Group identity and symbolic political behavior

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Abstract

Political expression often revolves around ethnic, religious, or cultural group identities. I develop a game-theoretic model explaining how group identities interact with citizens' social environments to induce political behavior designed to express group identity. Citizens make political choices before engaging in social interactions which may involve members of the individual's ingroup or outgroup. The strength of an individual's group identity is private information and affects payoffs from political behavior and from cooperative behavior in social interactions. Therefore, symbolic political behavior informs social interactions by revealing information about the group identity of the participant. Furthermore, cross-cutting pressures from ingroup and outgroup interactions govern the intensity with which individuals pursue symbolic political behavior. Symbolic political behavior is more common in segregated communities and among members of large majority groups. I illustrate the broad importance of the theory through applications to anti-immigrant activism.

Political scientists across subfields hope to explain the factors that motivate people to act on their group identities. For example, scholars have analyzed the sources of activism in favor of civil rights legislation (Chong, 1991) or in opposition to civil rights (Key, 1949) in the United States, anti-immigrant mobilization in the US (Hopkins, 2010) and Europe (Klandermans and Mayer, 2006), the causes and effects of ethnicity-based voting (Dickson and Scheve, 2006, 2010), variation in the popularity of religiously symbolic clothing (Patel, 2012) and the sources of ethnic violence (Hardin, 1997; Horowitz, 2000). Though these topics are substantively diverse, they share several characteristics in common: they focus on actions taken by ordinary people on behalf

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of their ethnic, religious, or cultural groups; the behavior of interest is costly and public; and the subjects of study are likely driven by a combination of internal identity-based motivations and external social motivations. Despite the far-reaching importance of identity-based political behavior, political scientists lack a general theory to explain the internal and external forces that motivate such behavior.

In this paper I provide a new theoretical account of identity-based political behavior. My model places an individual's political choices in the context of day-to-day social interactions, which may involve members of the ingroup or outgroup. Importantly, group identity affects both political choices and behavior in social interactions: High group identifiers experience more expressive benefits from political behavior and exhibit ingroup favoritism in social interactions. Therefore, some political activities are motivated in part as ways for individuals to shape their social interactions by revealing private information about their group identity. I refer to these activities as forms of *symbolic political behavior*.

In the model, society consists of two groups and each citizen is associated with one group. Each citizen has a level of group identity known only to that citizen. The model has two time periods. In the first time period, citizens choose how much political expression they will engage in on behalf of their group. Though political expression is costly, citizens with strong group identities experience lower costs of political expression. Since political expression choices are public, they potentially reveal information about group identity that shapes play in the second period. In the second period, citizens are paired together to be involved in social interactions with one another in which both partners simultaneously select levels of *effort* to produce a mutual gain. Partners in social interactions are randomly selected at this stage, so each citizen is *a priori* uncertain about whether she will interact with a member of her own group or a member of the outgroup. Once social partners are revealed, preferences in social interactions diverge according to levels of group identity. Specifically, individuals with high group identity prefer to play higher effort in ingroup interactions and (weakly) lower effort in outgroup interactions.

Symbolic political behavior occurs when political expression reliably signals high group identity. When this happens, citizens have incentives to change their political behavior in order to improve their prospects in social interactions. Some citizens engage in high levels of group expression in order to persuade their fellow ingroup members to think that they have high group identity. Conversely, some citizens engage in low levels of group expression to avoid spoiling their social interactions with outgroup members.

The social pressures that drive symbolic political behavior differ from the determinants of other political activities. Since the perception that an individual is a high group identifier helps that individual in ingroup interactions but can be harmful in outgroup interactions, the group context in a community modifies the intensity with which citizens pursue symbolic political behavior. Specifically, my model predicts that the same person is more likely to engage in symbolic political behavior if she moves from a very integrated community to a very segregated community. Similarly, members of large majority groups engage in more symbolic political behavior.

Many outcomes of interest to political scientists can be usefully conceived of as symbolic political behaviors. To demonstrate the broad usefulness of this concept, I present an application of my model to anti-immigrant mobilization. My model explains some otherwise puzzling findings in the literature. For instance, consistent with empirical evidence in Bowyer (2008), my model predicts that support for anti-immigrant parties may be strongest in localities where voters have low levels of contact with immigrant populations. Furthermore, as I explain in the literature review later in this paper, the model provides an explanation for collective action that contributes to a large literature on public goods.

1 The model

I consider a situation in which the strength of a citizen's group identity is private information. Citizens make choices about group expression in the face of uncertainty about who they will meet in social interactions.

Social environment and game play

The citizens are denoted $i \in N$. N is partitioned into two groups, L and R. The groups may be ethnic, religious, ideological or cultural. Group membership is public knowledge. For each i, let $g(i) = L$ if $i \in L$ and $g(i) = R$ if $i \in R$.

The game has four stages. First, Nature assigns each citizen a level of group identity t_i from the interval $[\underline{t}, \overline{t}]$. Group identity levels are drawn independently from a continuous probability density function $p(g(i))$ for each individual i. Thus, the prior probability distribution over levels of group identity may be different for members of group L than for members of group R.

Second, the citizens choose signals $s_i \in \Sigma$, where Σ is a compact subset of the real numbers. Signals are interpreted as levels of public political expression. This choice is publicly observed.[1] Σ may be finite (e.g. a binary participation decision or an ordinal choice) but may also be a closed interval on the real line. Substantively, each s_i is a costly and publicly observable expression of identity. Relevant forms of political expression may include attending a protest, putting up a yard sign or donating money to a campaign.

Third, Nature randomly matches the citizens together for social interactions. Though I consider a more general matching procedure in the extensions, the matching process for the baseline model closely resembles the one in Fearon and Laitin (1996): a non-negative number $m \leq \min\{|L|, |R|\}$ of citizens are selected out of both groups for across-group interaction and matched with a member of the other group and the rest are matched with ingroup members. The probability that i is matched with an outgroup member is $m/|g(i)|$, where $|g(i)|$ denotes the size of i's group. To distinguish ingroup and outgroup interactions, let $\gamma(i, j) = 0$ if $g(i) \neq g(j)$ and $\gamma(i, j) = 1$ if $g(i) = g(j)$.

Finally, the citizens play a two-player social game with their selected partners. In the social game, the citizens simultaneously choose *effort levels* $a_i \in A$, where A is a closed interval on the real line. The final stage is general but could represent friendship formation: efforts signify actions required to form a social relationship with one's partner. I assume that all social interactions occur

[1] The results extend easily to the case in which s_i simply has some probability of being made public.

simultaneously or, equivalently, that actions in one social game are only observed by the two players involved.

Payoffs

The payoff to each player at the end of the game is her payoff from the social interaction minus the costs of group expression. The assumptions about payoffs do not rely on a particular functional form and are designed to be very general and flexible. The following definitions simplify the presentation of my assumptions about players' payoffs and follow from those in Ashworth and Bueno De Mesquita (2006).

Definition 1. *For a function h:*

(A) h satisfies (strict) increasing differences in (x,y) if, for $x' > x$, the incremental return $h(x',\cdot) - h(x,\cdot)$ is strictly increasing in y.

(B) h is (strictly) supermodular in $(x,y,\cdots,z)$ if it satisfies strict increasing differences for all pairs of arguments $(x,y,\cdots,z)$.

I make no assumptions about differentiability of functions. However, in the event that h is twice differentiable, increasing differences in (x,y) is equivalent to $\frac{\partial^2 h}{\partial x \partial y} > 0$.

Political expression

The cost of political expression is represented by a function $c : \Sigma \times [\underline{t},\bar{t}] \to \mathbb{R}_+$ that maps identity levels and expression choices onto (nonnegative) costs. I make two assumptions about c. First, political expression is costly.

