On the Formation and Economic Impacts of Social Identity

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The history of Social Identity Theory applied to economics traces back to the seminal work of Akerlof and Kranton, 2000. Since that time, many papers have explored the importance of this theory in experimental and theoretical settings. In this thesis I explain the need for a new model of Social Identity Theory. Two significant problems of research into Social Identity Theory have been an unclear definition of what an identity is and a conflation of identity with groups. I clarify these issues by providing a clear definition of identity and clarify the distinction between public and private identities.

Next, I show how identities are formed and manipulated using a novel source of micro level data. Using data from the 2004 General Social Survey and Wisconsin Ads Project, I develop a model which demonstrates how public identities are influenced by long-term and short-term priming. There are different effects between and within groups. In general, I find increasing exposure effects with increasing priming. Further, I find that individuals who exhibit behavior's indicative of possessing a stronger identity experience little impacts from external priming. Those who select an identity but do not exhibit behavior's associated with that identity are what drive the exposure effects. These results suggest that identities can be manipulated to alter individual's choices.

Finally, one avenue that Social Identity Theory impacts economics is through the ballot box. How groups vote informs modern political policy choices and political advertising. I investigate the role that Social Identities have on whether and for whom to vote. Social Identity Theory has been applied in the understanding how race and ethnicity group membership shapes voters preferences. I expand this literature to consider identity directly. I find that including a measure of whether an individual identifies with a demographic group improves our understanding of how groups vote.

Dedication

To Emily, Rafaela, and Greta, who provide daily love and support no matter how difficult the road.

For my children, Sebastian and Katie, who's smile and laughter always recharges me.

To my Mom without whom I wouldn't be here and who's struggles and perseverance showed me I could do more and my Dad who came into my life and taught me through our arguments to always question everything.

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On The Need For A New Model of Social Identity

1.1   Introduction

Social Identity Theory owes it's inclusion into the economics toolkit through the work of George Akerlof and Rachel Kranton in their seminal 2000 paper *Economics and Identity*, Akerlof and Kranton, 2000. Over the last two decades progress investigating the role social identity plays in economics has been slow. What progress has been made has focused on demonstrating that identity can shape economic decision making and outcomes. For the first decade or so, the evidence consisted primarily of demonstrations through limited experiments that group behaviors were present. More recently, papers have been written focusing on real world identities. This literature has found that groups do matter, whether in explaining consumer behavior, (Atkin et al., 2019; Charness & Chen, 2020; Shayo, 2020), political preferences, (Besley & Persson, 2019; Calderon et al., 2020; Duell & Valasek, 2017; Gennaioli & Tabellini, 2019), preferences for the distribution wealth, (Benjamin et al., 2010; Chen & Li, 2009; Klor & Shayo, 2010; R. E. Kranton & Sanders, 2017), ethnic conflict, (Berman et al., 2020; Feld et al., 2016; Grossman & Helpman, 2021; Shayo, 2018), or life choices, (Bettencourt et al., 2001; Carvalho, 2012; Cassan et al., 2021; Destin, 2020; Oh, 2019; Oyserman et al., 2014).

While these papers have found groups matter, what has proven to be difficult is investigating how identities are formed and whether they are malleable or not. Part of this difficulty lies in properly defining what an identity is. Therefore, one of the goals of this paper is to put a firm definition of what an identity is and how it is different than a group.

The second difficulty arises from disentangling the various identities that do exist. To circumvent this issue, researchers have relied on either controlled experiments where artificial groups are created or studying regions with extremely strong, singular, identities, such as Israel and India. Experiments have the advantage of allowing researchers to isolate specific identities though they are typically artificial and of questionable external validity. Focusing on Israel and India allows for answering many questions related to how groups form, but the groups studied are specific to those countries and provide little to no insights into understanding societies with more complex identity structures.

These issues have provided strong constraints on the type of research Identity Economics can address. Without clear definitions of identity, economists are stuck working with largely the same framework we were prior to the publication of Akerlof and Kranton's foundational work. The cause of this problem is where Social Identity Theory comes from. Historically, psychology and sociology have been the drivers of identity research. Papers in these fields have primary focused on the impact that groups have on individuals, why groups compete, and how groups impact individuals. They have also looked at the formation of group norms and behaviors which help to differentiate groups from one another. When looking at the impacts of priming they have distinguished between groups and identities, but even in these cases it's not uncommon to see groups and identities conflated.

This lack of differentiation has not been detrimental to the development of Social Identity Theory however because of the questions that have been asked by researchers. It is of great interest to understand what impact groups have on individuals. Failing to differentiate between identity and groups is of no concern when the research question focuses within a single identity to uncover how group membership impacts behaviors. Where this differentiation is required is when asking questions about how groups interact with one another across identities and when investigating how individual's choose between multiple identities.

The most striking example of this is in research involving identities within the United States. There is has been little work done on identities within the United States because there are so many different identities. Papers throughout the literature over the last several years have discussed the

increasingly identity driven politics within the United States. But little to no work exists investigating identities role into this due to the difficulty of understanding which identities matter. Studies that do attempt to investigate this typically focus on specific groups rather than across identities. The work that does exist shows a diverging society along several group lines, (Desmet & Wacziarg, 2021; Gentzkow et al., 2016). This divergence in the United States provides another justification for separating identity and groups. Group composition is changing quite slowly within the United States, Tom W. Smith; Co-Principal Investigators and Hout, 2017. Therefore, something else related to groups must be changing relatively quickly in order to drive the divergence the United States is seeing. This something is identity.

Given these difficulties it is clear why Social Identity has gained such little traction in the broader economics community. In this paper I will provide a definition which clearly distinguishes between groups and identities and explain why most identity based research has actually focused on groups rather than identities. I will also layout a methodology for determining identities so that future research can more precisely measure identity and uncover its economic impacts.

This paper is organized as follows. Section 2 provides the psychological definition and basis for identity. I also lay out the case for why identities are malleable and how they differ from groups. In section 3 I discuss the current state of research into identity formation and manipulation within economics. Finally in Section 4 I provide a road map for future research and the expanded benefits that identity can be expected to have on a variety of fields within economics.

1.2   Social Identity

Social Identity Theory is a theory "that rests on people making social comparisons between in-group and out-group ... in order to construct a sense of who they are and how they are evaluated. The outcome of such comparisons is status differentials and the entire edifice of intergroup behavior", Hogg, 2000, pg. 401. These social comparisons are the foundation of how groups impact behavior. Indeed, Tajfel argued that "the scope of nonsocial means of acquiring knowledge is tiny. Even the most apparently nonsocial physical judgments acquire meaning, and therefore validity,

socially", Hogg, 2000, pg. 404. Hogg goes on to explain, " ... knowing that (an object) is a bed rests on a wide consensus that things that look like beds are beds and that they are for sleeping on. If someone told you it was a table, you would be surprised; but if enough people told you continually from birth that it was a table, then it would be a table to you."

Given that everyday objects only acquire meaning because of group consensus, it is easy to see how groups can impact all levels of the decision making process. But which groups matter? We can partition individuals into any set of groups that we like. People can be grouped by race, religion, and what language they speak. They can also be grouped by what sport and sports team they support, what books they like, or what clubs they belong to. They can even be grouped by completely arbitrary things like hair color, handedness, or preferences for art. That these last three groups are almost laughable as a cause of discrimination while the first three I listed are not demonstrates that there is more to groups than simply being able to be grouped. Understanding why some groups matter and others don't led to Social Identity Theory and our current understanding of how groups impact behavior.

1.2.1   Identities and Groups

The first problem of Social Identity Theory is in defining it. As explained in Abdelal et al., 2009, "The wide variety of conceptualizations and definitions of identity has led some to conclude that identity is so elusive, slippery, and amorphous that it will never prove to be a useful variable for the social sciences." This is highlighted in some of the works cited above where identities are associated with "Palestinian", "Jewish", "Nation", or different castes. We see with Palestinian and Jewish that these "identities" are categorical groups, while the concept of "Nation" subsumes a multitude of categorical groups. I will formalize the meaning of identities and groups shortly.

The basis for my definition of identity, one that I believe clarifies precisely what an identity is and why it is different from being a member of a group, begins with the definition of Tajfel in his seminal work on Social Identity Theory. Tajfel gives two different, but similar, definitions of identity. In the first he defines social identity as " ...the individual's knowledge that he belongs

to certain social groups together with some emotional and value significance to him of this group membership", Tajfel, 1972, pg. 292. His second definition came 7 years later after being joined by his graduate student Turner, "...individuals must have internalized their group membership as an aspect of their self-concept: they must be subjectively identified with the relevant in-group. It is not enough that others define them as a group, although consensual definitions by others can become, in the long run, one of the powerful casual factors for a group's self-definition.", Tajfel and Turner, 1979.

We can see in Tajfel's definitions of Social Identity three critical components; identification, categorization, and comparison. These three concepts are closely related and are the cause of the vagueness of the definition of Social Identity that has prevailed since Tajfel first developed the theory. However, despite this closeness, they participate in three quite distinct phases of identity formation. Given Tajfel's definition I am now in a position to properly define a social identity and a group and explain how comparison relates these two concepts and provides the means for groups to impact behaviors. I begin by defining a group.

Definition 1.2.1. Group A *Group*, G, is a collection of individuals sharing a set of common characteristics.

Another useful name for a group is "categorical group". These common characteristics can be absolutely anything. Characteristics are typically easy to recognize by an external observer.

Definition 1.2.2. Related Groups Two or more groups are said to be related if individuals in those groups are classified by the same set of characteristics, but differ in those characteristics.

As an example, being "White", "Black", "Hispanic" are all related groups that an individual can belong to. They have been classified by the characteristic, "skin color", and differ in their skin color. Before discussing groups further, it is useful to define what an identity is.

Definition 1.2.3. Identity An *Identity*, J is set of related *groups*, G.

The following axioms define the relationship and differentiate between groups and identities.

(1) $\bigcup G \in J = 1$

(2) $\bigcap G \in J = 0$

(3) Individual's movement between groups is restricted or impossible

(4) Individual's can move freely between identities

(5) Individual's do not need to hold one identity

(6) Group categorization is both internal and external to the individual, identification is strictly internal

The first axiom states that all individuals can be placed into a group belonging to an identity, J. Everyone can be grouped. The second axiom states that these groups within an identity are mutually exclusive. An individual cannot belong to multiple groups within an identity. These first two assumptions are less restrictive than they may appear.

Returning to our example of race, every individual can be classified as belonging to a group based on their skin color. They cannot belong to two groups. It is possible to define these groups as "light", "medium", "dark" skinned. Every person will fall into one of these categories. This doesn't mean every individual will classify every person identically, rather they will simply be classified by every individual into one and only one of these categories.

We can split these categories more finely. The example of the United States Census question on race highlights this as the categories corresponding to one's race have expanded from simple skin color to dozens of different classifications. Allowing for individual's to choose more than one of these categories does not place them into two groups, it places them in an entirely new group. Individual's with that same set of selected characteristics belong to the newly created group.

The third axiom states individuals can move between groups, however this movement is limited, difficult, and may even mean creating a new group rather than truly leaving one group and joining another existing group, Hogg, 2000. An example of this is how, currently, individuals who transition from one gender to another are classified, and classify themselves, as "transgender". They

are differentiated from "cisgender" individuals. Religious affiliation is another example of being able to switch between groups, and while this transition may be quite simple in some times and places, it can also carry enormous stigmas in others and create new groups rather than transition cleanly to pre-existing groups.

The fourth and fifth axiom's demonstrate how identities are truly different than groups. An individual can simultaneously identify with all identities or no identities. They can switch between the identities they hold quite freely, even within a single conversation. This is why differentiating between groups and identities is critical. An individual cannot move between groups. Returning to the example of race, an individual is white. They cannot stop being white. What it means to be white may change, slowly, over years or longer, but they are fundamentally white. They can identify with race, or stop identifying with it, in an instant. This malleability of identities is the critical component that differentiates Social Identity Theory from the study of groups.

The final axiom refers to the fact that, externally, one can classify any individual by any criteria one chooses. They can also classify themselves by any criteria they choose. These classifications don't have to match. For example, one of the first black baseball players to almost play Major League Baseball was a man named Charlie Grant who was light-skinned enough to attempt to pass as Cherokee. The attempt was prevented by white owners when Charlie's black friends threw him a party. Several other attempts of this type were tried prior to Jackie Robinson breaking the color barrier. These cases show that categories don't have to correspond to any kind of truth, or even be consistent from one individual to another. This is one of the theoretical challenges faced by studying group behavior, however in practice this problem can be avoided as exemplified by no black baseball player playing Major League Baseball for almost 60 years. It is an interesting research question to ask what happens when an individual's internal classification doesn't match their external one, but I leave this topic for future work.

The final part of the the last axiom is that identity is strictly internal. Another way to state this axiom is that one "can" be grouped into a category, but one doesn't need to care about that category. Hair color is an interesting example to highlight this point. For many individual's the

color of their hair is taken as given and no further thought is put into it. One can say that they are categorically a member of a group, but the emotional attachment to their hair color that creates the identity does not exist and so they do not hold this identity.

For other's however, hair color is a defining identity. They may like their hair color, or they may change it. They may prefer natural colors or unnatural ones and their hair color becomes a part of who they are. There is no way for an external observer to know whether an individual identifies with their hair color or not without asking them. Even someone who has dyed their hair a radically unnatural color may not identify with their hair color. It may just be a means of communicating another identity that they hold. Externally we can classify them by their hair color, but internally their hair color may hold no meaning on it's own.

This example highlights what is meant by Tajfel when he states, " ... together with some emotional and value significance to him of this group membership" and "... individuals must have internalized their group membership as a concept of their self-concept". Identity is fundamentally an internal process. Any investigation into group behaviors that does not account for the internal process of identity is not a study into identity, it is a study into groups that may or may not matter.

Finally, researchers need to be careful about which groups they consider to matter. The further from one's own culture that one is researching, the more likely they are to misdiagnose the groups that matters. For example, one of the first studies into the fractionalization of a society that exists is the Atlas of the People's of the World which measured the distribution of ethnic groups around the world, Mira, 1964. This study was conducted by scientists in the Soviet Union which had strong ethnic boundaries marked by language. To the Soviet's of the time, language defined the groups and so the United States was measured to be much more homogeneous than it truly is. Which groups are important in the sample is the first question any study into the impacts of groups needs to ask.[1]

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[1] Of course reversing this is also possible. One can look at a variety of groups to see which groups matter within a society. The point is assuming one group matters and finding that it doesn't is not evidence that groups don't matter. It is evidence that that particular group doesn't matter within the society being studied.

1.2.2   Social Comparison

I stated earlier there were three components of group identity, but I have only discussed two, *identity* and *categorization*. The third component is comparison and merits it's own subsection as it is the linkage between groups, identities, and behaviors. As stated in Hogg, "Any theory of the social group therefore would be a strange theory indeed if it did not deal with the social comparison processes." Hogg, 2000, pg. 401. Given the importance of social comparison to social identity, a strong definition is critical. Fortunately, because the concept of comparison is older than that of social identity, a universal concept of what is meant by social comparison exists.[2]

From Hogg, "Social comparison is a pervasive and fundamental feature of group life. People compare themselves with fellow group members, they compare themselves with people in other groups, and they compare their own groups with other groups. From these comparisons emerge group norms, group structure, and intergroup relations, which in turn provide the framework for group-based social comparison." Hogg, 2000, pg. 401. Quite simply, without social comparison there would be no Social Identity.

Social comparison has more to do with Social Identity than simply being the mechanism through which groups evaluate one another. It also drives identities. It is what gives meaning to why some groups matter and why others don't. Hogg explains, "... all groups in society live in the midst of other groups" (Tajfel, 1972, pp. 293-294), the positive aspects of social identity ... and the social value of a specific group membership ... "... only acquire meaning in relation to, or in comparison with, other groups" (Tajfel, 1972, p. 294).", Hogg, 2000, pg. 404. Further, "... research tends to support the idea that in intergroup contexts social comparisons are governed by striving for positive in-group distinctiveness", Hogg, 2000, pg. 407.

These comparisons feed into identities by reinforcing them. Figure 1.1 provides a visual representation of the interaction between identities, groups, and comparison for a public identity. We see that an identity causes individuals to compare their categorical group to the outside groups of

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[2] In fact the research into comparison in the 1950's and 1960's was the justification for the need for a theory of social identity.

that identity. This comparison leads to the group norms and behavior's that lead the consequences of groups. In addition to these consequences, it also feeds back into making salient the very groups that are being compared. This increases the propensity for an identity to be held creating a feedback loop.

Figure 1.1: A graphical relationship between public identities, categorical groups, and social comparison
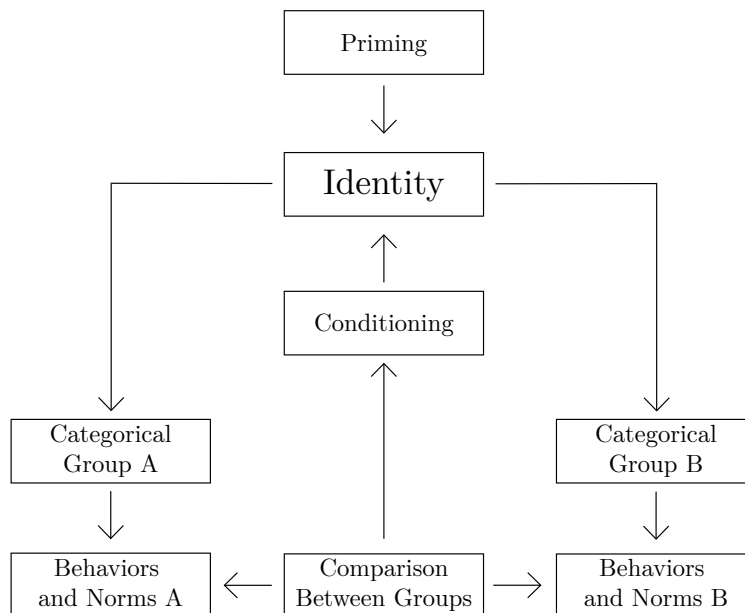
Priming and conditioning influence public identity selection. Once a public identity is chosen individuals are grouped according to the categorical groups related to that identity. Comparison occurs between the behaviors and norms of the groups which reinforces the differences between groups and influences the identity choice.

It is this feedback loop that makes identities so difficult to remove. It is not enough to curb behaviors associated with identities, one must also address the internal comparisons that are being made that reinforce the identity within the individual. It is through this channel that long-term identities are passed on. Before discussing this further it is necessary to define what is meant by salience and the issues surrounding the interaction between salience and identity.

1.2.3   Salience of Identities

To this point I have discussed what an identity is. What we have yet to see is how identities come about in the first place. After all, hair color has existed since before the rise of *Homo Sapiens*, but we don't see societies segregated by hair color. Something must happen to make an identity important. That something is priming.

Priming is an action that makes an identity salient. Without priming, there is no identity. The clearest example of this is in the identity that is nationalism. Most people would be surprised to learn that the idea of the nation, and the identity associated with it, are quite new, Hobsbawm and Ranger, 1983/2012. Nationalistic identity is a modern invention. While individual's took pride in the city or region they were from, rarely did they consider the overall society they lived within as something to care deeply about. Until the time of the American and French Revolutions, nationalism simply didn't exist. The salience for national identity took shape during the Industrial Revolution and Napoleonic Wars. Communities began to see themselves as part of a larger society, and in turn began to develop a stronger sense of identity.

There are two ways identities are made salient which are distinguished by their time frame of occurrence, conditioning and priming. In the long-run, salience is increased by the comparison of groups. This comparison comes from the values instilled by parents, the interactions one has with members of one's own group and outside group's, and the comparisons made by the society. Individual's make the comparison both in the upward direction and in the downward direction. Which direction they compare in depends on the context of the groups being compared.

When an individual belongs to a minority group that is lower status and the groups are stable but permeable individuals in the low status groups attempt to redefine themselves into the higher-status group, Hogg, 2000. For those who belong to a minority group that is lower status, stable, but impermeable, such as race, three options exist. They can make upward comparisons are made to re-evaluate the properties of the group, attempt to choose a different identity, or they make downward comparisons to groups that are even further down the status hierarchy. Finally,

when a group is unstable or the rankings are perceived to be illegitimate and the groups are impermeable, then a highly competitive upward comparisons ensue, i.e. a power struggle between categorical groups. For high-status groups, when their status is threatened we see the downward status become highlighted.

These comparisons reinforce the identities associated with the categories and the cycle continues. This cycle determines the primary identities a society holds. It is this cycle that led to nationalism's rise as an identity. But how does the cycle begin? To answer this, we must look towards the second type of salience driver, priming.

Priming is the short term salience driver which shifts identities. Unlike conditioning, priming isn't driven by group comparisons. Instead it is driven by references to the groups. These references can be abrupt and strong, such as an attack on a nation or the persecution of a group member, or they can be subtle and weak, such as through the reference to a characteristic an identity may be associated with or even mentioning the group in the context of a larger conversation.

Short term identity primers provide the mechanism to shift identities relative importance to an individual. With enough short-term priming, comparison can begin and an identity can develop. When looking at the way nationalism arose, we see that short term priming in the form of conflicts, societies that were integrating, and the rise of newspapers which allowed for more rapid dissemination of news and stories helped to build a new identity. The conflicts that followed, specifically the American and French revolutions and Napoleonic Wars, created the comparison cycle that led to Nationalism becoming a common identity in the modern world. Nationalism in particular, because of it's recent formation, allows for a detailed study of how identities arise and would be an interesting future research project.

1.3   How is Identity Formed?

There are two primary paths economists have followed in the pursuit of understanding how identities are formed and chosen. The first is through the mechanism of priming and status. In these models, individuals derive some kind of utility from membership in a group, whether material

or psychological, and choose group membership in order to maximize their utility. The second is to consider identity as a club good where individual's look to choose an identity that has a costly behavior associated with it and groups look to set a cost of membership that selects who is allowed to identity with that group.

I consider each of these cases separately as they are addressing two types of identity formation and understanding these two types of identity can help to understand the difficulty in understanding identity from an economist viewpoint. The first type of identity formation are those identities that society values, namely public identities. The second are those identities that society may not care about, but some individuals do which I shall refer to as private identities.

The above framework of identity, groups, and comparison applies to both of these types of identity. The difference is the composition of the groups. For public identities, every individual can be grouped into a group belonging to that identity in accordance with axiom 1 in subsection 1.2.1. For private ones there are only ever two groups, those who are in the group and all of those not in the group.

For example, race is an identity that all individual's within a society can identify with and all belong to groups that make up that identity. A private identity would be membership in a club, such as a Freemason group. All individual's in society are either members of this club or are not members of it. One cannot identify with a private identity unless they are also a member of that group. Because identity and group membership in private identities are so tightly correlated, the common conflation of identity and group membership is understandable.

Religion straddles the lines of public and private identity as there are a multitude of religious beliefs, even within the same religion. As religion is one of the most common identities studied by economists, it is easy to understand why economists have mistaken identity and group composition for so long. It is a public identity in the sense that individual's can belong to a multitude of groups that fall into the religious umbrella and do so without the associated costly behaviors being required to be a member of a particular group. The General Social Survey for example gives individual's dozens of options for their religious affiliation. There are many people for whom religion may be

an identity they hold but for which they take little to no actions.

It can also be a private good when the religion demands compliance and behaviors in accordance with that religion. To fail to uphold the standards of the group is to be ostracized from the group. We see that in general, Christian's in the United States may identify with Christianity, in any of it's forms, but do not need to enact behaviors in accordance with it. On the other hand, there exist Christian sects for which the behaviors are an absolute requirement. These behavior's can take the form of donations, prayer, scripture study, or religious sacrifice. Failure to partake in these activities can mean removal from the group and loss of the associated identity.

1.3.1   Public Identities

Having drawn a distinction between a public and private identity choice, I am now in a position to review the models used by economists to understand identity formation. The first model I look at is that of a public identity.

The model of public identity was first articulated in Shayo, 2009. This model of identity formation consists of two parts; the perceived distance d_{ig_i} from group g_i, and the status of that group S_{g_i}. Each *social group* belongs to the nonempty set $G = \{J : J \subseteq \mathcal{N} \text{ is a social group}\}$. Shayo defines social groups as categories that individuals learn to recognize when growing up and living in a society. Shayo makes no distinction between categorization and identity. Each categorical group is an identity in Shayo's model. To highlight this lack of differentiation between categorization and identity, Shayo defines three social groups for the purposes of his model; "Poor", "Rich", and "Nation".

The first direct driver of identity formation in Shayo's model is perceived distance. This is a measure of how far an individual is from the "prototypical" member of that group as measured by a variety of characteristics. An example of this is if one is in the bottom 20% of the income distribution, they are closer to the prototypical member of the poor group than they are to the rich group along the income axis. This distance measure is the weighted sum of all of the relevant characteristics. For simplicity, Shayo uses the mean characteristics, h, of the group, but it's not

difficult to imagine that every person has in their mind what the ideal member of a group is. Importantly, Shayo includes a term he refers to as the attention weights which Nosofsky, 1986 defined as: the more salient is attribute h relative to other attributes, the higher is w_h. This gives the following equation of the weighted Euclidean distance function for measuring how far from the "ideal" an individual perceives themselves:

$$d_{ij} = (\sum_{h=1}^{H} w_h(q_i^h - q_j^h)^2)^{1/2}$$

The attention weights are the weights that correspond to how important different qualities of a group are. This means that one's income may become more salient at the expense of one's skin color.

The other direct driver of identity formation for Shayo is the status of identities. Status is not an absolute standard but a relative one in which an individual compares themselves to other groups. Shayo argues that individuals want to be associated with high status groups and disassociate themselves with low status groups. As Shayo is focusing on material payoffs in his model, he defines the status payoffs for each group to take the form:

$$S_j(t) = \sigma_0^j + \sigma_1^j(\tilde{\pi}_j(t) - \tilde{\pi}_r(j)).$$

Without focusing on the specific material payoff, this status equation is defined as the sum of all exogenous factors that influence group status, σ_0^j and the weight an individual places on their group income relative to the other group income. More generally, one can think of the second term of this equation as a measure of how strongly an individual cares about what happens to members of their own group $\tilde{\pi}_j(t)$ relative to the outside group $\tilde{\pi}_r(j)$.

These two identity drivers result in the following utility function, $U_i(t)$, for selecting one identity over another:

$$U_i(t) = \gamma S_j(t) - \beta d_{i,j}^2.[3]$$

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[3] I've ignored the material payoff term of Shayo as it has no bearing on the identity portion of his model.

To be clear, in Shayo's model an individual will choose an identity that is high status over one that is low status but the further they are away from the high status group the more likely they are to select the low status group. What pushes one towards an identity is the status, what pushes one away is how different they are from the group.

While Shayo's model is the basic building block of the identity literature it has been extended in an important direction in Collier, 2020. His model begins with the same building blocks as Shayo's model but adds two new direct contributions to utility. The first is to bring salience into the utility function directly rather than keep it in the background with the distance function. In doing so he is following Chandra, 2012 in stating that there is a psychological significance from a particular social context and a type of constraint known as a rationality constraint which prohibits individual's from selecting an identity that they do not match. That is, an individual feels pride in their class or their nation but cannot identify with a group they are not a categorical member of.

The effect of this is to change the scale of the utility function when identifying with an identity. From Collier, "I specify the effect of bestowing salience on a characteristic: whichever identity the actor chooses to make salient doubles the potency of that identity, and so doubles the amount of utility generated by it", Collier, 2020, pg. 574. Here identity is being differentiated from the group.

The second addition to direct utility is in group membership, the utility derived from individual's choosing the same group as oneself. This utility contribution is what differentiates Collier's model from Shayo's. Rather than continue to discuss Collier's work, I will highlight how it brings Shayo's model closer to the definitions above but how it also falls short.

First, in bringing salience into the model directly Collier is recognizing the need to indicate how strongly one feels with a group. His model falls short by still conflating groups with identities. To see this I turn to the group membership contribution to utility. In Collier's model a new group is being created by identifying with nationality. This group is composed of individual's who also identify with the nation. For Collier, the group's are still the identities. All he has done with the salience characteristic is shift it from the distance measure of Shayo to a term inside the utility

function which effectively weights the groups.

Mathematically this is precisely what is happening when one identifies with an identity. But, by declaring the groups are the identities, he's not allowing for the kind of identity group relationship that does exist. To see this, Collier is stating that low-wage individuals hold the same identity as high-wage individuals because they lack the characteristics of the high-wage group. They are excluded because they are not high-wage earners. This is contrary to the findings that low-income individual's identify with wages as well, Schabla, 2021a. To be sure, high-wage individuals have a higher rate of wage identification than middle and low-wage individuals, but these groups can and do identify with wages as well. Thus, any model of identity must account for this behavior.

Additionally, status is a driver of identification for both Shayo and Collier. In fact, status is seen as a primary mechanism for identity selection in all economic models of identity. While this is intuitively appealing for an economist, status cannot be what pushes individuals towards an identity as we see minority groups hold identities in their minority status at a higher rate than the majority does, Schabla, 2021a. Instead what is pushing individuals towards a public identity is solely salience. Minorities are discriminated against, treated differently, and otherwise reminded that they are minorities. This has the effect of conditioning them. This is where social comparison is driving individuals towards an identity. Rather than comparison being a status measure where individuals strive for higher status identities, it is being used as a bludgeon forcing them into identities they may not want.

Thus, any model of identity formation must feature salience as the primary mechanism for identification. Further, it must clearly distinguish between identities and groups and explain why individuals will choose an identity corresponding to a group they are a minority in. To accomplish this we must look to a public identity model that has in it's utility function features that increase the salience of a group and does not include status.

1.3.2   Private Identities

The second type of model for identity formation looks at identity formation as a rival club good. The main model for this viewpoint comes from Carvalho, 2016. In this model he applies to identity the model of cultural transmission and production of Bisin and Verdier, 2001 and Bisin et al., 2011. Here, the primary difference in the formation of identities relative to that of subsection 1.3.1 is that they cultivate identity by "(i) imposing rules of participation in identity-producing activities, and (ii) excluding nonmembers from social interactions", Carvalho, 2016, pg. 410. The key assumption is that identity-formation is based on the exclusion of nonmembers. It is this exclusion which makes the identities private. Figure 1.2 gives a graphical model of private identities.

Figure 1.2: A graphical representation of the relationship between private identity, categorical groups, and comparison.
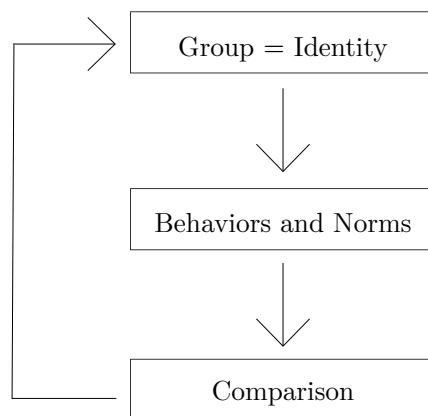
In private identities the categorical group is equivalent to the identity. The in-group requires behaviors and norms which are the mechanism through which the group compares and differentiates themselves from outside group members. The outside group does not participate in the identity at all.

Before investigating this model I want to highlight the conflation of identities and groups. It is not that individual's are excluded from the identity, they are excluded from the group. In the case of a private group that one can identify with, these terms are synonymous. In models of private identities this imprecision is not a problem, but when investigating how public identities

are shaped, this conflation is problematic.

In this model individual's have a payoff function:

$$u_i = \pi_{\theta k}\bar{x}_k + \pi_{\theta 0}(1 - \bar{x}_k) - x_i^2 - c.$$

Here an individual's payoff, $\pi_{\theta k}$ from an identity rises as the probability, $\bar{x}_k$ that an individual they view as a role model is in an identity, k. The more likely an individual they admire is in identity 0 the more likely they are to choose that identity and the less they are to choose the other identity, k. The payoff falls with the cost of participating in that identity, x_i^2 and the individual's own idiosyncratic likelihood of choosing an identity, c.

From this model we can reformulate the identity choice decision to correspond to the framework from subsection 1.2.1. The payoff an individual receives from an identity rises with the priming they receive from a role model. Here, the fact that not all individual's appear to care or need to identify with groups is captured by the cost c.

The difference in this model is the participation cost, x_i^2. This cost can be ignored in the public identities as it is subsumed in the priming of various identities. That is, there is no explicit cost associated with being a member of an identity in public identities. This is because the determination of whether an individual holds an identity is determined entirely by the set of public identities that exist and the idiosyncratic costs an individual pays by being a member of a group at all.

The need for a private identity to have a participation cost is due to the group existing without societal pressures. Society isn't pushing individual's towards membership in a private group. For public identities, every individual in the society is primed, at least to some extent, towards every public identity while many are not even aware a private identity exists. Thus, participation is required in order to give the group meaning. This participation requires a cost in terms of financial resources, participatory behavior, and other explicit actions. Without this participation the group falls away.

Carvalho provides a slightly different explanation for this cost. His intuition is that the

group has an objective function dependent on the number of individuals.[4] This cost is a means for increasing the differences between the identity and the rest of society. That is, by requiring members to pay a cost, and by controlling how strictly the price is paid, the groups are more able to effectively pull individual's into the group because this cost brings with it status.

If there was no cost to the group there would be no status achieved which pulls an individual towards that group. Therefore, one can view this cost as either a mechanism to prime individuals towards an identity or a means to differentiate a group from different identities in society. Group and identity are conflated in the case of the private identity but this is without issue for private identities as highlighted by the cost of group membership being the driver of group identity.

Carvalho focuses on religious groups/identity in his paper. Religious groups provide a nice example of what differentiates a public and private identity. For a new religious group to pull individuals from pre-existing groups, they must differentiate themselves from the other potential groups. An effective way to do this is by requiring activities and behaviors that differentiate this group from others. We can view this as either priming which reinforces the new group or we can view this as a mechanism to differentiate and draw in individuals who want an alternative to pre-existing groups.

Finally, we can see the evolution of this in the example of new religions. When a religion is formed, followers are typically required to participate in activities in support of that religion, such as relocating to an isolated area, participating in regular group activities, or providing financial resources for the group. As the group becomes established, the requirements become more relaxed.

Eventually, if the group is able to achieve a critical mass of individuals, the requirements for the group are no longer a requirement for the identity to be held as individuals will begin to hold the identity simply because it has been passed onto them through the society in which they live. Thus, a private identity becomes a public one.[5]

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[4] What the objective is can vary but in all instances the more individual's in the group, the more likely it is to achieve it's objective.

