

**The Appearance of Moderation:  
The Economics of Choosing Individual Identity**

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ABSTRACT: This paper models the individual's choice of identity as the rational outcome of a game of incomplete information. Although an individual is born in society defined by her ethnicity, or other social identity, she has a choice that can modify her interactions with others. By focusing on the individual's choice of identity and the endogenous constraints to that choice, we formalize sociological concepts such as Sanskritization (Srinivas [1952]) and provide an explanation to why and how individuals choose traditions that perpetuate violence, conflict, and a lack of productivity. Unlike other papers related to this issue, our results do not rest on assuming the incompatibility of social prowess and individual productivity.

Keywords: Identity, Rational Choice, Incomplete Information

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# 1 Introduction

The question of how polarized societies evolve has become one of the most urgent issues in our contentious time. One often wonders, where have all the moderates gone? Further, how and when are identities politicized to mobilize populations in the way that we see on the news every night? What forces create a world where Yugoslavians become warring Serbians and Croats and a Danish cartoon has the power to spark riots and brutal killings worldwide? Nigeria alone lost over 100 people as competing sides defended the sanctity of their God. With the death and destruction caused by racial, ethnic and religious polarization, mutual cooperation seems clearly preferable to the alternative. What keeps identities in conflict?

Although sociologists and anthropologists have a tradition of studying the individual in relation to her society, it is only in more recent years that economists have begun to formally explore the link between an individual's social identity and her optimal actions and payoffs. With the publishing of Akerlof and Kranton's, "Economics and Identity" [2000], economists were given license to place considerations of identity into the individual's preferences and the importance has been profound. Subsequently, Basu's "Malignancy of Identity" [2005] and Sen's *Identity and Violence* [2006] brought attention to the venomous and divisive potential of identity when the behavior of an individual is attributed to all individuals of her social group. While Sen's focus is on the multiple identities a person might associate with and the conflict that can arise as a result, Basu shows how a small minority of extremists can cause conflict between two otherwise peaceful groups. In closely related work, Darity et. al. [2005] use an evolutionary game-theoretic framework to model the persistence of racialized identities. While their focus is not on resolving conflict between two competing groups, their work gives insight into some of the conditions that make for a more polarized society. In addition to the theoretical literature, empirical research by those such as Hoff and Pande [2006] has engaged in projects to quantify the cost of social stigma.

The early economic works on identity treat a person's social identity as a parameter in her utility function, i.e. a constant an individual is either lucky or unlucky enough to be born with. Of course much of how an individual is seen by the world is impacted by her choices.

Although the individual is constrained by the outside world, it is a dramatic simplification to model her as having no choice in her social identity. Fryer and Jackson [2003] attempt to overcome this shortfall in previous works by giving individuals an element of choice. In an adaptation of a signaling model in the spirit of Akerlof [1970], Arrow [1971] and Spence [1973], the individual shapes how she is seen by her investments in social and productive capital. As a result Fryer and Jackson provide insight into why within an identity, individuals may be encouraged to perform unproductive activities. Although the Fryer and Jackson model has results consistent with some otherwise puzzling empirical realities, its modeling of the individual's choice is not completely satisfactory in that it assumes the peer-group neither cares about its member's productive ability nor well-being. A peer group, however, is made of a collection of individuals, all of whom care about their own well-being. To model the impact of a social identity on an individual, the preferences of the individuals in the society, both in and out of the peer group, should shape the preferences of the peer-group. The most striking results of the Fryer and Jackson model break down when the peer-group desires its members to be productive elements of society.

From middle class Blacks in the United States about whom Wilson [1980] wrote, made "a conspicuous effort to disassociate themselves from the black masses" [pp. 21] to lower caste groups in India, for example the Namasudra that Banjeree-Dube [2008] wrote, "constructed a collective self-image radically different" from the historical view, history has provided examples of individuals and groups of individuals making proactive choices with the hope of changing their social position. To model the peer-group's preferences as fixed and independent of the group members' preferences precludes such choices. Indeed, excluding these changes precludes individual rationality. When an individual is assigned a social identity that results in an inferior social status that results in a low well-being, the economist should examine the incentive an individual has to change society's perceptions and the constraints on this choice. It is on this bilateral relationship between the individual and her social identity that this model focuses. Although a social identity shapes the individual, the social identity exists only as a collection of individuals and the objectives of a peer-group depend on the preferences of its members. Thus the goal of this paper is to continue a progression in the economics literature from the atomistic individual, to the individual born into and

with a social identity, to an individual with some choice, however constrained, in shaping how society views her.