Assumption 1. *For any $s',s \in \Sigma$ such that $s' > s$, $c(s',t) > c(s,t)$ for all $t \in [\underline{t},\bar{t}]$.*

Second, the marginal cost of political expression is lower for high group identifiers.

Assumption 2. *c has increasing differences in $(s_i,-t_i)$.*

Two plausible mechanisms justify Assumption 2. First, research in political behavior demonstrates that group identifiers respond affectively to racial policies (Citrin, Reingold and Green, 1990; Ayers et al., 2009). High-identifiers should therefore be less sensitive to the increased cost associated with any given level of political expression. Second, high-identifiers experience greater expressive benefits from political expression. As Hamlin and Jennings (2011) explain, "The link [between identity and] expressive behaviour is that some actions directly express the actor's identity (or the identity they wish to project) and this provides a route to explaining those actions." Expressive benefits are thought to motivate participation choices in many models (Schuessler, 2000; Chong, 1991).[2]

Identity in social interactions

The payoff to citizen i from a social game with j is represented by a function $v : A^2 \times [\underline{t}, \bar{t}] \times \{0,1\} \to \mathbb{R}$ mapping both citizens' efforts, i's group identity level, and values of the ingroup indicator function $\gamma(i,j)$ onto payoffs. Assumption 3 states that player i always benefits from more effort by her partner.

Assumption 3. *$v(a_i, a_j, t_i, \gamma(i,j))$ is strictly increasing in a_j.*

Furthermore, I assume that v is strictly quasi-concave in a_i. Though this assumption guarantees pure strategy equilibria, relaxing the assumption does not qualitatively change the results.

Assumption 4. *v is strictly quasi-concave with respect to a_i.*

I also make the following assumption about payoffs from social interactions.

Assumption 5. *Assume i and j are matched for social interaction. If $\gamma(i,j) = 1$ (ingroup interactions), v is supermodular in (a_i, a_j, t_i). If $\gamma(i,j) = 0$ (outgroup interactions), v is supermodular in $(a_i, a_j, -t_i)$.*

[2] Chong (1991) also notes that the expressive benefits of participation are often positively correlated with the material cost, which further justifies my assumption that identity affects the marginal, as opposed to absolute, cost of expression.

Assumption 5 has two implications. First, efforts are complementary, as captured by the increasing differences in (a_i, a_j). This assumption is substantively appealing in an intergroup relations setting since it relates to one of the conditions for optimal intergroup contact. Pettigrew (1971) summarizes one condition for prejudice-reducing contact as requiring that participants "are cooperatively dependent upon each other" (p. 275). If this condition is met, a citizen should prefer to cooperate more when she believes the other agent will cooperate. Potentially optimal intergroup contact is a reasonable starting point for this model since I emphasize how group expression creates discrimination between groups.

The second implication of Assumption 5 relates to how group identity effects social interactions. An assumption about *ingroup favoritism* is represented by the fact that v has increasing differences in (a_i, t_i) when $\gamma(i, j) = 1$ and in $(a_i, -t_i)$ when $\gamma(i, j) = 0$. This reflects the finding from Social Identity Theory that group identity leads to a desire for "positive distinctiveness" between one's ingroup and the outgroup (Tajfel and Turner, 1986; Tajfel et al., 1971).

Utility function

The payoff to player i at the end of the game is

$$u(a_i, a_{j(i)}, s_i, t_i, \gamma(i, j(i))) = v(a_i, a_{j(i)}, t_i, \gamma(i, j(i))) - c(s_i, t_i), \tag{1}$$

where $j(i)$ is i's social partner. This is i's payoff from social interactions minus the cost of group expression. The linearity in the utility functions implies an assumption that payoffs from social interactions and payoffs from symbolic political behavior are separable. This is a conservative choice because it implies that any relationship between symbolic political behavior and actions in social interactions is a direct result of the information about group identity that is communicated through the players' political choices.

2 Analysis

I characterize perfect Bayesian equilibria (PBE) of the game. I focus on symmetric strategies, meaning that members of the same group with the same type use the same strategy and distinguish between other players by group membership but not by label. A behavior strategy for i is $b_i = (\sigma_i, \alpha_i)$.

A signaling strategy is a measurable function $\sigma_i : [\underline{t}, \bar{t}] \times \{L, R\} \to \Delta(\Sigma)$, where $\Delta(\cdot)$ is the set of probability distributions over a set. Therefore, σ_i maps identity levels and groups into probability distributions over political expression choices.

A (pure) social strategy $\alpha_i : [\underline{t}, \bar{t}] \times \{0, 1\} \times \Sigma^2 \to A_i$ maps identity levels, values of the ingroup indicator $\gamma(i, j)$, and players' expression choices into efforts in social interactions.[3] A profile of behavior strategies for all players is $b = (\sigma, \alpha)$. Posterior beliefs are represented by $\mu : \{L, R\} \times \Sigma \to \Delta([\underline{t}, \bar{t}])$. Thus, $\mu(\tau | g(j), s_j)$ is the probability density at $t_j = \tau$ conditional on j's expression choice and group membership.

I have defined symbolic political behavior as public activities designed to communicate information about the participant's level of group identity for the sake of shaping social interactions. Thus, to demonstrate the importance of this concept, I first show that there is an equilibrium to the game in which all players' strategies meet two requirements for symbolic political behavior:

1. Citizens with higher group identity play (weakly) higher signals, and
2. Citizens respond to higher signals from social partners by acting as if they believe their partner has higher group identity.

I show that the game always possesses an equilibrium with these two properties. Furthermore, if intergroup contact is not "too high," any equilibrium to the game has these properties.

Afterwards, I turn my attention to the comparative statics of equilibria exhibiting symbolic political behavior. Specifically, I show that symbolic political behavior is sensitive to group context:

[3]The focus on pure social strategies simplifies notation and, as Lemma 1 demonstrates, is without loss of generality.

signals are higher in more segregated communities and among members of large majorities. Furthermore, individuals face a greater incentive to participate in symbolic political behavior as more of their peers participate.

2.1 Symbolic political behavior

I start by establishing a result about strategies in social interactions. A citizen's strategy in a social interaction depends on the citizen's group identity, the type of interaction (ingroup versus outgroup), and the signal choices of the citizen and her partner.

Citizen i's expected payoff from playing an action a_i in a social interaction with j given her group identity level and beliefs about her partner's group identity level is

$$V(a_i, t_i, \alpha_j) = \int_{\underline{t}}^{\bar{t}} v(a_i, a_j, t_i, \gamma(i,j))\alpha_j(s_j, s_i, t_j, \gamma(j,i))\mu(t_j|g(j), s_j)dt_j, \tag{2}$$

which is citizen i's interim payoff for the social interaction.

In a PBE to the game, $a_i \in \arg\max_{a \in A_i} V(a, t_i, \alpha_{j(i)})$ for all i. Additionally, posterior beliefs μ, which are incorporated into the interim payoffs in Equation 2, must be consistent with Bayesian updating using the equilibrium signaling strategies described in the next section. However, as Lemma 1 illustrates, it is possible to make some predictions about strategies in social interactions that do not depend on political choices in the first stage. Specifically, in any best response to any profile of strategies, citizens with higher group identity engage in more ingroup favoritism.

Lemma 1. *Any best response by a player $i \in N$ to any profile of opponents' strategies is a pure strategy that is monotonically non-decreasing (non-increasing) in identity level for ingroup (outgroup) interactions.*

Lemma 1 verifies the intuition that motivated Assumption 5, which is that high group identity should be associated with weakly higher levels of ingroup favoritism.