[5] One can also see this with nationalism. As nationalism rose we saw individuals needed to actively participate in the "traditions" of their group. As these become embedded in the society and accepted by more and more, the need to actually participate fell away until now all that is left is the mythology, or stereotypes if you will, of the group,

1.4   Future Directions

In this paper I have clarified the definition of identities and groups to better match the original formulation of identity by Tajfel. I have also developed a new concept of private and public identities which restates why status and identity costs seem to matter for identities in some instances but not in others. With this distinction new theories can be developed to help economists understand how identities shape decision making.

Further, the definitions I provide allow for economists to develop new methods to measure identity. These measurements will allow for economists to finally understand what is really happening when we see group behavior matter in some circumstances but not others. Social Identity Theory also provides economists with a new tool to understand the incentives people have in their choices. These questions can be applied across all of economics to better target poverty reduction programs, better understand discrimination and how to combat it, and help predict individuals responses to different public policy choices.

Throughout this paper I have highlighted the need to differentiate between a group and identity. I have also shown how failure to differentiate between these concepts creates problems for understanding identity. With a private identity these differences are insignificant as there is no difference between the group and the identity. In these cases, to be a member of the group is to identify with the group. One cannot be a member without identification.

With a public identity however it is necessary to differentiate between these two concepts as without this differentiation false concepts will take hold. The primary falsehood is that individuals choose identities that are high status. As is shown in Schabla, 2021a, minority groups are more likely to select the corresponding identity than individual's in majority groups are. This result cannot be explained by allowing for status to influence an identity choice. Additionally, status itself is an odd concept as what does it mean to have higher and lower status identities? With groups this concept makes sense, but is holding a gender identity higher status than holding a

Hobsbawm and Ranger, 1983/2012.

religious one or vice versa?

Another difficult concept to capture when mistaking groups for identities is why a society that is seemingly highly fractionalized along one axis is not. Or conversely, why a society that is seemingly not very fractionalized along the group dimension actually is fractionalized. By making clear the distinction between identities and groups, in particular public identities in this case, answering this question is possible.

Future research needs to focus on differentiating these concepts, theoretically and empirically. Additionally, surveys need to account for the identities an individual holds as well as the groups they belong to. While information on societal level group composition is readily available, information about identities is much more difficult to obtain. To my knowledge, only the General Social Survey has a question about a variety of identities held, and even this survey only asked this question in one year. Other social survey's, inspired by the General Social Survey, exist, such as the World Value's Survey and Afrobarometer survey, but neither of these ask any identity related questions except for Nationalism.

Asking individuals about only one type of identity is likely to overestimate the feeling towards this identity because they aren't allowed to rank it in relation to other identities. So, individuals in America appear to be very nationalistic in the World Values Survey, but when comparing their responses for Nationalism to the General Social Survey we see that Nationalistic feelings are not a significant identity with Americans when they are allowed to identify with other groups as well.

While surveys will be the best source of identity information about individuals, this is not the only means we have to obtain information about the identities a society holds. Identities a society holds are not hidden and the writings of a society will reflect the relevant identities. This opens up the opportunity to measure identity through newspapers, social media, and even novels. Using word analysis, in the spirit of Gentzkow et al., 2016 opens up the ability to measure identities historically and really understand how the identities within an society have changed.

Again, this is only possible when differentiating between identities and groups. Group composition is a measurable variable in developed societies going back decades and even centuries.

We know that group composition doesn't change quickly but identities do shift rapidly, Hogg, 2000. Without differentiating between identities and groups we miss the opportunity to study the long-term impacts that identities have on a society.

Finally, another mechanism we have to measure identity is to look at identity moving events. When an event occurs who's outcome is focused on one group, priming of the identity related to that group occurs. These events can be used as exogenous identity movers. They don't occur in isolation, that is the event targeting the identity happened for a reason tied to the identity in question, but the event should cause a discrete, measurable, increase in the priming towards that identity that can be recoverable in the data. This will allow us to study natural experiment type events that occur and understand how identities are impacted.

Again, this is not possible without differentiating between groups and identities. An event that shifts identities will not cause any shift in the group composition of society. So failing to differentiate between identities and groups will cause us to miss these events. But the identities do shift and every model of identity formation provides a mechanism for identities to shift.

Chapter 2

Measuring the Demand for Social Identities

2.1   Introduction

Human beings are social creatures. We group ourselves in many ways, such as within lines on a map, the beliefs that we hold, or the color of our skin. These groupings are highly arbitrary as evident through the many ways humans have grouped themselves over the centuries. The goals of this paper are to understand how individuals choose an identity and whether these identities can be manipulated and changed using subtle forms of priming, in this paper through the use of political ads. I also build a model for determining which groups within a society matter and how we can alter where individuals group themselves.

The question of whether group identity matters to economic outcomes has been asked since at least the time of Weber, 1905/2002. Accurate measures of the groups that are meaningful to societies are required to answer this question. The first attempt measuring the distribution of ethnic groups across countries was the Atlas of the Peoples of the World, Mira, 1964. This data set used language as the defining characteristic to denote a group as Soviet theory of the time identified language as the defining characteristic of an ethnicity. Attempts at correcting the Atlas' flaws have led to further refinements in measuring groups (Alesina et al., 2003; Fearon, 2003; Marquardt & Herrera, 2015). Deciding which groups matter is the fundamental issue with estimating the role that groups play in societies.

Each attempt to measure groups has brought with it the individual researchers personal opinions on which groups matter. Some believe that religion should matter while other's think that

ethnicity is the meaningful group. Simply measuring how fractionalized a society is by enumerating it's categorical groups could lead to far more measurement error than has been previously assumed. For example, while voting behavior by demographic groups is well established, individuals can be categorized in some of or all of these groups. Do racial or religious groups matter more for preferences for redistribution, taxation, and preferences for local versus national governments? Social Identity Theory can answer these questions in a way that simply categorizing individuals cannot.

Social Identity Theory builds a framework to understand how individuals group themselves and adjust their behavior to match or distinguish themselves from others. This framework states that there are three components to identity; categories, which states which groups a person "can" belong to, identification which is how an individual selects which group they "do" belong to and, comparison, which connects the formation of identity to actual behaviors. Social Identity Theory is a psychology theory developed in Tajfel and Turner, 1979 as a means of understanding discrimination and group behavior. Akerlof and Kranton, 2000 extended Social Identity Theory to economics by developing a model of utility wherein an individual cares not only about their own well-being, but that of their in-group and out-of-group members. It provides a framework for understanding how a society that is fractionalized can succeed or fall apart. The ability to bring people together, or drive them apart, has major implications for the health of any society. The addition of a group motivation can reconcile choices previously seen as puzzling by internalizing group utility into one's own utility function. Examples include the poor voting against redistribution of incomes, discriminatory practices, intractable negotiations, and responses to social programs.

Research investigating the importance of group identities on economic growth, government spending, and individual consumption has demonstrated that social groupings do impact behaviors in an economically meaningful and significant way (Atkin et al., 2019; Easterly & Levine, 1997; Luttmer, 2001; Shayo, 2009). The fractionalization and polarization of groups within a society has relevance and importance to the stability of the society and it's ability to make policy choices, (Azzimonti & Fernandes, 2018; Bertrand & Kamenica, 2018; Desmet & Wacziarg, 2020; Gentzkow

et al., 2016; Wichardt, 2008). Meanwhile, experimental settings have shown the malleability of group identities using the minimal group paradigm, see for example Chen and Li, 2009 and R. Kranton et al., 2020.

This paper provides a new means to investigate these issues. First, I develop and estimate a two-step model of identity formation that captures the long-term and short-term effects of priming. Second, I develop a first approximation of identity formation and provide evidence that social identity can be measured and manipulated by external events and messages. I accomplish this using survey data from the 2004 General Social Survey and political ads from the 2004 Wisconsin Advertising Project. Group identities, and thus which group a person feels close to, can be influenced by external priming that is as subtle as political advertising. Third, I discuss how surveys can be developed to more accurately measure identity in order to allow the investigation of how identity shapes economic outcomes.

I find there are differences in identity formation caused by long-term exposure to priming. In general, minorities are more likely to select an identity than a majority category member is. Short-term priming influences how intensely a group is identified with. Identity specific behaviors determine how influential this priming is. Individuals who select an identity in the first stage but do not exhibit behaviors in their day to day lives reflecting this identity are more likely to be influenced by external priming. This priming can take a form as innocuous as political advertisements indicating that more targeted advertising can shift identities. An interpretation of this result is that individual's who strongly identify with a group and undertake behaviors related to that group don't need short-term external priming to feel closer to that group. They are already receiving strong priming by participating in the behavior related to the group. When someone goes to church regularly they are receiving religious identity priming each time. It's likely they are also doing more internal activities that also prime them towards religious identity, such as praying regularly, discussing their religion with friends and family, or participating in church related groups. The small amounts of priming received through other avenues will be dwarfed by the priming received by these behaviors.

My model can be used to measure identity and what shapes the choice of which identities to hold, questions that have been difficult to address. As highlighted in Akerlof and Kranton, 2000, identity can help resolve a variety of group based economic questions. Some of the ways that identity has been applied to answer economic questions include the natural resource curse, climate change, consumer preferences, voting behavior, and discrimination; (Atkin et al., 2019; Berman et al., 2020; Besley & Persson, 2020; Hoff & Pandey, 2006; Shayo, 2009). The difficulties of measuring identity require most research to focus on a limited set of identities or to perform artificial experiments with a limited number of individuals.[1] Recently, identity research has focused on India due to the clear cut identities held and strong associations with those identities within Indian culture which help with these problems. This papers contribution is to demonstrate that identity can be measured through survey's and that these identities can be manipulated. This will allow researchers to focus on a broader array of societies and identities as well as open up avenues for natural experiments that shift identities to be explored.

I organize this paper in the following way. Section 2 briefly gives a literature review and background information in Social Identity Theory. Section 3, discusses a detailed description of the data sources and construction. Section 4, describes the econometric techniques used. In Section 5, I present the results of the model and a detailed explanation of how to interpretation the model. Section 6 explores robustness while Section 7 concludes.

2.2 Background and Relevant Literature

2.2.1 Social Identity Theory

Social identity theory owes its existence to the work of Tajfel and Turner, 1979 who developed the theory to explain inter-group discrimination from a psychological basis. It is considered the most robust theory of identity experimentally tested to date, McDermott, 2009, p. 345 - 346. According to this paradigm, identity is broken into three distinct components: categorization, identification, and comparison, Chen and Li, 2009. Categorization defines which groups an individual is put into.

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[1] Ethnic or religious identities are the two most commonly studied.

Identification is the degree to which an individual identifies themselves with a certain groups while lastly, comparison is how one compares their group to another and forms the mechanism through which group identity impacts behavior. It is the comparison component that relates identities to economics. This paper focuses on identity formation and whether identities can be shifted to and from.

Figure 2.1 gives a pictorial representation of the relationship between categorization and identification. The outer ring is composed of categorical groupings of individuals. These groups are arbitrary. The color of one's skin matters in some societies but not in others. The same is true of the language's one speaks, the style of one's dress, and the gods one worships. Being a member of the "wrong" group in all of these categories has meant persecution, oppression, slavery, or even death in some societies. In others, these same groupings wouldn't have even merited consideration much less resulted in a drive to dominate.

Every person can be easily placed into categories such as what race they are, which religion they belong to, how they dress, etc.[2] Importantly for my purposes, the categories that matter in the fractionalization literature are such that they can only be changed slowly, if they can be changed at all, Hogg, 2000; Wormald, 2015.[3] Categories are the level at which individuals compare and differentiate themselves from others and what drives group identification to impact behavior.

Looking at Figure 2.1, consider an example of two people, person A who identifies with religion and belongs to Group M while person B identifies with ethnicity and is a member of Group X. Person A doesn't compare themself to B along the lines of Group M vs Group X. Rather, they compare whether person B belongs to Group M or Group N. It doesn't matter to A if B identifies with ethnicity. For A, religious identification means all of his comparisons will be between Group M and Group N. All individuals will be placed into one of these two groups by A. The same is true

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[2] While it may seem that how an individual feels about themselves is all that matters, the reality is that both how the individual feels and how society perceives them matters. At the individual level, how one identifies themselves shapes decision making however, at the societal level, how one is perceived is what matters. Consider the fears of racial profiling among Mexican-Americans who have been in America for generations. They themselves may not identify with their ethnic origin, but society does and treats them as such, both in interpersonal interactions as well as official (or practically applied) policy.

[3] Data from the GSS measuring various categories, such as race/ethnicity, gender, age, and religions show relatively little change from the 1972 to 2016 in overall societal composition.

Figure 2.1: The relationship between identity and categories.
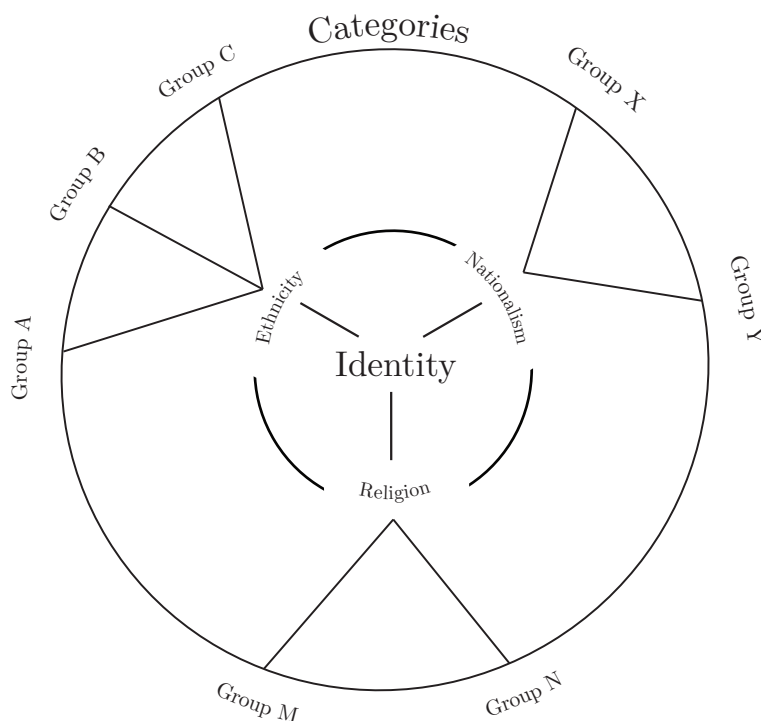
This figure shows how categories and identities are different. One does not identify as a member of group C. They identify with Nationalism and belong to Group C within that identity. Comparison occurs between the groups in the outer rings, not between the identities.

from B's perspective. Person A is classified as a member of Group X or Group Y, regardless of whether they share the religious group or not because religion isn't the identity that B holds. It is the group that is being compared, not the identity.

Specifically, the reason for believing that group fractionalization should influence economic outcomes is that these social categorizations provide the framework upon which prejudice and discrimination are built and what choices individuals make in decisions such as consumption and voting behavior.[4]   In addition to these behaviors impact on economics, these behaviors also drive long-term conditioning that reinforces identities within a society.

Some groups are regarded as higher status than others. This status is what creates the

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[4] Indeed, the reason for developing Social Identity Theory in the first place was to provide a psychological basis for inter-group discrimination, Chen and Li, 2009.

notion of a majority and a minority group. I use the concept of a majority and minority to denote the power a group has rather than it's numerical composition within a society.[5] Further, this majority/minority grouping is rather crude. For example, race in the United States is not cleanly divided between white's and non-white's. There are many categories that one can place individuals in based on race and these categories experience different treatments in different situations.

While categorization and comparison are important components of Social Identity Theory, all they can tell us is which groups one "can" be placed into and how these groups interact. The third component of Social Identity Theory is identification, namely which groups one "does" belong to. That is, there is more to group membership than simply being able to be classified as a member of that group. What really matters for understanding the impact of groups on society and economic decision making is how strongly individuals within that society identify with those groups. A trivial example of this would be if people were grouped by the direction of their hair whorl. While hair whorl is a way to categorize people, this categorization doesn't matter.

What's more, unlike categorical groups which are relatively unchanging, how one identifies with a group is malleable. These identities change through circumstances and over time, Abdelal et al., 2009. Identity is also artificial. Consider the example of Nationalistic identity. This identity is a modern phenomenon, (Anderson, 2006; Deutsch, 1953; Gellner & Breuilly, 2008; Hobsbawm & Ranger, 1983/2012). Nationalism simply didn't exist 500 years ago. That an identity as important to understanding the 20th century as Nationalism is a recent creation is usually met with surprise. If an identity that is used to understand one of the greatest conflicts in human history is new, why should any identity be fixed?

How an identity shapes decision making today may not be how it shapes the decisions of tomorrow. A striking example of this historically is the waxing and waning of discrimination towards Jews in Europe. Jewish ethnicity and religion has existed for thousands of years. But as religious identity is primed; such as through rhetoric, plagues, famines, or other calamities, Jews

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[5] For example, in apartheid South Africa the minority group was blacks despite blacks outnumbering whites by a substantial margin. The lack of power of blacks defined their minority status, Lemay, 2005.

would find themselves the brunt of attacks. As the priming ceases, being Jewish becomes less of a problem only to become more so again when the cycle repeats. Thus, seemingly highly categorically fractionalized societies may not be fractionalized at all if there is a propensity to not identify with these particular groups. Similarly, in societies with stronger group identification, even low levels of categorical fractionalization may have strong impacts. An example of this is the religious peace that exists within the United States contrasted with the Yugoslav wars which fractured a country along religious and ethnic lines. Existing measures of fractionalization do not capture this distinction as they all lie within the categorization domain.

The implication of studies into the impacts of group identity on redistribution suggests that as society identifies more strongly with groups, their behavior is more likely to have a negative impact on outside groups. These studies have not gone unchallenged. There is debate on whether groups matter or not. What is missing from this research is that the outside researcher may struggle to accurately measure how fractionalized a society is. This struggle comes from a lack of understanding the strength of identification with the groups the society has. Different societies have different opinions about which groups matter. Thus, the researchers own cultural biases influence their measure of fractionalization.

2.2.2   Priming

There are two different methodologies that provide evidence that identities can be manipulated. These methods are the justification for the importance of measuring which potential identity an individual identifies with. The first technique uses priming of actual groups to influence behavior. Through the use of priming, a certain category an individual belongs to is made more salient. An example of this method is the study of social identity and stereotype susceptibility in a group of Asian-American female undergraduates by Shih et al., 1999. In this study, a group of Asian-American women were placed into three groups and given a standardized exam testing their math ability which was then compared to their actual exam test scores. One group had female identity primed, one had their Asian identity primed, while the third formed the control group. Women in

a culture that stereotypes women as being bad at math and Asian's as good at math resulted in the salience of these identities impacting test scores relative to their original scores. Specifically, those who had their female identity made more salient performed worse and those whose Asian identity was highlighted performed better than their actual results on the tests for college admission while the control group remained unchanged. This result is extended and confirmed in Steele et al., 2002.

The most relevant portion of Shih to this paper is that these identities were made salient through the use of a pre-exam questionnaire that asked questions related to gender or ethnic identity without explicitly doing so. That is, gender identity was highlighted through the use of questions about dorm-room preferences related to co-ed versus single-sex floors and similar questions. Ethnic identity was targeted through the use of questions related to languages other than English. This demonstrates that identities can be manipulated through subtle measures that relate to the identities without needing to target the identities directly. Another important finding was that in a culture without Asian stereotypes about math, the impact of the respondents Asian heritage being made salient had a negative effect.[6]   This highlights the importance of accounting for how a society feels about categorizations rather than on how fractionalized it can be. From a behavioral perspective, the stereotypes also matter in shaping behavior as individuals have a tendency, unconsciously, to match the mean behavior of the group they identify with, for better or for worse.

It can be difficult to disentangle all of the irrelevant pre-existing stereotypes and associated behaviors in identities that the researcher wishes to investigate. In order to circumvent this issue, researchers turn to a minimal group design. In the minimal group design, subjects are grouped arbitrarily through responses to questions about impressionist art, flipping a coin, or some other meaningless mechanism. They must also have no social interaction with each other and must remain anonymous to one another, these last two ensuring the integrity of the experiment by preventing spurious group formation, Chen and Li, 2009. Using this technique, Charness and Rabin, 2002 and Chen and Li, 2009 have found that there is a willingness to sacrifice own income in order to improve

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[6] That Asians are good at math.

the overall group to which an individual belongs. These findings indicate that individuals seem willing to make themselves slightly worse off in order to make their own group relatively better off.

An interesting extension of these findings is provided in R. Kranton et al., 2020. In this study, the authors found several results that are important for understanding the connection between group identity and macroeconomic outcomes. They grouped individuals along both a real pair of groups (Democrat versus Republican) and a groups assigned by using the minimalist group paradigm design. In doing so, several interesting results were uncovered. First, they found that not everyone was willing to sacrifice for the group. Indeed, a large fraction of participants in the experiment were utility maximizing in purely selfish ways. Second, while a majority did not care about the groups, a sizable minority did and included both own and outside groups well-being in their own utility maximizing behavior. On average participants cared about groups, confirming the results of Charness and Rabin, 2002 and Chen and Li, 2009. However, when looking deeper it was found that the sizable minority is what drove these results.

One important finding in R. Kranton et al., 2020 comes from the authors distinguishing between real and minimalist groups. Those individuals who took group identity into account in their decisions to redistribute in the minimalist framework were far more likely to identify as a Democrat.[7]   They were more likely to alter their choice of income distribution. The stronger the identification with the Democratic party, the more groups shaped the choice made in the game. This behavior occurred in both real and minimalist groupings. To be clear, identifying as a Democrat was strongly correlated with preferences for income in both the Democrat and minimalist groupings, while identifying as a Democrat leaning Independent lead to reduced influence of group identity on preferences in the minimalist design but still significant deviations from the expected utility maximizer in the political setting. This difference between Democratic and Independent identifying individuals reinforces a possible finding in R. Kranton et al., 2020. Some people are naturally "groupy" while most are not. Membership in groups and more intense preferences within

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[7] As opposed to independent. There were too few Republican observations to draw meaningful conclusions in this direction of political identity.

groups are indicative of an individual who is more likely to have strong identity driven preferences.

Finally, a common finding outside the economics literature is that minorities identify more strongly with their minority status, (Abdelal et al., 2009; Shih et al., 1999). Within the economics literature economists typically argue minorities should be less likely to identify with their minority or group status as this provides dis-utility to the individual, Shayo, 2009. Being a minority reminds one of their status as an outsider daily which as a form of long-term priming should drive minorities towards identities they are a minority in. To take an extreme example, how could one be black in the South during the Jim Crow era and not chose race as being an important component of one's identity? I am able to test whether individuals are more likely to select an identity they are a minority in. I do this by including an indicator variable in my model specification denoting whether an individual is a member of the minority group in that particular identity category. I then compare the probability of selecting that identity to a majority members probability of selection.

In the following section I give a detailed description of the political ads and relate how they shape identity in the context of the above frameworks. Just as Shih et al., 1999 manipulates identities by asking questions related to those identities, the political ads shape identities by specifically talking to identities, talking about how an issue impacts a group, or referring to an issue that is common to that group.[8] I then model the discrete choice made by individuals about which identity they will take. This choice is usually, but not always, subconscious. I show that categories do play a role in determining which identity individuals choose as well as demonstrate that priming from political ads has an impact on identity choice.

2.3   Data

There are two primary sources of data for this paper. The first comes from the 2004 General Social Survey (GSS), Tom W. Smith; Co-Principal Investigators and Hout, 2017. The other is the 2004 election cycle University of Wisconsin Advertising Project data set (WAP), Goldstein and

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[8] The difference between these last two is the difference between you will be impacted by this thing versus this thing is important.

Rivlin, 2007.[9]   The WAP is comprised of the Presidential Advertising and the Congressional and Gubernatorial Advertising Projects. Additional sources used to match the two data sets are the 2004 Television & Cable Factbook, Warren and Taliaferro, 2004, and mapchart.net's interactive county level map of the United States.

2.3.1   General Social Survey

The data contained in the 2004 GSS survey is comprised of individual-level demographic data as well as a variety of variables used in the analysis. Table 2.1 provides a comparison of the GSS sample with the 2004 Current Population Survey (CPS) sample, Ruggles et al., 2020. As can be seen in Table 2.1, the GSS sample is older, more educated, and more feminine. The CPS gave more options for race than the GSS did in 2004 meaning that there are potentially individuals in the "other" category that are actually "white" or "black". However, most individuals that are mis-categorized will be "non-white" rather than "white" based on the CPS categories.[10]

Table 2.1: Demographic information of the GSS compared to the CPS. Income class was set in the GSS at 20% poor and 10% rich. The same values were used on the CPS sample generating the proportions indicated.

	Age			Gender			Income Class		
	18-24	25-60	61+	Male	Female		Poor	Middle	Rich
GSS	9.54%	69.24%	21.22%	44.08%	55.92%		18.32%	69.77%	11.91
CPS	12.53%	68.59%	18.88%	48.47%	51.53%		19.41%	69.84%	10.75%
	Race				Education				
	White	Black	Other		Less HS	HS	> HS	4 yr.	Graduate
GSS	79.93%	13.57%	6.50%		12.66%	24.51%	30.51%	18.83%	13.49%
CPS	80.24%	11.31%	8.45%		21.90%	29.41%	25.65%	15.35%	7.69%

The sensitive data files contain information on geographic location that is used to match the GSS to the WAP to form the complete data set.[11]   Also contained in the GSS is the fundamental

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[9] "The data were obtained from a project of the University of Wisconsin Advertising Project includes media tracking data from TNSMI/Campaign Media Analysis Group in Washington, D.C. The University of Wisconsin Advertising Project was sponsored by a grant from The Pew Charitable Trusts. The opinions expressed in this article are those of the author and do not necessarily reflect the views of the University of Wisconsin Advertising Project or The Pew Charitable Trusts."

[10] Unfortunately, it is not possible to identify these individuals as belonging to either white or non-white with certainty.

[11] Some of the data used in this analysis are derived from Sensitive Data Files of the GSS, obtained under special

question of significance for this paper, that on social identity. This question has only been asked in 2004 and used the following verbiage to elicit responses to the question of identity: "We are all part of different groups. Some are more important to us than others when we think of ourselves. In general, which in the following list is the most important to you in describing who you are? And the second most important? And the third most important?"[12] Respondent choices are presented in Table 2.2 and they could not pick the same identity twice.

Table 2.2: Count of identity choices by selection ranking in the full sample.

Identity Choice	1st Choice		2nd Choice		3rd Choice		
	Count	Freq	Count	Freq	Count	Freq	Total
current occupation	186	15.30	236	19.41	165	13.57	587
race ethnic background	52	4.28	74	6.09	72	5.92	198
gender	103	8.47	102	8.39	140	11.51	345
age group	42	3.45	118	9.70	128	10.53	288
religion	132	10.86	158	12.99	94	7.73	384
political party	5	0.41	14	1.15	32	2.63	51
nationality	29	2.38	63	5.18	64	5.26	156
family or marital status	581	47.78	236	19.41	124	10.20	941
social class	25	2.06	75	6.17	122	10.03	222
region	46	3.78	120	9.87	242	19.90	408
Don't Know	11	0.90	13	1.07	26	2.14	-
No Answer	4	0.33	7	0.58	7	0.58	-
Total	1216	-	1216	-	1216	-	-

These choices are not the only categories of identity possible; one can think of other groupings that matter to an individual such as membership in a group, club, or sports team fandom. They do however, broadly defined, represent a wide range of identities that everyone can relate to. Each identity that wasn't explicitly clear had a list of suggested types of groups associated with that identity, given in Table 2.3. In subsection 2.3.4, I elaborate on exactly what determines which identity an ad is associated with.

contractual arrangements designed to protect the anonymity of respondents. These data are **not** available from the author. Persons interested in obtaining GSS Sensitive Data Files should contact the GSS at **GSS@NORC.org**.
[12] The reason that this question was only asked in 2004 remains unclear. It was part of the ISSP II questionnaire and could have been included in the ISSP III questionnaire. A possible reason for the lack of this question in subsequent surveys is addressed by this paper. Namely it isn't clear what determines the identity choice.

Table 2.3: Wording of Identity Choices

Identity Choice	Actual Wording In GSS
current occupation	Your current or previous occupation (or being a homemaker)
race ethnic background	Your race/ethnic background
gender	Your gender (that is, being a man or woman)
age group	Your age group (Young, Middle Age, Old)
religion	Your religion (or being agnostic or atheist)
political party	Your preferred political party, group, or movement
nationality	Your nationality
family or marital status	Family or marital status (that is, son/daughter, mother/father, etc.)
social class	Social class (that is, upper, middle, lower, working, or similar class)
region	The part of America that you live in

2.3.2   Wisconsin Advertising Project

The Wisconsin Advertising Project (WAP) was a project managed by the University of Wisconsin-Madison Political Science department between 1998 and 2008. In 2010 Wesleyan University took over the project. This projects goal is understanding how candidates, political parties, and special interest groups communicate with voters. An increasing amount of information has been gathered on political advertising, beginning with only TV ads in the largest 75 Designated Media Area's (DMA's) in 1998 and now encompassing both online and television ads in all media markets through 2020.[13]

In 2004, the data set consisted of all television ads ran in the largest 100 DMAs. Table 2.4 replicates Table 2.2 for respondents in the GSS living within these 100 media markets. Due to the restriction of the 2004 WAP to these 100 largest media markets, I have 889 unique individual level observations out of a possible 1,201 responses to the social identity question in the GSS.[14] Looking at the percentages of each of the identity choices with the total number of observations, we see that only in the case of the 2nd choice being religion (an increase of 1.22%) did any change exceed 0.6% when restricting the data. While response data on the remaining 114 DMA's exists in the GSS, the ads ran in those DMA's weren't collected anywhere to my knowledge, so at this time

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[13] A designated media area is a region where the population can receive the same or similar television and radio station offerings.

[14] Omitting don't know and no answer response's.

it appears nearly 300 observations cannot be included.

Table 2.4: Count of Identity Choices by Ranking in Restricted Sample

	1st Choice		2nd Choice		3rd Choice		
Identity Choice	Count	Freq	Count	Freq	Count	Freq	Total
current occupation	142	15.29	182	19.59	125	13.46	449
race ethnic background	39	4.20	55	5.92	57	6.14	151
gender	77	8.29	76	8.18	103	11.09	256
age group	27	2.91	85	9.15	95	10.23	207
religion	107	11.52	132	14.21	70	7.53	309
political party	3	0.32	12	1.29	27	2.91	42
nationality	25	2.69	47	5.06	51	5.49	123
family or marital status	443	47.69	177	19.05	98	10.55	718
social class	19	2.05	52	5.60	92	9.90	163
region	35	3.77	94	10.12	184	19.81	313
Don't Know	9	0.97	11	1.18	21	2.26	-
No Answer	3	0.32	6	0.65	6	0.65	-
Total	929	-	929	-	929	-	-

2.3.2.1   Content of the Dataset

The WAP is comprised of Presidential ads and Congressional/Gubernatorial ads and contains two types of data. The first is digitized by the WAP staff and contains a variety of information. This data includes what time the ad aired, which channel it ran on, which DMA it appeared in, and a variety of other information that has been culled from the ad. The second type of data is the ad itself, available in PDF form.

For my purpose, the pdf copy of the ad contains several pieces of useful information. First, at the top is the unique ad title. The title provides information about which electoral race the ad was in reference to; Presidential, Governor, Senate, or House district. Next is the name of the sponsor of the ad, usually the candidate but also special interest groups, and finally a brief word or two description about the contents of the ad. Beneath the name and front matter is the ad itself broken into panes of screenshots taken an average of every 3-4 seconds timed to capture any unique images present in the ad. Beneath each of these panes is a text describing any words printed on the screen as well as the complete audio accompanying the ad. In this way, the entire ad is captured in an easily viewable way.

Figure 2.2 gives an example of what is contained in the PDF form of the ad allowing me to see and read exactly what was displayed and said in the ad when it ran. The name of this ad is House/AL6 Bachus Community Endorsements 2. This tells us that it is a House race, in Alabama's 6th congressional district, for Congressman Bachus, and consisted of community endorsements. The two after "Endorsements" represents there were multiple similar ads ran by Congressman Bachus of which this was the second. The panels show 5 different members of the community expressing support for Congressman Bachus followed by Congressman Bachus making a statement.

Some further interesting points to note about this ad. First, it was run in late May indicating that this was an ad for the primary election. His opponent in this primary was Phillip Jauregui.[15] Second, despite the strong identities highlighted in this ad, Jauregui never ran a single ad.[16] A potential reason for Representative Bachus to run this ad is to reinforce the identities that lead to Republican votes for the Presidential election. Taken in this context, Rep. Bachus isn't using the ads to advertise for himself, rather he's using them to advertise for the Republican party and pit voters in his district against Democrats, both for the current election and in the future.

2.3.3   Additional Data Sources

The last two sources of data took the form of mapchart.net's interactive map generator and the 2004 Television & Cable Factbook. The first was used to create a visualization of the sampling area in order to help in the assignment of individuals to DMA's, for whom county data was available. Information on the DMA's comes from the 2004 Television & Cable Factbook which, among a wealth of other information involving Cable and Television, had a map that allowed me to link counties to the DMA's.

Consider the image contained in Figure 2.3. An example of how to read the map is done by looking at the Milwaukee DMA located in the southeastern corner of Wisconsin. The 33 corresponds to Milwaukee being the 33rd largest DMA in the United States in 2004. This DMA consists of

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[15] Information on the 2004 congressional race for Congressman Bachus came from his Wikipedia page.

[16] Which identities this ad was categorized into and how the strength was determined is detailed in subsection 2.3.3.

Sheboygan, Dodge, Washington, Ozaukee, Milwaukee, Waukesha, Jefferson, Walworth, Racine, and Kenosha counties. All ads ran in the Milwaukee DMA were allocated to individuals living in these counties. An interesting note is that the counties within the DMA's are not always contiguous. With the exception of the Denver DMA, these breaks do not exceed the television broadcast range of the major broadcast stations.

2.3.4   Variable of Interest

To measure whether identity priming can occur, I use political ads as the exogenous influencers of social identity. The ability for political ads to shift identities comes from experimental evidence which demonstrates that triggering identities requires very little effort. In Shih et al., 1999, questions provoking ethnic or gender identity were not direct yet still elicited identity reactions. The minimal paradigm framework causing people to group themselves based on responses to questions about paintings or poetry further demonstrates the fact that it doesn't take important or direct mechanisms to alter identity choices, Diehl, 1990; R. Kranton et al., 2020. Participants weren't directly asked questions about gender and ethnicity, nor do paintings and poetry explicitly move the needle, yet these subtle questions were able to move identities and cause study participants to behave and react in ways determined in part through their identities.