Although the individual's choice is the particular focus of this paper it would be naive to conceive of as a completely free and costless. Indeed, moving against mainstream attitudes, actions, and beliefs can have very uncomfortable results. Examples abound in the anthropological literature. In studying Muslim and Christian relationships in the Philippines, Lacar estimated that as recently as 1980, only 12-18% of parents agreed with such a marriage and 78% of parents were kept in the dark about such courtships. Finally, Lacar notes a "dropping out" of religion by the inter-religious couples, which he supposes is caused by an avoidance of conflict suggesting there is a cost of cooperating with those of the other culture.

Sociological and anthropological literature suggests that in polarized societies, teaching stereotypes about a hostile group and indoctrination of fear is common practice. Lacar [1980] also presents stories of such child-rearing practices and stories of children who are proficient in identifying others as members of a visual group. In the Philippines in the 1980's, Lacar documents Christian children being taught to use the derogatory "Moro" to describe their Muslim counterparts while Muslim parents whisper "land grabber" to their children behind their Christian neighbors' backs. Similarly, Bar-tal [1996] observes that Israeli children as young as eight use visible cultural traits, such as dress and language, to distinguish good (friendly) Arabs from the bad (those that kill Jews).

Another cost is revealed by Powell and Campbell [1976] who offer a compelling survey of East African cultural attitudes. Their work reveals how colonialism brought together groups who were previously isolated and eventually defined them in ethnic blocs determined by the stereotypes attributed to those groups. One particular stereotype noted in the survey is the "thriftlessness" of the Luo. It is difficult to imagine the "thrifty" Kikuyu embarking on a business venture with such a wasteful people. When evaluating a business venture with a Luo, a Kikuyu who believes in this stereotype will factor in this cost even if this stereotype does not fit the particular Luo. In parallel a Luo might over exert his energies trying to overcome this stereotype in meetings with a Kikuyu. In both cases cooperation across ethnic groups comes at a greater cost than within ethnic groups.

Basu [2005] suggests that a key to overcoming these prohibitive costs is recognizing the

fallacy of such stereotypes and attributing historical actions to those who committed them as opposed to attributing them to a whole group. If this ideal could only be achieved, the cost to cooperating with other groups would be greatly diminished and the cooperative equilibrium would be possible. This model presupposes that this identity-blind world does not exist. Further, given that these stereotypes and fears attached to identity exist, there will never be a situation in which everyone is moderate. This must have a damaging effect on the psyche of the optimist. It is very possible however, that as more people become moderates, the cost to dealing with the traditionally hostile group decreases for each individual. To understand this, the model would have to be extended to include in depth dynamics. However, the first step to a truly dynamic understanding is conceptualizing how the choice of identity and actions complicate cooperation in the face of small amounts of animosity towards people of different types.

## 2 Model

Following Basu [2005] we begin with a society with a set  $S$  of individuals. Each individual has two characteristics. For person  $i \in S$ ,  $e_i \in \{A, J\}$  is her innate, visible characteristic; for example, her ethnicity. Her second characteristic is private. It captures a cost that she incurs when she cooperates with individuals of a different visible identity. These costs may be associated with stereotypes and prejudices she holds against the other group's members, but they may also be the result of physical impediments such as the costs of communicating across the different languages and customs of each ethnicity. A person  $i \in S$ , with visible type  $e_i$  has invisible characteristic  $c_i \in [0, \bar{c}_{e_i}]$  and is summarized by the ordered pair  $(e_i, c_i)$ .

