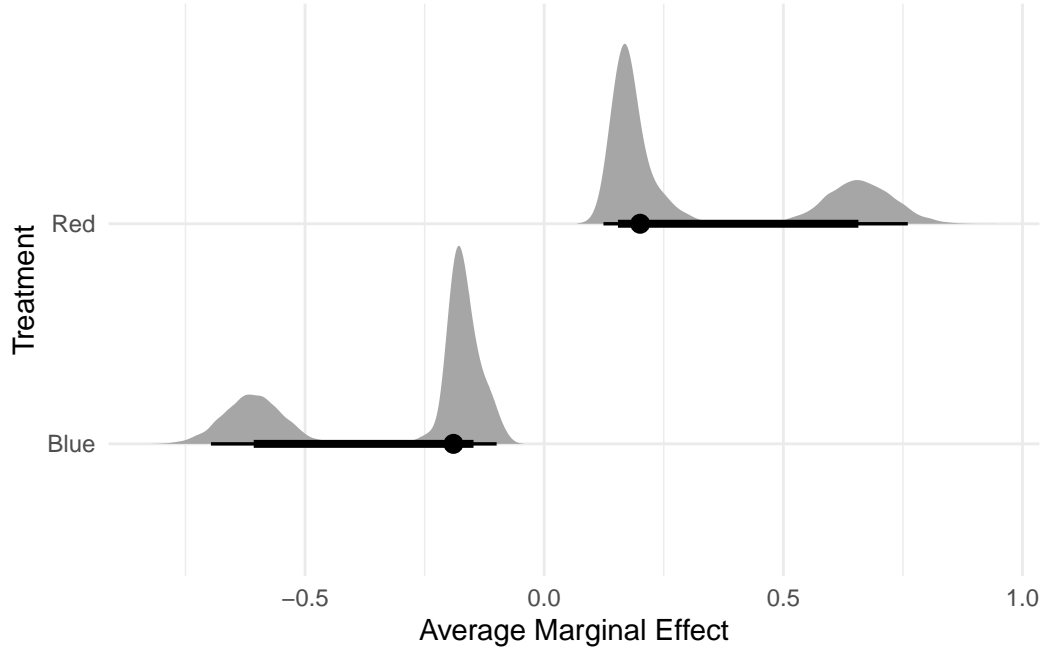


Figure 2: Associate color with partisanship

The results suggest that there is some *preliminary* support for my expectation that individuals associate red and blue with Republicans and Democrats. My results suggest that individuals in the treatment with the red yard sign were more likely to presume that the candidate was a Republican, despite having *no* other information about the candidate other than their name and the color of their yard sign. Those in the blue yard sign treatment were more likely to assume that the candidate was a Democrat. The credible intervals for these estimates can be interpreted as the probability that the true estimate is contained in the interval. As neither of these intervals overlap with zero, there is a 95% chance that the true effect is not zero.

With confidence that the subjects associate the yard signs with the candidate's partisan affil-

²Full results are presented in Table 4.

iation, I turn my focus to their evaluations of the owner of the yard sign and the neighbor who display the yard sign. I make the same assumptions with the model of candidate evaluations given the treatment. As the outcome of interest is a ordinal categorical variable, I specify a cumulative link function from the logistic distribution and specify a prior location of the R^2 with an average of 0.3 when the predictors are at their sample means. As I coded my outcome for the neighbor evaluation as binary, I specify a cumulative link function from the logistic distribution and rely on the default uniform distribution as my prior - which represents that I expect a coefficient on any real number line is equally likely as another. The results of these two models are included in the second and third columns of Table 4 and as the conditional marginal effects of representative values in Figure 3 and Figure 4.

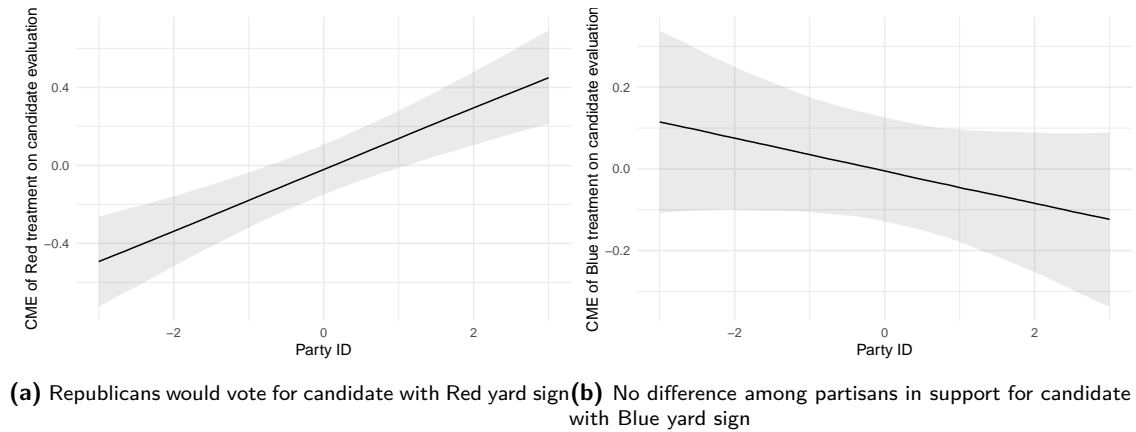


Figure 3: Effect of yard sign color on candidate evaluation

Figure 3 presents results suggesting that among Republicans receiving the red treatment, they are more likely to indicate that they have a positive valence toward the candidate than Democrats who are more likely to report a negative evaluation of the candidate. We see that while Democrats receiving the blue treatment are more likely to also report a positive valence toward the candidate relative to Republicans, the effect is plausibly zero. This may be an artifact of asymmetric

political polarization. Some scholars suggest that Republicans are much more group-oriented than Democrats (see Lupton et al., 2020), these results may fit with such a narrative. Republicans are reactive to those they may presume to be a co-partisan in a way that Democrats do not appear to be as reactive in a similar magnitude.