To measure how an ad was related to identity, I used cues from both the visual in the panel of the ad and the actual spoken wording. These cues were first categorized into the 10 identities listed in the GSS before being further grouped into three categories describing how strongly an identity was targeted in that ad. I extrapolate from the work of Tajfel and Turner, 1979, Shih et al., 1999, and R. Kranton et al., 2020, to group the ads into three different strengths of identity manipulation, *STRONG*, *MEDIUM*, and *WEAK*

I highlight how I categorized primers into the three strength categories with examples from previous work. In Shih et al., 1999, subtle cues were used to activate various identities. Specifically, to activate the female identity, questions on co-ed dorms, mixed sex roommates, etc. were asked. I would classify this as a weak identity primer as the gender identity was being targeted but in

a very subtle and indirect way. In Benjamin et al., 2010, the manipulation is made more salient through the use of questions; such as which language is spoken, ethnicity of roommates, etc. Finally, also in Benjamin et al., 2010, a strong identity manipulation was also used as respondents had to specifically identify their race and answer questions related to race. These examples form the foundation I used to categorize the ads into the respective strengths of their impact.

To provide some examples of how I justified placing ads in the STRONG, MODERATE, or WEAK categories, I present two examples of ads that I categorized before explaining in detail what these categorizations mean.

Consider again Figure 2.2 where Congressman Bachus runs an ad that talks about the *Northern Beltline*, *ACLU* extremists, strong support for *veterans*, and *abortion*.[17] Abortion is an extremely controversial topic in the United States with views for and against it commonly provoking strong emotional responses. Therefore, abortion is an automatic *STRONG* categorized identity primer. Further what makes abortion interesting from an identity perspective is it one of the few topics that actually elicits a strong response in two separate identities. I categorize it as *STRONG* targeting gender, for the pro-choice movement, and *STRONG* targeting religion, for the pro-life movement.

The ACLU extremists remarks specifically targets an identity, political party, and uses an extremely strong adjective to highlight this attack against the ACLU. The extremists adjective is what takes the mentioning of ACLU from *WEAK* or *MODERATE* and brings it to *STRONG* targeted status. The adjective highlights the targeted identity by attempting to provoke an emotional response by labeling individuals within the ACLU as extremists. Strong support for veterans is categorized as *STRONG* as it touched on US nationalism towards the troops and has strong as the adjective. Again, there is a strong emotional component added to the word activating the identity. The Northern Beltline is targeted as a *WEAK* identity as residents in the area of Bachus' commercials know what it is and it's targeted at those residents of that region specifically, though done so

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[17] The ACLU is the American Civil Liberties Union an organization that is generally regarded to be liberal among conservatives. The Northern Beltline was a road project near Birmingham, Alabama.

by only mentioning it without any adjective thus avoiding any emotionally triggering mechanism.

As a second example of categorization of identity targeting, consider the ad in Figure 2.4 which targets nationalism identity strongly. It does so by using words directly tied to nationalism in a repeated fashion, using language designed to provoke a strong emotional response, and touches on issues provoking a strong reaction to viewers. This is in contrast to the *WEAK* categorization of family and age group identities. We see both of those groups mentioned, but briefly. They do carry an adjective of *protects* which is why they were characterized at all, but they are only mentioned in passing along with nationalism identities avoiding the emotional response the veterans comment attempted to elicit. Finally, the phrase "our values" could have created a weak political party grouping; but the ad is an attack on a Republican congressman by a Republican, and thus it's unclear which party the values refer to. They seem targeted towards a broader segment of society such as Americans, Minnesotans, Republicans, or Democrats. Thus I leave it uncategorized as no particular identity is being targeted with that statement.

The above two ads highlight the role that words have in categorizing an ad. Table 2.5 shows how ads were grouped by sub-group. The categorization of these ads into their respective identity groupings is highly subjective and it's doubtful two individuals would classify all ads in precisely the same way. Thus, in addition to the more concrete rules discussed below, I proceeded with the classification on a conservative basis.[18] Ads were categorized as *STRONG* if I believe most people would classify that identity as having been targeted by that ad. They were classified as *WEAK* if I believed anyone would classify that ad as targeting that identity, but that this targeting could be disputed as often as accepted. Ads that fell somewhere the middle were classified as *MODERATE*.

The rule of thumb I used to categorize an ad as a *STRONG* ad required at least two but usually three of the following; the identity was specifically targeted, it was done so in a repeated fashion, used language and verbiage designed to provoke a strong emotional response in the viewer, or touched on significant issues to Americans in 2004. Significant issues to Americans in 2004

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[18] The final preferred model specification uses only ads that were categorized as strong for reasons discussed in section 2.4.

Table 2.5: Identities and Their Targeted Subgroup

Identity	Sub-Group
Age Group	Seniors
	Young
Gender	Abortion
	Female
Race	Black
	Immigrant
	Latino
	Native American
	Other
Religion	Christian
	Pro-Life/Gay Rights
	Stem Cell
Social Class	Job Creation
	Middle Class
	Other
	Lower Class
	Rich v Poor
	Taxes

almost always were classified as *STRONG*.[19] The only time they weren't was when that topic was mentioned once without any adjective qualifiers.[20] As demonstrated above, ads can have strongly targeted identities even in the presence of other, less targeted identities. Overall 75% of ads that targeted at least one identity did so strongly, while 64% of all identities that were targeted were classified as strongly targeted.

Ads that were classified as *MODERATE* in strength generally fell into one of two patterns: identities that were discussed as part of larger topics or identities that could go either way as being targeted or not, but I felt were likely to be classified as targeting an identity by more than half of those who viewed the ad. In practice this simply meant an ad that didn't rise to the level of a *STRONG* identity but was clearly more heavily targeted than a *WEAK* identity was classified as *MODERATE*. Figure 2.5 gives an ad with multiple *MODERATE* identities. This ad strongly

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[19] These issues include the topics: abortion, dead soldiers, firearm control, and stem cell research.

[20] An example of this difference is, "fights for our veterans" versus "fights for our children, seniors, and veterans." The former is *STRONG* while the latter is *WEAK*. In the former veterans are being specifically singled out and discussed while in the later multiple groups are being lumped together, still brought to attention but done so in a manner less direct than the former.

targeted the female gender due to only women, and several different women, appearing in the ad. Family, Social Class, and Age Group were assigned moderate strengths due to each receiving a panel worth of airtime. Clearly the ad wasn't talking about these groups heavily, but they were discussed in more than just passing. Due to my practice of assigning as *MODERATE* ads that didn't make it to the level of a *STRONG* identity but made it beyond a *WEAK* identity, few ads were actually classified as *MODERATE*. In total, only 15% of all ads targeted an identity moderately while only 12% of all identities targeted were done so moderately.

The final classification of ads is *WEAK* ads. This was a catch-all and any ad that could possibly be considered targeting an identity was classified here. In Figure 2.6 we see an ad targeting five separate identities. They're classified as WEAK despite taking a full panel like Figure 2.5 due to the fact that it's an announcer talking about Leibermann while he's with other people who typically have little to nothing to do with the groups being discussed. In other words, the identities are being discussed, not identified with. All told, 27% of ads included a weakly targeted identity while 23% of all identities were weak. The sum of percentiles of all ads that targeted an identity is 114% because 41% of the ads targeted more than one identity. Throughout the main results of this paper I use only those ads classified as strongly targeting identities. As a robustness check I include all ads that were classified and find the effects are slightly weaker statistically and in magnitude compared to the baseline model of only strongly targeted ads, however the main findings remain unchanged.

2.4   Econometric Model

In this section I develop an empirical model of identity formation. First, I present Shayo's model of identity formation developed in Shayo, 2007, 2009 in order to compare my model with a common model in the literature and lay out the requirements any identity model must satisfy. Next I present my own model of identity formation. I compare the two models and demonstrate how my model addresses the short comings of Shayo's. I conclude with a discussion of the econometric issues when estimating my model and how they are addressed.

2.4.1   Shayo's Model of Identity Formation

The model of identity formation developed by Shayo consists of two parts; the perceived distance d_{ig_i} from group g_i, and the status of that group S_{g_i}. Each *social group* belongs to the nonempty set $G = \{J : J \subseteq \mathcal{N} \text{ is a social group}\}$. Shayo defines social groups as categories that individuals learn to recognize when growing up and living in a society. Shayo makes no distinction between categorization and identity. Each categorical group is an identity in Shayo's model. To highlight this lack of differentiation between categorization and identity, Shayo defines three social groups for the purposes of his model; "Poor", "Rich", and "Nation".

The first direct driver of identity formation in Shayo's model is perceived distance. This is a measure of how far an individual is from the "prototypical" member of that group as measured by a variety of characteristics. An example of this is if one is in the bottom 20% of the income distribution, they are closer to the prototypical member of the poor group than they are to the rich group along the income axis. This distance measure is the weighted sum of all of the relevant characteristics. For simplicity, Shayo uses the mean characteristics, h, of the group, but it's not difficult to imagine that every person has in their mind what the ideal member of a group is. Importantly, Shayo includes a term he refers to as the attention weights which Nosofsky, 1986 defined as: the more salient is attribute h relative to other attributes, the higher is w_h. This gives the following equation of the weighted Euclidean distance function for measuring how far from the "ideal" an individual perceives themselves:

$$d_{ij} = (\sum_{h=1}^{H} w_h (q_i^h - q_j^h)^2)^{1/2}$$

The attention weights are the weights that correspond to how important different qualities of a group are. This means that one's income may become more salient at the expense of one's skin color.

The other direct driver of identity formation for Shayo is the status of identities. Status is not an absolute standard but a relative one in which an individual compares themselves to

other groups. Shayo argues that individuals want to be associated with high status groups and disassociate themselves with low status groups. As Shayo is focusing on material payoffs in his model, he defines the status payoffs for each group to take the form:

$$S_j(t) = \sigma_0^j + \sigma_1^j(\tilde{\pi}_j(t) - \tilde{\pi}_r(j)).$$

Without focusing on the specific material payoff, this status equation is defined as the sum of all exogenous factors that influence group status, σ_0^j and the weight an individual places on their group income relative to the other group income. More generally, one can think of the second term of this equation as a measure of how strongly an individual cares about what happens to members of their own group $\tilde{\pi}_j(t)$ relative to the outside group $\tilde{\pi}_r(j)$.

These two identity drivers result in the following utility function, $U_i(t)$, for selecting one identity over another:

$$U_i(t) = \gamma S_j(t) - \beta d_{i,j}^2.^{21}$$

To be clear, in Shayo's model an individual will choose an identity that is high status over one that is low status but the further they are away from the high status group the more likely they are to select the low status group. What pushes one towards an identity is the status, what pushes one away is how different they are from the group. Again, Shayo makes no distinction between categorical groups and identity groups.

2.4.2   A New Model of Identity Formation

Any model of identity formation must account for the attention of Nosofsky, 1986 and the comparison of Tajfel and Turner, 1979. The primary difference in my model of identity formation from Shayo's is that I draw a distinction between categorical grouping and identity formation following the theory developed in Tajfel and Turner, 1979. Tajfel defined social identity as "...

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[21] I've ignored the material payoff term of Shayo as it has no bearing on the identity portion of his model.

the individual's knowledge that he belongs to certain social groups together with some emotional and value significance to him of this group membership", (Tajfel, 1972, p. 292). The first half of that statement concerns categorization while the second part is identification. Separating these steps is necessary to understand Social Identity. This distinction has significant consequences in the interpretation of attention and comparison.

A society has a set of identity groups $\{j \in J | \text{society cares about identity j}\}$ that individual i may care about.[22] Each identity j is comprised of a set of categorical groups $\{m \in M | m \subset j\}$. Each category, m, belongs to one and only one identity j. As an example, poor, middle income, and rich are categorical groups, defined as being poor if you are in the bottom 20% of income, rich in the top 10% of income, and middle income otherwise. These three categories belong to the single identity, social class. Another set of categorical groups are young, middle aged, and old. You are young if you are between 18 and 24, old if you are over 60, and middle aged otherwise. Again, every individual can be categorized as belonging to one of these three sets. These three categories belong to the age group identity.

While all individuals in a society belong to a group m which is associated with identity j, not all individual's identify with an identity j. Returning to our example, every individual in a society can be classified as poor, middle income, rich, young, middle aged, and old. Some individual's identify with the social class, some with the age group, some with both, and some with neither. As I discussed at the beginning of this paper, categorical groups are completely arbitrary, but once an individual is a member of a categorical group, it is extremely difficult to move to another group if it is even possible at all, Hogg, 2000.[23] Categorical groups are groups to which an individual can be assigned. Identities are the degree to which an individual feels close to the group. The question of identity formation is not whether an individual belongs to a categorical group, it's why they

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[22] An identity within the United States is sports teams. Not all individual's within the United States care about sports teams. Other societies may not care about sports team identities. Thus, the identity sports teams is in the set J within the United States but not the set J in a country that does not care about them.

[23] One can find ways to switch groups. Changing ones gender, religion, and aging are all events that shift a person from one group to another. What distinguishes these groups from identities is that identities can be switched to and from rapidly. Within a single conversation a person may hold multiple identities. Categorical groupings however require significant effort to change, if it is even possible to change them.

choose an identity when they have different identities to choose from.

All individuals can hold the same identity but not all individuals can be in the same categorical grouping.[24] The categories within an identity may be oppositional in nature but there doesn't need to be conflict between groups within the same identity. The ethnic conflict of Sambanis and Shayo, 2013 places Jews in one category and Palestinians in another, but both identify with race/ethnicity as their identity. Contrast this with the religious identity within the United States where individual's belong to a multitude of categorizations within the religious identity but there is no conflict between these groups.

Categories belong to unique identities. That is, the poor category cannot belong to both social class identity and religious identity. There are examples where this seems to be contradicted, but this is simply because the same category has different interpretations in different identities. For example, Jewish categorization can refer to either a racial/ethnic identity or a religious identity. What being Jewish means differs if considering the racial/ethnic identity versus the religious identity so that even though "Jewish" is the category, it means two completely different things in the context of race/ethnic identity and religious identity. The discrimination faced in Spain in the 14th and 15h centuries was religious in nature, while the persecutions suffered at the hands of the Nazi's were ethnic. In the former case, one's conversion to Christianity allowed one to remain a part of society and discrimination, though still undoubtedly present, was different.[25] In the latter case, one merely needed some state-defined level of Jewish ethnic ancestry to be persecuted. In both cases the category is the same, Jew, but the way this category relates to the different identities is very different.

Having distinguished between categories and identities, I am now in a position to develop how an identity is chosen. As an identity one associates themselves with is primed, the category the individual belongs to that is associated with that identity becomes more salient. Thus, more

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[24] Which highlights the arbitrariness of the categorical groupings. One could simply define all individuals into a single categorical group, human. But to highlight how even this category is arbitrary, who qualifies as human has had different meanings throughout history.

[25] One can argue that Jew's who publicly converted switched categories, however the point here is that Jewish categorization differed between religious and ethnic contexts, Novoa, 2014.

attention is paid to the category being primed. By measuring the priming occurring I am accounting for the attention of Nosofsky, 1986. There are two types of priming that an individual receives with the temporal dimension distinguishing between the two. To distinguish between these two types of priming I refer to long-term priming as conditioning and short-term priming as priming. Priming occurs in the short-run and sporadically relative to the long-term conditioning experienced by individuals. Conditioning is priming that has occurred over years and decades. It may not happen in the present, but it happened throughout ones formative years and shapes the baseline identities an individual may hold. This leads to identity formation as a two-stage model, a first step in which long-term "core" identities are selected and a second step in which these "core" identities are made more or less salient to an individual.

The second feature that must be accounted for is comparison. Primarily, comparison is how identity becomes actions and beliefs, however comparison also serves as an identity primer. As described by Hogg, "... because social identity is self-evaluative ... the intergroup social comparison process strives to accentuate differences that evaluatively favor the in-group; that is, it strives to achieve evaluatively positive intergroup differentiation", (Hogg, 2000, p. 405). Individual's are constantly evaluating the categories that they belong to within the core identities that they hold.

Individual's seek to highlight their differences when comparing the groups to which they belong, Hogg, 2000. Rather than status being related to identities, it is related to the categorical groups. When an individual belongs to a minority group that is lower status and the groups are stable but permeable, such as with social class identity, individuals in the low status groups attempt to redefine themselves into the higher-status group. For those who belong to a minority group that is lower status, stable, but impermeable, such as race, three options exist. They can make upward comparisons are made to re-evaluate the properties of the group, attempt to choose a different identity, or they make downward comparisons to groups that are even further down the status hierarchy.[26] An example of this downward comparison is the notion of a black man being

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[26] It is important to remember that even though I group social class by rich, middle class, and poor, these are not the only ways to group social class. One can subdivide the poor into rural, city, suburban. These subdivisions can be broken down even further to which part of town one lives in, what kind of house they are in, etc. Again, categorical

"too white" or a "ghetto black". In both cases a downward comparison is being made in order to build up the identity of the individual making the comparison. Finally, when a group is unstable or the rankings are perceived to be illegitimate and the groups are impermeable, then a highly competitive upward comparisons ensue, i.e. a power struggle between categorical groups. For high-status groups, when their status is threatened we see the downward status become highlighted.[27]

Again, these are categorically focused and while a great deal of research can be conducted along these lines, I stop here except to highlight that these comparisons result in identity priming. To make this precise, by differentiating between categorical groups and identity groups, status is removed as a direct cause of identity selection. Instead it acts through highlighting categorical differences and increasing the priming that occurs.

Thus there is only one driver of identity, salience. The differences between attention and status then are not to push identity in different directions, as in Shayo's model, but in the time frame's they operate in. Attention shifts as short-term priming occurs. Individual's are made more aware of different categories they belong to which can alter the importance of the core identities they hold. Status results in categorical comparisons which drive long-term conditioning. These status primers define the core identities an individual holds.

2.4.2.1   Random Utility Model

I now develop a random utility framework of identity formation based on two discrete choice steps. In the first step, individuals select a baseline set of identities that matter to them and exclude all others based on conditioning. Again, conditioning is long-term priming and is the mechanism through which comparison influences identity choice.

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groups are arbitrary and one can partition individuals as finely as they desire. Thus one can always find a categorical group that is lower in status.

[27] The GSS actually allows me to directly test this hypothesis. A question was asked, If you were asked to use one of four names for your social class, which would you say you belong in? It then gave options as Lower, Working, Middle, and Upper class. The distinction between working class and middle class is that working class is not poor but is living paycheck to paycheck. Comparing the actual income distribution from all years of the GSS to this question, an individual in the bottom 20% is 4 times as likely to select the working or middle class as they are the lower class. For individual's in the top 10% income, they are also 4 times as likely to select middle class as upper class.

In the second step, priming occurs which *reorders* the ranking of this subset of identities. This reordering occurs based on what the individual has seen, heard, or experienced in the recent past. Most forms of priming only influence an individual when that priming is targeting identities already selected in the first stage. For priming to move an individual towards an identity they don't choose in the first stage, the priming must be extremely powerful.

For example, nationalism is an identity that was chosen as one of the top three identities in 156 out of 3,580 possible choices in the full sample.[28] In the immediate aftermath of the 9/11 attacks on the United States, it is expected that nationalism would have been picked far more often had this survey been performed immediately after the 9/11 attacks. However, this was a one-off event. It is not surprising that three years later nationalism had fallen back to low levels of individuals' identity. Contrast this one-off with the years and decades of conditioning that establishes which identities are held "permanently".

2.4.2.2   First Step Identity Choice

In order to identify with a specific identity, an individual must first have been conditioned to care about that identity. This conditioning shapes which identities matter to them and which don't. Conditioning occurs explicitly and implicitly, on purpose and accidentally, and from our parents and our society. That is, a child can be raised to have a strong sense of family, gender roles, and religion. But if this child also happens to be black, they are exposed by society to a constant level of discrimination and isolation, even if subtly, (Bertrand & Mullainathan, 2004; Schiller, 2008).

Notice the role comparison is playing in this first stage. People generally don't want to be different and don't want to be around people who are different. Bullying, discrimination, and the formation of "us" versus "them" is the very reason social identity theory was developed and comparison is the step in Social Identity Theory that these behaviors occur.[29] Groups provide

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[28] Nationalism was selected 29 out of 1,201 first choices, 63 of 1,196 second choices, and 64 times in 1,183 choices in the third choice from the full sample found in the GSS.

[29] The push towards inclusiveness is an attempt to either remove people from grouping themselves together (impossible), an attempt to change "who" the group is (possible), or an attempt to change the identities that are important to individuals (also possible). An example of this is the impact WWII had on white's who fought side by side with blacks. Many returned with changed attitudes about segregation. I argue that this is because instead of race/ethnicity

a ready means to categorize people that are the same versus groups that are different. Being a minority is to be reminded, sometimes daily, that you are different and this constant reminder serves as a source of conditioning that increasing the likelihood that you identify with the identity you are a minority in.

Lifelong conditioning that occurs causes an individual to care about certain identities. In the United States, religion is difficult to avoid and reinforces the categorical Christian group the majority of the United States belongs to. On the other hand, the implicit and explicit discrimination faced by women and minorities should make identification with gender or race/ethnicity much more likely for these individuals. The common theme of these two points is that there is regular conditioning occurring which should drive individuals towards these identities when they are a member of the appropriate group.

Generally speaking, with the exception of any majority identity that is highlighted within the society, such as through imagery and regular references, those identities in which an individual belongs to a minority category should be selected at a higher rate in the first stage of identity formation than those they hold a majority category in. Again, comparison is the driver of this. Further, minority status should increase the effectiveness of priming in the second stage as they should be making the comparison of groups at a higer rate than the majority is as described above.

Finally, each identity is different. Some societies value gender identities, some racial, and some religious over other possible identities. The more important the identity within a society the more being a minority in that identity should matter towards selection of that identity. That is, *a priori* it should be expected that being a minority in race/ethnicity should be far more likely to drive an individual towards race/ethnic identity than being a minority in the age identity should in the United States.

This leads to the following reduced functional form of 1st stage identity formation for each individual identity with the individual i subscripts omitted for clarity:

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being important, they began to see nationality as important. "This man fought and bleed next to me, he *is* a member of my group." Because skin color didn't change, the identity must have and thus the group shifted from being based on race to being based on nationality.

$$Identity_j = \beta_0 + \beta_1 * ads_j + \beta_2 * age + \beta_3 * gender + \beta_4 * income + \beta_5 * race + \beta_6 * interaction_j + \epsilon_{i,j}, \quad (2.1)$$

Here, $Identity_j$ represents the $0, 1$ binary variable that indexes the latent variable associated with the utility, $V_{i,j}$, of the first stage identity choice. This variable takes a value of 0 when the identity was not selected by the respondents as one of their top 3 identity choices and 1 when it was. I measure the amount of priming that an individual is potentially exposed to via political ads in ads_j. Only ads related to the identity of interest are included in this model, necessitating the subscripts. The coefficients related to the ads should be 0 in this specification as short-term political ads should not influence long-term identity decisions.

The demographic variables are indicator variable indexing which demographic group an individual is a member of. For gender and race this corresponds to male/female and white's/non-white's respectively. When religious identity is considered I include a Christian/non-Christian variable as well. The $interaction_j$ term is the specific interaction between the majority/minority group of interest and the ads of interest. That is, when social class identity is considered I interact social class ads with the poor class and the rich class where this variable is investigating whether there are differential impacts of ads by categorical group.

The error term, $\epsilon_{i,j}$, gives all unmeasured influences to baseline identity selection. These influences range from the values instilled as a child by one's parents and the environment outside of one's parents to influential events growing up such as the overall society and time that one was raised. Finally, events as an adult can potentially reshape these identities, such as attending college and having a significant other with different identities.

Theoretically, these unobserved influences can be partially quantified. Survey's could ask for different values that parents instilled in an individual as a child such as, gender roles, religious belief, and caring about different groups. The environment can be accounted for with large enough samples using dummy variables that control for time and location growing up or significant events.[30]

Where one went to college, whether one was in organizations in college, what organizations one belongs to at the time of the survey, and information about the identity choices of significant others could also be used to understand identity formation. However, the present sample is too small or doesn't ask the questions necessary to investigate these issues at a deeper level.

From all of the identities that are possible, an individual chooses a subset of identities which they derive a total utility $U_{i,k}$ from. In this model there is no correlation in choosing one identity given that you've selected another. Thus, the contribution of each identity is additively separable resulting in the following utility function for the subset of identities chosen:

$$U_{i,k} = \sum_{j=1}^{k} V_{i,j} + \mu_{i,j}, \tag{2.2}$$

where an individual is free to select as many identities as they would like for the subset, k, up to and including the full set of identities. An individual selects an identity, j into the subset, k, from all other identities if:

$$Pr(V_{i,j} > V_{i,J-k}),$$

with $J - k$ corresponding to the set of identities not already selected into the selected subset.

As is shown in Benson et al., 2018, additive separability of a subset of choices means that the probability of any identity j belonging to the selected subset, conditioned on identities $k - j$, is the same as the unconditional probability of selecting that identity. Justification for the additive separability of this utility function is given by the independence of the identities from one another. Specifically, I am assuming no interactions in selection of one identity given that another identity has already been selected. Assuming the error terms are i.i.d. normal, this leads to the multinomial probit choice model given by:

$$Pr_i(\text{select}\{j_1, j_2, ..., j_k\}|J, j_2, j_3, ..., j_k) = \int ... \int I(V_{k,n} + \epsilon_{k,n} > V_{k,n-j} + \epsilon_{k,n-j})\phi(\epsilon_{k,1})d\epsilon_{k,1}...d\epsilon_{k,N},$$

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[30] The civil rights movement and events such as the murder of Emmett Till surely altered some people's first stage identity choices.

where N denotes the total number of subsets involving the identity of interest, $\phi(\cdot)$ is the normal distribution, and $I(\cdot)$ is the indicator function.

This expression can be simplified by applying the independence assumption. Therefore, I can reduce this multinomial probit distribution to just a simple probit model taken over the identity of interest.

$$Pr(\text{select}\{g\}|J, j_2, j_3, ..., j_k) = \int I(V_g + \epsilon_g > V_j + \epsilon_j)\phi(\epsilon_j)d\epsilon_j.$$

where the identity of interest, g is a success while the remaining identities are a failure. That is, the probability of selecting the subset of identities, $\{g_1\}$ conditioned on all remaining identities that haven't been selected, J and all identities that have already been selected, $\{j_2, j_3, ..., j_k\}$ is equal the probability of selecting identity g unconditionally. This result follows from the result that in a multinomial normal distribution, $f(x, y)$, independence between x and y results in $E(x|y) = E(x)$. Intuitively this means that the marginal probability of selecting x is unaffected by which y was drawn when x and y are independent. In the context of this paper this means that the probability of selecting identity g is unaffected by having selected identity j.

This assumption is supported by the correlations shown in Table 2.6. Religion is the only identity with a correlation coefficient above 0.09, however this is an artifact created by religion identity being chosen by a quarter of the sample. Investigating the raw correlations with all ten identities family displays the same pattern as it was chosen by fully three quarters of all respondents. Tellingly, family, religion, gender, and age, which are the most common identity choices, have the lowest pairwise correlation coefficients of all pairwise correlations supporting the correlation coming from how often these identities were selected rather than any actual correlation between them.

Table 2.6: Correlation Coefficient Between the Identity Choices

	Age	Gender	Race	Religion	Class
Age	1				
Gender	.001	1			
Race	-.085	-.008	1		
Religion	-.214	-.171	-.099	1	
Class	-.04	-.086	-.076	-.235	1

2.4.2.3   Second Step Identity Choice

As an adult, a person's baseline identities become more difficult to change.[31]   However, *within* the subset of the identities that an individual finds important, priming can easily shift an individual between these identities. This shift occurs because priming pushes a person towards or away from an identity. But in order to feel the push of the identity, a person needs to already find that identity important. Again, only extraordinary priming can cause an individual to identify with an identity that isn't in their original subset.

The reduced form intensity function that determines how intensely an individual feels an identity is based on priming and conditioning. This function is identical to the first-step regression except rather then the outcome variable measuring whether an identity was selected in the top 3 choices, the outcome is how highly an identity was ranked conditional on having selected in the top.

$$y_j = \beta_0 + \beta_1 * ads_j + \beta_2 * age + \beta_3 * gender + \beta_4 * income + \beta_5 * race + \beta_6 * interaction_j + \mu_{i,j}. \quad (2.3)$$

where $\mu_{i,j}$ is i.i.d. normally distributed. The independent variables are identical to the first step regression's variables.

The probability of observing $y_j = \alpha$ where $\alpha = 1, 2, 3$ for given amounts of priming and membership in a categorical group, m, corresponds to the region of the distribution where y_j falls

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[31] While this is a testable hypothesis, I lack the data to test it. Anecdotal evidence would suggest, a priori, that this statement is true as numerous experiments in conditioning demonstrate. Peer pressure becomes less influential as one ages. As priming can be thought of as a form of peer pressure, it stands to reason that adults should be less susceptible to priming into areas they have never cared about before.

between τ_{n-1} and τ_n:

$$Pr(y = j|x, c) = Pr(\tau_{n-1} \leq y_j < \tau_n | x, c)$$

Substituting $\beta_0 + \beta_1 * ads_j + \beta_2 * age + \beta_3 * gender + \beta_4 * income + \beta_5 * race + \beta_6 * interaction_j + \mu_{i,j}$ for y_j and using some algebra leads to the standard formulation for the predicted probability in the ordered probit model,

$$Pr(y = j|x, c) = F(\tau_n - (\beta_0 + \beta_1 * ads_j + \beta_2 * age + \beta_3 * gender + \beta_4 * income + \beta_5 * race + \beta_6 * interaction_j)) -$$

$$-F(\tau_{n-1} - (\beta_0 + \beta_1 * ads_j + \beta_2 * age + \beta_3 * gender + \beta_4 * income + \beta_5 * race + \beta_6 * interaction_j)),$$

where F is the cumulative distribution function of the normal distribution.

2.4.3   Comparing Models

Comparing these models, the most significant difference is how I split groups into categorical and identity. This distinction matters because the perceived distance and status measures used in Shayo correspond to the categorical groupings, not the identities. Therefore to use them to measure identity formation is an error. The true driver of identity formation is through salience and only salience.

For Shayo, both salience and status determine identity. Both of our models agree that salience should influence identity formation. But for Shayo, the higher the status of the identity, the more likely an individual is to chose that identity. I will show this is the opposite of what occurs. Further, status is linked to categorical groups, not identities. It is only through priming that status impacts identity. Whether one belongs to a high status category or not, if no priming occurs towards that identity there will be no reason to select that identity.

To see this consider the example of clothing fashion. Without priming in the form of fashion shows, influencers, and advertisements how would one rank which fashions are high status and which are low? Signals must be sent to declare one category high fashion and another low fashion.

In the absence of these signals, there is no meaning to high and low fashion. Thus, while comparison is required to distinguish between the high and the low, the fashion identity only forms once the signal is sent. Status is not a direct driver of identity, it is a consequence of the identity and an indirect driver of identity.

In figure **??** I provide a representation of the relationship between comparison, salience, categorization, and identity for each model. In Shayo's model, salience and comparison directly influence the categorization/identity. Again, Shayo makes no distinction between categorization and identity. In my model priming and conditioning directly influence identity. Identity is related to categorization which leads to comparison. Comparison is what take identity to action and influences conditioning before the cycle repeats itself.

The other prime difference in our models is that I distinguish between long-term and short-term identity choices. To my knowledge this distinction has never been made in the literature. I do this because there are two types of identity priming occurring, one impacting the salience of the identity and one being impacted by the comparison of groups. I present evidence in the next section that this separation is necessary and uncovers impacts that would not be found by assuming individual's have all identities available to them at all times. Identities cannot be primed for if an individual doesn't care about those identities.

2.4.4   Empirical Considerations

The regressand variable of interest in the first stage probit model is *identity*. This is a discrete variable in the 2004 GSS and is comprised of 10 identity choices an individual can choose, as listed in Table 2.2. Choices *Political Party* and *Nationalism* are dropped as they are chosen less than 5% of the time and inhibit convergence of the model. Theoretically, this data structure lends itself to a rank ordered multinomial probit model, however I have neither the limitations in choice structure nor the observations to support this model.[32]   I also exclude *Occupation* and *Region* from the

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[32] There are $6p3 = 120$ possible paths. Additionally with 6 options to choose the rank ordered probit is simply too complex to calculate. There are 889 individual observations remaining after excluding DMA's without ad data.

analysis as well due to there being no clear majority/minority in either of these groups.

Table 2.7 gives a breakdown of the identity counts used in the probit and ordered probit models as well as the missing observations distribution across the identities. Table 2.8 does the same for the categorical groups. From these tables we can see the impacts of dropping observations. Individuals were dropped for lack of data as they lived outside the top 100 DMA's, were surveyed after the election, or lacked income data. Comparing the makeup of categorical groups of those dropped with those not dropped we see that only in the case of religion is the makeup of the group different by more than 3% indicating that we have a slightly more "Christian" sample in the final regression than the original sample but that overall the exclusion of those for whom no ad data was available is the same. As a robustness check I included these observations without the income data and found no statistically significant impact. This indicates that the missing observations due to missing income were drawn from the same distribution that those observations for whom income data is available. I conclude that these missing observations, due to missing DMA information, interview date, or income data, do not systematically influence the final results.

Table 2.7: Count of identities included in final regression and data missing caused by observations being lost due to not being in a top 100 DMA data or missing due to the subject being surveyed after the election or missing income data.

Identity	Included	Freq	Dropped	Freq
Age	191	22.71%	98	22.12%
Gender	240	28.54%	105	23.70%
Race	137	16.29%	61	13.77%
Religion	276	32.82%	108	24.38%
Social Class	151	17.95%	71	16.03

The regressor variable of interest in the ranking regressions is the number of ads targeting an identity that were run, averaged over the 10 days prior to the interview with the individual. Using the number of ads run, rather than the number of ads exposed to, means that the estimates generated are lower bounds as it is highly unlikely that individuals were exposed to all of the ads measured in the time frames. The time period, 10 days, was chosen for two reasons. First, Gerber et al., 2011 identifies a little more than a week as the time at which ads have an impact. Second

Table 2.8: Count of the demographic groups of those in the final regression and those dropped due to missing data.

Group	Included		Excluded	
	Count	Freq	Count	Freq
Religion				
Christian	672	79.90%	218	75.96%
non-Christian	169	20.10%	68	24.04%
Gender				
Female	466	55.41%	167	58.19%
Male	375	44.59%	120	41.81%
Race				
White	624	74.20%	214	74.56%
non-White	217	25.80%	73	25.44%
Age Group				
< 60 years old	663	78.83%	234	81.53%
≥ 60 years old	178	21.17%	53	18.47%
Social Class				
Bottom 20% Income	160	19.02%	34	13.28%
Middle 70% Income	591	70.27%	183	71.48%
Top 10% Income	90	10.70%	39	15.23%
Education				
No College Degree	567	67.42%	191	66.55%
College Degree	274	32.58%	96	33.45%

is that the average amount of time an ad ran was 10.5 days.[33] Average time frames were tested ranging from the day before the interview was conducted to two months prior. The 10-day window provided the maximum levels of significance, in line with Gerber et al., 2011.