Community engagement is modeled as a random matching game. One could imagine the players deciding whether or not they should build a community school, form a worker's union or engage in a cooperative business venture. In their meeting they can choose to be cooperative and play C, or to take a more aggressive stance in their meeting and play A. As individuals are matched in pairs and each has two possible actions there are four possible outcomes to a match. The monetary payoffs to each possible match is described in Table A. The outcomes are such that the literature describes the game as an Assurance

Game. It is one of trust. Table A describes the situation of two people working together on a project where each person hopes for a cooperative outcome. As long as there is mutual trust between the players a high payoff equilibrium with each person working cooperatively will be reached. The less optimistic result is one where a lack of believable assurances leads to the pareto-inferior aggressive equilibrium where each individual chooses to play A.

Society is modeled so that individuals of the same ethnicity have the necessary networks of family and friends to maintain the trust needed to reach the cooperative equilibrium in meetings among each other. In meetings across ethnicity, the game is different. When people of different ethnicities are matched, the benefit to cooperation is lower for each individual  $i$  by the amount  $c_i$ . The payoffs to inter-ethnic meetings is Table B. Neither person knows the other's cost of cooperation. They might only form expectation of the cost based on the known distribution of cost for each ethnicity. When  $\bar{c}_e > 2$  for  $e \in \{A, J\}$  there are some people, "extremist", in the society that never want to cooperate across ethnic groups. It is the possibility of being matched with an extremist that causes inter-ethnic cooperation to break down in this model.

		Player j	
		C	A
Player i	C	10, 10	1, 8
	A	8, 1	2, 2

**Table A**

		Player j	
		C	A
Player i	C	$10 - c_i, 10 - c_j$	$1 - c_i, 8$
	A	$8, 1 - c_j$	2, 2

**Table B**

An individual has many visible characteristics. One's ethnicity falls into the small category of innate and fixed features. Others, such as level of education (visible from the enunciation and usage of certain words or from the degrees from an office wall), style of dress, or membership to a business or political organization are subject to individual choice. In all of these spheres an individual might find it worthwhile to adopt such features in order to be identified by another group, in this case the other ethnicity, as an individual with low cost of cooperation. Here we present an extension of the Basu framework that focuses on the individual's choice of a particular visual characteristic, her culture, and explore the

conditions in which as a result inter-ethnic cooperation may be reached.

We introduce a period 0 before the being randomly matched in the human interaction game, where individuals augment their visible ethnicity by choosing a culture. We assume this to be a binary choice of a visible trait  $t \in \{T, M\}$ . After choosing  $t$ , individuals are matched and the human interaction game commences. Before there were two types of matches that could occur. Individuals could be matched with someone of their own ethnicity and cooperate costlessly, or be matched with someone of a different ethnicity and not cooperate due to uncertainty over the other's cost of cooperation. With the pre-game choice there are four visibly distinct types an individual might be matched with,  $\{M, A\}$ ,  $\{T, A\}$ ,  $\{M, J\}$  and  $\{T, J\}$  and in each case expectation over the cost of cooperation can be based on both  $e$  and  $t$ .

In the Basu model, individuals experience a cost to cooperate across ethnicity. This cost might be explained by historical conflict and prejudice. If individuals of one cultural type benefit from cooperating across ethnicity, others might try to mimic that culture in the hope of benefiting from inter-ethnic cooperation. This suggests an important way an individual is constrained in her choice of identity. The larger the share of individuals choosing the M culture the higher their average costs to cooperating. At some point it becomes irrational to believe that individuals choosing the 'cooperative' culture will actually cooperate across ethnicity. Although there is freedom of choice in culture, how the culture will be perceived by others is out of the individual's control.

As modeled, implicit in creating a new identity to overcome inter-ethnic polarization is the creation of intra-ethnic hostility. We assume this is the result of the same type of prejudice and stereotypes that impacts the cost of cooperating across ethnic types. There are situations in which this assumption may be extreme, i.e. ethnic networks cross cultural lines, but in many other cases the assumption might be too weak, i.e. those of a different culture are seen as traitors who choose to distinguish themselves and are thus hated more than those born a natural enemy. To simplify the analysis we look at the case when the cost an individual has cooperating with someone of a different culture is the same as the cost of cooperating with someone of a different ethnicity. Thus, if two individuals,  $i$  and  $j$ , are matched, the payoffs to their actions is given by Table A if  $(t_i, e_i) = (t_j, e_j)$  and their

payoffs are given by Table B otherwise.