In the first stage, citizens account for the expected consequences of political choices in social interactions. For any i, the expected payoff to i in a social interaction with j after choosing the signal s is

$$W(t_i,s,\gamma(i,j)) = \int_{\underline{t}}^{\bar{t}} \sum_{q\in\Sigma} v(a_i,\alpha_j(s_j,s_i,t_j,\gamma(i,j)),t_i,\gamma(i,j))\sigma(q|t_j,g(j))p(t_j|g(j))dt_j$$

if Σ is finite, and

$$W(t_i,s,\gamma(i,j)) = \int_{\underline{t}}^{\bar{t}} \int_{\Sigma} v(a_i,\alpha_j(s_j,s_i,t_j,\gamma(i,j)),t_i,\gamma(i,j))\sigma(q|t_j,g(j))p(t_j|g(j))dqdt_j$$

if Σ is infinite. Player i's total expected payoff from choosing $s\in\Sigma$ is therefore

$$\overline{W}(t_i,s) = \left(1-\frac{m}{|g(i)|}\right)W(t_i,s,1)+\frac{m}{|g(i)|}W(t_i,s,0)-c(s_i,t_i) \tag{3}$$

Thus, in an equilibrium to the game, all players choose s_i to maximize $\overline{W}(t_i,s)$ given their own level of group identity, and choose efforts a_i to maximize $V(a_i,t_i,\alpha_j)$ given their own level of group identity and the available information about their partner's level of group identity.

Theorem 1 (Existence of equilibria with symbolic political behavior)**.** *There exists an equilibrium to the game in which:*

1. *Citizens with higher group identity engage in (weakly) higher levels of symbolic political behavior (i.e. σ_i is weakly increasing in t_i for all i).*
2. *In ingroup (outgroup) interactions, citizens increase (decrease) effort in response to higher levels of symbolic political behavior (i.e. α_i is increasing in s_i and $s_{j(i)}$ for all i when $\gamma_i = 1$ and decreasing in s_i and $s_{j(i)}$ when $\gamma_i = 0$).*

Theorem 1 has several implications, each of which merit independent discussion. First, citizens' levels of symbolic political behavior are increasing functions of their levels of group identity. In applications, this result is consistent with empirical studies showing that people who identify with a group are more likely to protest on behalf of that group (van Zomeren, Postmes and Spears, 2008). Furthermore, it is clearly a prerequisite for my conceptualization of symbolic political behavior – for signals to communicate any information about an individual's level of group identity, there must be a clear relationship between identity and participation.

Second, citizens respond to higher signals from their fellow ingroup members by increasing their effort in social interactions, but they respond to higher signals by outgroup members by decreasing effort. Thus, the model implies that expressions of identity can have a broader divisive effect on group relations within a community.

To clarify this implication, imagine two communities with similar populations. In one community, there is a pending ballot initiative over whether English or Spanish will be the official language in the community, and citizens from both the English-speaking and Spanish-speaking groups have an opportunity to mobilize in support of one view or another. In the other community, there is no ballot initiative and therefore no similar opportunities for political expression. Holding everything else equal, the model suggests higher levels of ingroup favoritism in the community with the ballot initiative. In general, controlling for the preferences within the communities, the presence of symbolic political behavior in a community increases solidarity within groups and strains relationships between groups.

The third implication is that citizens' levels of effort in social interactions depend on their own signals. This implication illustrates how symbolic political behavior structures individuals' social interactions not only by causing others to respond differently to that individual but also by allowing that individual to commit to changing her own behavior in future interactions. In the outgroup context, this implication also illustrates how views about outgroup members can be self-reinforcing. After a citizen observes a high signal from an outgroup member, she believes that the outgroup member will exert low effort in their social interactions. As a result, she lowers her own effort in interactions with that outgroup member, which causes the outgroup member to exert lower effort, in line with the citizen's original expectations.

Theorem 1 implies that there is always an equilibrium with symbolic political behavior but does not guarantee that it is the unique equilibrium to the game. In fact, for very high levels of intergroup contact, there may exist equilibria in which σ_i is decreasing in t_i for some i over some range of types. These equilibria are a result of the unusual characteristics of outgroup interactions. In contrast to most signaling games, the trait that decreases the cost of political expression in this game is undesirable in outgroup interactions. Appendix B demonstrates one set of circumstances under which low identity types are sufficiently motivated to separate themselves from high identifiers so they will pay the higher cost of signaling and high identifiers are unwilling to pay the lower cost because they have less to gain from outgroup interactions. However, as Theorem 2 shows, if ingroup interactions are sufficiently likely relative to outgroup interactions, symbolic political behavior is the unique prediction of the game.[4]

Theorem 2 (Uniqueness)**.** *There exists $\rho^* \in [0,1)$ such that, if $\min_{g\in\{L,R\}}\{1-\frac{m}{|g|}\} > \rho^*$, all equilibria exhibit symbolic political behavior.*

Theorem 2 and the results in Appendix C demonstrate that the model can only guaranteed to provide unique predictions when intergroup contact is low. Though this is a limitation of the model, low intergroup contact is typical for many applications. In the immigration contact, to which I refer many times in this article, segregation is the rule rather than the exception. In the United States, Anglo-Americans live in neighborhoods that are less than ten percent Hispanic on average and nearly half of Hispanic Americans live in immigrant enclaves (Alba et al., 2014).

To summarize, symbolic political behavior is conceptualized as political expression designed to communicate information about individual social identity for the sake of shaping social interactions. This behavior occurs when there is a positive relationship between group identity and signals and citizens respond to partners' signals accordingly. There is always an equilibrium to the game that meets these criteria and this is the only type of equilibrium to the game when intergroup contact is low enough. In an equilibrium exhibiting symbolic political behavior, citizens

[4]Since my definition of an equilibrium involving symbolic political behavior requires only that signals are *weakly* increasing in types, Theorem 2 does not rule out pooling equilibria in which all types play the same signal. However, Appendix C demonstrates existence and uniqueness of separating equilibria under additional assumptions that guarantee smoothness of utility functions and rule out corner solutions.

increase effort in social interactions when they or their partners have sent high signals. In outgroup interactions, citizens respond to signals in the opposite fashion.

2.2 The effects of social context

Since symbolic political behavior is driven by pressures from social interactions with ingroup and outgroup members, the comparative statics for symbolic equilibria generate implications about how social context changes incentives to engage in political expression.

Lemma 2 shows that individuals have a greater incentive to engage in symbolic political behavior when others in the community are doing the same. Lemma 2 provides a useful way of conceptualizing incentives off-the-equilibrium-path. Suppose, for example, that a random subset of the population received an exogenous intervention (e.g. they were targeted by a door-to-door canvassing campaign) that made them more likely to engage in political expression. Lemma 2 suggests that such an intervention would also have a positive indirect effect on the likelihood of political expression for those in the same community that were not targeted by the intervention.

Lemma 2. *Let* (σ_i, α_i) *be an equilibrium involving symbolic political behavior. Let* s_{-i} *be the profile of expression choices by players in* $N \backslash \{i\}$*. Then* $\overline{W}(\cdot)$ *has increasing differences in* (s_i, s_{-i}) *for any* $i \in N$.

Finally, citizens should engage in higher levels of symbolic political behavior when most of their social interactions are with members of their ingroup. Two parameters in the model affect the likelihood of ingroup interactions: the level of intergroup contact m and the size of the individual's group $|g(i)|$. Citizens pursue symbolic political behavior more intensely when intergroup contact is low or when their group constitutes a large majority.

Theorem 3 (Comparative statics)**.** *In any equilibrium exhibiting symbolic political behavior, signals are lower when intergroup contact is higher (i.e.* σ_i *is decreasing in* m *for all* i*) and signals are higher for larger groups (i.e.* σ_i *is increasing in* $|g(i)|$ *for all* i*).*

Theorem 3 is useful for empirically distinguishing symbolic political behavior from other types of political behavior. Specifically, political participation based purely on instrumental policy motivation should not depend on levels of segregation or group sizes in this way.