In this paper another factor determining the impact of the ads comes the fact that I only measure potential exposure effects, not actual. Time periods shorter than the 10-day window mean the likelihood of seeing an ad will decrease which should reduce the measured effect of the ads. Conversely, periods that include ads ran further from the date of the interview are less likely to still have an impact by the date of the interview which reduces the measured impact of the ads.[34] The 10-day window provides the peak combination of likelihood to have been exposed to an ad at least once while not being too far into the past to lose the effectiveness of the ad.

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[33] There were 11,175 total unique ad market combinations with a standard deviation run time of 6.2 days, a minimum of 1 days aired and a maximum of 60 days aired.

[34] This is explicitly demonstrated in the next section.

From Table 2.9, we see that some of the most common ads ran were targeting *Class* and *Age*. These reflect two of the primary issues the candidates campaigned on which included job loss, job creation, healthcare, and prescription benefits for seniors.

Table 2.9: Summary statistics of ads targeting identities ran in the DMA averaged over 10 days prior to the interview.

	All ads included					At least one ad ran				
Identity	Obs	Mean	Std. Dev.	Min	Max	Obs	Mean	Std. Dev.	Min	Max
Age	841	4.91	9.65	0	71.2	376	10.97	11.91	0.1	71.2
Gender	841	2.23	7.03	0	50.5	150	12.50	12.22	0.1	50.5
Race	841	1.29	5.03	0	39.9	103	10.50	10.50	0.1	39.9
Religion	841	1.51	5.09	0	45.6	146	8.73	9.30	0.1	45.6
Social Class	841	14.52	22.27	0	129.3	449	27.21	24.17	0.1	129.3

Finally, in order to test whether minority status has a significant impact on selecting identities I create a series of indicator variables. These variables correspond to religious affiliation, gender, racial group, age group, and income group. Due to data limitations, these groups were split into indicator variables. Future research that breaks groups into more finely separated categories should find more interesting effects. For example, with racial categorization I simply use whites and non-whites. Using groupings of White's, Asian's, Hispanic's, and Black's should find more interesting results due to the different levels of discrimination and identity priming these groups face.

2.4.5   Estimation Approach

In this section, I limit the analysis to the identities *age*, *gender*, *race*, *religion*, and *social class*. *Occupation* is excluded as it is not clear what constitutes a "majority" occupation versus a "minority" one. *Region* has no majority/minority group and so is also excluded, though ads that targeted region did have a significantly positive impact on selecting *region* as an identity.

I present the probit results for each of the five identities of interest first. These probit models are the first step of the two step model. The dependent variable of interest takes on the values 1 when an individual chose the identity in any of their top three choices and 0 otherwise. The dependent variables include the ads targeting that specific identity, demographic variables, and an

interaction term between the ads and the demographic variable that is specific to the identity of interest. As an example, with the age regression, ads that targeted age are considered individually as well as interacted with the age demographic variable. This allows for the ads to have different effects on different groups. Here, all individuals are considered as they either choose the identity of interest in their top three ranking (take a value of 1) or they did not choose the identity of interest (take a value of 0).

Next, I run a series of ordered probit models. These models are the second step of the two-step model. These models have an identical specification as the probit models. The difference now is that the dependent variable can take values of 1, 2, or 3. These models are a regression measuring the intensity of feeling about an identity. Because I focus only on individuals that selected the identity, there are fewer observations in each regression model than in the probit models. Returning to our age example, there were 841 observations in the probit model but only 191 in the ordered probit model. This reflects that only 191 of the 841 observations selected age as one of their top 3 identities. These results are presented in the same manner as above.

These first two regressions represent the baseline models of the entire population. Of particular interest though is how sub-populations are impacted by priming. One method of dividing up the population is to include behaviors or beliefs into the models that demonstrate a pattern of actions or thoughts that provide more information about the identities held. Data limitations limit me to race and religion for this analysis. I rerun the above two regressions exactly as described above but with the addition of a variable that reflects behaviors or beliefs that could have an impact on the effectiveness of priming. In the case of religion I use church attendance while for race I use a variable that reflects a belief in the importance of fighting discrimination.

Potential selection issues are why I favor the probit model over the linear probability or logit models. I believe there is selection occurring and the probit model is the most flexible model for handling this type of correlation. Data limitations force me to rely on the functional form of the first stage model to identify the parameters of interest in the second stage. Unfortunately this form gives nonsensical results and so I omit these results from the analysis. Good first stage instruments

are required to test for selection. These instruments could include survey questions about values parents raised an individual to have, and are an important area of future research.

2.5   Results

2.5.1   Identity Formation

In this subsection I present the results of the impacts of conditioning on baseline identity choice. To reiterate, this section will use the following econometric specification which comes from equation 2.1, again omitting individual i subscripts:

$$Identity_j = \beta_0 + \beta_1 * ads_j + \beta_2 * age + \beta_3 * gender + \beta_4 * income + \beta_5 * race + \beta_6 * interaction_j, \ (2.4)$$

with the interaction being between ads that prime the identity of interest and the appropriate demographic dummy.

Due to the nature of the sampling of the GSS, I cluster errors at the state level. The GSS samples cities, then a ring around cities that captures suburban regions, and finally a second, more distant ring that captures rural areas. This results in a sampling distribution clustered around major population centers which is captured at the state level clustering. These regressions are quite simple given the lack of theoretical modeling in what shapes identity choices. Hopefully these results drive further interest in exploring identity formation and manipulation and allow for the richer specification of the models developed above.

Table 2.10 provides the results from the first stage probit regression. In these models I am looking at what drives the formation of identities in the long-run. Looking at these results we see a broad pattern emerge. First I test whether short-run priming has an impact on the probability of selecting an identity as one of the top three choices. We see that ads, which provide this measure, have no effect in any situation except for non-White's interacted with ads. In this case the the probability of selecting race identity goes from 40% to 34% when shifting between 0 ads ran per day to 20 ads ran per day, which is a change of 2 standard deviations.

Table 2.10: Baseline First Step Regressions.

VARIABLES	(1) Age	(2) Gender	(3) Race	(4) Religion	(5) Social Class
Age Ads	-0.00473				
	(0.00403)				
18 - 24	0.357**	0.0725	-0.0612	-0.0566	0.0330
	(0.153)	(0.192)	(0.220)	(0.147)	(0.196)
61 +	0.226*	-0.130	-0.223**	0.345***	-0.329**
	(0.137)	(0.143)	(0.0999)	(0.119)	(0.144)
Male	0.0608	-0.339***	0.107	-0.0784	0.115
	(0.117)	(0.0972)	(0.122)	(0.101)	(0.127)
non-White	-0.102	-0.0486	1.163***	0.0298	-0.0375
	(0.0972)	(0.0907)	(0.137)	(0.134)	(0.106)
Bottom 20% Income	0.0538	0.164*	-0.110	-0.151	0.180
	(0.129)	(0.0909)	(0.185)	(0.146)	(0.159)
Top 10% Income	-0.256	0.104	0.109	-0.131	0.626***
	(0.189)	(0.135)	(0.200)	(0.134)	(0.135)
18 - 25 * Age Ads	0.0112				
	(0.0232)				
61 + Age Ads	-0.0158				
	(0.0157)				
Gender Ads		0.00923			
		(0.00994)			
Male * Gender Ads		0.000719			
		(0.0161)			
Race Ads			0.0154		
			(0.0144)		
non-White * Race Ads			-0.0233*		
			(0.0127)		
Religion Ads				0.00411	
				(0.00586)	
non-Christian's				-0.608***	
				(0.150)	
non-Christian's * Religion Ads				0.00125	
				(0.0302)	
Social Class Ads					-0.00102
					(0.00309)
Bottom 20% Income * Social Class Ads					-0.00321
					(0.00596)
Top 10% Income * Social Class Ads					-0.00236
					(0.00697)
Constant	-0.789***	-0.461***	-1.414***	-0.345***	-0.999***
	(0.0858)	(0.0931)	(0.116)	(0.115)	(0.119)
Observations	841	841	841	841	841
# Clusters	38	38	38	38	38
Log pseudolikelihood	-442.7	-493	-318.4	-511.2	-383.2
Pseudo R-squared	0.0175	0.0196	0.148	0.0395	0.0320

First step probit models. Each outcome is a binary variable indicating whether an individual chose an identity as one of their top 3 identity choices. Robust standard errors clustered at the state level are in parenthesis. Ads variables are continuous and are a measure of the average number of ads ran in the DMA in the 10 days prior to the survey interview. All other variables are indicator variables. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

The second test is whether long-term conditioning impacts this choice. Again, the hypothesis is that long-term priming will occur for minorities generally with the exception of religion which primes for Christian identity. Looking at these variables we see a broad pattern emerge. Focusing on significance we see that with age, those between 18-24 and those over 61 are more likely to select age than those that are middle aged. In other words, those that are young and those that are old are more likely to select age identity than those who are middle aged.

Breaking this up further, it can be shown that for those who are old these results are driven by the very old. As shown in Table 2.11, partitioning the age groups into 18-24, 25-70, and 71+ the coefficient of the young stay the same. The coefficient on the old however double and become statistically significant. When I exclude those who are 71 + from the age regression in Table 2.10, the significance on the old is lost. I therefore conclude that only those who are over 71 are driving the significance of the result.

This is evidence for long-term priming driving the significance of the demographic variables. Those who are 71 and over have been old for longer. Their bodies are feeling the impacts of age, they've possibly faced more discrimination, been treated differently due to their age, and are in a different stage of life than those who are under 70. Therefore, when I see the results of old age being driven by those 71 and over and see the sign jump by such a large factor, even when significance is lost, I interpret this to mean that being conditioned does increase the probability of selecting an identity as being important.

Shifting our attention to the other, non-religion, identities we see this pattern continue. Being male causes a decrease in the probability of selecting gender. For non-White's the probability of selecting race is substantially higher. Being poor does not seem to have an impact but being wealthy has a large impact on selecting social class identity. In all three of these cases we see the group that is experiencing long-term conditioning at a higher rate is selecting the identity at a higher rate.

Looking at the the demographic variables that aren't directly tied to identity we see that old people are significantly different than middle aged in both race and social class. For social class there is no obvious story as to why the old should value social class less. Perhaps the story is that

Table 2.11: Alternative First Step Regressions

VARIABLES	(1) Age	(2) Religion
18 - 24	0.352**	-0.0271
	(0.155)	(0.147)
61+		0.331***
		(0.119)
Male	0.0586	-0.0713
	(0.118)	(0.0961)
non-White	-0.0990	0.0191
	(0.0974)	(0.134)
Bottom 20% Income	0.0405	-0.130
	(0.127)	(0.145)
Top 10% Income	-0.246	-0.184
	(0.189)	(0.137)
71+	0.409**	
	(0.171)	
Age Ads	-0.00752*	
	(0.00426)	
18 - 24 * Age Ads	0.0141	
	(0.0229)	
71+ * Age Ads	0.00100	
	(0.0166)	
Religion Ads		0.00689
		(0.00462)
non-Religious		-0.872***
		(0.198)
non-Religious*Religion Ads		-0.0947
		(0.0844)
Constant	-0.780***	-0.360***
	(0.0919)	(0.104)
Observations	841	838
# Clusters	38	38
Log pseudolikelihood	-441.2	-505.5
Pseudo R-squared	0.0207	0.0481

This is identical to the First step probit models in Table 2.10. The specific identity groups have changed to be 71+ for age identity. Religion has seen the groups change to religious versus non-religious. Each outcome is a binary variable indicating whether an individual chose an identity as one of their top 3 identity choices. Robust standard errors clustered at the state level are in parenthesis. Ads variables are continuous, all other variables are dummy variables. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

they are retired so income matters less or they are more secure in what they've achieved in life. There is no clear way to test this however so I simply leave it as speculation.

In the race regression, the age can be broken into a white and non-white component by adding an interaction term. When doing this it becomes clear that old white's are driving this

result. Those who are non-white and over the age of 61 have a slightly positive and insignificant result while those who are non-white and over 61 maintain this result. I conclude that for those who are white and over the age of 61, race is an even less important identity than it is for the typical white person. Again, this is further evidence of long-term conditioning. Those who were 61 or older in 2004 were born in 1943 or earlier. For these individuals, the Civil Rights movement was in full swing as they became adults and into their early adult lives. It's not surprising then that race isn't an identity they are likely to hold.

Finally let us turn our attention to religion. Religion is split between Christian's and non-Christian's. Of the non-Christian's, 2/3 don't have a religious belief. Being non-Christian is associated with a lower probability of selecting religious belief. Looking at Table **??**, we see that for non-Christian's the distribution is far more spread then that for Christian's. As 2/3 of the sample just doesn't have a religion, it is possible to run this same model with the religion variable split between religious and not religious. This result is shown in Table 2.11. Splitting it into religious/non-religious shows the clear divide that exists. When splitting up religious identity by church attendance we see a about the same impacts but with differences in the variance of the regressions. This combines to provide more evidence in favor of long-term conditioning having an impact on the identity choices.

Figures 2.7 and 2.8 provide a graphical representation of the probability of selecting these identities broken up between the demographic groups with each respective identity choice. Throughout these graphs we see differential impacts caused by the demographic variables. For example, when looking at the gender graphs we see that the distribution of females selecting gender identity is shifted to the right compared to males. For race, non-white's distribution is far to the right of white's distribution, indicating they are far more likely to select race in their first step than white's are.

These results hold across all five of these identity choices. When I define old to be 71+ the probability distribution for the old shifts to the right relative to the middle age group. The same holds true when considering all religious individuals compared to those who stated they had

no religion. Overall this pattern tells a compelling story. Long-run conditioning, as measured by demographic variables, seems to cause individuals to develop a core of identities that they feel are important. That ads are not significant suggests that short-run priming does not change these "core" identities.

2.5.2 Identity Intensity

In this subsection I repeat the regressions above with one important difference. Rather than regressing on whether an individual selected a specific identity in their top 3 choices, I am regressing on where an individual ranked the identity based on short-term priming. This creates a measure of the intensity of the identity for an individual. The sample sizes in this section are much smaller than before as only individuals who ranked an identity are included in these regression.

Again, our regression of interest is given by:

$$Intensity_j = \beta_0 + \beta_1 * ads_j + \beta_2 * age + \beta_3 * gender + \beta_4 * income + \beta_5 * race + \beta_6 * interaction_j, \quad (2.5)$$

where $Intensity_j$ is measured on a scale 1, 2, and 3.

Table 2.12 gives the results of the ordered probit model assuming independence between the first and second steps, i.e. assuming no selection occurs. In this stage, I expect that the demographic variables are insignificant. Again, these are proxying for long-term conditioning and the long-term shouldn't have a significant impact on the short-term intensity choice. We see that this is true with one exception, income. Men rank social class higher than women do. Further, non-white's seem to favor social class higher. Finally, the poor identify with social class more intensely than the middle class.

The data available lack the ability to test explanations for these results. Speculative reasons are that society judges men based on their social class standing more than women do. This societal pressure causes men to internalize their social class more than women, causing the increase in social class identity intensity for those men for whom social class is an important identity. For

race minorities, social class could provide an alternative identity to value themselves with. Another possible explanation is that because poverty rates are far higher for non-white's than white's, there is a strong correlation between poverty and race for non-white's. Finally, the poor could tie into the previous explanation as well as be that for those who do identify with social class, it's an important identity. Unfortunately, due to a lack of observations I am unable to delve deeper into this issue but why certain demographics identify with social class more intensely is an interesting topic for further research.

The impacts of ads targeting social class identity on the probability of the choice selection are shown in figures 2.9 and 2.10.[35]   These impacts are the change in probability of selection of the relevant choice given that a DMA has had that many ads ran per day in the ten days leading up to the interview with the individual.

Throughout these figures the probability of selecting the identity is specified by choice ranking in the top graph. A rise in third choice probability as the graphs increase means that as individuals are exposed to ads, their intensity for that identity falls. The bottom graph in these figures gives the marginal change in probability. This graph demonstrates the change in probability for the respective choice as the number of ads increases. For each of these figures, the x-axis gives the number of ads that represents a standard deviation increase. For example, with social class identity 24 ads is a one standard deviation increase in the number of ads that were ran in the DMA.

In figure 2.9, we see that the probability of ranking social class least important increases as the number of social class ads ran in the DMA increases. This is interpreted to mean that individuals who belong to the bottom 20% of the income distribution are pushed away from social class identity when exposed to targeted ads.

Looking at figure 2.10, the opposite effect is seen. The probability of ranking social class as the third choice decreases while the rankings of the second and third increases. This is interpreted to mean that individuals who belong to the middle 70% of the income distribution are pushed

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[35] Graphical representations of the impacts of ads are presented throughout this paper. The tables that are used to generate these graphs are available upon request.

towards social class identity when exposed to targeted ads. For those at the top of the income distribution ads seem to have no impact, both statistically and when looking at the margins the probabilities are flat.

Shifting our attention to gender there is negative significance of gender ads but no statistical difference between men and women. Table 2.13 provides a cross tabulation of the ranking of gender identity for those who chose identity. This table demonstrates there is no difference in the ranking of gender identity conditioned on selecting gender as an identity. That is, women are significantly more likely to select gender identity than men are. Once gender identity has been selected, there is no difference between the sexes in how important gender is.

Finally, investigating race we see that ads have a positive impact on minorities increasing the intensity of racial identity. This finding is consistent with Bisin and Verdier, 2001. Figure 2.11 provides the same type of graphical representation of the impact of ads on the intensity probabilities. We see that ads have a significant impact on pushing non-whites intensity of racial identity up as evident by the falling third choice probability and the increasing first choice probability.

These baseline results demonstrate that ads may have an impact, however the impact is difficult to uncover. R. Kranton et al., 2020 suggests a possible reason for this is that a majority of the population is not impacted by priming, but those who are "groupy" are. In R. Kranton et al., 2020, distinguishing these individuals came from strength of identification with a political party. It is possible to provide a more direct measure of group identification through behavioral traits. In the next subsection, I focus on religion and race identities as these have behaviorally based questions that can help tease out any potential effects that may be occurring.

2.5.3   Behavioral Intensity

For the models in this section the results are presented slightly differently. Rather than having an identical model with each column corresponding to a different identity, I display only one identity at a time. Column (1) is the baseline probit model from subsection 2.5.1 which I include for ease of comparison. Column (2) displays the same model as column (1) with the inclusion of

the relevant behavioral/belief variable. Column (3) is the baseline ordered probit model. Column (4) presents the ordered probit model with the behavioral variables included.

I begin with religious identity. As shown in Table 2.12, the ordered probit regression shows no variable was significant in manipulating the intensity that an individual identified religion. In this subsection I include a behavioral variable, church attendance. This variable provides a measure of the strength of religious identity as demonstrated to others. Individuals were asked how often they attended church and given seven different options ranging from never to more than once a week. I collapse these choices into a set of three groups, rarely attend church, sometimes attend church, and regularly attend church. These correspond to church attendance of less than once a month, one to three times per month, or four or more times a month. Table 2.14 provides a breakdown of the responses to church attendance.

Table 2.15 gives the results of the baseline and behavioral ordered probit regression investigating the impact of ads on intensity of religious identity. The first point to note is that the ads are now significant across all interactions. The second point is in the behavioral variables. We see that church attendance is the largest determinant in religious choice and intensity. Going to church regularly is associated with stronger feelings of religious identity than if someone identifies as religious but rarely attends church. This is in line with the hypothesis that individuals who exhibit their identity through real world action feel stronger about that identity.

Looking deeper at the ads in graphs 2.12 - 2.14 we notice several interesting results. First, ads strongly move individuals who claim religious identification but rarely attend church. With 10 ads ran per day in the DMA, the probability of selecting strong religious identity intensity jumps from 17% to 55%. The marginal impact of an ad is substantial in this regression compared to the baseline results we saw above. Here the first few ads are pushing the probability up around 5 percentage points per ad. Contrast this with the previous results for social class and race which moved the identity intensity by less than half this amount. The second point to take note of is the non-linear impact of ads. A few ads move identities strongly, but once more than 10 ads were ran per day the impact becomes negligible quickly.

When we look at the impact of ads on those who attend church sometimes or regularly we see that the ads have almost no impact. Comparing these two results to the baseline extends the results of R. Kranton et al., 2020. Individuals who identify with religion can have their identity moved. However, these results are limited to those who don't have strong behaviors associated with the identity. For those who attend church sometimes or regularly, the priming of religious identity is much stronger from that church attendance. Further, without accounting for the behavior associated with religious identity we cannot find the impacts of the ads. From this I conclude that individual's do show different proclivities for "groupy" behavior. Individual's aren't likely to select religious identity because of the ads, but those who do select it, and do not normally behave in a way reflective of that identity, the ads do increase the intensity of the religious belief. An interesting question would be, are people more likely to go to church in the week after telling a stranger that they don't go to church often but do feel religious identity. This can be generalized to questioning if people who feel an identity, but don't act on it, can be moved to acting on that identity, at least temporarily.

One way to interpret these results is that individual's who attend church often don't need a political ad to remind them of their religious beliefs. For those who don't attend church but still care about religion, as evident by selecting religious identity in the first stage, priming they receive from those ads reminds them of their religious identity and we see a subsequent rise in religious identification. Another possible interpretation is that church attendance is driven by intensity of identity rather than driving it. This doesn't change the interpretation for those who do not attend church however. They still are reacting to priming of an identity they care about that is occurring in the same manner. Either way of looking at the causal mechanism of church attendance and religious identity intensity we are left with those who do not attend church regularly reacting to priming because they've selected religious identity in the first stage.

Table 2.15 also gives the first stage probit model in column 3 that includes church attendance. We see ads still don't have an impact on selecting religious identity in the first stage. As with intensity, the magnitude of the impact of church attendance on selecting religion is substantial. In

fact, comparing the magnitude of the coefficient of regular church attendance with that of being non-white, we see that church attendance is even more likely to predict religious identity than being non-white is to racial identity. Race is primed regularly for non-white's in the United States, so for regular church attendance to be an even stronger driver of religious identity selection demonstrates how strong the correlation between behaviors and identities are.

The conclusion to be drawn from this subsection is to highlight the need to measure behaviors associated with identities when measuring those identities. Behaviors are a type of priming as well as a reaction to identities so there is causation in both directions. Instrumenting for behaviors is required in order to determine the causation from behavior to identity and vice versa. An obvious instrument for church attendance is how far from the church that they attend, or would attend, that an individual lives.

2.5.3.1 Behavioral Race

The other regression that a partial behavioral variable exists for is race. I call this a belief to contrast it with the church attendance variable above. Church attendance is an obvious behavior that I happen to have information on. For race, there are behaviors that are possible but these are less clear cut. In this paper I rely on a variable from the GSS that asked the following question: "We are faced with many problems in this country, none of which can be solved easily or inexpensively. I'm going to name some of these problems, and for each one I'd like you to name some of these problems, and for each one I'd like you to tell me whether you think we're spending too much money on it, too little money, or about the right amount." One of the categories asked involved "Improving the conditions of blacks."

Table 2.16 gives a breakdown of the responses by racial minority status. From this table it is clear the racial divide that exists in the response to this question. There are many potential explanations for this. One could be simple information about the conditions faced by blacks. We see that white's are nearly split evenly between too much and too little. Another could be that minorities would be favored by saying too little so there is strategic decision making occurring

distorting their responses. A third explanation is that non-white's have more information on their own problems and believe that government intervention is the only solution.

A fourth potential explanation is the belief response. Individual's who identify with race are more likely to select too little or too much, depending on their race. Table 2.17 gives the correlation coefficients of the variable with the choice to select race and the racial intensity variable. These coefficients demonstrate a weak relationship between the intensity variable and the first stage, but a stronger one with the second leading some credence to the notion of this variable being tied to racial identity. For comparison church attendance and the correlations are also given. We see that the second stage correlations are nearly identical in absolute value lending weight to this variable as a behavioral question.

Having established the plausibility of the government impacting blacks question I turn my attention to analyzing the racial identity in the same manner as the religious identity. Table 2.18 provides the same table for race as was shown in Table 2.15 for religion. Due to a lack of observations of minorities who selected too much, I only am able to investigate the role of about right versus too little. Once again we see racial ads become significant with the addition of the behavioral variable. Figures 2.15 and **??** show the probability of selecting race identity by race for each of the different responses to the question of government intervention reflecting the results of column (2) in 2.18.

As with religion, I focus on the graphs found in figures 2.16 - 2.19.[36] Focusing first on too little, white's are pushed away from racial identity by ads. This is reflected with the rise in third choice intensity and the fall in the first and second choice. Again, white racial identity is a negative in the United States. Further, white's who believe that too little is done are probably more likely to have positive feelings for minorities, and blacks specifically. Therefore, knowing that discrimination and racism occurs, there is probably a push away from racial identity.

The lack of movement caused by racial ads within racial minority groups reinforces this. For minorities, there is little to no stigma attached with racial identity[37] and so there is nothing

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[36] These tables are also available upon request.
[37] At least compard to what it means to identify with race as a white person.

pushing away from racial identity. However, there is little pulling these individuals towards racial identity either for the same reason as those who go to church regularly don't need ads to tell them how important religion is. Therefore, while ads pull non-white's towards racial intensity, those who think too little is done are pulled less than those who believe about enough is done. Once again we see that individual's who hold beliefs associated with the identity don't need as much priming as those who do not hold those same beliefs.

Moving to "about right" we see the same story told, except with different behaviors. For white's who believe about right is done, racial ads shouldn't matter. Race is such a powerful identity within the United States that for those white's who think the government does about enough there are two probable reasons for selecting this. First, it's likely that for some it's likely that they truly hold that opinion. Ads probably won't shift these people as they hold this opinion for a reason and aren't finding ads to be educational. The second is that these people are indifferent and simply select about right because it's the middle answer. Ads shouldn't move individuals who are indifferent. In both cases it's expected that ads won't matter to these people, so the lack of impact of racially targeted ads on white's who think the government does about right is in line with our a priori expectations.

For racial minorities we see quite a bit of movement. Minorities who believe the government does about enough for blacks react strongly to the ads, of the same magnitude as the effect that those who identified as religious but did not attend church reacted. Racial identity is being highlighted for a group of people for whom racial identity may not be as impactful in their day to day lives. Evidence for this can be found by comparing the graph in 2.17 – 2.19.

Looking at the intercepts of the probabilities, we see that for those racial minorities who think the government does too little, we see no significant difference between between the three intensity choices. For those who think the government does about enough, there is a significant difference between the first and third choices, with the third choice being selected more often than the first choice. Further, looking at the probit model in column 3 of figure 2.18, we see positive significance in the too little dummy variable. The interpretation from both of these lines of evidence

is that racial minorities who believe the government does about enough for blacks are less likely to choose race identity as important and if they do choose racial identity as important will have a lower intensity of racial identification than those racial minorities who believe the government does too little.

Comparing the racial regressions as we did with religion we see the same pattern. When a behavioral variable is added, the ads become significant. The signs indicate that those who have a strong indicator towards holding an identity are not impacted by priming. Those who indicate in a survey that they hold an identity but do not hold behaviors or beliefs associated with that identity are impacted by ads.

2.5.4   Overall

In this section I demonstrated that long-term priming in the form of conditioning can be captured by majority/minority power groups. This is significant because it provides evidence for the psychological models that tell us minorities should hold identities they are a minority in at a higher rate than the majority. It also provides counter evidence to the economics literature that believes that individuals want to hold identities that have higher status. In this model evidence for the economics literature would have been minority groups being less likely to select the identity they were a minority in and more likely to select an identity that they weren't a minority in, i.e. a black individual would want to hold a social class identity more. We see this is true with intensity, but not with selecting social identity in the first place.

Another primary result is that ads don't seem to shape identities for the population at large. This is in line with the results of R. Kranton et al., 2020 where the average result is no result. Breaking the population into sub-groups based on behaviors does reveal these results are heterogeneous. Individuals who hold an identity but do not act on that identity through behaviors or beliefs are able to be primed, strongly, towards those identities. This result could also demonstrate why political ads seem to matter sometimes but not others. Religious ads shown to a devote population who act in said manner are unlikely to have any impact. Those same ads in an

area with high rates of baseline identification but lower rates of behavior are likely to have a strong impact.

The policy conclusion is that identities can be moved in populations which have high levels of "characteristic" identities but lower rates of actual follow through. We can find these populations with religion by looking for areas that are religious but have lower rates of church attendance. For race these areas can be found by looking for areas that have more discriminatory statistics, such as housing, workforce, or lower rates of engagement with groups working to lower discrimination. In each of these areas, ads that target religion or race will have a larger impact and can move individuals towards a latent identity.

2.6   Robustness Checks

In the previous section I presented the main results which demonstrate heterogeneous impacts of ads on the intensity of identity choice. In this section I provide some robustness checks which demonstrate these results are actually quite robust.

I run the same regressions as in section 2.5 except rather than restricting the ads to only those that I gave the strong strength of identity priming I include all ads that primed an identity. Given that weaker ads are included, it is expected that the coefficients of the model should fall in magnitude.

I begin with the probit models given in Table 2.19. We see that as with the baseline model the ads are insignificant. There is no difference in significance with the non-ads variables. This confirms the original specification and demonstrates that using ads that prime identities more weakly does not change the results. Shifting our attention to the ordered probit models, there are no new variables that are significant. Those that are significant, social class, the magnitude of the coefficients has fallen.

Table 2.20 provides the behavioral religion model when using ads of all strength that primed religious identity. Comparing all of the columns of this table with Table 2.15 we see that the magnitude of the ads coefficients has fallen substantially however all signs remain the same and the

same variables are still significant. Nothing that was significant in Table 2.15 is insignificant in the model in Table 2.20.

Table 2.21 provides the behavioral race model when using ads of all strength that primed racial identity. Comparing column 2 of Table 2.18 we see that the magnitude of the coefficients of the impact of race are less significant and smaller. The behavioral coefficient is approximately the same while the behavioral interaction with white's and racial ads is also approximately the same. Column 3 displays similar patterns although despite the drop in the magnitude of the coefficient the impact of ads on white's who believe too little is done is now significant. The remainder of the table is statistically the same.

Based on these findings I conclude that including weaker strength of priming ads caused a slight reduction in the measured effects and did not create a change in the core findings. This also demonstrates that the measurement error of the ads is not a significant driving of the findings. The more restrictive model has stronger results than the model that includes all strength ads, but other than differences in the magnitudes of the effect the direction and conclusions remain the same.

Another way to check for robustness would be to use ads that came after the interview. Unfortunately, these ads are highly correlated with ads that came before the interview prohibiting this form of robustness check. A way around this is to extend the time periods of the ads. Ads covering 20 or more days shouldn't be as strongly correlated and when I use ads over this time frame I find no significance in the ads for any of the regression models. This is an indication that the results from the ordered models are not spurious. Finally, I restructure behavioral models to include a measure of racial fractionalization and shift the construction of the majority/minority religion variable. In the case of racial fractionalization, there is no impact by including a measure of racial fractionalization within the DMA. This evidence that the results for race are not being driven by differences in the underlying population between DMAs.

The last check I can perform is intuitively simple. If ads had an impact on the intensity of ads, we should see this result in a simple univarite regression. On the left hand side I create a variable, "groupy" that takes a value of 1 if an individual selected a "non-groupy" identity, in

this case family or occupation, but chose a "groupy" identity, the other eight choices, higher. That is, individual's who are "groupy" are defined as holding at least one selfish identity but choosing a "groupy" identity as a choice higher than family and/or occupation. On the right hand side is the variable, battleground which is an indicator variable that takes a value of 1 if the state was considered a battleground state by the Kerry campaign, Appleman, n.d. States that were battleground states received the majority of funding and advertisements. Thus, if ads really do push individual's towards higher strength of identification, then individual's in battleground states should be more "groupy" than individual's outside of battleground states. This is precisely what I find in Table 2.22. Individuals living in battleground states are significantly more likely to select a non-selfish identity as their first choice when they hold selfish identities as well. If the ads had no impact I would expect that living in a battleground state would not have an impact on whether individual's were "groupy" or not.

In all of these instances the robustness checks failed to alter the results or give spurious results. This bolsters the case that while the exact magnitude of the effects is not clear, the direction and significance strongly points to identities being measurable and malleable. These results also validate a two-step model of identity formation and demonstrates that behavior and beliefs matter for measuring identity.

2.7   Conclusion

This paper developed a new model of identity formation. In this model identity is formed in two steps, an identification step and an intensity step. In the first stage, long-term conditioning leads to an increase in the probability of selecting group identities that matter. This is evidence for the rejection of the economic literature which states that status should drive identities and verifies the psychological literature. The second stage of identity priming, where ads shape which identities are most important demonstrates that on average identities cannot be primed through political ads but when the population is broken down by behaviors related to the identities an effect is uncovered. This effect impacts individuals who hold an identity but do not hold beliefs or

behaviors that are related to these identities.

Overall, this paper has provided empirical evidence based on micro level data that individual's identities can be measured, that identity can be manipulated, that the effect of primers on identity is behaviorally driven, and that identity has differential impacts between categorical groups. In addition I show that while the majority of people identify most strongly with selfish identities, a sizable minority show strong social identity choices. The implication of this fact is that a simple measure of the mean identity is not sufficient to capture how "groupy" a society is nor how easily the society can be manipulated.

Previous work in identity has been in experimental settings or has taken identities as given. I've shown that work in the experimental realm can be extended to the real world when it comes to who is "groupy". Research that takes identity as given suffers the problem of being unable to explain cultural shifts which allowing identities to shift does capture. Additionally, which groups matter shouldn't be left up to the researcher. An example of this is in Shayo, 2009 where nationalism is equated in the United States and Europe. Nationalism may appear to be important to the United States, but when individuals are given the choice of which identity to target it is revealed to be an insignificant identity. Arguments using nationalistic identity in the United States appear valid to the researcher but when applying actual data they're inappropriate. It's reasonable to assume this is not an uncommon occurrence and this can lead to inappropriate results.

The limitations of this paper follow from the small number of observations and the measurement error inherent in only having information on potential exposure effects rather than actual. This paper should not be looked at as the definitive answer to the malleability of identities. What it does do is generate a model of identity formation that allows for the measurement of real world identities in all their multitude. It also demonstrates compelling evidence that there is value in generating more comprehensive data sets which can properly answer the questions posed in this paper. For example, breaking race between Whites, Asians, Blacks, and Hispanics should be instructive given the different experiences these groups have. The lack of data prevents this from occurring. Similarly the ideal specification is a rank-ordering given that multiple identities can

be held simultaneously. A larger amount of observations will allow this specification to become computationally feasible.