At this point it is helpful to clarify this paper’s innovation in how social identity and peer-groups impact an individual’s choice of culture. Individuals are not born with a preference for a certain group or type of people. They are born with an ethnicity and a cost for cooperating with anyone visibly, in culture or ethnicity, different. By her choice of culture, the individual has some control of who she is and when and where these costs occur. It should also be noted that for the cases we consider, regardless of the meeting type both individuals cooperating Pareto dominated neither individual cooperating. As a result, unlike Fryer and Jackson’s work the model’s results are not driven by a choice between social prowess and productivity. The model’s results are driven by the individual’s inability to separate the actions of one individual from those of the group. Low cost individuals hope to choose a culture that is identified with a willingness to cooperate with those expected to cooperate. This hope is constrained by the actions of other individuals and the resulting beliefs individuals have on the distribution of cost in each culture.

## 2.1 A Moderate Sub-Culture with No Dominant Ethnicity

In order for behavior strategies to constitute a Bayes-Nash equilibrium each individual must act in accordance with the best strategy given the strategy of the other individuals. Let  $\Delta_e : (F_e, F_{e_i}), (F_e, M_{e_i}), (M_e, F_{e_i}), (M_e, M_{e_i})$  and  $\Lambda \equiv \Delta_A \cup \Delta_J$  be the possible matches in the interaction game. A strategy  $\sigma : [0, \bar{c}_{e_i}] \times \Lambda \rightarrow \{C, A\}$  maps an action to each possible meeting. In period 0 the individual chooses the culture and strategy that yield the highest expected payoff given the strategies of everyone else. As a result of the random matching framework of the model incredible threats are not possible, i.e. in equilibrium no individuals use dominated strategies and the set of Bayes-Nash equilibria is the set of sequential equilibria. As a result, in deciding which culture to choose, an individual only needs to compare the expected payoff of playing the highest paying strategy for an M to the expected payoff to the highest paying strategy for an F given the other players strategies. In this sense, each individual chooses her optimal culture.

The particular focus is on pure strategy Bayes-Nash equilibrium in which individuals choosing M always cooperate with others choosing M. If this is the case, in equilibrium

person  $i$ 's expected payoff to choosing the moderate culture is decreasing in her idiosyncratic cost  $c_i$ . Since the moderate signal is not meaningful if everyone chooses to be moderate, then an equilibrium with inter-ethnic cooperation must involve an interior solution. Such an equilibrium involves a pair of thresholds  $(\hat{c}_J, \hat{c}_A)$ , such that an individual  $(x_i, c_i)$  with cost less than her respective threshold. i.e.,  $c_i < \bar{c}_x$ , best responds by choosing the moderate cultural trait and cooperating in meetings with other M's

Let  $\Theta$  be the share of A in the community so that  $1 - \Theta$  of the community is J. To keep the model as simple as possible we assume that the matching probabilities are determined by the population shares and are equal across ethnicities. Let  $F_e(c)$  be the fraction of individuals with ethnicity  $e$  that have idiosyncratic cost  $c_i \leq c$ .

**Assumption 1**  $F_e(c) = U[0, \bar{c}_e]$  for  $e \in \{J, A\}$  and  $2 < \bar{c}_e < 8$  for  $e \in \{A, J\}$

The costs are distributed uniformly across the population to simplify the algebra. That  $\bar{c}_e > 2$  ensures there are extremist in the population, those that would benefit from aggressive play against cooperative players, but  $\bar{c}_e < 8$  ensures the (C,C) equilibrium Pareto dominates the (A,A) equilibrium in all matches.

**Proposition 1** *Given Assumption [1], there is no pure strategy Bayes-Nash equilibrium where everyone with cost less than two, takes on the 'cooperative' culture, M, and in equilibrium best responds by cooperating across culture and ethnicity.*

**Proof.** The proposition considers the case where all non-extremist take to one culture. This could happen in two ways. If everyone, extremist or not, chooses the same the same culture then of course there is no cross culture cooperation. In the second possibility society has one cooperative and one extremist culture. It is clear that in inter-cultural meetings members of the extremist culture never cooperate. Knowing this, individuals of neither group cooperate in inter-cultural meetings. In neither case is their inter-ethnic and inter-cultural cooperation when all non extremist take the cooperative culture. ■

Proposition 1 demonstrates that implicit in this model is that overcoming inter-ethnic conflict requires the creation of intra-ethnic division. In what follows we explore one type of equilibrium that demonstrates this tension.