Additional comparative statics results apply to changes in the distribution of identity levels in either of the two groups. Theorem 4 states that any individual faces a weak incentive to increase her engagement in symbolic political behavior when the distribution of group identity in either her group or the outgroup increases according to the monotone likelihood ratio (MLR) order.[5]

Theorem 4. *Fix a prior distribution over t_i for any $i \in N$. In any equilibrium with symbolic political behavior, σ_i weakly increases in response to an MLR increas in $p(g(i))$ or $p(G \backslash \{g(i)\})$.*

Theorem 4 suggests a new set of hypotheses regarding how individual engagement in identity politics may respond to group-level changes in the distribution of identity in either the individual's own group or in her outgroup. For instance, in an immigration context, members of the dominant group should be more willing to engage in anti-immigration expression when they perceive more nativist attitudes among members of their own group or when they believe believe that immigrants identity very strongly with fellow people their country of origin.

2.3 Generalizing the structure of social interactions

So far I have treated intergroup contact as a community-wide characteristic. However, the main implications of the model are unchanged if intergroup contact is treated as a characteristic of an individuals' social network. This generalization makes the model more applicable to network datasets often analyzed in studies of political behavior.

[5]Following the definition in Athey (2002), the distribution g is higher than another distribution f in the MLR order if, for all $\theta' > \theta$,

$$\frac{g(\theta')}{g(\theta)} \geq \frac{f(\theta')}{f(\theta)}.$$

To accommodate heterogeneous social networks, I change the process for pairing citizens for social interactions. Nature assigns pairs using a function f, which assigns probability to each element of a set $\beta = \{B_1, \ldots, B_K\}$ of symmetric binary relations on N. For each $B \in \beta$, the graph (N, B) represents a possible network of interactions. Citizen i's *partners* are

$$E(i,B) = \{j \in N : (i,j) \in B\}.$$

Some citizens may be matched with more than one partner. In this case, I assume as before that all social interactions occur simultaneously and the payoff to that citizen from her social interactions is the sum of her payoffs from each social game.

For any individual i,

$$H(i) = \frac{\sum_{B \in \beta} f(B) \sum_{j \in E(i,B)} \gamma(i,j)}{\sum_{B \in \beta} f(b) |E(i,B)|} \tag{4}$$

is the *homogeneity* of individual i's social network. $H(i)$ represents the expected proportion of ingroup partners in i's social interactions.

Theorem 5. *There is an equilibrium to the game with heterogeneous social networks exhibiting symbolic political behavior. In such an equilibrium, signaling strategies are weakly increasing in $H(i)$ for all i.*

Theorem 5 verifies that the basic implications of the baseline model are preserved in a setting that allows for richer social interactions. The individual homogeneity variable $H(i)$ replaces the group-level variable $m/|g(i)|$ from the baseline model, and the basic implication about intergroup contact remains the same.

The very general class of distributions over social interactions used in Theorem 5 is especially important in light of the fact that individuals have some ability to select into social groups, which might create wide variation in intergroup contact levels within members of the same group. Allowing endogenous selection into contests is outside of the scope of this paper. However, as long as social interactions have a stochastic element, the result suggests that the implications of the model should be robust to the distributions that would result from self-selection into contests.

3 Application to Anti-Immigrant Politics

In this section, I show how my model may explain variation in levels of anti-immigrant mobilization. Mobilization against immigrants is a critical issue in many modern democracies. For instance, many right-wing parties in Western Europe gain support based on anti-immigrant platforms (Fennema, 1997) and opposition to immigration drives many local initiatives in the United States (Alvarez and Butterfield, 2000).

The policy game

In order to apply the model to anti-immigrant mobilization, I expand the model to include policy motivation. The policy game includes a final outcome that depends on the expressive choices of the citizens. Group L is the "native" group and R is the immigrant group. An anti-immigrant policy is under consideration and natives can affect the probability of passing the policy by attending a demonstration ($s_i = 1$) or staying home ($s_i = 0$). The sequence of play is identical to the baseline model except that, after the social interactions, the pro-majority-group policy is enacted ($x = 1$) or not ($x = 0$). If $\bar{s} = \sum_{i \in L} s_i$ is the total number of group L members attending the demonstration, the probability that the policy is enacted is $\bar{s}/|L|$, or the proportion of group L members attending the demonstration.

If the anti-immigrant policy is enacted and $i \in L$, individual i receives a policy benefit equal to $y(t_i)$. The function $y(\cdot)$ is increasing in t_i. The function y need not be strictly positive; some types in the native group may be opposed to the anti-immigrant policy. Policy preferences are private information since they depend on t_i.

The social and policy benefit to a majority group member from attending the demonstration is

$$Y(s_i, t_i) = \overline{W}(s_i, t_i) + \frac{\bar{s}}{|L|} y(t_i) \tag{5}$$

The key implications of the baseline model also apply to the policy game.

Theorem 6. *There exists an equilibrium to the policy game with symbolic political behavior.*

Theorem 6 verifies that, although the baseline model focused on the extreme case in which there was no policy motivation, the logic of the model applies equally well to cases with substantial policy motivation.

An example with racial threat

The implication that immigrant contact reduces anti-immigrant activism appears at odds with the "racial threat hypothesis" (Key, 1949) and recent empirical work on anti-immigrant actions (Hopkins, 2010). However, a slight modification of the model provides guidance for thinking about the different ways that contact can affect mobilization.

By way of example, I construct an environment with three communities. The "Diverse" community has equal numbers of natives and immigrants. In the "Immigrant Minority" community the vast majority $(2/3)$ of residents are natives. The "Homogeneous" community has zero immigrants. The composition of the communities is depicted below.

	Diverse	Immigrant Minority	Homogeneous
# Natives	30	20	10
# Immigrants	30	10	0

For this example, policy preferences depend on community of residence in addition to type. Members of more integrated communities perceive a greater threat from the immigrant community so are more supportive of the anti-immigrant policy. The perceived benefit of the policy is:

$$y(t_i) = t_i + \upsilon\left(\frac{\text{\# Immigrants}}{\text{Size of Community}}\right).$$

All types are independently drawn from a uniform distribution on $[0,1]$. Expression costs are linearly decreasing in type, so $c(0,t_i) = 0$ for all t_i and $c(1,t_i) = 1 - t_i$. Payoffs to i from social interactions with j are $\beta\left[\sqrt{a_i}(1+a_j) - \gamma(i,j)(2-t_i)a_i - (1-\gamma(i,j))(1+t_i)a_i\right]$ where $\beta > 0$ is a scaling parameter. The payoffs for social interactions are chosen to meet Assumptions 3-5, but are otherwise arbitrary.

	$\upsilon = 0$	$\upsilon = 1$	$\upsilon = 2$	$\upsilon = 3$	$\upsilon = 4$
Diverse	0.37	0.46	0.56	0.65	0.75
Immigrant Minority	0.43	0.49	0.56	0.62	0.69
Homogenous	0.55	0.55	0.55	0.55	0.55

Table 1: Cell values are the proportion of members of each community who attend an anti-immigrant demonstration for $\beta = 25$, for four different values of υ. Since types are uniformly drawn, the proportions are $1 - r$, where r is the cutpoint representing the signaling strategy.

Consider an empirical strategy that simply compares mobilization levels in each community without accounting for individual preferences. In equilibrium, activism can be either positively or negatively correlated with contact, depending on the effect of contact on policy preferences (υ).

Table 1 lists the proportion each community who attend the anti-immigrant demonstration in equilibrium for several values of υ. When racial threat has a large effect on policy preferences, anti-immigrant mobilization is positively associated with immigrant contact. In these cases, an analyst would conclude (incorrectly) that immigrant contact has a positive effect on mobilization.