This is a research topic with little real world research to draw from. Nearly all of the results that exist in the identity literature come from experimental settings. What little evidence for identity formation that is developed from the real world focuses on short-term identity malleability. Thus, while the results of this paper may be weak due to lack of observations, they should be viewed in the context of demonstrating methodology and justification for further money to be spent generating better data sets that can answer the very important question of identity formation.

Research in the future should focus on the following questions. Do these results hold when sample size is sufficient to run truly rich models allowing for categories to be measured at a finer level than majority/minority. How do behaviors shape identity formation and malleability? What is the optimal level of targeting to manipulate identities? Are there "good" and "bad" identities?

These questions are of fundamental economic importance because of the role identities play in the fractionalization of a society. In the experimental literature we see differences in preferences for redistribution while in the real world there have been mixed results that show fractionalization inhibits government services and economic growth. Are there identities that are better for society in that getting people to identify with those identities allow for more cooperative behavior? Conversely can society be fractionalized to the point of being paralyzed and unable to accomplish anything? Answering these questions can help explain and help to solve the challenges democracies face where greater abilities to communicate allow for greater levels of fractionalization as individuals are able to find like-minded groups with greater ease and there is less peer pressure occurring to keep society homogeneous. In short, social identity matters and good real world measures of these identities are necessary to address the growing problems democratic societies face that can only be solved through cohesive action among the population.

Figure 2.2: Example of a PDF of a political ad from the Wisconsin Ads Project

HOUSE/AL6 BACHUS COMMUNITY ENDORSEMENTS 2

Brand: POL-CONGRESS (B332)
Parent: POLITICAL ADV
Aired:
Creative Id: 3419772
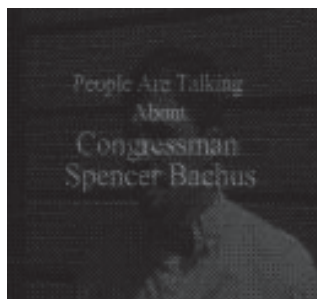
[Man 1]: "Spencer's on the Transportation Committee and that's important. We need the Northern Beltline."

[Man 2]: "Spencer supported the ban on late term abortions, and that was the right thing to do."

[Woman 1]: "We have a crisis with decency and Spencer has led the fight against the ACLU extremists."

[Man 3]: "We really appreciate Spencer's strong support for us veterans."

[Man 4]: "Spencer's done a good job. We need his leadership in Congress."

[Bachus]: "I'm Spencer Bachus and I'm authorizing this message to make certain

you know where I stand." [Man 5]: "I'm voting for Spencer Bachus." [PFB]: Bachus for Congress.

Figure 2.3: Wisconsin DMA map

© 2004 Warren Communications News
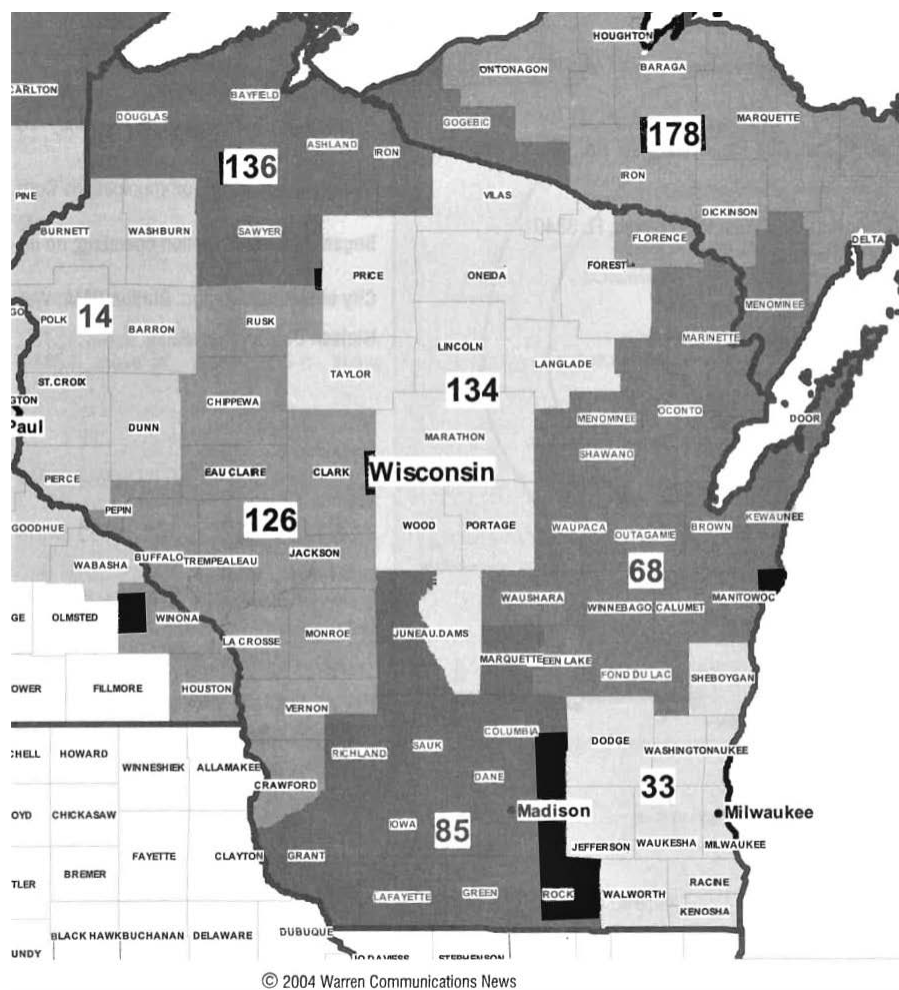
Example of the DMA map with the ranking of the media market associated with each DMA. Sheboygan, Dodge, Washington, Ozaukee, Jefferson, Waukesha, Milwaukee, Walworth, Racine, and Kenosha counties are all within the Milwaukee DMA which was the 33rd largest DMA in the United States in 2004. This image is reprinted with permission of Warren Communications News. Do not further redistribute without written permission from Warren: www.communicationsdaily.com, 202-872-9200 or sales@warren-news.com

Figure 2.4: An example of an ad targeting nationalism strongly as well as age group and family weakly.

HOUSE/MN2 DALY RUBBER STAMP

Brand: POL-CONGRESS (B332)
Parent: POLITICAL ADV
Aired:
Creative Id: 3600792

[Daly]: "Two years ago I gave $50 to John Kline because he claimed to share our values,	instead he was a rubber stamp for his party 98%	of the time. Kline even voted to cut health care for our veterans
and against pay raises for our troops in Iraq. I'll vote with either	party if it protects our veterans, seniors, and children.	I'm Teresa Daly and I approved this ad. Hey John,
I want my $50 bucks back and we want our Congressional seat back." [PFB: Daly for Congress]		

Figure 2.5: An example of an ad targeting gender identity strongly and family, social class, and age group as moderately targeted identities.

PRES/TVC THE FUTURE

Brand: THIS VOTE COUNTS ORG (B329)
Parent: PARENT UNKNOWN
Aired:
Creative Id: 3600778
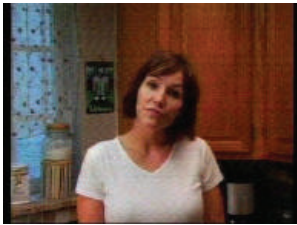
[Man1]: "This election can't be just about terrorism."

[Woman1]: "This is about getting our own hosue in order." [Woman2]: "How do the wealthiest

1% percent get the tax breaks?" [Woman3]: "The average family cannot even afford

health insurance." [Man2]: "And benefits are being taken away from our own veterans."

[Woman4]: "It's ridiculous that seniors cannot get affordable medication."

[Woman5]: "We have a 2 year old daughter, this vote is about her future too." [Woman6]: "Of course

we have to be safe from terrorism, but we also have to start taking care of things right here."

[Announcer]: Vote for Change. This Vote Counts is responsible for the content

of this advertisement.
[PFB]: This Vote Counts

AdDetector tns
www.PoliticsOnTV.com

Copyright 2004 TNS Media Intelligence/CMAG

tns media intelligence/cmag
1-866-559-CMAG

Figure 2.6: An example of an ad targeting gender, race, age group, social class, and nationality weakly.

PRES/LIEBERMAN DETERMINED

Brand: LIEBERMAN FOR PRESIDENT (B331)

Parent: LIEBERMAN FOR PRESIDENT COMMITTEE

Aired:

Creative Id: 3217910

[Lieberman] "I am more determined than ever to fight for what's right for you."

[Announcer] He's one of our strongest environmental leaders. A consistent

champion of a woman's right to choose.

A consistent opponent of discrimination. And, even in the face of political pressure,

Joe Lieberman has never wavered in his fight against terrorism

or cutting taxes. He's a man of rock solid integrity.

[Lieberman] "I know how to unite America again and take us forward not backward.

[PFB: Lieberman for President. Message approved by Joe Lieberman]

Figure 2.7: Probability density of selecting the associated identity as one of the top three identities grouped by demographic group.
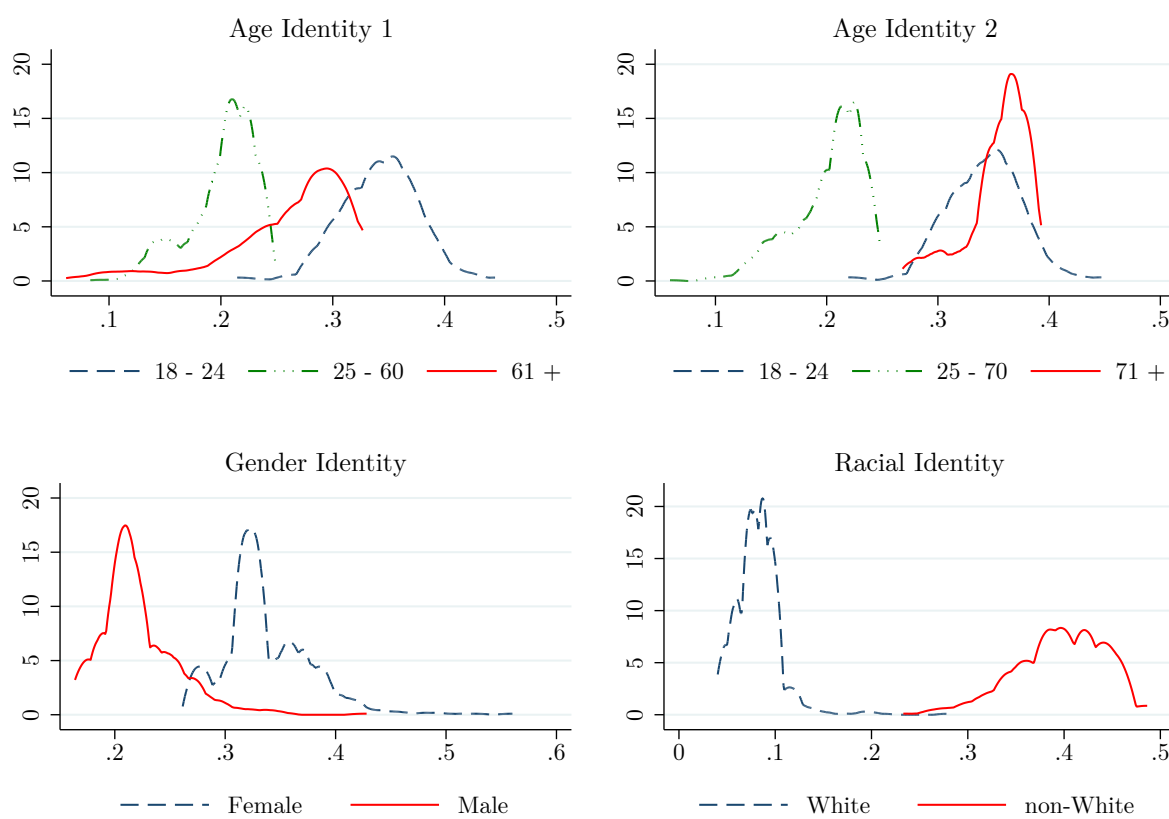
Figure 2.8: Probability density of selecting the associated identity as one of the top three identities grouped by demographic group.
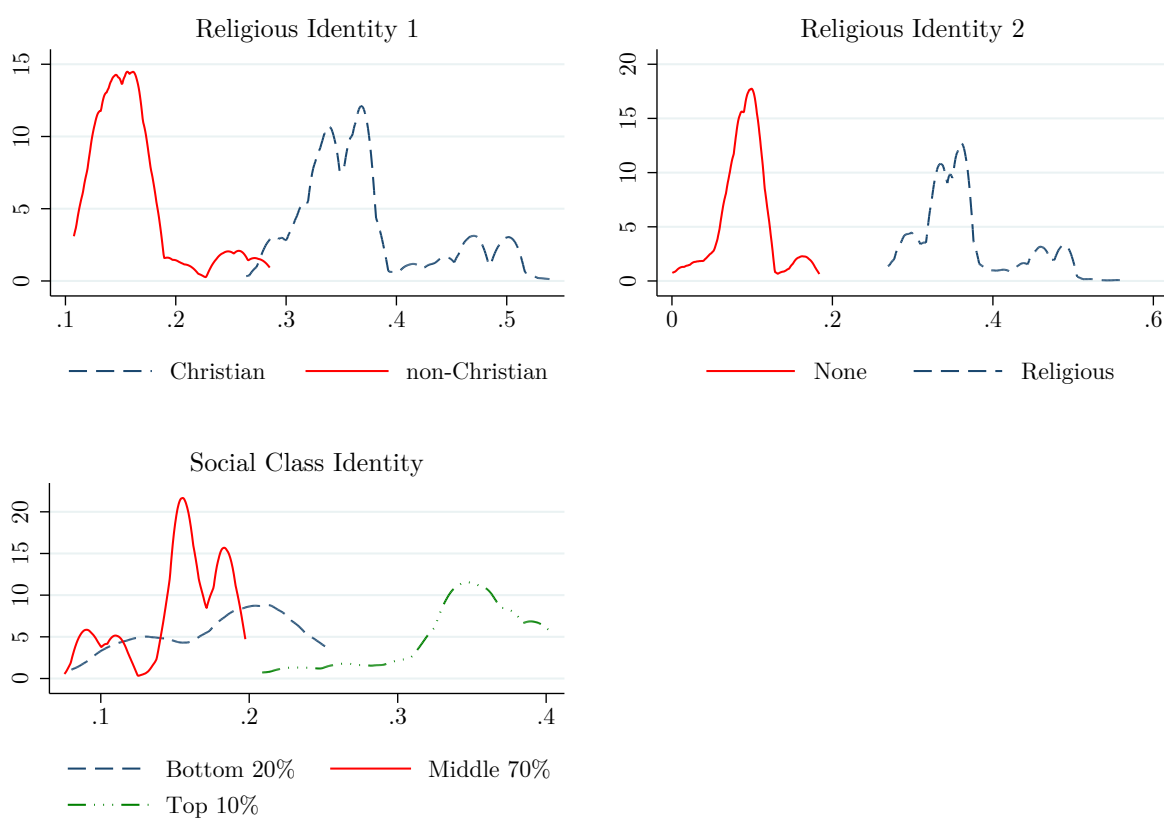
Table 2.12: Baseline Ordered Probit Regressions

VARIABLES	(1) Age	(2) Gender	(3) Race	(4) Religion	(5) Social Class
18 - 24	0.0267	0.116	-0.143	0.345	-0.291
	(0.301)	(0.288)	(0.309)	(0.270)	(0.258)
61 +	-0.0306	-0.208	-0.193	0.0833	0.0280
	(0.154)	(0.208)	(0.282)	(0.199)	(0.252)
Male	0.0411	-0.142	0.0438	-0.0482	0.460**
	(0.135)	(0.182)	(0.202)	(0.150)	(0.181)
non-White	0.200	-0.215	0.114	0.120	0.592***
	(0.271)	(0.149)	(0.207)	(0.133)	(0.186)
Bottom 20% Income	0.286	0.0782	0.379	-0.232	0.534*
	(0.250)	(0.148)	(0.254)	(0.231)	(0.276)
Top 10% Income	-0.170	-0.223	-0.202	-0.343	-0.0420
	(0.324)	(0.184)	(0.359)	(0.283)	(0.259)
Age Ads	-0.00435				
	(0.0102)				
18 - 25 * Age Ads	0.0198				
	(0.0192)				
61 + Age Ads	0.0432**				
	(0.0181)				
Gender Ads		-0.0210**			
		(0.00876)			
Male * Gender Ads		0.0287			
		(0.0212)			
Race Ads			0.00350		
			(0.0128)		
non-White * Race Ads			0.0420*		
			(0.0229)		
Religion Ads				0.00281	
				(0.0137)	
non-Christian's				-0.180	
				(0.271)	
non-Christian's * Religion Ads				0.00411	
				(0.0213)	
Social Class Ads					0.00947***
					(0.00340)
Bottom 20% Income * Social Class Ads					-0.0276**
					(0.0115)
Top 10% Income * Social Class Ads					-0.00985
					(0.00716)
/cut1	-0.0501	-0.397***	-0.175	-0.812***	0.633***
	(0.107)	(0.142)	(0.164)	(0.121)	(0.231)
/cut2	1.285***	0.374***	0.781***	0.376***	1.769***
	(0.179)	(0.131)	(0.185)	(0.105)	(0.243)
Observations	191	240	137	276	151
# Clusters	33	35	31	34	32
Log pseudolikelihood	-185.2	-257.1	-145.1	-290	-132.7
Pseudo R-squared	0.0211	0.0139	0.0274	0.00976	0.0700

Second step probit models. Each outcome is an ordered choice variable from Choice 1 to Choice 3 indicating where an individual ranked an identity. Robust standard errors clustered at the state level are in parenthesis. Ads variables are continuous and are a measure of the average number of ads ran in the DMA in the 10 days prior to the survey interview. All other variables are dummy variables. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Figure 2.9: The probability of each choice ranking of social class identity for a given number of ads ran per day is on top. The bottom graph shows the marginal change in probability that occurs after the given number of ads ran per day. Both x-axis are the number of ads ran per day, with the labels corresponding to a one standard deviation change in number of ads ran.
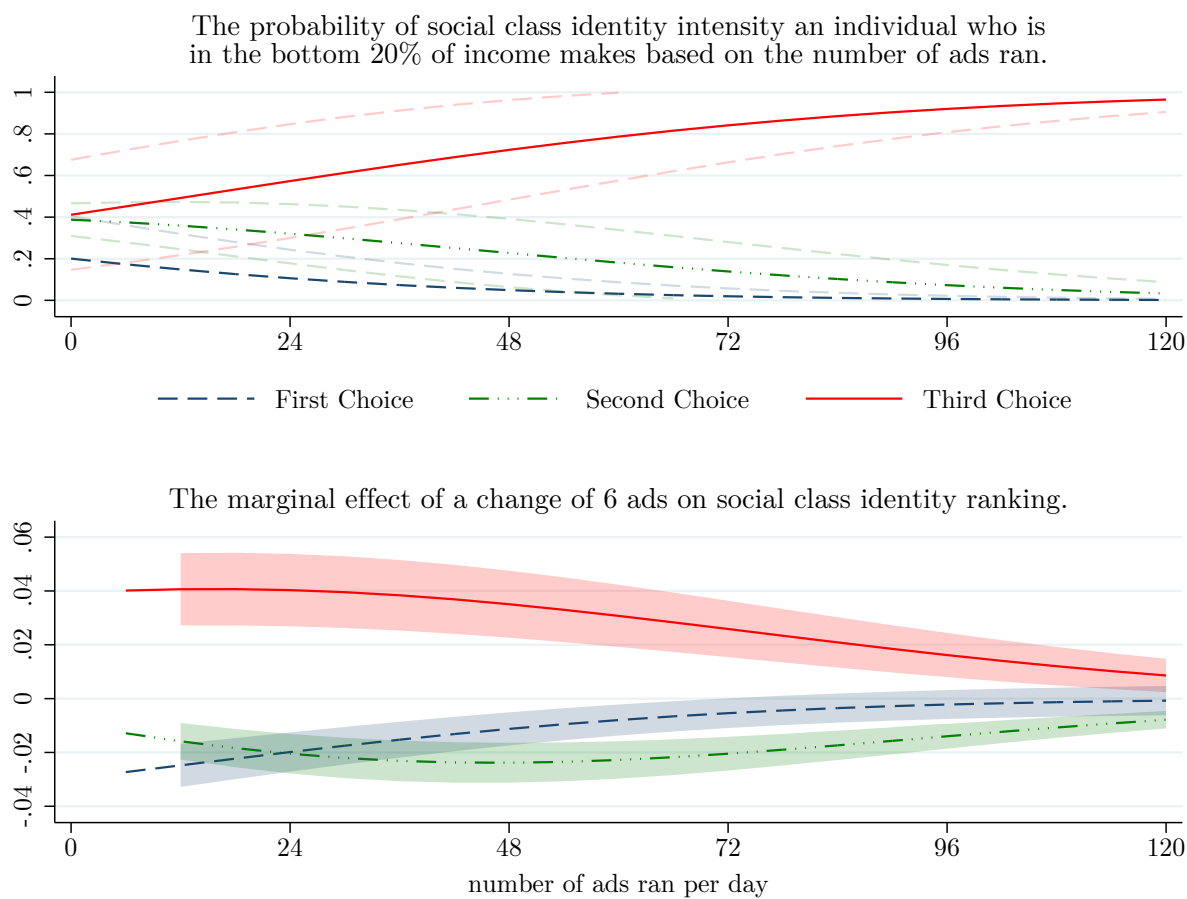
Table 2.13: Gender Identity Ranking by Gender

gender ranking	female	male
first choice	49	28
	29.88%	30.43%
second choice	51	25
	31.10%	27.17%
third choice	64	39
	39.02%	42.39%
Total	164	92

Figure 2.10: The probability of each choice ranking of social class identity for a given number of ads ran per day is on top. The bottom graph shows the marginal change in probability that occurs after the given number of ads ran per day. The x-axis are the number of ads ran per day, with the labels corresponding to a one standard deviation change in number of ads ran.
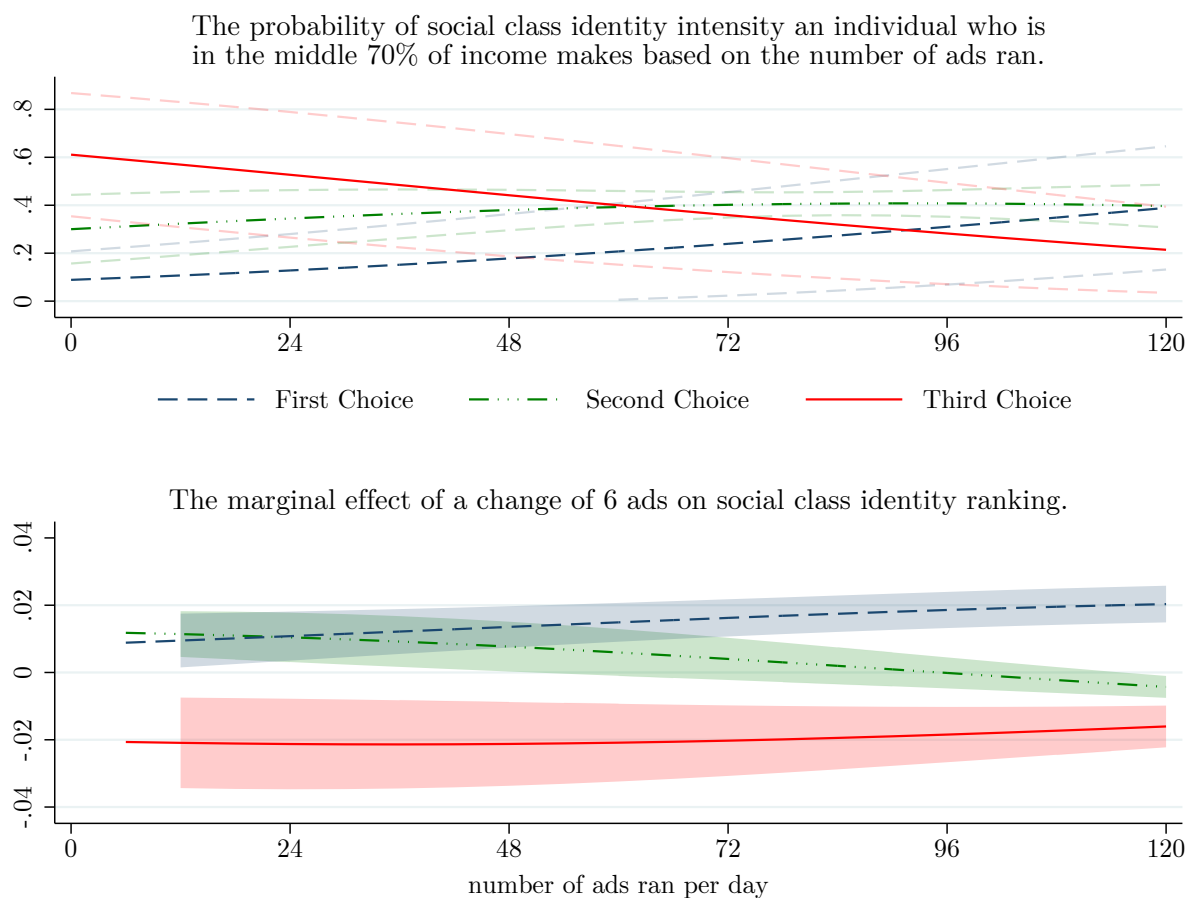
Table 2.14: Responses to the Question of How Often Does One Attend Church

	Freq.	Percent	Category
never	139	15.19	Rarely
< 1/yr	62	6.78	Rarely
once/year	133	14.54	Rarely
severall times/yr	125	13.66	Rarely
once a month	66	7.21	Sometimes
2-3x a month	92	10.05	Sometimes
nrly every week	56	6.12	Regularly
every week	166	18.14	Regularly
> 1/wk	76	8.31	Regularly
Total	915		

Figure 2.11: The probability of each choice ranking of racial identity for a given number of ads ran per day is on top. The bottom graph shows the marginal change in probability that occurs after the given number of ads ran per day. Both x-axis are the number of ads ran per day, with the labels corresponding to a one standard deviation change in number of ads ran.

The probability a non-white individual
has of selecting racial identity intensity based on the number of ads ran.

First Choice   Second Choice   Third Choice

The marginal effect of a change of 1 ad on racial identity ranking.

number of ads ran per day

Table 2.15: Baseline and Behavioral Models of Religious Identity Selection and Intensity

VARIABLES	(1) Probit	(2) Probit	(3) Ordered	(4) Ordered
Religion Ads	0.00411	-0.0105	0.00281	0.219***
	(0.00586)	(0.0191)	(0.0137)	(0.0630)
non-Christian	-0.608***	-0.107	-0.180	0.384
	(0.150)	(0.179)	(0.271)	(0.271)
18 - 24	-0.0566	0.0305	0.345	0.507*
	(0.147)	(0.198)	(0.270)	(0.267)
61+	0.345***	0.198	0.0833	0.0188
	(0.119)	(0.122)	(0.199)	(0.191)
Male	-0.0784	-0.00885	-0.0482	-0.000296
	(0.101)	(0.114)	(0.150)	(0.150)
non-White's	0.0298	-0.122	0.120	0.159
	(0.134)	(0.0986)	(0.133)	(0.106)
Bottom 20% Income	-0.151	0.00421	-0.232	-0.144
	(0.146)	(0.164)	(0.231)	(0.208)
Top 10% Income	-0.131	-0.185	-0.343	-0.406
	(0.134)	(0.127)	(0.283)	(0.327)
non-Christian * Religion Ads	0.00125	0.0394	0.00411	-0.192***
	(0.0302)	(0.0483)	(0.0213)	(0.0708)
Attend Sometimes		0.691***		0.729***
		(0.143)		(0.258)
Attend Regularly		1.671***		1.112***
		(0.154)		(0.216)
Sometimes * Religion Ads		0.0189		-0.216***
		(0.0258)		(0.0674)
Regularly * Religion Ads		0.0198		-0.225***
		(0.0209)		(0.0631)
/cut1			-0.812***	0.118
			(0.121)	(0.183)
/cut2			0.376***	1.375***
			(0.105)	(0.200)
Constant	-0.345***	-1.187***		
	(0.115)	(0.143)		
Observations	841	839	276	276
# Clusters	38	38	34	34
Log pseudolikelihood	-511.2	-400.8	-290	-277.4
Pseudo R-squared	0.0395	0.246	0.00976	0.0528

Baseline and behavioral probit and ordered probit model of religious identity formation and intensity. The probit models outcome variable is whether an individual selected religion as one of their top 3 identity choices while the ordered outcome is where those individuals who chose religious identity ranked it. Robust standard errors clustered at the state level are in parenthesis. Ads variables are continuous, all other variables are dummy variables. *** p < 0.01, ** p < 0.05, * p < 0.1

Figure 2.12: The probability of each choice ranking of religious identity for a given number of ads ran per day is on top. The bottom graph shows the marginal change in probability that occurs after the given number of ads ran per day. The x-axis are the number of ads ran per day, with the labels corresponding to a one standard deviation change in number of ads ran.

The probability of religious identity intensity an individual who attends church rarely makes, based on the number of ads ran.

The marginal effect of a change of 1 ad on religious identity ranking.

Table 2.16: Responses to, "Does the government do enough for blacks?" by Race Minority

	White's	non-White's
Too Little	143	124
	23.64%	57.67%
About Right	332	75
	54.88%	34.88%
Too Much	130	16
	21.49%	7.44%
Total	164	92

Figure 2.13: The probability of each choice ranking of religious identity for a given number of ads ran per day is on top. The bottom graph shows the marginal change in probability that occurs after the given number of ads ran per day. The x-axis are the number of ads ran per day, with the labels corresponding to a one standard deviation change in number of ads ran.

The probability of religious identity intensity an individual who attends church 1-3x/month makes based on the number of ads ran.

- - - - First Choice   — · · — Second Choice   —— Third Choice

The marginal effect of a change of 1 ad on religious identity ranking.

number of ads ran per day

Table 2.17: Correlation coefficient of the government helping blacks variable and church attendance variable with the first and second stage racial identity variables.

	First Stage	Second Stage
Gov't do enough?	-0.119	-0.215
Church attendance	0.540	0.232

Figure 2.14: The probability of each choice ranking of religious identity for a given number of ads ran per day is on top. The bottom graph shows the marginal change in probability that occurs after the given number of ads ran per day. The x-axis are the number of ads ran per day, with the labels corresponding to a one standard deviation change in number of ads ran.


The probability of religious identity intensity an individual who attends church more than 3x per month makes based on the number of ads ran.