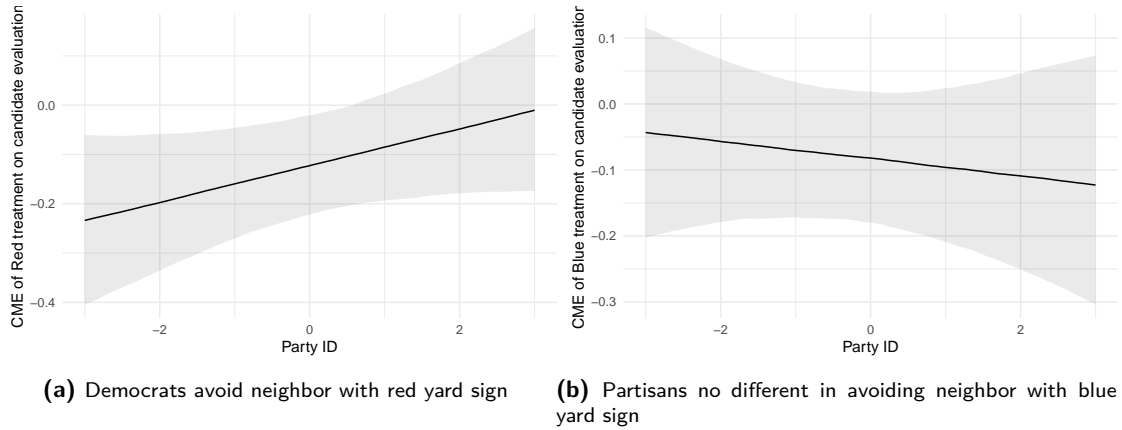


Figure 4: Effect of yard sign color on neighbor evaluation

Figure 4 presents results that we might have expected. That is, Democrats receiving the red treatment were more likely to report that they would want to avoid an interaction with a neighbor who are displaying the red yard sign relative to Republicans. It also demonstrates that Democrats would be more likely report a desire to interact with a neighbor who are displaying the blue yard sign. Neither of these effects appear to be plausibly different than zero, however. These results could possibly be explained by characteristics of the respondent and the outcomes measured. Those who are more extraverted may be more willing to interact with a neighbor about a yard sign that they posted, which will affect whether they are willing to ask a neighbor more about the candidate or to tell the neighbor about their support for the candidate. For those who are less extroverted, these “approach” behaviors may be unpalatable not because of the treatment. In other words, I have a confound that I did not collect data on. It also appears that there was a

steep drop-off in the number of participants who responded to these questions with an N of only 267 relative to the other two models which have an N over 400.

The evidence from this pre-test is limited. The experimental design is not testing pre-conscious evaluations. The treatments are explicitly political and was conducted on a convenience sample of those enrolled in political science classes. The ability for individuals to associate partisanship with the treatments are likely overstated. The sample is also quite unrepresentative, so inference is certainly threatened. As I discussed with the third model, I also have omitted variable bias as the result of my outcome being a better measure of approach behaviors for those who are extroverted.

Though there are problems with the design here, it does serve some purpose for this prospectus. It demonstrates, that despite its problems, that at some level, when thinking of politics, color can betray information. It also provides a useful first test of a possible research design to examine what this particular design can and cannot tell me about my proposed mechanism.

Appendix



Vote for Riley 2020

Figure 5: Treatments

Table 3: Descriptive Statistics

	Unique (#)	Missing (%)	Mean	SD	Min	Median	Max	
Female	3	3	0.6	0.5	0.0	1.0	1.0	
White	3	3	0.8	0.4	0.0	1.0	1.0	
Age	30	2	21.7	5.6	18.0	20.0	68.0	
Party ID	8	15	0.1	2.2	-3.0	0.0	3.0	

Data source: Pre-test experiment.

Unique column includes NA values.

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Table 4: The association of color with partisanship and its effects

	Party	Candidate evaluation	Neighbor evaluation
Blue treatment	−2.437 [−2.919, −1.955]	−0.020 [−0.524, 0.515]	−0.082 [−0.180, 0.019]
Red treatment	2.636 [2.092, 3.200]	−0.086 [−0.613, 0.437]	−0.123 [−0.222, −0.021]
Party ID		−0.183 [−0.360, −0.005]	−0.007 [−0.041, 0.025]
Blue treatment × Party ID		−0.162 [−0.401, 0.078]	−0.013 [−0.059, 0.036]
Red treatment × Party ID		0.637 [0.382, 0.905]	0.037 [−0.008, 0.082]
Intercept			0.924 [0.856, 0.993]
Thresholds			
Threshold 1	−1.223 [−1.562, −0.899]	−1.929 [−2.353, −1.527]	
Threshold 2	0.693 [0.402, 0.999]	2.880 [2.384, 3.405]	
N	520	463	267

Data source: Pre-test experiment.

Median estimate from fitted model with 6 chains and 2000 iterations.

95-percent credible intervals in brackets.

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