A superior empirical strategy would use individual-level measures of preferences and participation to separate the effect of intergroup contact on policy preferences from its direct effect on mobilization. I focus on the worst case of $\upsilon = 4$ in Table 1 and show that the analyst would still find a negative direct effect of intergroup contact on mobilization.

An analyst may start by running a linear regression[6] for mobilization as a function of contact. In keeping with the conclusions of the first study, this regression yields[7]

$$E[\text{Mobilization}] = .6 + .26 \cdot \{\text{Intergroup contact}\}$$

indicating that intergroup contact has a positive total effect on mobilization in this situation.

To decompose the total effect into direct and indirect effects, an analyst might use the mediation

[6] It simplifies my example, but does not change the intuition, to assume a linear probability model for this example.

[7] These results are generated by drawing types uniformly for natives in each community, computing policy preferences using the formula above, and recording mobilization decisions from the numerical solution to the game given in Table 1.

methods described by Baron and Kenny (1986). The first step is to run a linear regression model on the measure of policy preferences as a function of intergroup contact and the measure of group identity. By construction of the example, this regression would yield

$$\text{Policy preferences} = 4 \cdot \{\text{Intergroup contact}\} + 1 \cdot \{\text{Group identity}\}.$$

Next, the analyst would regress mobilization decisions on intergroup contact and policy preferences,[8] which yields

$$E[\text{Mobilization}] = -.001 - 4.54 \cdot \{\text{Intergroup contact}\} + 1.2 \cdot \{\text{Policy preferences}\}.$$

The indirect effect through policy preferences of intergroup contact on mobilization is $4 \cdot 1.2 = 4.8$ and the direct effect is -4.54. Thus this approach would lead to the correct conclusion that intergroup contact has a negative direct effect on anti-immigrant mobilization.

This example illustrates that researchers should be cautious when applying the empirical implications of the model to data when there is significant policy motivation. The effects of intergroup contact on policy preferences may cut in the opposite direction of its direct effects on mobilization, confounding results in studies of anti-immigrant mobilization that do not control for individual policy preferences. I turn now to another application of the model to a different form of symbolic behavior.

4 Implications for Extant Theoretical Work

This study has implications for two distinct strands of theoretical research. First, I provide an informational rationale for group-based collective action that complements other theories in which social processes created selective incentives for individual contributions to group goods (Hardin,

[8] Normally group identity would also be included at this stage, but in this example policy preferences are a linear combination of group identity and intergroup contact.

1997; Kuran, 1998; Chong, 1991). Though that work focuses on group coordination on equilibria in which non-contributing group members are socially sanctioned, the present study suggests that high levels of contribution can also be supported when contribution communicates private information about an individual's attachment to her group in other interactions.

Second, this study contributes to a growing political economy literature on the effects of social identity and group dynamics. [9] Most notably, Posner (1998) explains why some actions such as showing respect for the American Flag gain symbolic significance by signaling cooperativeness to other members of society.

The model in this paper relates to several existing applications in economics and political science. Austen-Smith and Fryer's (2005) model of "acting white" illustrates how a desire to signal social (as opposed to academic) ability to peers may explain why group norms in some African American communities discourage academic achievement. Charles, Hurst and Roussanov (2009) explains how members of low-status groups to engage in conspicuous consumption to signal that they have high social status. Though that paper explains how group-level characteristics affect individual behavior, they predict that a lower type (social status) distribution in an individual's own group will lead her to work harder to signal social status. This contrasts with my Theorem 4 in which it is demonstrated that increasing one's ingroup type distribution leads to higher signals. This difference occurs because, while Charles, Hurst and Roussanov's (2009) result is driven by the way that an individual's group affects others' assumptions about that individual, I hold beliefs about the individual constant and focus on the way that the distribution of others' types affects the value of different social interactions to the individual. Finally, Patel (2012) provides a signaling-based explanation for the resurgence of conservative "Islamic dress' among women in the Middle East. Through Patel does not specify an explicit formal model, the mechanism described in his

[9] Recent political science models including identity concerns into individual preferences include in an electoral setting include some game-theoretic models designed to ascertain the effect of identity in elections (Dickson and Scheve, 2006, 2010) and a series of models that consider group identity itself as a strategic decision (Penn, 2008*a*,*b*; Shayo, 2009).

work is similar to the results in this study.

Some previous models treat social identity as a choice made endogenously by the players of the game (Penn, 2008*a*,*b*; Shayo, 2009; Sambanis and Shayo, 2013). In contrast, I take identity to be an exogenous characteristic of the citizens playing the game. Thus, some readers may be concerned about the possibility that, if identity were endogenous, the aspects of social identity analyzed here would not be relevant under the conditions provided by the game. However, a notable feature of the equilibria in my model is that in-group favoritism is self-reinforcing: as long as a person believes that other members of society are engaged in in-group favoritism, the incentive is to treat members of one's in-group better and members of one's out-group worse. This suggests that the aspects of group identity emphasized in the model ought to be stable in a world where citizens actively chose their identities.

5 Conclusion

Empirical work on identity in political science has focused predominantly on the way that identity maps onto policy attitudes (Citrin, Reingold and Green, 1990, e.g.). Though understanding the determinants of political attitudes is valuable, attitudes do not translate automatically into behavior. In the area of identity politics, I show that the private nature of preferences and their relevance for social interactions may provide unexpected connections between attitudes and behavior. Citizens with strong group identity take advantage of the opportunity provided by group expression to distinguish themselves from weaker group identifiers to improve their prospects in social interactions with members of their ingroup. As a consequence of this argument, I am able to derive well-defined implications about the effects of social context on individual decisions to participate in group expression.

The results of my model lead naturally to empirical applications. The model yields the following empirical implications related to political expression as symbolic political behavior:

- Citizens who identify more strongly with a group are more likely to engage in political expression on behalf of that group.

- A citizen is more likely to engage in political expression if more of her acquaintances are doing the same.

- If most of a citizen's social interactions are with members of her own group, she is more likely to engage in political expression on behalf of that group.

- Members of communities with higher rates of group-based political expression tend to exhibit higher rates of discrimination in social interactions.

Empirical applications of this model should make use of detailed individual-level data with valid measures of group identity and policy preferences in addition to local group context and outcomes of interest.

Overall, the theory provides a foundational logic for political expression based on informationally valuable signals. The theory accounts for the fact that citizens' social lives affect their political choices and their social interactions are affected by the forms of political expression in which they participate. This logic applies to a broad range of political choices: The examples presented in this paper include anti-immigrant mobilization and display of symbolic clothing, but the argument could apply equally well to some forms of protest behavior, ethnic voting, or violent ethnic conflict.

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Appendix

A Proofs of Results

In this section I prove the main results from the text as well as some supplemental Lemmas that help establish the results. I prove the main existence result and all results for social interactions using the case with heterogeneous social networks. The baseline model is a special case in which f assigns equal probability to all graphs B such that $E(i,B) = 1$ for all i and $|\{(i,j) \in B : \gamma(i,j) = 0\}| = m$.

To simplify the exposition of some of the proofs, I establish two definitions.

Definition 2. *A social strategy α is divisive if, for all $i,j \in N$, $\alpha_i(s_i, s_j, t_i, \gamma(i,j))$ is monotonically increasing in (s_i, s_j) when $\gamma(i,j) = 1$ (ingroup interactions) and monotonically decreasing in $(s_i, s_{j(i)})$ when $\gamma(i,j) = 0$ (outgroup interactions).*

Definition 3. *A signaling strategy is increasing if, for any $s \in \Sigma$ and any $t, t' \in [\underline{t}, \bar{t}]$ such that $t' > t$, if $\sigma(s|t,g) > 0$, then $\sigma(s'|t',g) = 0$ for any $s' < s$.*

Thus, an equilibrium exhibiting symbolic political behavior as described by Theorem 1 is one in which social strategies are divisive and signaling strategies are increasing.