First Choice   Second Choice   Third Choice

The marginal effect of a change of 1 ad on religious identity ranking.

number of ads ran per day

Figure 2.15: Probability density of selecting the associated identity as one of the top three identities grouped by behavior.
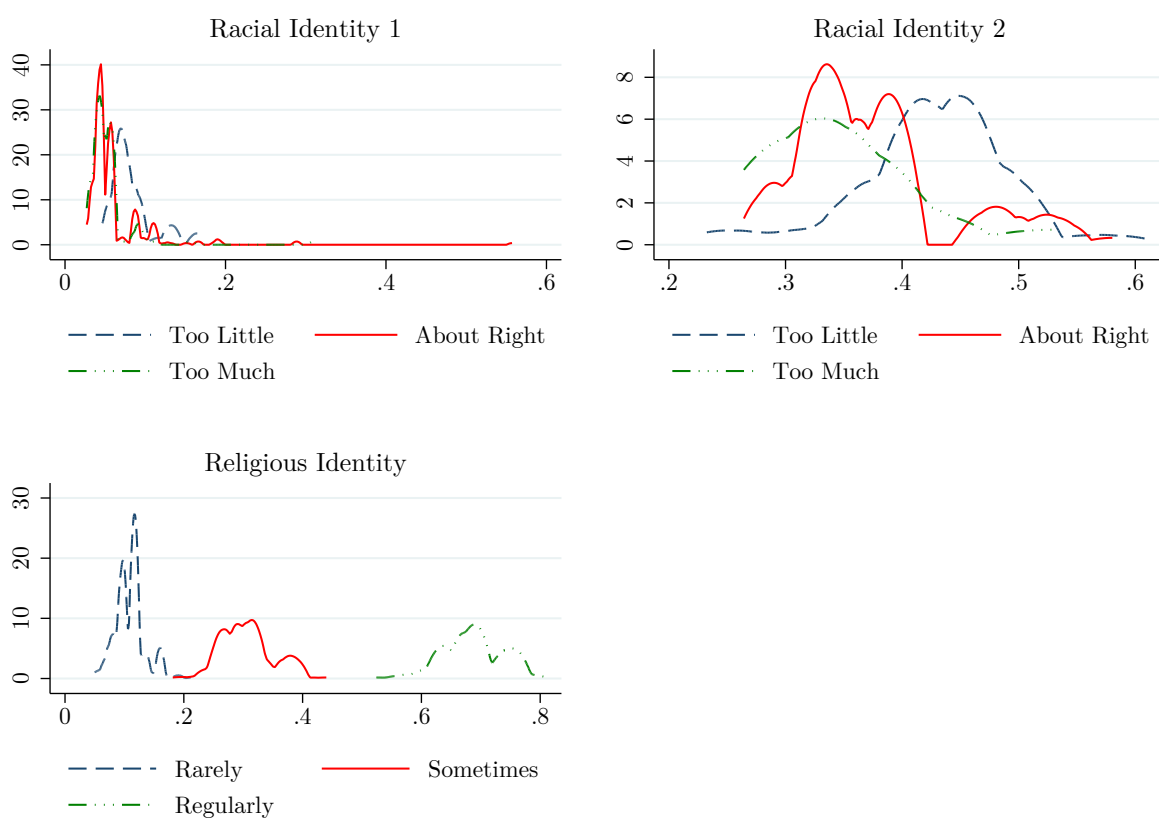
Table 2.18: Baseline and Behavioral Models of Racial Identity Selection and Intensity

VARIABLES	(1) Probit	(2) Probit	(3) Ordered	(4) Ordered
Race Ads	0.0154	0.0346*	0.00350	-0.000929
	(0.0144)	(0.0198)	(0.0128)	(0.0176)
18 - 24	-0.0612	-0.0222	-0.143	0.0570
	(0.220)	(0.227)	(0.309)	(0.315)
61+	-0.223**	-0.0864	-0.193	-0.151
	(0.0999)	(0.104)	(0.282)	(0.327)
Male	0.107	0.136	0.0438	0.0465
	(0.122)	(0.152)	(0.202)	(0.237)
non-White's	1.163***	1.296***	0.114	-0.209
	(0.137)	(0.151)	(0.207)	(0.297)
Bottom 20% Income	-0.110	-0.126	0.379	0.270
	(0.185)	(0.171)	(0.254)	(0.371)
Top 10% Income	0.109	0.356	-0.202	-0.214
	(0.200)	(0.218)	(0.359)	(0.382)
Too Little		0.246*		0.488**
		(0.133)		(0.218)
non-White's * Race Ads	-0.0233*	-0.0174	0.0420*	0.114***
	(0.0127)	(0.0469)	(0.0229)	(0.0232)
Too Little * White's * Race Ads		-0.0389		-0.126*
		(0.0304)		(0.0699)
Too Little * non-White's * Race Ads		-0.0350		-0.0929***
		(0.0431)		(0.0338)
/cut1			-0.175	-0.199
			(0.164)	(0.306)
/cut2			0.781***	0.671**
			(0.185)	(0.293)
Constant	-1.414***	-1.713***		
	(0.116)	(0.165)		
Observations	841	627	137	105
# Clusters		37	31	29
Log pseudolikelihood		-228.4	-145.1	-109.3
Pseudo R-squared		0.194	0.0274	0.0509

Baseline and behavioral probit and ordered probit model of race identity formation and intensity. The probit models outcome variable is whether an individual selected religion as one of their top 3 identity choices while the ordered outcome is where those individuals who chose religious identity ranked it. Robust standard errors clustered at the state level are in parenthesis. Ads variables are continuous, all other variables are dummy variables. *** p < 0.01, ** p < 0.05, * p < 0.1

Figure 2.16: The probability of each choice ranking of racial identity for a given number of ads ran per day for white's who believe too little is done to help blacks is on top. The bottom graph shows the marginal change in probability that occurs after the given number of ads ran per day. The x-axis are the number of ads ran per day, with the labels corresponding to a one standard deviation change in number of ads ran.
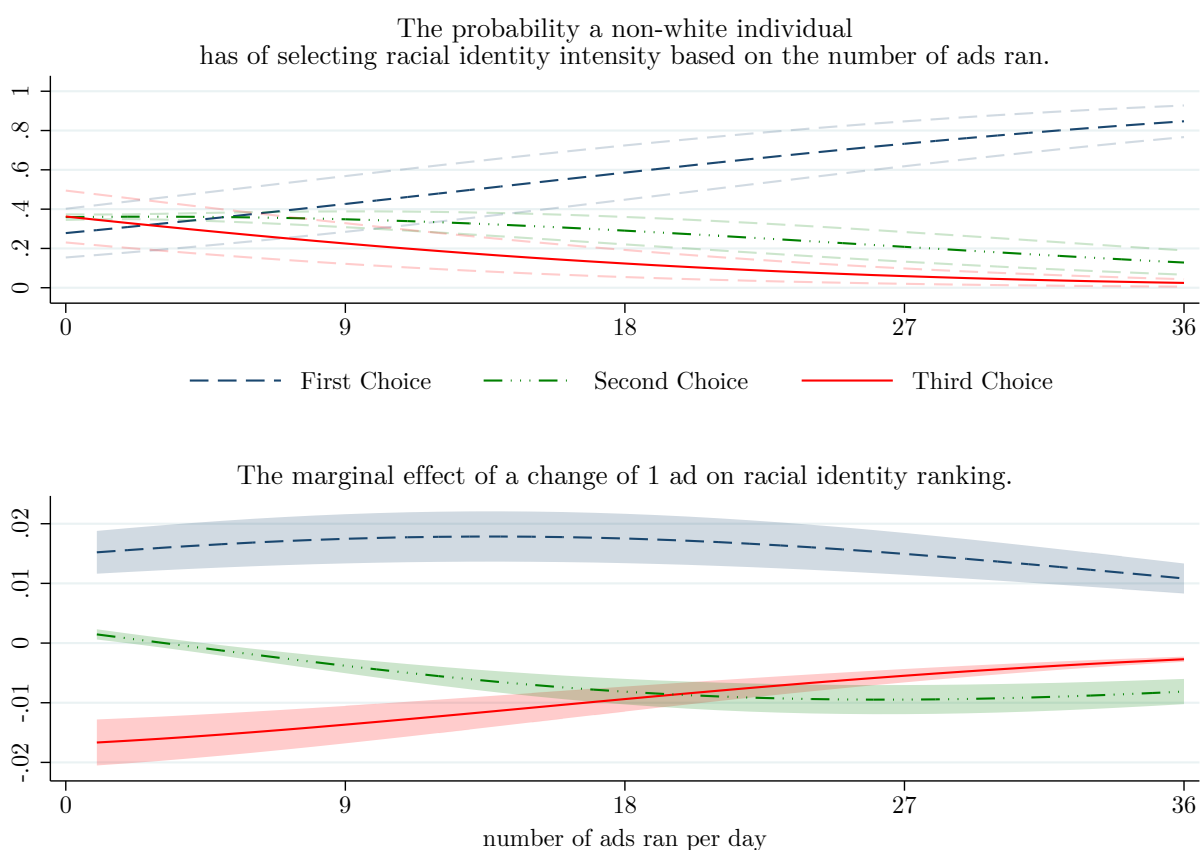

The probability a white individual who believes the government does too little to help blacks has of selecting racial identity intensity based on the number of ads ran.

The marginal effect of a change of 1 ad on race identity ranking.

number of ads ran per day

Figure 2.17: The probability of each choice ranking of racial identity for a given number of ads ran per day for non-white's who believe too little is done to help blacks is on top. The bottom graph shows the marginal change in probability that occurs after the given number of ads ran per day. The x-axis are the number of ads ran per day, with the labels corresponding to a one standard deviation change in number of ads ran.
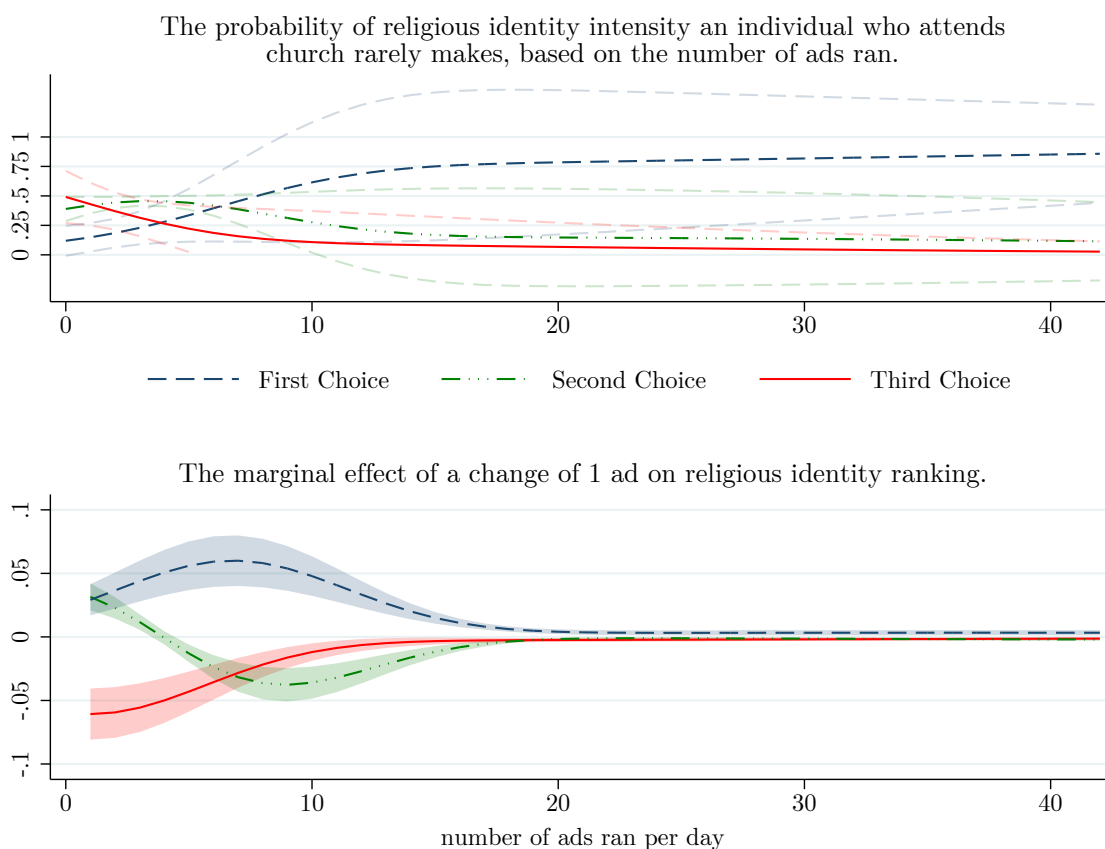
The probability a non-white individual who believes the government does too little
to help blacks has of selecting racial identity intensity based on the number of ads ran.

The marginal effect of a change of 1 ad on race identity ranking.

number of ads ran per day
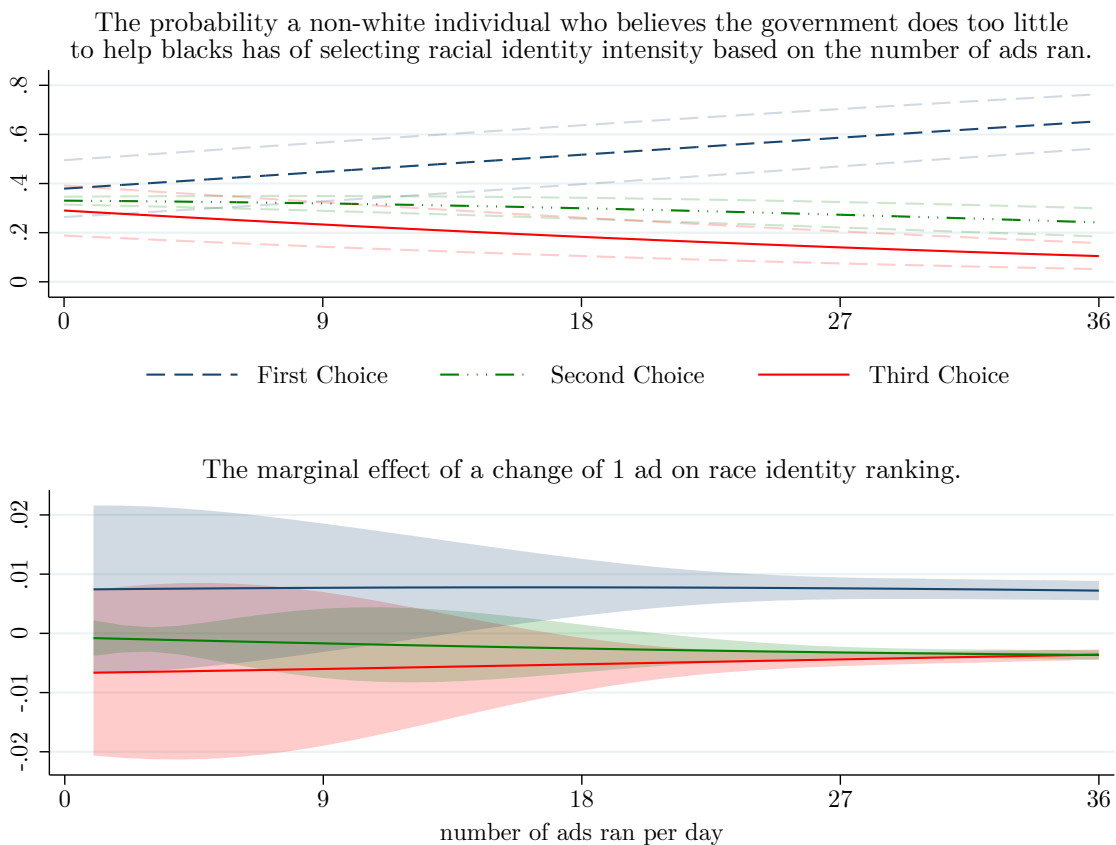
Figure 2.18: The probability of each choice ranking of racial identity for a given number of ads ran per day for white's who believe about enough is done to help blacks is on top. The bottom graph shows the marginal change in probability that occurs after the given number of ads ran per day. The x-axis are the number of ads ran per day, with the labels corresponding to a one standard deviation change in number of ads ran.

The probability a white individual who believes the government does about the right amount to help blacks has of selecting racial identity intensity based on the number of ads ran.

The marginal effect of a change of 1 ad on race identity ranking.
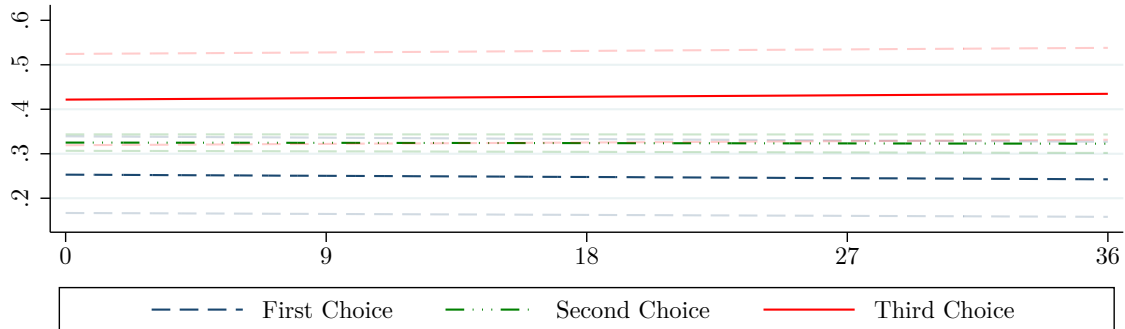
number of ads ran per day
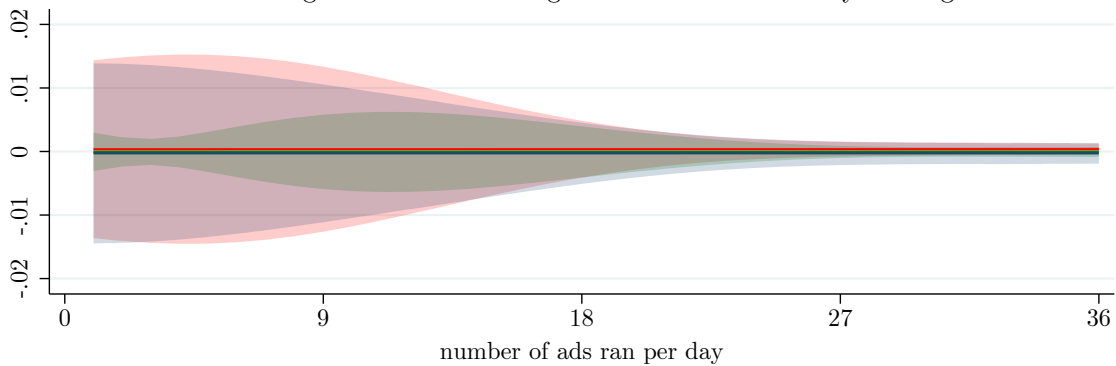
Figure 2.19: The probability of each choice ranking of racial identity for a given number of ads ran per day for non-white's who believe about enough is done to help blacks is on top. The bottom graph shows the marginal change in probability that occurs after the given number of ads ran per day. The x-axis are the number of ads ran per day, with the labels corresponding to a one standard deviation change in number of ads ran.
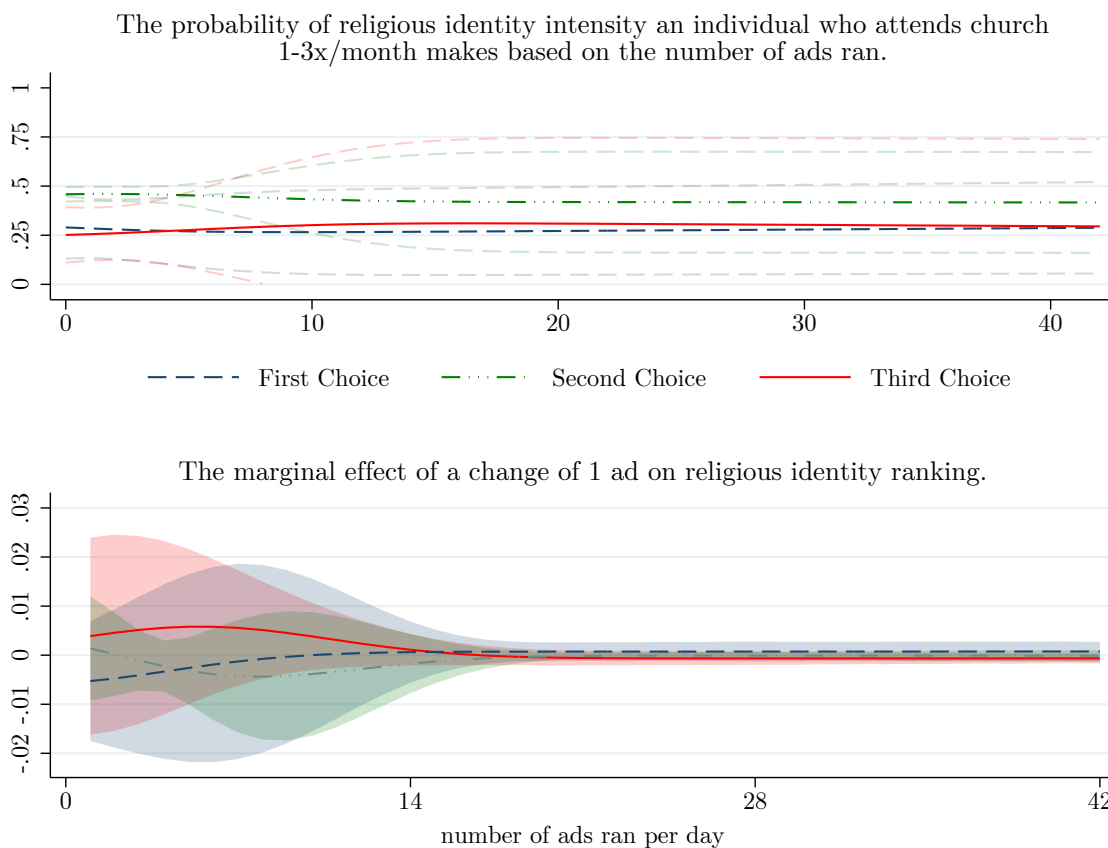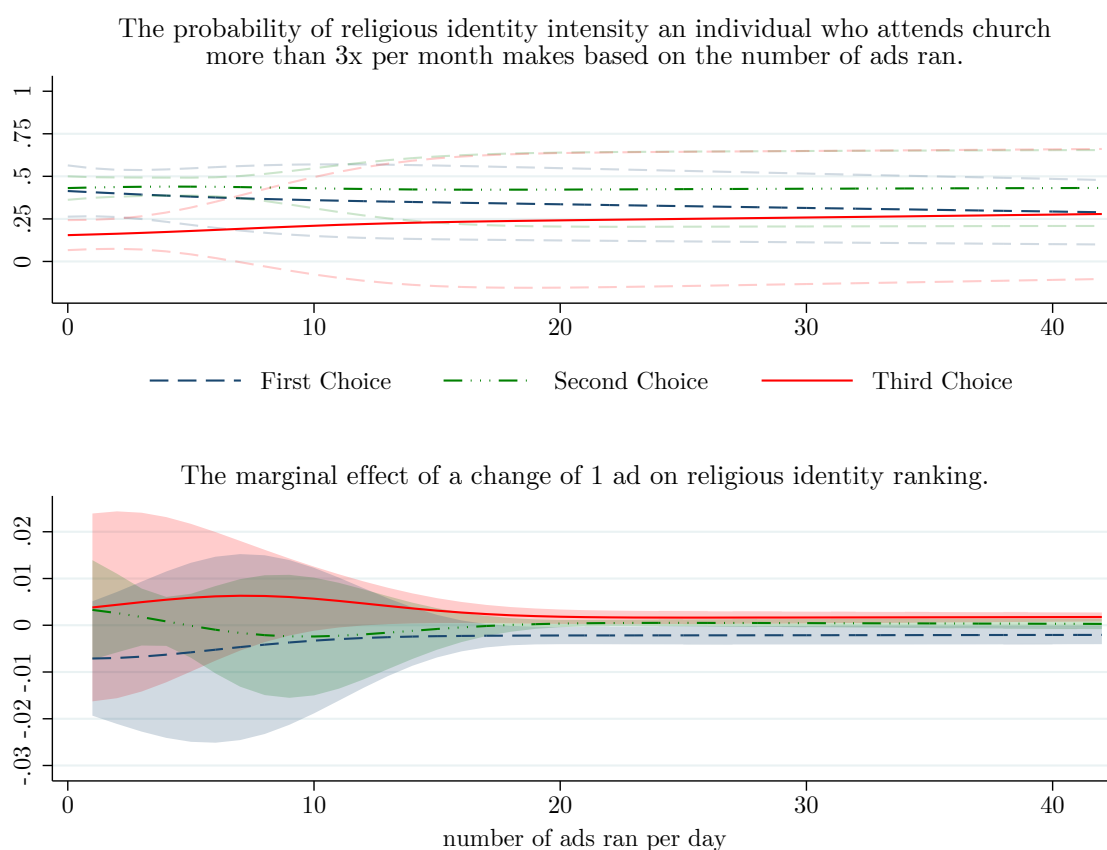
The probability a non-white individual who believes the government does about the right amount to help blacks has of selecting racial identity intensity based on the number of ads ran.

The marginal effect of a change of 1 ad on race identity ranking.

number of ads ran per day
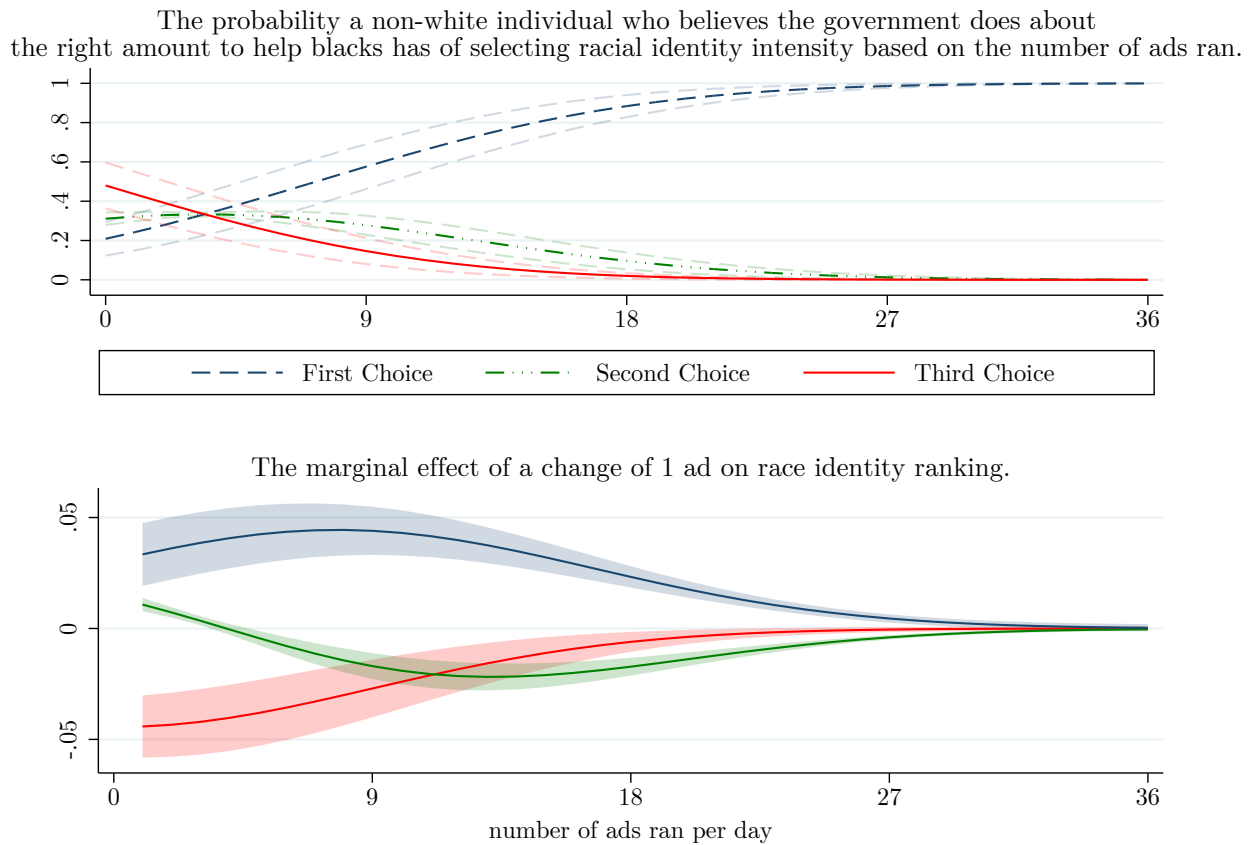
Table 2.19: Baseline probit regressions with all ads rather than only strong ads

VARIABLES	(1) Age	(2) Gender	(3) Race	(4) Religion	(5) Social Class
1.agegroupsone61	0.406***	0.0712	-0.0593	-0.0563	0.0417
	(0.147)	(0.191)	(0.222)	(0.146)	(0.192)
3.agegroupsone61	0.213	-0.133	-0.223**	0.345***	-0.326**
	(0.143)	(0.143)	(0.101)	(0.119)	(0.145)
1.sex	0.0608	-0.337***	0.105	-0.0780	0.120
	(0.120)	(0.102)	(0.121)	(0.101)	(0.126)
1.raceminority	-0.103	-0.0467	1.177***	0.0303	-0.0352
	(0.0961)	(0.0908)	(0.139)	(0.135)	(0.103)
1.classlogrealinc	0.0547	0.161*	-0.107	-0.151	0.0949
	(0.129)	(0.0910)	(0.185)	(0.145)	(0.184)
3.classlogrealinc	-0.254	0.102	0.114	-0.132	0.567***
	(0.187)	(0.133)	(0.200)	(0.132)	(0.155)
1.agegroupsone61#c.tenadsaverage1allage	-0.00115				
	(0.0164)				
3.agegroupsone61#c.tenadsaverage1allage	-0.00869				
	(0.0102)				
tenadsaverage1allage	-0.00453				
	(0.00345)				
tenadsaverage1allgender		0.0108**			
		(0.00472)			
1.sex#c.tenadsaverage1allgender		-0.000759			
		(0.0104)			
tenadsaverage1allrace			0.0163		
			(0.0134)		
1.raceminority#c.tenadsaverage1allrace			-0.0272**		
			(0.0127)		
tenadsaverage1allreligion				0.00275	
				(0.00480)	
1.religminority				-0.614***	
				(0.146)	
1.religminority#c.tenadsaverage1allreligion				0.00478	
				(0.0228)	
tenadsaverage1allsocial					-0.00239
					(0.00215)
1.classlogrealinc#c.tenadsaverage1allsocial					0.00159
					(0.00386)
3.classlogrealinc#c.tenadsaverage1allsocial					0.00118
					(0.00408)
Constant	-0.782***	-0.480***	-1.422***	-0.344***	-0.953***
	(0.0881)	(0.0944)	(0.118)	(0.114)	(0.128)
Observations	841	841	841	841	841
# Clusters	38	38	38	38	38
Log pseudolikelihood	-442.9	-491.1	-318.7	-511.3	-383.3
Pseudo R-squared	0.0170	0.0235	0.147	0.0394	0.0317

First step probit models. Each outcome is a binary variable indicating whether an individual chose an identity as one of their top 3 identity choices. Robust standard errors clustered at the state level are in parenthesis. Ads variables are continuous and are a measure of the average number of ads ran in the DMA in the 10 days prior to the survey interview. All other variables are dummy variables. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$
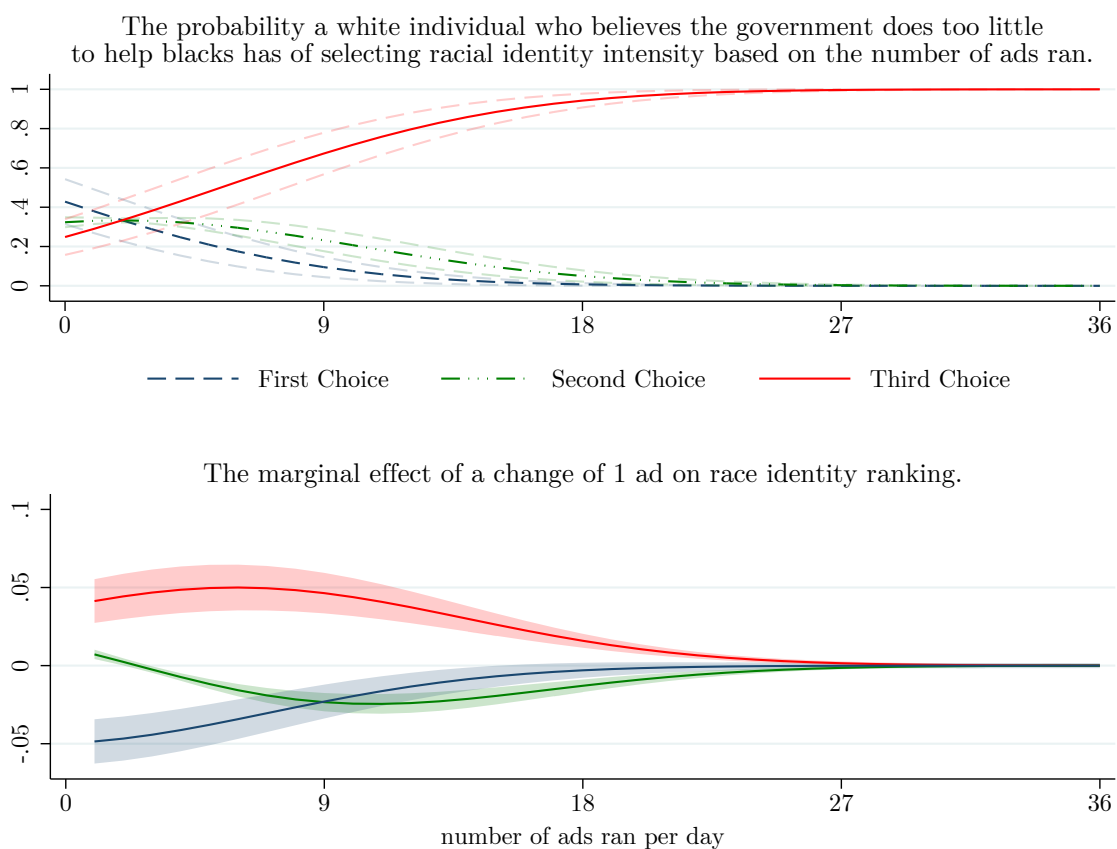
Table 2.20: Baseline and behavioral models of religious identity selection and intensity with all religious ads considered.

VARIABLES	(1) Probit	(2) Probit	(3) Ordered	(4) Ordered
Religion Ads	0.00275	-0.00585	-0.00345	0.101**
	(0.00480)	(0.0142)	(0.0115)	(0.0428)
non-Christian	-0.614***	-0.103	-0.194	0.382
	(0.146)	(0.178)	(0.282)	(0.282)
18 - 24	-0.0563	0.0372	0.349	0.489*
	(0.146)	(0.195)	(0.272)	(0.266)
61+	0.345***	0.200	0.0878	0.0284
	(0.119)	(0.122)	(0.197)	(0.186)
Male	-0.0780	-0.00723	-0.0466	0.0161
	(0.101)	(0.114)	(0.149)	(0.152)
non-White	0.0303	-0.127	0.132	0.183
	(0.135)	(0.0991)	(0.133)	(0.111)
Bottom 20% Income	-0.151	0.00764	-0.230	-0.159
	(0.145)	(0.162)	(0.231)	(0.214)
Top 10% Income	-0.132	-0.181	-0.319	-0.397
	(0.132)	(0.124)	(0.275)	(0.325)
non-Christian * Religion Ads	0.00478	0.0257	0.00674	-0.0768*
	(0.0228)	(0.0366)	(0.0208)	(0.0419)
Sometimes		0.693***		0.673***
		(0.146)		(0.253)
Regularly		1.666***		1.083***
		(0.158)		(0.200)
Sometimes * Religion Ads		0.0146		-0.0986***
		(0.0187)		(0.0336)
Regularly * Religion Ads		0.0180		-0.115**
		(0.0177)		(0.0490)
/cut1			-0.817***	0.0821
			(0.123)	(0.169)
/cut2			0.371***	1.335***
			(0.106)	(0.179)
Constant	-0.344***	-1.191***		
	(0.114)	(0.147)		
Observations	841	839	276	276
# Clusters	38	38	34	34
Log pseudolikelihood	-511.3	-400.8	-290	-278.3
Pseudo R-squared	0.0394	0.246	0.00980	0.0500

Baseline and behavioral probit and ordered probit model of race identity formation and intensity. The probit models outcome variable is whether an individual selected religion as one of their top 3 identity choices while the ordered outcome is where those individuals who chose religious identity ranked it. Robust standard errors clustered at the state level are in parenthesis. Ads variables are continuous, all other variables are dummy variables. *** p < 0.01, ** p < 0.05, * p < 0.1

Table 2.21: Baseline and behavioral models of racial identity selection and intensity with all racial targeted ads considered.

VARIABLES	(1) Probit	(2) Probit	(3) Ordered	(4) Ordered
Race Ads	0.0163	0.0333*	0.0215**	0.0113
	(0.0134)	(0.0183)	(0.0108)	(0.0110)
18 - 24	-0.0593	-0.0234	-0.131	0.0784
	(0.222)	(0.229)	(0.312)	(0.321)
61+	-0.223**	-0.0944	-0.191	-0.143
	(0.101)	(0.107)	(0.291)	(0.331)
Male	0.105	0.137	0.00862	0.0259
	(0.121)	(0.150)	(0.200)	(0.229)
non-White	1.177***	1.306***	0.165	-0.164
	(0.139)	(0.154)	(0.198)	(0.279)
Bottom 20% Income	-0.107	-0.119	0.393	0.269
	(0.185)	(0.169)	(0.255)	(0.373)
Top 10% Income	0.114	0.364*	-0.190	-0.188
	(0.200)	(0.218)	(0.362)	(0.374)
Too Little		0.247*		0.513**
		(0.134)		(0.219)
non-White * Race Ads	-0.0272**	-0.0361	0.0206	0.0871***
	(0.0127)	(0.0463)	(0.0226)	(0.0253)
Too Little * White * Race Ads		-0.0420		-0.133**
		(0.0304)		(0.0673)
Too Little * non-White*Race Ads		-0.0148		-0.0816**
		(0.0445)		(0.0369)
/cut1			-0.138	-0.146
			(0.161)	(0.288)
/cut2			0.821***	0.724***
			(0.178)	(0.272)
Constant	-1.422***	-1.719***		
	(0.118)	(0.165)		
Observations	841	627	137	105
# Clusters		37	31	29
Log pseudolikelihood		-228.2	-144.7	-109.4
Pseudo R-squared		0.194	0.0298	0.0504

Baseline and behavioral probit and ordered probit model of race identity formation and intensity. The probit models outcome variable is whether an individual selected religion as one of their top 3 identity choices while the ordered outcome is where those individuals who chose religious identity ranked it. Robust standard errors clustered at the state level are in parenthesis. Ads variables are continuous, all other variables are dummy variables. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 2.22: Model on whether individual's who lived in battleground states in 2004 were more likely to select "groupy" identities.

| | (1) |
VARIABLES	Groupy
Battleground State	0.197**
	(0.0890)
Constant	-0.719***
	(0.0677)
Observations	1,201
# Clusters	39
Log pseudolikelihood	-687
Pseudo R-squared	0.00449

Individual's who are classified as "groupy" selected current occupation or family or both in their top 3 identities but selected any other identity higher than either occupation or family.