Lemma 1 *Any best response by a player $i \in N$ to any profile of opponents' strategies is a pure strategy that is monotonically non-decreasing (non-increasing) in identity level for ingroup (outgroup) interactions.*

Proof. Since increasing differences (ID) is preserved by integration, V satisfies ID in (a_i, t_i) when $\gamma(i,j) = 1$. By Monotone Selection Theorem 4' of Milgrom and Shannon (1994, p. 163), every selection from

$$\arg\max_{a \in A_i} V(a_i, t_i, j)$$

is monotone non-decreasing in t_i for ingroup interactions. After substituting $-t_i$ for t_i, the same argument applies to interactions for which $\gamma(i,j) = 0$, so these strategies are monotone non-decreasing in $-t_i$. Furthermore, since strict quasi-concavity is preserved by integration, V is strictly quasi-concave and its maximizer is a pure strategy. $\square$

Lemma 3. *There exists an equilibrium to the social game. Furthermore, if σ_i is increasing in t_i for all i, then α is increasing (decreasing) in $(s_i, s_{j(i)})$ for ingroup (outgroup) interactions.*

Proof. First, $\gamma(i,j) = 1$. Recall that V has ID in (a_i, a_j) and (a_i, t_i). By Lemma 1, $a_j(s_j, s_i, t_j, i)$ is non-decreasing in t_j. Furthermore, since σ_j is in increasing strategies, if $t' \in \{t \in [\underline{t}, \bar{t}] : \sigma_j(s'|t, g(j)) > 0\}$ and $t \in \{t \in [\underline{t}, \bar{t}] : \sigma_j(s|t, g(j)) > 0\}$ and $s' > s$, then $t' > t$. Thus, V has ID in (a_i, s_j). By the Monotone Selection Theorem, a_i is non-decreasing in s_j. Furthermore, since the same argument implies that a_j is non-decreasing in s_i, V has ID in (a_i, s_i), so a_i is non-decreasing in s_i. Next, $\gamma(i,j) = 0$ and recall that V has ID in (a_i, a_j) and $(a_i, -t_i)$. By Lemma 1, $a_j(s_j, s_i, t_j, i)$ is non-decreasing in $-t_j$. Since σ_j is in increasing strategies, the same argument made above implies that V has ID in $(a_i, -s_j)$. Therefore, in any equilibrium, a_i is non-decreasing in $-s_j$ and $-s_i$. Since actions in the social game are strategic complements, the best response correspondence $BR : \alpha \to \alpha$ is increasing, so Tarksi's fixed point theorem implies the existence of an equilibrium. $\square$

Lemma 4. *If α is increasing (decreasing) in $(s_i, s_{j(i)})$ for ingroup (outgroup) interactions, $\overline{W}(\cdot)$ has increasing differences in (s_i, t_i).*

Proof. Since increasing differences is preserved after taking expectations over potential partners, it is sufficient to show that i's value from all social interactions satisfies ID in (s_i, t_i). I start by noting the fact that ID is preserved under the maximization operation (Topkis, 1978). Let

$$V^*(t_i, j) = \max_{a_i \in A_i} V(a_i, t_i, j).$$

First, let $\gamma(i,j) = 1$. Since α is divisive, a_j is increasing in s_i, so V has ID in (s_i, t_i). Since ID is preserved under maximization, V^* has ID in (s_i, t_i). Next, let $\gamma(i,j) = 0$. Since α is divisive, a_j is increasing in is_i, so V has ID in $(-s_i, -t_i)$ and therefore in (s_i, t_i). Since increasing differences is preserved under maximization, V^* has ID in (s_i, t_i). Therefore, $\overline{W}(\cdot)$ also has ID in (s_i, t_i). $\square$

Lemma 2 *Let (σ_i, α_i) be an equilibrium involving symbolic political behavior. Let s_{-i} be the profile of expression choices by players in $N \backslash \{i\}$. Then $\overline{W}(\cdot)$ has increasing differences in (s_i, s_{-i}) for any $i \in N$.*

Proof. Following the strategy in the proof of Lemma 4, I will show that $V^*(t_i, j)$ has ID in (s_i, s_j) for all social interactions. Since V satisfies ID in (a_i, a_j) and actions are increasing in (s_i, s_j) when α^* is divisive, V satisfies ID in (s_i, s_j). Since ID is preserved by integration and maximization, $V^*(t_i, j)$ has ID in (s_i, s_{-i}). Hence, $W(\cdot)$ has ID in (s_i, t_i). $\square$

Lemma 5. *If α is divisive, then the corresponding signaling game has an increasing equilibrium.*

Proof. By Theorem 14 of Van Zandt and Vives (2007), if each agent's utility function has ID in (s_i, s_{-i}) and in (s_i, t_i), then there exists a greatest and a least Bayesian Nash equilibrium, and each one is in monotone strategies.[10] Thus, it is sufficient to note that for any monotonic equilibrium α of the effort stage and any profile of signaling strategies σ_{-i} by the other agents, if α divisive, then $\overline{W}$ has ID in (s_i, t_i) and in (s_i, s_{-i}), which follows from Lemma 4 and Lemma 2. Thus, if α is divisive, the corresponding signaling game has an equilibrium in increasing strategies. $\square$

Theorem 1 (Existence of equilibria with symbolic political behavior) *There exists an equilibrium to the game in which:*

1. *Citizens with higher group identity engage in (weakly) higher levels of symbolic political behavior (i.e. σ_i is weakly is increasing in t_i for all i).*

[10] The complete statement of the original theorem is as follows. *Assume for each player $i \in N$ that u_i is supermodular in a_i, has increasing differences in (a_i, a_{-i}), and has increasing differences in (a_i, t), and assume that each individual i's beliefs mapping is increasing in t_i with respect to the partial order on probability measures on $\mathscr{T}$ of first order stochastic dominance. Then there exists a greatest and least Bayesian nash equilibrium, and each one is in monotone strategies.* Since $[\underline{t}, \bar{t}]$ is one-dimensional and beliefs are derived from a common prior, the condition on the beliefs mapping also holds trivially. Thus, I need only show that payoffs have increasing differences in (a_i, a_j) and (a_i, t_i) to obtain the existence and monotonicity result.

2. *In ingroup (outgroup) interactions, citizens increase (decrease) effort in response to higher levels of symbolic political behavior (i.e. α_i is increasing in s_i and $s_{j(i)}$ for all i when $\gamma_i = 1$ and decreasing in s_i and $s_{j(i)}$ when $\gamma_i = 0$).*

Proof. By Lemma 3, when citizens with group identity engage in (weakly) higher levels of symbolic political behavior, there is an equilibrium to the social game in which citizens increase (decrease) effort in ingroup (outgroup) interactions in response to higher signals. That is, α is divisive following increasing signaling strategies. By Lemma 5, any divisive social strategies α induce an increasing equilibrium to the signaling stage. Thus, there exists an equilibrium in which α is divisive and σ is increasing. □

Theorem 2 (Uniqueness) *There exists $\rho^* \in [0,1)$ such that, if $\min_{g\in\{L,R\}}\{1-\frac{m}{|g|}\} > \rho^*$, all equilibria exhibit symbolic political behavior.*

Proof. In a decreasing equilibrium, there must be a type t' playing a signal s' and a type $t < t'$ playing a signal $s > s'$. Thus, $c(s,t) - c(s',t) \leq \overline{W}(s,t) - \overline{W}(s',t)$ and $c(s,t') - c(s',t') \geq \overline{W}(s,t') - \overline{W}(s',t')$. In particular, since $c(s,t) - c(s',t) > 0$, we must have $\overline{W}(s,t) - \overline{W}(s',t) > 0$. Furthermore, in a decreasing equilibrium, $W(s,t',1) - W(s',t',1) < 0$ and $W(s,t',0) - W(s',t',0) > 0$. Furthermore, since $\overline{W}(s,t) - \overline{W}(s',t)$ is continuous and strictly decreasing in $\frac{m}{|g(i)|}$, we have $\overline{W}(s,t) - \overline{W}(s',t) < 0$ when $1 - \frac{m}{|g(i)|}$ lies in some interval $[\rho^*, 1]$. Thus, when $1 - \frac{m}{|g(i)|} > \rho^*$ for all i, only monotonic strategies are played in equilibrium. □

Theorem 3 (Comparative statics) *In any equilibrium exhibiting symbolic political behavior,signals are lower when intergroup contact is higher (i.e. σ_i is decreasing in m for all i) and signals are higher for larger groups (i.e. σ_i is increasing in $|g(i)|$ for all i).*

Proof. Lemma 2 establishes that $\overline{W}$ has ID in actions in an increasing equilibrium. Since divisiveness of α and Assumption 3 imply that the marginal effect of increasing s_i is positive for ingroup interactions and negative for outgroup interactions, $\overline{W}$ has ID in $-m/|g(i)|$. Thus, the Monotone Selection Theorem implies that signaling strategies are increasing in $|g(i)|$ and decreasing in m. □

Theorem 5 *There is an equilibrium to the game with heterogeneous social networks exhibiting symbolic political behavior. In such an equilibrium, signaling strategies are weakly increasing in $H(i)$ for all i.*

Proof. Existence of an equilibrium with symbolic political behavior is implied by the proof of Theorem 1. To establish the comparative statics result for $H(i)$, note that Equation 3 can be decomposed in the following way

$$\begin{aligned}
\overline{W}(t_i,s) &= \sum_{B\in\beta}\left[f(B)\sum_{j\in E(i,B)} W(t_i,s,j)\right] - c(s_i,t_i) \\
&= \sum_{B\in\beta}\left[f(B)\left[\sum_{j\in E(i,B)\cap g(i)} W(t_i,s,j) + \sum_{j\in E(i,B)\cap N\backslash g(i)} W(t_i,s,j)\right]\right] - c(s_i,t_i) \\
&= \sum_{B\in\beta} f(B)\left[\left|E(i,B)\cap g(i)\right|\hat{W}(t_i,s,g(i)) + \left|E(i,B)\cap N\backslash g(i)\right|\hat{W}(t_i,s,N\backslash g(i))\right] \\
&= H(i)\hat{W}(t_i,s,g(i)) + (1-H(i))\hat{W}(t_i,s,N\backslash g(i))
\end{aligned}$$

Since divisiveness of α and Assumption 3 imply that the marginal effect of choosing higher s_i is positive for ingroup interactions and negative for outgroup interactions, $\overline{W}$ has ID in $H(i)$. Thus, the Monotone Selection Theorem implies that signaling strategies are increasing in $H(i)$, □

Theorem 4 *Fix a prior distribution over t_i for any $i\in N$. In any equilibrium with symbolic political behavior, σ_i weakly increases in response to an MLR increase in $p(g(i))$ or $p(G\backslash\{g(i)\})$.*

Proof. By Theorem 2 of Athey (2001), if payoffs have ID in (s_i,τ) then the optimal s_i is nondecreasing for MLR changes in the distribution of τ. Since α is divisive, α_j is increasing in s_i and in t_j and α_i is increasing in s_i when $\gamma(i,j)=1$. Thus, since v has ID in the actions of both players, social payoffs have ID in (s_i,t_j) for in-group interactions. Furthermore, by divisiveness of α, α_j is decreasing in s_i and t_j and α_i is decreasing in s_i when $\gamma(i,j)=0$. Thus, social payoffs also have ID in (s_i,t_j) for outgroup interactions. Thus, by Athey's theorem, σ_i is increasing in response to MLR changes in either $p(g(i))$ or $p(G\backslash\{g(i)\})$. □

B An equilibrium without symbolic political behavior

Since equilibria without symbolic political behavior are unusual and difficult to construct, I use an example with only two types and where citizens interact only with members of the outgroup. In this extreme example, $n_L = n_R = \frac{|N|}{2}$ and all agents are guaranteed to interact with an outgroup member. Assume citizens belong to one of only two types, $t_i \in \{0,1\}$ occurring with equal probability in both groups. Let $v_i(a_i, a_{j(i)}, t_i, 0) = \sqrt{a_i}\sqrt{a_j} - a_i^{2-t_i}$, with actions restricted to the interval $[0, \frac{1}{2}]$. It is easy to confirm that v_i is concave in a_i, increasing in $a_{j(i)}$, and has increasing differences in both $(a_i, -t_i)$ and $(a_i, a_{j(i)})$ over the range of possible efforts. Citizens can send one of only two signals, labelled L and H, with $c(L,0) = c(L,1) = 0$ and $c(H,0) > c(H,1)$. I show that, for some range of costs $c(H,0)$ and $c(H,1)$, there may be a separating equilibrium in which low types signal H with probability 1 and high types signal L with probability 1.

Consistent beliefs place full probability on low types conditional on a signal H and full probability on high types conditional on a signal L. A set of sequentially rational efforts at each information set are as follows:

$t_i = 0$

Own Signal \ Partner Signal	L	H
L	0	$\frac{1}{4\sqrt[3]{2}}$
H	$\frac{1}{8}$	$\frac{1}{4}$

$t_i = 1$

Own Signal \ Partner Signal	L	H
L	0	$\frac{1}{32}$
H	$\frac{1}{128}$	$\frac{1}{16}$

From these strategies, it follows that the marginal effort-stage benefit to a high type for signalling H rather than L is $\frac{1}{256}$, or around .0195. The marginal effort-stage benefit to a low type for signalling H rather than L is $\frac{3}{128}\left(5 - 2\sqrt[3]{2}\right)$, or around .0581. Thus, an equilibrium of this kind exists if $c(H,0) < .0581$ and $c(H,1) > .0195$. $\square$

C Separating equilibria in smooth games with low intergroup contact

In this Appendix, I demonstrate existence and uniqueness of separating equilibria for a class of smooth games with low intergroup contact.

A parametrization of this game will be called *smooth* if $\Sigma = [0,1]$, $c(0,t) = 0$ for all t, and both c and v are twice continuously differentiable. For the purpose of brevity, I will say that a smooth parametrization of the game *admits only interior solutions* if the cost of the highest signal outweighs any possible social benefit ($c(1,\bar{t}) > \max_a v(a, \sup A, t_i, \gamma(i,j)) - \max_a v(a, \inf A, t_i, \gamma(i,j))$ for all t_i and all j) and if the lowest and highest effort levels are dominated for all types and all beliefs. A fully separating equilibrium is an equilibrium in which no two types play the same $s \in \Sigma$.