Chapter 3

Social Identity and Voting

3.1   Introduction

In recent years, concern has grown over polarization within the United States, Gentzkow et al., 2016. Internationally, the World has seen a push towards nationalistic, conservative concerns. Events such as Brexit and the rise of far right parties in Central and Southern Europe demonstrate the changing nature of how individual's identify themselves. In the face of intractable positions how can we bring divergent sides together? Social Identity Theory provides a means through shifting identities from intractable groups to other, more malleable, groups.

This paper explores the impact that Social Identities have on the decision on whether to vote and for whom. Understanding what motivates an individual to vote has long been a subject of interest, (Brady et al., 1995; Jacobson, 2015; Leighley & Nagler, 2013; Lewis-Beck et al., 2008; Rentsch et al., 2019; Verba et al., 1995; Wolfinger & Rosenstone, 1980). This literature has touched upon Social Identity in the context of how it relates to race and ethnicity, but has conflated groups and identities which has caused the application of Social Identity Theory to be limited. Using data from the 2004 General Social Survey I find that Social Identity Theory helps explain why groups vote in the patterns we observe. Social Identity Theory posits there is more to being in a group than simple group membership. One must identify with the group, that is feel an attachment to it for the group to matter to the individual.

The second voting behavior I investigate is once an individual votes, who do they vote for? Do identities shift candidate preferences? For example, an individual may be a black, Baptist man.

Does he vote for Republicans or Democrats? If he identifies as Black he is almost certain to vote for a Democrat. If he identifies strongly as Baptist rather than his race, he may be more inclined to vote for the Republican party.[1] This paper demonstrates that voting behavior can be influenced by applying social identity.

The mechanism for Social Identity Theory impacting voting is that the outcomes of the group one identifies with are internalized in the decision making process of the individual. For those groups who an individual does not identify with, the outcomes of the associated groups are not internalized. Voting provides a mechanism to impact group outcomes. How one votes shapes what the groups they belong to experience. As these groups become more or less salient, the issues impacting them becomes more or less relevant to the individual. Informing an individual about the problems a group they don't identify with faces may or may not elicit a response. Informing an individual about the problems a group they do identify with is far more likely to elicit a response as this group's utility has become internalized by the individual. By priming identities, then hitting them with information, individuals are far more likely to respond and take action than they are when receiving information they might not care about.

Another channel that Social Identity Theory can impact voting behaviors is through who we trust. Trust is greater within groups than across groups, Balliet et al., 2014. When information is being presented by an out-group member, that information can more easily be dismissed as propaganda or lies. No amount of evidence will shift an individual's opinions if that individual doesn't trust the person presenting the evidence. Manipulating identities can alter how we receive information. This means that political advertising, coming from a group one doesn't trust when holding one identity, should become more convincing if it can alter the identity the identity an individual is holding when receiving the information.

The economic implications of these findings are profound. By focusing on Social Identities policy choices can shift. For example, redistribution, policies related to climate change, and taxation

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[1] In the 2004, 2008, 2012 elections of a total number of blacks surveyed in the GSS, a total of 96 blacks voted Republican compared to 1879 blacks who voted Democrat. For Baptist's, the total difference is 901 Republicans and 1219 for Democrats. Only 2/3 of blacks voted in the 2004 election compared to 3/4 of whites.

policy can all be influenced by shifting the identities people hold. This influence occurs because people care about their in-group members, (Akerlof & Kranton, 2000; Chen & Li, 2009; Klor & Shayo, 2010; R. Kranton et al., 2020). Changing who belongs to the in-group can increase or decrease support for government intervention. This change in support will translate to a change in voting behavior.

I find that for race and religious identities, individuals propensity to vote can be shifted. Further, who they vote for can also be shifted. In 2004 this meant that racial minorities were less likely to vote, however this may have changed in the last several elections. The results suggest that targeting identities can shift the probability of voting by 3 to 5 percentage points. Further, the shift towards one party or another seems to change by 5 to 10 percentage points indicating large gains are possible by targeting identities specifically rather than just demographic groups.

I organize this paper in the following way. Section 3.2 provides a brief review of the literature. Section 3.3 describes the data and voting models used in this paper. In section 3.4 I develop a model to demonstrate that identity does impact voting behaviors and provide the equations used in the estimates in this paper. In section 3.5 I generate predictions for voting and use these to perform robustness checks on the findings in section 3. Lastly, section 3.6 concludes.

3.2   Review of the Determinants of Voting

Who votes is one of the most well studied issues in Political Science, (Brady et al., 1995; Jacobson, 2015; Leighley & Nagler, 2013; Lewis-Beck et al., 2008; Rentsch et al., 2019; Verba et al., 1995; Wolfinger & Rosenstone, 1980). Of significant interest has been which groups participate in the voting process and why. Social Identity Theory has been applied in an effort to understand why these groups participate in the pattern observed, (Abramowitz & Saunders, 2006; Ben-Bassat & Dahan, 2012; S. Greene, 1999, 2004; Pauls et al., 2015; Shockley & Gengler, 2020). These papers provide a variety of evidence that Social Identity Theory has applicability to understanding why groups should matter. In particular, Ben-Bassat and Dahan, 2012 and Shockley and Gengler, 2020 show that individual's are more likely to vote for members of their own group.

The mistake that this literature has been making is similar to what has been missing throughout the Social Identity literature, the conflation of groups with identities. In cases where the identity is strongly correlated with the group, such as with Ben-Bassat and Dahan, 2012 and Shockley and Gengler, 2020, this conflation is not an issue. Where it becomes more difficult is within a society like the United States where a multitude of groups exist. Individuals in the studies of Ben-Bassat and Dahan, 2012 and Shockley and Gengler, 2020 had clear identities towards their ethnic group. In America, these identities are far from clear. Which group matters to a Catholic, high-school graduate, white, wealthy, female?

The common model of voting takes as input 7 demographic characteristics. Decades of research has demonstrated these 7 variables are the most important demographic determinants of the voting decision, Leighley and Nagler, 2013. These variables are age, education, ethnicity, gender, income, marital status, and race. The results of this model demonstrate that individuals who are older, educated, wealthier, white, female, and married are more likely to vote. The source of voter data used in Leighley and Nagler comes from the Current Population Survey, November supplement in each election year from 1972 through today. Another common source of data is the National Election Survey, however this dataset demonstrates the same results as they pertain to voter turnout by demographic characteristics. Throughout this paper I am using voter data from the General Social Survey which allows for the addition of two more characteristics in order to more accurately predict voting behavior.

Among these variables, age, education, and wealth are expected to increase the voter rate as these individuals have more information about what they are voting on, a better understanding of how their vote influences their lives, and more to lose by not voting. They are likely to be the individuals more likely to have money taken from them by government policy while older individuals experience larger amounts of redistribution in the form of Social Security and Medicare, Leighley and Nagler, 2013. Marital status, gender, and race all impact the voting rate as well. These have less clear economic reasons. We would expect race to have an economic explanation as presumably racial minorities have more economic incentive to vote, however the investigation into voting behavior

does not support this.

We see in blacks a switch in the propensity to vote between 2004 and 2008 reflecting that blacks wished to vote for President Obama.[2]   Anecdotal evidence suggests that many blacks voted in 2008 who hadn't voted before in order to vote for the first black President. This pattern among blacks suggests that Social Identity Theory does play a role in elections as this is the same result as found in Ben-Bassat and Dahan, 2012 and Shockley and Gengler, 2020, ethnic groups voting for candidates belonging to their ethnicity. What was shown in Schabla, 2021a is that for many blacks, race was an important identity that they hold. For this group, there seems to be a tie between their identity and their voting outcomes.

Social Identity Theory is not a theory of groups, it is a theory of group identification. Political scientists studying voter behavior often mistake the group for the identity. Understanding the groups is important. By understanding group dynamics we can understand why some groups participate more or less, whether there are institutional features that inhibit or encourage voting among that group, and what a group feels they need from society.

Just because an individual can be classified within a group doesn't mean they are a member of that group. They don't have to have the same motivations as other's who are classified in a similar way. Thus, there needs to be a factor that scales how strongly an individual identifies with the various identities in order to properly gauge how an individual will vote. With the inclusion of a scale of identification, we are able to understand the behavior of an individual that belongs to a variety of groups, even when these groups vote in contradictory ways.

3.3   Data

The primary source of data for this paper comes from the 2004 General Social Survey (GSS), Tom W. Smith; Co-Principal Investigators and Hout, 2017.[3]   The GSS provides demographic

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[2] The General Social Survey indicates that most blacks who do vote vote for the Democratic party. President Obama was the first year in the GSS that saw black's vote at a higher rate than whites.

[3] Some of the data used in this analysis are derived from Sensitive Data Files of the GSS, obtained under special contractual arrangements designed to protect the anonymity of respondents. These data are **not** available from the author. Persons interested in obtaining GSS Sensitive Data Files should contact the GSS at **GSS@NORC.org**.

and voting data from the 2004, 2006, 2008, and 2010 surveys. Demographic data on education, income, age, gender, marital status, region of origin, religious beliefs and racial classification are available for all four survey years. From the 2004 survey, I have information about the identity that an individual held. The 2006 – 2010 survey's contain information about voting behavior in 2004. Specifically, the 2006 – 2010 survey's asked respondents if they voted in 2004 and if so who they voted for. In addition, all survey years asked a question about party affiliation. Table 3.1 gives the summary statistics used in this paper by year.

Table 3.1: Summary Statistics For the Variables Split by Sample Year.

	2004		2006 − 2010	
	Count	Freq	Count	Freq
Age				
18 - 24	116	9.66%	333	5.05%
25 - 60	857	71.36%	4713	71.42%
61 +	228	18.98%	1553	23.53%
Education				
No College	812	67.61%	4558	69.07%
Some College	389	32.39%	2041	30.93%
Income				
Bottom 20%	201	18.36%	1286	19.49%
Middle 70%	765	69.86%	4577	69.36%
Top 10%	129	11.78%	736	11.15%
Race				
White	891	74.19%	4861	73.66%
non-White	310	25.81%	1738	26.34%
Religion				
Religious	1029	85.96%	5489	83.34%
non-Religious	168	14.04%	1097	16.66%
Gender				
Female	673	56.04%	3613	54.75%
Male	528	43.96%	2986	45.25%
Married				
Never Married	482	40.13%	2889	43.78%
Married	719	59.87%	3710	56.22%

	2004			
Identity	Count	Choice 1	Choice 2	Choice 3
Age	288	42	118	128
Gender	345	103	102	140
Race	198	52	74	72
Religion	384	132	158	94
Social Class	222	25	75	122

	2004		2006 − 2010	
	Count	Freq	Count	Freq
Party				
Strong Dem	208	17.51%	1174	18.09%
Not Strong	201	16.92%	1120	17.26%
Ind, Near	106	8.92%	818	12.61%
Ind	201	16.92%	1071	16.51%
Ind, Near	113	9.51%	560	8.63%
Not Strong	177	14.90%	1005	15.49%
Strong Rep	182	15.32%	740	11.41%

	2006 − 2010	
Vote		
Did Not Vote	1907	28.86%
Voted	4700	71.14%
Who Vote		
Kerry	2274	49.19%
Bush	2349	50.81%

I've grouped race into two categories, racial majority comprised of only whites and racial minority composed of non-whites. This is primarily done as there aren't enough observations in the 2004 dataset to categorize race into finer groups. A secondary reason for aggregating racial

groups is that the standard model of voting only includes black's as a minority without taking into account other races. This is not because other races voting behavior are not interesting, rather Leighley and Nagler, 2013 wished to maintain an apples to apples comparison throughout the years. Further, they suffer from the same data problems I do. Minority groups do not have enough observations to provide a group to group comparison outside of blacks and Hispanics. Finally, race categorization itself is subject to interpretation, with dozens of racial categories included in the GSS and Census in recent years while only a handful of groupings were included in earlier years. For all of these reasons I feel it most appropriate to categorize race into white's and non-white's. However, research focusing on specific races would be beneficial as it is expected that different races have different take-up rates for racial identity and different behaviors associated with these identities.

Due to the data limitations in the 2004 GSS, I split age into three groups corresponding to 18-24, 25-60, and 61+. These groups capture the different voting behavior individual's display based on their position in life, with increasing age showing increasing likelihood of voting. Aggregating age in this manner is necessary to ensure convergence of the identity models in section 3.4. The results I find by this aggregation do not differ significantly from those found in Leighley and Nagler, 2013, thus restricting the sample by the amount I do compared to their model is not problematic.

I group income into three categories rather than the quintiles that Leighley and Nagler use for the same reasons as age. These categories correspond to the bottom 20%, top 10%, and incomes between to generate three classes, poor, middle class, rich. For similar reasons education is categorized between those with at least some college and those who have never attended college. Marital status is split between those who have ever been married and those who have never married. Region of origin is included in the standard model of voting as a dummy variable indicating individuals living in the US South, so I do the same. As with age the impacts of this grouping is not significant in the predictive power of the model.

Religious membership is a variable that is normally difficult to obtain and is excluded from the standard voting models. The GSS allows me to include this variable and, as religion is a

significant consideration in political campaigns, I include it in my voting models. As with the other demographic variables I split it into religious/not-religious where the majority is defined as religious and the minority as non-religious.[4]   As with the previous variables it is expected that splitting groups into more detailed categories will produce interesting results.

The variables that only occur in a subset of the data are identity, did a respondent vote, and if so, for-whom. Identity only occurs in the 2004 data. It asked, "We are all part of different groups. Some are more important to us than others when we think of ourselves. In general, which in the following list is the most important to you in describing who you are? And the second most important? And the third most important?" Individuals were given a list of 10 choices of which I picked 5 to analyze based on number of responses and modeling concerns. These choices correspond to, "Age", "Gender", "Religion", "Race/Ethnicity", and "Social Class".

Following Schabla, 2021a, I generate a first and second step identity variable. The first is an indicator variable taking the value of "1" when an individual selected the relevant identity in their top three choices. The second is a variable that is created only for individuals who ranked an identity and indicates where an individual ranked that identity. For example, race has an indicator variable labeled "0" and "1" for all individuals in the 2004 GSS who answered the identity question. For those individual's who chose race this variable takes a value of "1". The second identity variable indicates how highly they ranked this identity, 1 for their third choice, 2 for their second, and 3 if they ranked race as their first choice.

The last two variables, vote and for-whom, are contained only in the years 2006 – 2010. These variables asked respondents, "In 2004, you remember that Kerry ran for President on the Democratic ticket against Bush for the Republicans. Do you remember for sure whether or not you voted in that election?" and if the respondent answered yes to that question, "Did you vote for Kerry or Bush?". As they only exist in the 2006 – 2010 datasets, they will need to be predicted in the 2004 analysis to fully explore the question of interest of this paper. This is an impediment to

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[4] Those classified as not religious specified no religion when asked in the GSS. Everyone who gave a religious group they were a member of are classified as religious.

the analysis in this paper but not an insurmountable one. I cannot directly include identity into actual voting behaviors because there are no individual's for whom both pieces of data exist. I either know your identity or I know who you voted for.

Fortunately, a variable exists in all years that allows for powerful predictions of voting behavior to be made. This variable is strength of party affiliation. This variable asks the question: "Generally speaking, do you usually think of yourself as a Republican, Democrat, Independent or what?" Potential answers are "Strong-Republican", "Not very strong Republican", "Independent, close to Republican", "Independent", and the corresponding Democrat responses. I dropped responses for "Other Party" as these constituted only a sum total of 111 responses out of more than 6,599 responses. I will demonstrate that this variable provides the GSS with a significant advantage to explaining voting behavior over the standard voting models.

Another alternative is to use the regressions on core identity formation from Schabla, 2021a to generate predictions of the core identities individuals would select in the 2006 – 2010 samples. I only use these predictions as a robustness check as there is quite a bit of noise in them due to the low sample size of the original regressions. For both these and the voting predictions I rely primarily on the predicted values rather than constructing a $0 - 1$ variable for the primary results. This is again due to the small sample size in 2004, though I also include the $0 - 1$ results for completeness.

3.4   Model

3.4.1   Who Votes?

3.4.1.1   Background

I build my model off of that found in Leighley and Nagler, 2013. This voting model is a reduced form multivariate logit model designed to investigate the relative strengths of various demographic characteristics on the decision to vote. A reduced form expression is used rather than a structural model as I am simply interested in whether or not social identities play a role in the

decision on whether to vote and for whom. Leighley and Nagler's model has the following reduced form expression of individual $i's$ decision to vote:

$$Pr(vote_i|y_i) = \beta_0 + \beta z_i + \epsilon_i. \tag{3.1}$$

Here, the probability on whether an individual votes is the dependent variable which takes on the values yes/no. Justification for this reduced form expression comes from the structural models on voting which state that an individual votes if their benefit from voting is higher than their cost. This specification can be thought of as representing an unobserved underlying utility function that governs whether an individual votes or not. The latent variable for the decision on whether to vote, y_i, determines the cutoff above which potential voters decide to vote and below which they do not. The cost-benefit analysis performed in maximizing the underlying utility function has significant non-economic factors that weight into it, such as a sense of civil duty, a feeling of pride in participating in the voting process, and even the weather.

The demographic characteristics, z_i, included in Leighley and Nagler's model are education, income, age, gender, marital status, where an individual lives, and race. The error term, ϵ_i is a logistically distributed error which captures all other factors that go into the decision to vote. In addition to the factors described in the previous paragraph, this error also includes the cost of voting for individual i, either in the time commitment it takes to vote or the financial cost of voting in terms of being able to take time for work or other financially beneficial activities. Table 3.2 gives is the Leighley and Nagler model for both the decision on whether to vote and for whom.

One mechanism for Social Identities to contribute to altering voting behavior is financial. This mechanism operates by altering the utility function of the individual to include the groups they identify with overall utility and place within society into their own. Other mechanisms include an increased sense of participation or belief that others in their group will vote which increases the probability that they can be decisive voters. These effects don't need to be positive. A group may feel disenfranchised, that their vote doesn't matter, or even that they don't want to participate in

Table 3.2: Leighley and Nagler Voting Model Regressions

VARIABLES	(1) Does Vote?	(2) Does Vote?	(3) Vote For Whom	(4) Vote For Whom
College	1.173***	1.068***	-0.262**	-0.410***
	(0.0821)	(0.0848)	(0.108)	(0.104)
Bottom 20% Income	-0.724***	-0.668***	-0.288***	-0.165
	(0.0803)	(0.0787)	(0.103)	(0.162)
Top 10% Income	0.561***	0.505***	0.194*	-0.125
	(0.131)	(0.147)	(0.105)	(0.167)
18 - 24	-0.260	-0.222	-0.0603	-0.438*
	(0.164)	(0.165)	(0.212)	(0.242)
61 +	0.878***	0.763***	-0.151**	0.102
	(0.0826)	(0.0877)	(0.0761)	(0.105)
Male	-0.152***	-0.144***	0.298***	-0.0735
	(0.0511)	(0.0551)	(0.0702)	(0.0976)
Never Married	-0.282***	-0.259***	-0.300***	-0.0796
	(0.0601)	(0.0610)	(0.0822)	(0.0895)
South	-0.211**	-0.263***	0.295**	0.389***
	(0.0951)	(0.0932)	(0.124)	(0.115)
non-White	-0.462***	-0.528***	-1.727***	-0.735***
	(0.124)	(0.109)	(0.148)	(0.133)
non-Christian	-0.387***	-0.193**	-1.286***	-0.953***
	(0.0749)	(0.0800)	(0.117)	(0.125)
Strong Dem		2.020***		-2.982***
		(0.0985)		(0.172)
Not Strong Dem		1.134***		-1.681***
		(0.0827)		(0.125)
Ind, Near Dem		0.875***		-1.737***
		(0.115)		(0.142)
Ind		0.943***		1.363***
		(0.118)		(0.157)
Ind, Near Rep		1.461***		2.079***
		(0.121)		(0.179)
Not Strong Rep		2.363***		3.598***
		(0.140)		(0.358)
Strong Rep		1.460***		0.598***
		(0.222)		(0.221)
Constant	1.077***	-0.0433	0.657***	0.803***
	(0.0663)	(0.0939)	(0.121)	(0.148)
Observations	6,619	6,607	4,626	4,623
# Clusters	40	40	40	40
Log pseudolikelihood	-3502	-3221	-2809	-1571
Pseudo R-squared	0.120	0.189	0.124	0.510

Probit model of whether to vote and for whom. The decision on whether to vote is a $0-1$ variable, 0 for didn't vote, 1 for voted. The decision for whom to vote takes a 0 when voting for John Kerry and 1 for President Bush. Robust standard errors clustered at the state level are in parenthesis. Ads variables are continuous, all other variables are dummy variables. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

a society that they don't feel a sense of belonging to. In all of these cases increasing the identity towards that group may actually decrease the voting probability.

In my theory, the inclusion of Social Identities to the utility function causes the payoff received by members of other groups, j, to contribute to the overall utility of the individual. These payoffs need not be solely financial. Consider a simple utility model of social identity:

$$U(\pi_i, \pi_j) = \pi_i + \sum_{k=1}^{J-1} \sigma_j(\pi_j - \pi_k) - c$$

Here, the payoff one receives for voting is broken into two parts. The first is the payoff directly received by the individual, π_i. The second component is a the weighted sum of the difference in payoffs received by their own group j and the out groups, k. A society is comprised of J groups which matter to an individual.[5] Each individual places different weights on the payoff received by these groups. For in-group members, Chen and Li, 2009 and R. Kranton et al., 2020 demonstrate individuals that identify with groups prefer to minimize the difference of their own income and their own group. Their results also suggest that some individual's are willing to maximize the difference in their own group. Finally, there is a cost to voting which is captured in c.

These weights on the groups may lead an individual to vote more often to less often. If the individual identifies with outside groups, their utility function will be altered which will alter their probability of voting. The specific directions of the change in voting behavior are unclear and rely on knowledge of the groups propensity to vote, the individual's identity, and the composition of the group in relation to the "other" group. As I am estimating a reduced form expression in the next subsection, I leave the specific details of the identity model for future work.

3.4.1.2   Social Identity Voting Model

In this section I combine Social Identity Theory with the voting model of Leighley and Nagler. To accomplish this, I turn to what it means to have a group. Recall that Social Identity Theory posits three steps to group formation. The first is categorization and is what the model of Leighley

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[5] The need to distinguish between groups that matter and don't is explained in Schabla, 2021a and Schabla, 2021b.

and Nagler involves. The second is identification.[6]   An individual must choose to identify with a group in order for that group to be salient. This leads to the following reduced form specification for the impacts of social identity on voter behavior:

$$Pr(vote_i|y_i) = \gamma_0 + \gamma_j x_{i,j} z_{i,j} + \mu_i.$$

This model differs from the Leighley and Nagler's by adding an interaction term with the demographic characteristics. This interaction, x_i is an indicator variable for the identity related to the demographic characteristic. That is, the categorical group race is now interacted with a zero-one variable on the identity of race. A person can be categorized into the group, but do they care about that group? The indicator variable tells us if they do or do not.

This indicator variable is coming from the first stage identity choice and takes a value of 1 when an individual has chosen that identity as one of their stop three identity choices. By interacting this indicator I am allowing the individual to tell us if they care about that particular categorization or not. This is critical to understanding why individual's voting decision is made when they fall into one category that votes for a Republican candidate but another category that votes for a Democratic candidate. The remainder of the model is as in Leighley and Nagler. That is, I assume a logistically distributed error term, μ_i and use the same demographic characteristics previously discussed.

Another important question related to voting is for whom do people vote. This question can be addressed in the same manner as the decision on whether to vote. The only difference in the model's is the outcome variable where instead of deciding on whether to vote, "1" or not "0", the individual's are deciding on whether to vote for the Democratic "0" or Republican "1" candidate.

A logit specification is preferred to the probit specification as there is no other choice on whether to vote or not. As for the choice of who to vote for, I assume candidates are always independent from one another. That is, individuals that vote for either of the main candidates are

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[6] The third stage is comparison and is left out of the voting model as it's influence on identity formation will not influence how identities shape voting beyond that of the group effects found in Leighley and Nagler.

never indifferent between the candidates at the final stage of the voting decision. This assumption is valid for a two party system such as the United States but may not hold for a multiparty system. The two party system removes the possibility for a third candidate as the two party system creates an environment where the two parties stake very clear, oppositional, positions on most issues. Within the primary elections, where more than two candidates are up for election between, this assumption may be more difficult to defend, but in the final Presidential election, which is the focus of this paper, there is no correlation in the unobservables between the candidates that would make the independence assumption invalid.[7]

The question of selection bias is also relevant to these models. Fortunately, an excluded instrument exists which allows me to test for any selection that is occurring. This instrument should impact the first regression and not the second. Battleground states satisfy this requirement. There is reason to believe that being in a battleground state will cause an increase in the probability of voting but not the probability of voting for a specific candidate. Using a Heckman two-step estimator, I find that there is no selection bias occurring. That is, the decision on whether to vote is not influential on the decision on for whom to vote.

3.4.2   Estimation Strategy

Generation of the voting data is done by predicting the values for voting and not voting from the regressions in Table 3.2 that include strength of party affiliation. I include strength of party affiliation to provide more accurate predictions as the party affiliation variable dramatically improves the model of Leighley and Nagler.[8]   In Table 3.3 I show the correlation and percentage of correctly predicted observations in the 2006 – 2010 sample for voting behavior. These predictions are quite good, though not perfect.

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[7] Another situation where the independence assumption may not hold is in the cases where one candidate is a proxy for another, however this is rarely an issue within the United States. An example of this is the election of Dmitry Medvedev in 2008 who was widely seen as a vote for Vladimir Putin. President Putin couldn't run for the office of the Presidency in 2008 due to the constitutional laws of Russia at the time. To my knowledge, the United States has never had a situation like this arise.

[8] A likelihood-ratio test cannot be performed with clustered errors as the true maximum likelihood function cannot be estimated, Sribney, 2017. A Wald test strongly rejects the null hypothesis that the partyid variable is 0. A Bayesian information criteria test demonstrates the models that include party affiliation are superior in fit as well.

Table 3.3: Correlation of Predicted Voting Behavior With Actual Voting Behavior

	Voted	For Whom
Correlation	0.467	0.765
Correct Predictions	74.59%	78.9%

Predicted values come from the regressions in columns (2) and (4) of Table 3.2. Correlation refers to the raw predicted probabilities while correct predictions are generated by assigning a 0 to predictions below 0.5 and a 1 to predictions above 0.5. Both of these predicted values are measured against actually observed behavior.

In Table 3.4 I show the correlation of core identity choice with predicted identity. We see that the predictions aren't very good for age, gender, or social class but pretty good and very good for race and religion respectively. These last two had their predictions significantly improved by including measures of behavior that reflect the appropriate identity. For race this variable was belief in the government doing enough to help blacks while for religion it was church attendance. Due to these predictions, I limit my robustness check to only race and religious identities as the correlation for the other identities is too low to be meaningful.

Table 3.4: Correlation Coefficients For the Predicted Core Identity Choice

	Age	Gender	Race	Religion	Social Class
Correlation	0.108	0.168	0.367	0.558	0.137

Predicted values come from the regressions of Schabla, 2021a without ads included. Correlation refers to the raw predicted values measured against the actual values observed in the 2004 dataset.

In addition to the problem of lack of voting and identity information, I suffer from a general low number of observations in the 2004 sample. I am able to run specifications with all core identities at once, that is if an individual chooses an identity as one of their top three identities, but I am unable to when using the rankings data. To help address this problem I run a full specification model and a reduced model that only includes the singular identity and it's associated demographic variable of interest. Looking at the variables one by one in Table 3.5 we see that only in the case of those 61+ did the sign of a demographic variable become significant when it wasn't. All other variables maintain the same sign and significance indicating the validity of running the

models one demographic variable at a time.

Therefore, accounting for all of these issues provides the final reduced form regression for the models found in this paper:

$$Pr(vote_i|y_i) = \gamma_0 + \gamma * \text{identity} * \text{demographic} + \mu_{1i} \tag{3.2}$$

for the decision on whether to vote and:

$$Pr(who_i|y_i) = \gamma_0 + \gamma * \text{identity} * \text{demographic} + \xi_{1i} \tag{3.3}$$

for the decision for whom to vote.

VARIABLES	(1) Does Vote? (DV)	(2) For Whom? (FW)	(3) DV	(4) FW	(5) DV	(6) FW	(7) DV	(8) FW	(9) DV	(10) FW
Bottom 20% Income	-0.560*** (0.0793)	-0.180 (0.149)								
Top 10% Income	0.436*** (0.153)	-0.166 (0.158)								
18 - 24			-0.307* (0.158)	-0.671*** (0.233)						
61+			0.711*** (0.0815)	0.195** (0.0969)						
Male					-0.110** (0.0488)	-0.145 (0.0920)				
non-White							-0.668*** (0.101)	-0.686*** (0.137)		
non-Christian									-0.208** (0.0990)	-0.890*** (0.114)
Constant	-0.0650 (0.0912)	0.475*** (0.124)	-0.289*** (0.0806)	0.394*** (0.113)	-0.0495 (0.0768)	0.508*** (0.117)	0.0330 (0.0683)	0.536*** (0.106)	-0.0378 (0.0924)	0.664*** (0.105)
Observations	6,607	4,623	7,502	5,207	7,502	5,207	7,502	5,207	7,502	5,207
# Clusters	40	40	40	40	40	40	40	40	40	40
Log pseudolikelihood	-3313	-1626	-3747	-1820	-3800	-1825	-3750	-1807	-3798	-1794
Pseudo R-squared	0.166	0.492	0.167	0.496	0.155	0.494	0.166	0.499	0.156	0.503

Table 3.5: Leighley and Nagler Voting Model Regressions, One Variable at a Time

These are identical models to Table 3.2 except I've run the demographic variables one by one. College, marital status, south, and party affiliation are included in all regression but omitted for brevity. All variables have the same sign and significance with the exception of for whom old who have become significant but maintained the same sign. Robust standard errors clustered at the state level are in parenthesis. Ads variables are continuous, all other variables are dummy variables. *** p < 0.01, ** p < 0.05, * p < 0.1

3.5   Results

I begin with the results of the voting decision model when including the identity choices found in Table 3.2. These two models correspond to equations 3.2 and 3.3. In this regression, a demographic variable is only included when the corresponding social identity is selected in the core identity. When the social identity is not selected, the identity indicator variable takes on a value of zero and the corresponding demographic variable is now zero.

Interpretation of this regression is complicated. I am not interested in the coefficients directly as I expect there to be a similar pattern of voting behavior as was found in the baseline model found in Table 3.2. What I am interested in is whether there is a statistically significant difference in the coefficients that differ only in the social identity choice. By this I mean, we already know that minorities voted at a lower rate in 2004 and so it is expected that the coefficients corresponding to non-White's who do not select identity and non-White's who do select identity are negative and statistically significant. What I am interested in is whether the difference in these two coefficients is equal to zero or not, where I am taking the baseline identity as no identity and subtracting from this value the coefficient corresponding to selecting an identity.

If the difference is equal to zero, then identity has no impact on voting behavior. If it is negative, then in the "Does Vote" model this indicates that an individual will vote at a lower rate when they selected the identity. In the "For Whom" model a negative difference corresponds to a shift towards the Democratic candidate. To be precise, I am interested in the following difference:

$$\beta * no\ identity * demographic - \gamma * identity * demographic. \tag{3.4}$$

To provide a numerical example, looking at non-White's we have the following:

$$-0.838 * 0 * 1 - -1.220 * 1 * 1. \tag{3.5}$$

This value is negative indicating a shift towards not voting. This is reflected in Figure 3.1. Testing where this difference is statistically significant or not requires is a test of equality of the

coefficients. There are two tests available, a linear Wald test and a non-linear margins test. The margins test differs from the Wald test by including the non-linearity of the model.

Figure 3.1: Graph of the probability distribution of a non-White individual voting based on their identity choice of race. This graph shows visually that individuals for whom race is a core identity are less likely to vote than those for whom race is not an identity. The quantitative analysis of this graph is located in Table 3.6 in the full logit model non-white individual's row.
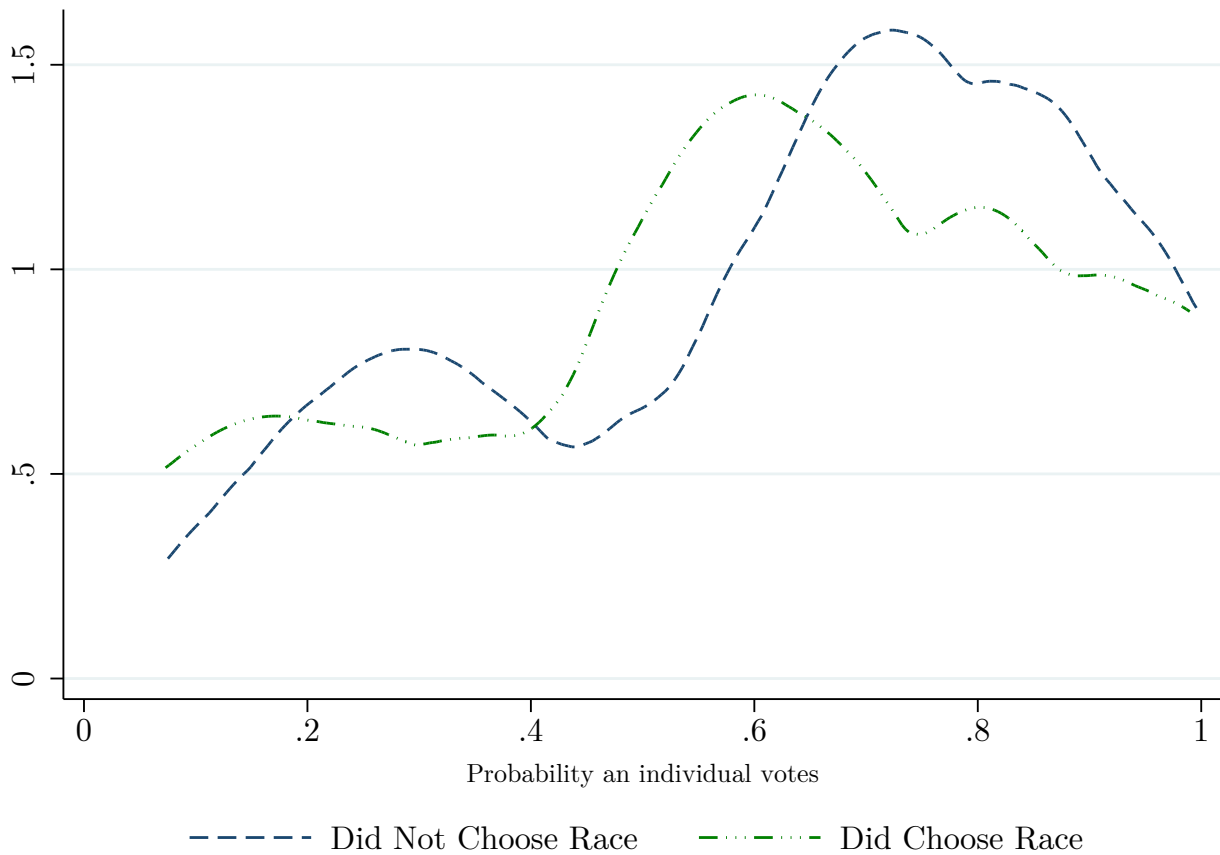
To calculate the margins, all observations in the relevant sample are set to the same value of the identity choice. A distribution of probabilities is generated corresponding to the probability that individual would vote given they do not hold the identity choice. From this distribution the mean and standard deviation are calculated, with the standard deviation being calculated via the delta-method. Once this is accomplished, the procedure is repeated with all individuals now choosing the identity. This creates two samples, one corresponding to all individuals in the sample

not choosing the identity of interest and all individuals choosing it. These sample means are then compared and the test statistic is generated. The non-linearity of the model will slightly alter this statistic as compared to the Wald test, so I prefer the margins method for testing for equality.

Throughout this section I focus on race and religion as these are the identities that seem most malleable based on Schabla, 2021a. Age, gender, and social class identities all seem as if they should matter as well, however I am unable to find convincing evidence in this direction. What little evidence I was able to find is focused on the decision for whom to vote and appears to have smaller effects than that found for race and religion. Therefore, I exclude the analysis of these identities from this paper but stress that it is expected that these identities matter as well and should not be ignored.

3.5.1   Racial Identity

Table 3.6 gives the marginal change in probability of voting for race when moving from not holding racial identity as a core identity to holding racial identity as a core identity. There are four regressions ran, two logit models and two linear probability models. The logit models outcome variable is whether an individual is predicted to vote. These values were set to a 1 when the predicted probability was greater than 0.5 and 0 otherwise. In the linear probability model, a linear regression is ran directly on the predicted probabilities. Additionally, I restricted the full model given in Table 3.7 to only include race identity and the race demographic variable, college education, marital status, and whether an individual was from the south. My reasoning for doing this was to obtain more observations in the regression by removing the perfect prediction present in the logit model.

Within each of these four regressions there are three tests performed based on different sample sizes. These are the entire sample, only those individual's who are non-White, and only those individuals who are white. Testing in this manner allows for me to investigate patterns in the behavior's of the coefficients to better understand what is driving the results.

Turning our attention to the full logit model specification, which again corresponds to the

Table 3.6: The Marginal Impact of Racial Identity on Whether to Vote

	dy/dx	Delta-method std. err.	z	P>z	[95% conf. interval]		Obs.
Full Logit Model							
All	-0.053	0.036	-1.48	0.138	-0.124	0.017	963
non-White	-0.061	0.044	-1.40	0.162	-0.147	0.025	259
White	-0.050	0.049	-1.04	0.300	-0.146	0.045	704
Only Race Logit Model							
All	-0.050*	0.030	-1.68	0.094	-0.109	0.009	1094
non-White	-0.048	0.049	-0.98	0.328	-0.145	0.048	282
White	-0.051	0.038	-1.34	0.180	-0.125	0.024	812
Full Linear Probability Model							
All	-0.033**	0.013	-2.51	0.017	-0.060	-0.006	1091
non-White	-0.028*	0.016	-1.77	0.084	-0.059	0.004	281
White	-0.035**	0.017	-2.03	0.049	-0.069	0.000	810
Only Race Linear Probability Model							
All	-0.032**	0.014	-2.26	0.029	-0.061	-0.003	1094
non-White	-0.017	0.017	-1.01	0.319	-0.051	0.017	282
White	-0.038*	0.019	-2.01	0.051	-0.076	0.000	812

For each model three samples were evaluated, all, only non-white's, and only white's. The marginal change is calculated by setting all observations race choice to 0 and predicting the probability that they vote, repeating this after setting race choice to 1, and taking the difference in the mean probabilities of the samples. Delta-method standard errors are calculated from these two distributions of probabilities to generate the z-scores. A negative value indicates a shift towards not voting.

output seen in Table 3.7 we see that the coefficients are not statistically different from one another. For non-white's, shifting from no identity to identity is predicted to decrease the probability of voting by 6 percentage points, however this is only significant at the 85% confidence level. Looking at the z-scores it is suggestive that the issue is one of lack of observations as the error drops by 25% when including all observations despite white's having a slightly higher variance within their group. Indeed, if the error bar for non-White's was what it is for all individuals, we would see this figure significant at the 95% level. However, we don't have these observations and so can only state that there is no significance in this model. Moving down to a logit model with the other four identities removed we see the marginal probabilities have decreased slightly, but otherwise nothing

has changed.

When proceeding to the linear probability models with the same specification as the logit model we see the coefficients become significant. Again, the only difference in these models is that in the logit regressions I have assigned whether an individual voted or not based on their predicted probability. In the linear probability model I am using the predictions directly as the outcome.

In the full LPM regression we see that non-white's are now less likely to vote. This amounts to a change of 2.8 percentage points less likely to vote than had they not held the identity, with significance at the 90% level. In the restricted LPM model the significance is again lost. Therefore, out of four regressions I have one that states that racial identity may decrease the probability of voting while the other three state that there is a statistically insignificant decrease.

Turning our attention to white voters, we see no significance in the logit models. In the LPM models we see significance in both instances. In fact, the impact of racial identity for white's is larger than it is for non-White's in these LPM models. Given that the initial hypothesis is that non-White's should vote less when identifying with race in the 2004 election, these results are confusing.

I believe the reconciliation of these results comes from the low sample size present in minorities. Notice that the marginal results for white's stay about the same within the logit and linear probability models. White's comprise about 75% of the sample, so they seem stable to the changes in model specification. Minorities on the other hand are more susceptible to small changes in the sample size. Notice that for the full LPM model there are nearly 10% more minorities than in the logit model.

A way to test this is to reverse the process. Rather than predicting votes, I can predict identities. The advantage to this is that I am not limited to the 2004 voting year. I can expand to investigate how voting behavior is predicted to have been influenced by identities in 2008. Given that the minority vote took such a massive swing in participation, these results should provide us with the reverse situation. That is, racial identity should increase the probability of voting rather

than decrease it. This is precisely what I find.[9]

Reconciling these results requires a deeper look at the predictions used to generate the model. Table 3.8 demonstrates that non-White's are more likely to be miscategorized as non-voters when they actually did vote. This introduces a bias in the analysis of voting behavior towards not voting. The importance of this bias for my results will depend on whether individuals are more likely to have been miscategorized if they are more likely to identify with race.

A two sample t-test of the predicted race probabilities in the $2006 - 2010$ and $20010 - 2014$ samples demonstrates that it is likely that those who are miscategorized in their predicted voting behavior are more likely to be drawn from those who identify with race.[10]   Given this bias, I expect that for non-White's I under predicted the probability of voting and did so in a way that those who identify with race are more likely to be under predicted than those who did not vote for race biasing my results towards no effect.

As for the decision on whether to vote, the same analysis as above applies. I plot the probability charts as with voting in Figure 3.2. Now a shift of the graph to the left indicates a shift towards the Democratic party. This graph is quantitatively analyzed in Table 3.9 which gives the same information as in Table 3.6, except now a negative outcome indicates a higher likelihood of voting for the Democratic party. Here the results are more straight forward, in part due to the enormous predictive power that the party affiliation variable has on who to vote for, therefore I limit this discussion.

We see that with the logit models racial identity causes non-White's to increase their voting probability for the Democratic party. The linear probability models have the same sign but lack the significance that the logit model has. For white's and when considering all individual's the sign stays the same but significance is lost, though just barely with the logit models. The interpretation of this result is that non-White's swing so far to the Democratic party when identifying with race

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[9] These results are omitted but are available upon request.

[10] This comes from a two sample t-test comparing individuals who are non-White by the predicted identity they had with whether their predicted vote was correct or not. This test shows that those who are predicted incorrectly are slightly more likely to identify with race than those who were predicted correctly at the 95% confidence level.

Figure 3.2: Graph of the probability distribution of a non-White individual's choice of whom to vote for based on their identity choice of race. Here 0 represents voting for the Democratic nominee while 1 is the Republican candidate. This graph shows visually that individuals for whom race is a core identity are more likely to vote for the Democratic candidate. The quantitative analysis of this graph is located in Table 3.9 in the full logit model non-white individual's row.

The lower the probability the greater the chance the individual voted for the Democratic nominee.

- - - - - Did Not Choose Race   - · · - · · - Did Choose Race
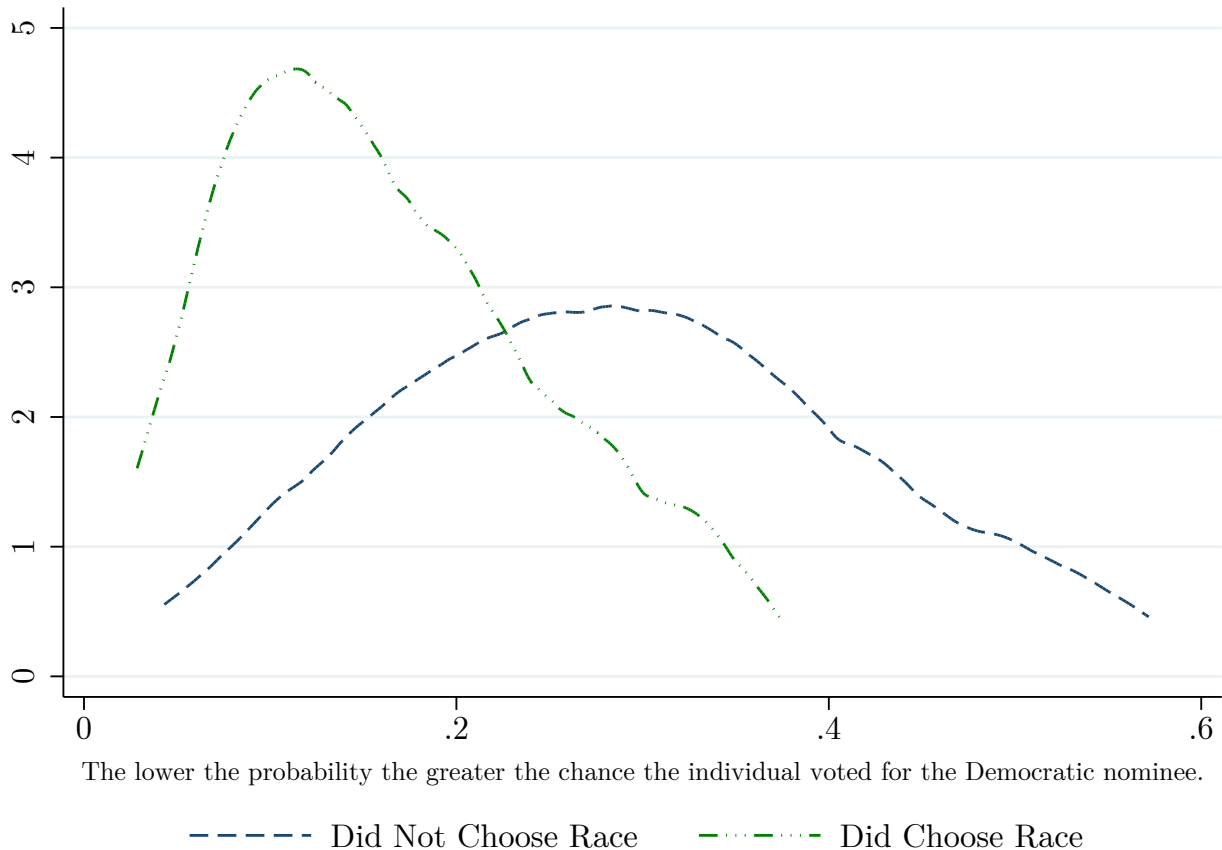
that even though they are outnumbered, they nearly bring the entire population average towards the Democratic party.

Intuitively these whom to vote for results make sense as the Democratic party is more likely to favor redistribution towards racial minorities. Given that Social Identity Theory's theoretical basis for shaping voting behavior is that group outcomes are internalized, it makes sense that the party that likely to increase the groups outcome will be heavily favored. Again, putting these predictions into the 2008 and 2012 elections shows similar patterns, indicating that it is likely that the small

sample size is inhibiting the uncovering of an effect in the linear probability models. Looking at the standard deviations between the four models, we see that these values are roughly the same. The loss of significance is caused by the decrease in the measured marginal effect, which is an artifact of the regression model. I conclude that there is a real effect of racial identity pushing individual's towards the Democratic party.

To conclude the discussion about race, there is evidence for and against identity impacting the probability of voting. However, I believe that I have demonstrated that there is a bias that undercounts the vote for minorities that impacts those who identify with race stronger than those who do not. The predictions for racial identity may be inaccurate in the voting samples between 2006 – 2014, but there is no bias one way or the other. These robustness checks demonstrate a significant negative impact of racial identity in 2004 and a significant positive effect in 2008, matching the findings of Ben-Bassat and Dahan, 2012 and Shockley and Gengler, 2020. Lastly, for all but the full logit model there is a significantly negative effect when considering all individuals, regardless of race. Therefore, I believe that I have shown that it is more likely than not that racial identity has a significant impact on the probability of a racial minority voting.

3.5.2   Religion

I now turn my attention towards religion. The United States has many deep cultural divides based on religion so it is expected that increases religious feelings will increase the probability of voting as well as shift individual's towards the Republican party. From a voter perspective it's expected that religion should act in the opposite direction as race did. Increasing the probability of voting as well as increasing the likelihood one votes Republican. As in subsection 3.5.1, I construct a series of margins tables to evaluate the change in voting behavior based on taking up the religious identity. As was done previously, there will be four models, each broken into three groups to analysis the impacts that religious identification has on different sub-populations.

I begin with the graph of the density function for the predicted probability to vote for religious individuals found in Figure 3.3. This graph shows us that individual's who are religious, regardless

of identity, vote at much higher rates than racial minorities do. This is a nice way to verify that nothing unexpected has happened. Had this graph shown that individual's who are religious vote at lower rates, we would have reason to question the validity of the model given the results in Table 3.7.

Figure 3.3: Graph of the probability distribution of a religious individual voting based on their identity choice of religion. This graph shows visually that individuals for whom religion is a core identity are more likely to vote than those for whom religion is not an identity. The quantitative analysis of this graph is located in Table 3.10 in the full logit model non-white individual's row.
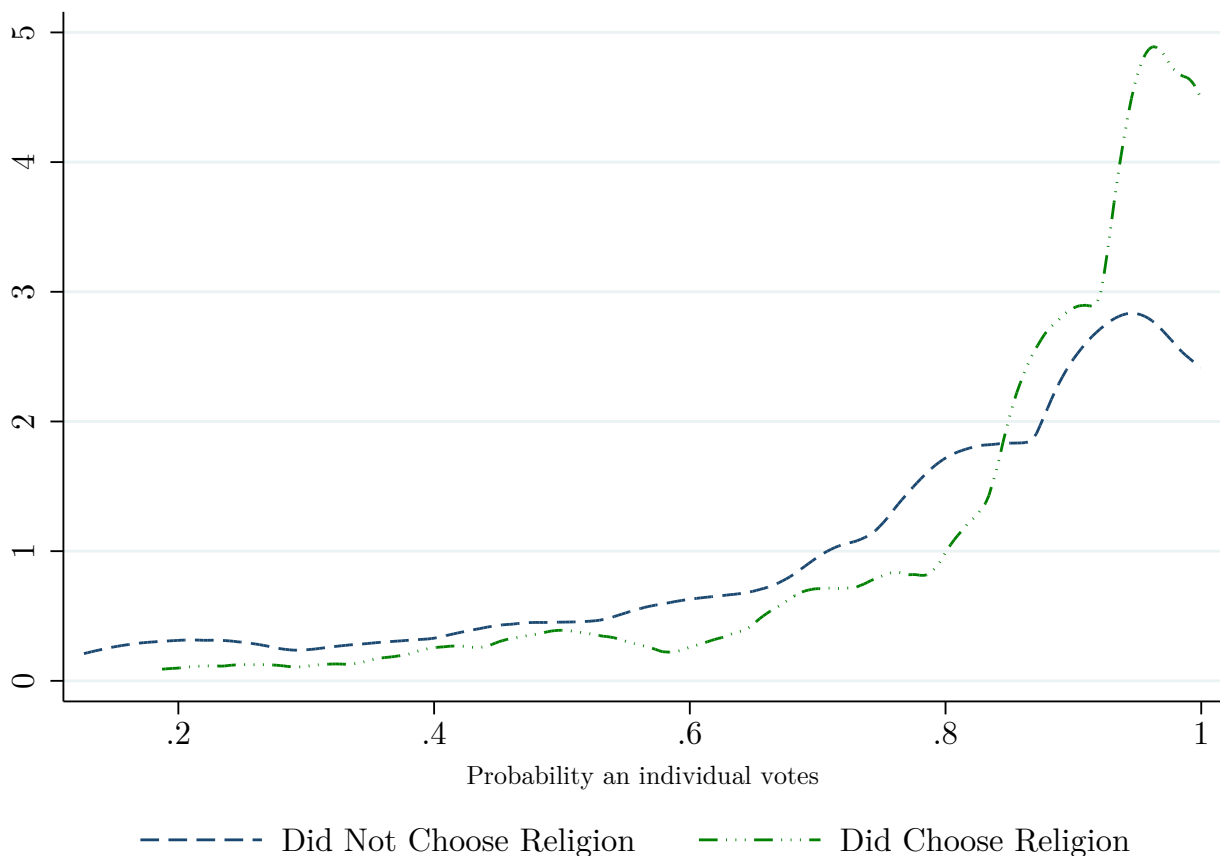
The next thing to look at qualitatively in this graph is that those who identify with religion seem to vote at a higher rate than those who are religious but do not identify religion as a core identity. In order to quantitatively study this I move to the margins output in Table 3.10.

From this table we see that religious identification seems to produce a strong positive voting

response in all models except for the full linear probability model. Given the large sample size of those categorizing themselves as religious, the stability of this result is expected. This table tells us that religious identification leads to an approximately 3 to 5 percentage point increase in the probability of voting. Compare this with the race model in the previous subsection which also showed about a 3 to 5 percentage point decrease in voting and the argument that racial identity does change voting patterns is strengthened further.

Moving to the question of whom to vote we again start with the graph in Figure 3.4. Here there appears to be a strong shift towards the Republican party. As the Republican party is generally favored by the religious groups in the United States, this result again is a check of validity of the model. Looking at Table 3.11 we see the strongest indications yet of identity influencing voting behaviors.
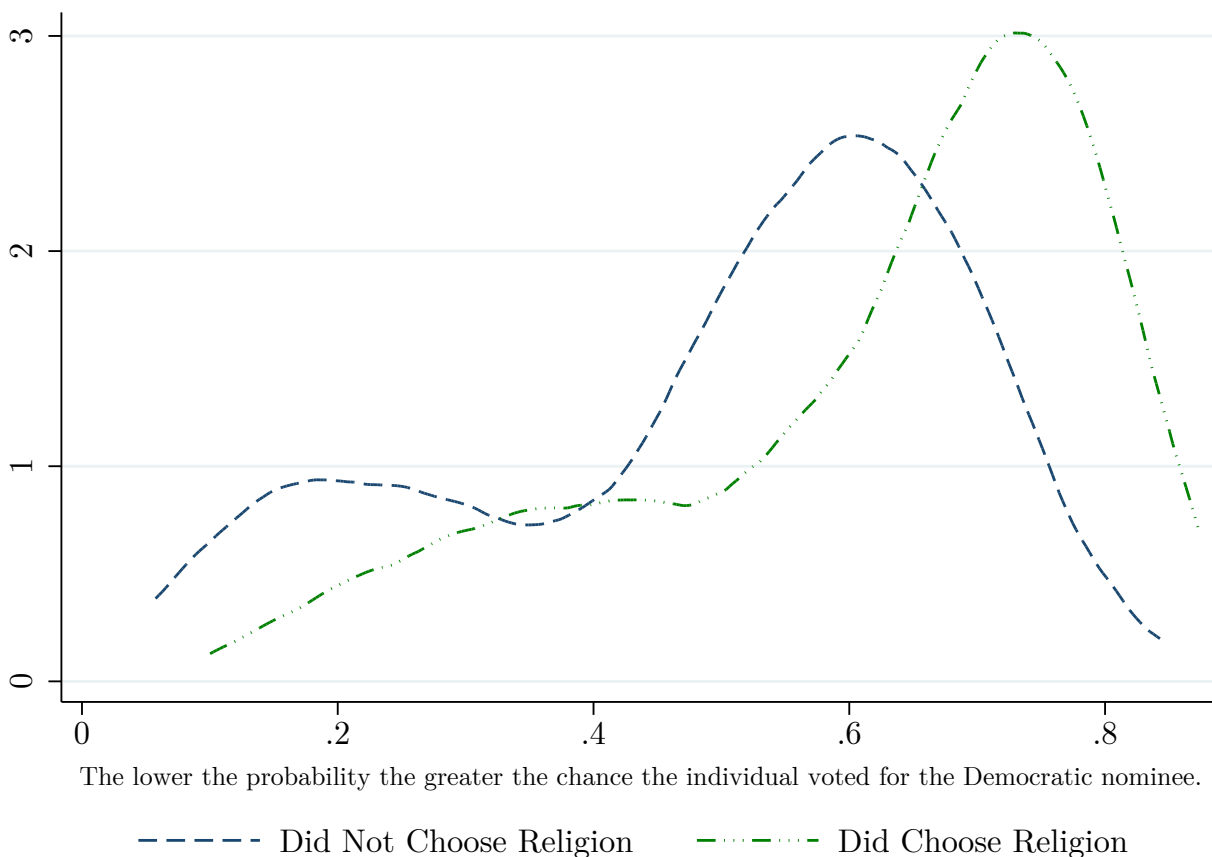
All four models in this table show clear, strong, movement towards the Republican party. Those who are not religious but identify with religion do not see their voting behavior impacted by their identity. Because the United States is religious overall, the average impact regardless of sub-population is a positive one. Individuals who identify with religion are more likely to vote, and they are more likely to vote for the Republican party.

Taking the results of both of these subsections at their face value an interesting result emerges. Democrats are able to shift racial minorities towards their party by targeting racial identity, but doing so causes fewer of these individuals to vote. Republicans are able to shift religious individuals towards their party by targeting religious identity and feel a second surge in increasing the voting rates. As with race, when predicting religious identity and regressing it on the samples for which we have voter data in 2004 and 2008, we see religious identity is strongly significant and positive indicating that religious identification does influence voting.

These results are tempered by the fact that for those who are religious voter turnout rates are already quite high. For non-White's the turnout is very low. Therefore, there is more room for gain by the Democratic party if they can find ways to shift racial minorities towards voting. This occurred with President Obama's election in 2008. Given the racial minority turnout in the

Figure 3.4: Graph of the probability distribution of a religious individual's choice of whom to vote for based on their identity choice of religion. Here 0 represents voting for the Democratic nominee while 1 is the Republican candidate. This graph shows visually that individuals for whom religion is a core identity are more likely to vote for the Republican candidate. The quantitative analysis of this graph is located in Table 3.11 in the full logit model religious individual's row.

The lower the probability the greater the chance the individual voted for the Democratic nominee.

− − − − − Did Not Choose Religion   − · · − · · − Did Choose Religion

2020 Presidential election, it may be that the Democratic party has reversed this voting result and is gaining voters through both channels; increased voter turnout and shifting individual's towards the Democratic party.

3.6   Conclusion

In this paper I have demonstrated that there is evidence that identity plays a role in the decision to vote. I have focused on race and religion as these were the two identities Schabla,

2021a found the clearest evidence for the ability to shift individual's towards and away from. Unfortunately, due to data limitations, the true size of the effect cannot be known at this time. This paper has developed a road map for future research in order to elucidate these effects. It has also built upon Schabla, 2021a to provide further evidence that Social Identity Theory can be measured and has impacts on behaviors. Further, these behaviors can be altered by priming the appropriate identity within the proper group.

Why the poor do not expropriate from the rich is a fundamental question in political economics. I believe I have helped refine the answer of Shayo, 2009. He provides evidence that perhaps the poor identify with nationalism rather than social class. This refinement demonstrates that social class identity is important in understanding the political leanings of individuals. I provide more evidence that shifting identities can shift the voting decisions of individuals. For racial minorities that identify weakly with racial identity, shifting them towards any other identity seemed likely to raise their vote probability without shifting them away from the Democratic party in 2004. However, the results presented here are suggestive rather than definitive. Further studies need to be conducted to strengthen this result and also determine if the voting behavior exhibited in 2004 has shifted. It seems likely that the answer to this is yes, it has.

An interesting question that I was unable to study here for lack of data is how the strength of identification matters. All I have been able to show is that identity seems to matter, I have not been able to answer whether the strength of that affiliation matters or if it's enough that a person consider the identity a core identity.

In order to uncover the true effects of social identity, more effective surveys need to be developed. We need to know the identities of individuals as they vote. We need to create surveys and experiments that attempt to manipulate identities in different dimensions. These surveys need to account for behaviors and beliefs that are correlated with identities in order to understand who can be manipulated and by how much.

There is increasing evidence of the fractionalization of society and the negative impacts it has for making societal level decisions, Gentzkow et al., 2016. Further, we see society fracturing along

lines of belief and trust of information. Social Identity Theory can provide the answer to why this occurs and how to reverse it. Individuals tend to trust their in-group members and distrust their out-of-group members. It is identity that shapes who we believe, who we trust, what information we take in and how we process that information.

Social identity shapes decision making, from what food we want to buy to how we think society should be structured, Atkin et al., 2019; Shayo, 2009. Unfortunately our current measures of identity are woefully inadequate if we want to answer these and other important questions. I believe that I have laid out the framework for understanding how to create surveys that can measure identities and how to influence them. Identities don't need to be taken as exogenous. Researchers don't need to guess which identities matter for different outcomes. The weaknesses of Schabla, 2021a and this paper can be overcome with improved data. That there are any findings at all, despite these weaknesses, is evidence in itself as to the strength and significance of identity in decision making.

Table 3.7: Social Identity Interacted with Leighley and Nagler Voting Model

VARIABLES	(1) Does Vote	(2) For Whom
No Class * Bottom 20\% Income	-1.734***	-0.308
	(0.234)	(0.211)
No Class * Top 10\% Income	-	0.283
	-	(0.216)
Class * Bottom 20\% Income	-1.270**	0.494*
	(0.512)	(0.281)
Class * Middle 70\% Income	0.0412	-0.0763
	(0.303)	(0.248)
Class * Top 10\% Income	-	-0.0472
	-	(0.406)
No Age * 18 - 24	-0.387*	-0.332
	(0.222)	(0.269)
No Age * 61+	2.548***	-0.364
	(0.514)	(0.230)
Age * 18 - 24	-0.106	0.0811
	(0.325)	(0.280)
Age * 25 - 60	-0.0912	-0.328
	(0.309)	(0.202)
Age * 61+	3.008***	-0.182
	(1.015)	(0.358)
No Gender * Male	-0.0777	0.254
	(0.214)	(0.187)
Gender * Female	0.0331	-0.0216
	(0.325)	(0.196)
Gender * Male	-0.0423	0.622***
	(0.441)	(0.226)
No Race * non-White's	-0.839***	-1.421***
	(0.244)	(0.297)
Race * White's	-0.508	-0.306
	(0.460)	(0.312)
Race * non-White's	-1.220***	-2.153***
	(0.248)	(0.275)
No Religion * Not Religious	-0.920***	-1.003***
	(0.202)	(0.224)
Religion * Not Religious	-0.404	-1.560**
	(0.787)	(0.640)
Religion * Religious	0.425**	0.439**
	(0.213)	(0.187)
Constant	1.920***	0.716***
	(0.264)	(0.149)
Observations	964	1,092
# Clusters	39	39
Log pseudolikelihood	-331.6	-651.4
Pseudo R-squared	0.323	0.139

These are identical models to Table 3.2 except I've run the demographic variables interacted with the corresponding social identity choice individual's make. These are a $0-1$ variable that indicate whether an individual selected that identity in their top 3 identity choices. College, marital status, south, and party affiliation are included in the regressions but excluded from the display for brevity. Due to perfect predictions, the voting decisions of the top 10% income are omitted. Robust standard errors clustered at the state level are in parenthesis. Ads variables are continuous, all other variables are dummy variables. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 3.8: Measure of Incorrect Predictions

	Whites		non-Whites	
	Count	Freq	Count	Freq
Did Not Vote	1,179	78.39	723	21.61
Voted	3,682	78.39	1,015	21.61
Predicted to Vote, Didn't Vote	792	70.65	329	29.35
Predicted to Not Vote, Did Vote	234	56.25	182	43.75

The first two rows give a breakdown, by race, of voters and non-voters in the 2006 – 2010 samples for the 2004 Presidential election. The last two give a breakdown of those predictions that were inaccurate in the 2006 – 2010 samples.

Table 3.9: The Marginal Impact of Racial Identity on Whom to Vote For

	dy/dx	Delta-method std. err.	z	P>z	[95% conf. interval]		Obs.
Full Logit Model							
All	-0.081	0.052	-1.55	0.121	-0.184	0.021	1092
non-White	-0.119**	0.054	-2.18	0.03	-0.225	-0.012	281
White	-0.068	0.070	-0.97	0.333	-0.206	0.070	811
Only Race Logit Model							
All	-0.085	0.056	-1.52	0.128	-0.193	0.024	1094
non-White	-0.115**	.049	-2.32	0.020	-0.211	-0.018	282
White	-0.074	.076	-0.970	0.330	-0.223	.0750	812
Full Linear Probability Model							
All	-0.045	0.035	-1.28	0.207	-0.116	0.026	1091
non-White	-0.060	0.046	-1.31	0.198	-0.153	0.033	281
White	-0.040	0.045	-0.88	0.384	-0.131	0.052	810
Only Race Linear Probability Model							
All	-0.053	0.036	-1.45	0.154	-0.126	0.021	1094
non-White	-0.054	0.037	-1.46	0.151	-0.130	0.021	282
White	-0.052	0.050	-1.05	0.302	-0.152	0.048	812

For each model three samples were evaluated, all, only non-white's, and only white's. The marginal change is calculated by setting all observations race choice to 0 and predicting the probability that they vote, repeating this after setting race choice to 1, and taking the difference in the mean probabilities of the samples. Delta-method standard errors are calculated from these two distributions of probabilities to generate the z-scores. A negative value indicates a shift towards the Democratic nominee.

Table 3.10: The Marginal Impact of Religious Identity On Whether to Vote

	dy/dx	Delta-method std. err.	z	P>z	[95% conf. interval]		Obs.
Full Logit Model							
All	0.048*	0.026	1.84	0.066	-0.003	0.098	963
Religious	0.043**	0.022	1.97	0.049	0.000	0.085	825
Not Religious	0.078	0.119	0.65	0.515	-0.156	0.312	138
Only Religion Logit Model							
All	0.051**	0.023	2.17	0.030	0.005	0.096	1091
Religious	0.048**	0.020	2.41	0.016	0.009	0.087	937
Not Religious	0.067	0.123	0.55	0.585	-0.174	0.309	154
Full Linear Probability Model							
All	0.014	0.011	1.21	0.235	-0.009	0.037	1091
Religious	0.016	0.010	1.56	0.127	-0.005	0.036	937
Not Religious	0.002	0.035	0.06	0.956	-0.069	0.073	154
Only Religion Linear Probability Model							
All	0.032**	0.014	2.36	0.024	0.004	0.059	1091
Religious	0.031***	0.010	3.03	0.004	0.010	0.051	937
Not Religious	0.038	0.061	0.62	0.538	-0.086	0.162	154

For each model three samples were evaluated, all, only non-religious individuals, and only religious individuals. The marginal change is calculated by setting all observations religion choice to 0 and predicting the probability that they vote, repeating this after setting religion choice to 1, and taking the difference in the mean probabilities of the samples. Delta-method standard errors are calculated from these two distributions of probabilities to generate the z-scores. A negative value indicates a shift towards not voting.

Table 3.11: The Marginal Impact of Religious Identity of Whether to Vote

	dy/dx	Delta-method std. err.	z	P>z	[95% conf. interval]		Obs.
Full Logit Model							
All	0.066**	0.031	2.14	0.032	0.006	0.126	1091
Religious	0.091**	0.038	2.40	0.016	0.017	0.166	937
Not Religious	-0.091	0.096	-0.95	0.343	-0.280	0.097	154
Only Religion Logit Model							
All	0.070**	0.033	2.09	0.037	0.004	0.135	1091
Religious	0.098***	0.038	2.60	0.009	0.024	0.171	937
Not Religious	-0.102	0.124	-0.82	0.411	-0.345	0.141	154
Full Linear Probability Model							
All	0.067**	0.027	2.51	0.016	0.013	0.121	1091
Religious	0.077***	0.028	2.74	0.009	0.020	0.133	937
Not Religious	0.009	0.085	0.10	0.920	-0.164	0.181	154
Only Religion Linear Probability Model							
All	0.072**	0.027	2.61	0.013	0.016	0.127	1091
Religious	0.082***	0.028	2.98	0.005	0.026	0.138	937
Not Religious	0.008	0.109	0.08	0.939	-0.212	0.229	154

For each model three samples were evaluated, all, only non-religious individuals, and only religious individuals. The marginal change is calculated by setting all observations religion choice to 0 and predicting the probability that they vote, repeating this after setting religion choice to 1, and taking the difference in the mean probabilities of the samples. Delta-method standard errors are calculated from these two distributions of probabilities to generate the z-scores. A negative value indicates a shift towards the Democratic nominee.

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