Theorem 7. *Assume the game is smooth and admits only interior solutions, that c is strictly convex, and v is strictly concave. Then there exists $\hat{p} \in (0,1)$ such that, if $1 - \frac{m}{|n_g|} > \hat{p}$ for each g, then there exists a fully separating equilibrium in which signals are strictly increasing in types for all agents.*

Proof. Let $\alpha_i^S(t_i, s_i, s_j, \gamma(i,j))$ be the equilibrium to the social stage in a separating equilibrium and let $V_i^S(s_i, t_i)$ be the expected payoff from that equilibrium for a given type-signal pair. Since the game admits only interior solutions under these assumptions, and since v is concave and convex, a separating equilibrium to this game satisfies

$$\frac{\partial c(s^*(t_i, g(i)), t_i))}{\partial s_i} - \frac{\partial V_i^S(s^*(t_i, g), t_i)}{\partial s_i} = 0 \; \forall i \in N. \tag{6}$$

Given that corner solutions are eliminated, there is a solution to Equation 6 as long as $\dfrac{\partial V_i^S(s^*(t_i, g), t_i)}{\partial s_i}$ is positive. Thus, since social payoffs are increasing in s_i for in-group interaction and V_i^S is continuous and strictly increasing in $1 - \frac{m}{|n_g|}$, there is a $\hat{p} \in (0,1)$ such that there exists a solution to

Equation 6 if $1-\frac{m}{|n_g|}\in(\hat{p},1)$. By the implicit function theorem,

$$\frac{\partial s^*(t_i,g)}{\partial t_i}=-\frac{\dfrac{\partial^2 c(s_i,t_i)}{\partial s_i\partial t_i}-\dfrac{\partial^2 V_i^S(s_i,t_i)}{\partial s_i\partial t_i}}{\dfrac{\partial^2 c(s_i,t_i)}{\partial s_i^2}-\dfrac{\partial^2 V_i^S(s_i,t_i)}{\partial s_i^2}}. \tag{7}$$

By Assumption 2, $\frac{\partial^2 c(s_i,t_i)}{\partial s_i\partial t_i}<0$. Furthermore, by Lemma 4, $\frac{\partial^2 V_i^S(s_i,t_i)}{\partial s_i\partial t_i}>0$. Thus, $\frac{\partial^2 c(s_i,t_i)}{\partial s_i\partial t_i}-\frac{\partial^2 V_i^S(s_i,t_i)}{\partial s_i\partial t_i}<0$. By concavity of v and convexity of c, $\frac{\partial^2 c(s_i,t_i)}{\partial s_i^2}-\frac{\partial^2 V_i^S(s_i,t_i)}{\partial s_i^2}>0$. Thus, $\frac{\partial s^*(t_i,g)}{\partial t_i}>0$, which completes the proof. □

Fix a vector of equilibrium expected payoffs $U^*(t,g)$. For each $s\in\Sigma$, define

$$D(t,s,g)=\bigcup_{\mu:\int_{[\underline{t},\bar{t}]}\mu(t)dt=1}\left\{a(t')\in\arg\max_{a'}V(a',t',\alpha,g|\mu)\forall t' \text{ and } U^*(t,g)<\overline{W}(s,t)\right\}$$

as the set of all strategies that would make type t in group g want to deviate from the equilibrium to play the signal s. Similarly, define

$$D^0(t,s,g)=\bigcup_{\mu:\int_{[\underline{t},\bar{t}]}\mu(t)dt=1}\left\{a(t')\in\arg\max_{a'}V(a',t',\alpha,g|\mu)\forall t' \text{ and } U^*(t,g)=\overline{W}(s,t)\right\}$$

as the set of all strategies that would make type t in group g indifferent between the equilibrium and deviating to s.

A type t is deleted for signal s under the D1 criterion[11] if there is a t' such that

$$\left\{D(t,s,g)\cup D^0(t,s,g)\right\}\subset D(t',s,g).$$

A D1 equilibrium is a PBE that can be supported by beliefs that place 0 probability on types

[11] Since D1 refinement was defined for signaling games with a single sender and a single receiver who each move only once, the definitions of $D(t,s,g)$ and $D^0(t,s,g)$ are slightly modified to fit the parameters of this game.

eliminated by the D1 criterion.

Lemma 6. *Assume the game is smooth and admits only interior solutions, that c is strictly convex, and v is strictly concave. Fix $s,s' \in \Sigma$ such that $s' > s$. The following statements hold as long as agents play rationally in the social stage:*

1. *If $W(t,s',1)-W(t,s,1)>0$ then $W(t,s',0)-W(t,s,0)<0$ and if $W(t,s',0)-W(t,s,0)>0$ then $W(t,s',1)-W(t,s,1)<0$.*
2. *For each $t \in [\underline{t},\overline{t}]$ there exists $\rho(t)$ such that, if $1-\frac{m}{|n_g|}>\rho(t)$, then $\overline{W}(t,s') \geq \overline{W}(t,s)$ implies that social strategies are divisive.*

Proof. **(1)** By Lemma 1 and the fact that v is concave, there is a unique (pure) best response in the social stage for each agent following any beliefs. Thus, if $W(t,s',1)-W(t,s,1)>0$ then $\mu(t|s')$ has a higher expectation than $\mu(t|s)$, which implies that out-group members reduce their effort and $W(t,s',0)-W(t,s,0)<0$. Furthermore, if $W(t,s',0)-W(t,s,0)>0$ then $\mu(t|s')$ has a lower expectation than $\mu(t|s)$, which implies that in-group members reduce their effort and $W(t,s',1)-W(t,s,1)<0$.

(2) If $\overline{W}(t,s') \geq \overline{W}(t,s)$, then

$$c(s',t)-c(s,t) \leq \left(1-\frac{m}{|n_g|}\right)\left(W(t,s',1)-W(t,s,1)\right)+\frac{m}{|n_g|}\left(W(t,s',0)-W(t,s,0)\right) \quad (8)$$

Let Δ_t represent the maximum value of $W(t,s',0)-W(t,s,0)$ for type t, which must be bounded by the interior solution assumption. Assume that $W(t,s',0)-W(t,s,0)>0$, which by (1) implies that $W(t,s',1)-W(t,s,1)<0$. If $1-\frac{m}{|n_g|}>1-\frac{W(t,s',1)-W(t,s,1)}{W(t,s',1)-W(t,s,1)-\Delta_t}$ then the right hand side of Equation 8 must be negative. Since $c(s',t)-c(s,t)$ is positive, this implies that Equation 8 cannot be satisfied when $1-\frac{m}{|n_g|}>1-\frac{W(t,s',1)-W(t,s,1)}{W(t,s',1)-W(t,s,1)-\Delta_t}$ if $W(t,s',0)-W(t,s,0)>0$. Thus, $\overline{W}(t,s') \geq \overline{W}(t,s)$ implies that $W(t,s',1)-W(t,s,1)>0$ and $W(t,s',0)-W(t,s,0)>0$, which implies that social strategies are divisive.

□

Theorem 8. *Assume the game is smooth and admits only interior solutions, that c is strictly convex, and v is strictly concave. Then there exists $p'' \in (0,1)$ such that, if $1-\frac{m}{|n_g|} > p''$, then there is a fully separating D1 equilibrium in which signals are strictly increasing in type all D1 equilibria have symbolic political behavior and involve at least two distinct signals on the path of play.*

Proof. A fully separating equilibrium exists for high enough values of $1-\frac{m}{|n_g|}$ by Theorem 7. Furthermore, this fully separating equilibrium satisfies D1 since, by construction of the equilibrium, no type would send a higher signal in order to pose as a higher type. Thus, I must show that the pooling equilibrium fails the D1 refinement for high values of $1-\frac{m}{|n_g|}$.

Fix a pooling equilibrium and an arbitrary $s \in \Sigma$. For some $t \in [\underline{t}, \bar{t})$ suppose that

$$\left\{D(t,s,g) \cup D^0(t,s,g)\right\}$$

is non-empty. By Lemma 6, if $1-\frac{m}{|n_g|}$ is high enough, then only divisive strategies are in

$$\left\{D(t,s,g) \cup D^0(t,s,g)\right\}.$$

Furthermore, by Lemma 4, $\overline{W}$ has increasing differences in (s,t) for such strategies, which implies that

$$\left\{D(t,s,g) \cup D^0(t,s,g)\right\} \subset D(\bar{t},s,g).$$

Furthermore, by continuity of c, there exists some s that would cause type $\bar{t}$ to deviate if $\mu(\bar{t}|s) = 1$ for all players. Thus, for large enough values of $1-\frac{m}{|n_g|}$, the pooling equilibrium fails to satisfy D1. $\square$