**Proposition 2** *If  $\frac{1}{3} < \Theta < \frac{2}{3}$ , i.e., neither ethnicity has an overwhelming majority, there is a pure strategy Bayes-Nash equilibrium with across-ethnicity cooperation. Individuals with ethnicity  $e$  and cost less than  $\hat{c}_e$  will choose the cultural type  $M$ . Those that choose cultural type  $M$  will cooperate regardless of ethnicity. Individuals not choosing  $M$  will only cooperate with individuals of the same ethnicity and culture. If  $\theta_e$  is the share of ethnicity  $e \in \{J, A\}$  choosing the modern culture, then i)  $0 < \theta_e < \frac{1}{2}$ , ii)  $\theta_e$  is increasing in her ethnicity's share of the total population, and iii)  $\theta_e$  is increasing in  $\bar{c}_e$ .*

**Proof.** In an equilibrium where moderates only cooperate with moderates, if person  $i$  has  $x_i = A$ , she is willing to choose the moderate cultural trait if and only if

$$F1(\theta_A, \theta_J, \Theta, c_i) = 8(-1 + 2\theta_A)\Theta + (1 - \Theta)(8 - c_i)\theta_J \geq 0 \quad (1)$$

When  $x_k = J$ , person  $k$  is willing to cooperate if and only if

$$F2(\theta_A, \theta_J, \Theta, c_k) = 8(-1 + 2\theta_J)(1 - \Theta) + \Theta(8 - c_k)\theta_A \geq 0 \quad (2)$$

At interior thresholds  $\hat{c}_A = \theta_A \bar{c}_A$  and  $\hat{c}_J = \theta_J \bar{c}_J$  equations [1] and [2] hold with strict inequality. When the A's are best responding, the share choosing the moderate cultural trait is

$$\dot{\theta}_A(\Theta, \theta_J, \bar{c}_A) = \frac{8(\Theta - (1 - \Theta)\theta_J)}{16\Theta - \theta_J \bar{c}_A(1 - \Theta)} \quad (3)$$

and the inverse of the share of A choosing the moderate culture is

$$\hat{\theta}_J = F^{-1}[\dot{\theta}_A(\Theta, \theta_J, \bar{c}_A)] = \frac{8\Theta(1 - 2\theta_A)}{(1 - \Theta)(8 - \theta_A \bar{c}_A)} \quad (4)$$

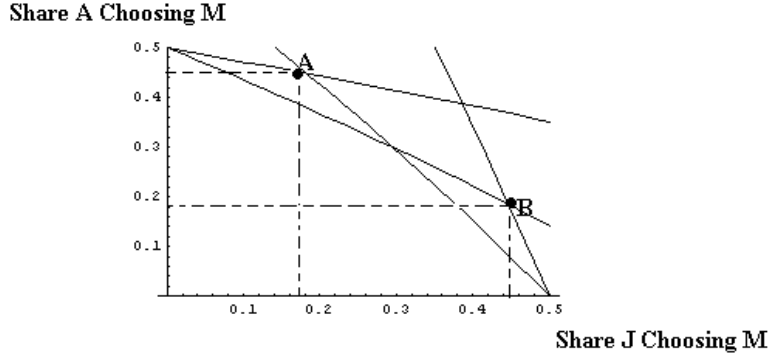
When the J's are best responding, the share choosing the moderate culture is

$$\dot{\theta}_J(\Theta, \theta_A, \bar{c}_A) = \frac{8(1 - \Theta - \Theta\theta_A)}{16(1 - \Theta) - \theta_A \bar{c}_J \Theta} \quad (5)$$

The inverse of the share of J's choosing the moderate culture is

$$\hat{\theta}_A(\Theta, \theta_J, \bar{c}_J) = F^{-1}[\dot{\theta}_J(\Theta, \theta_A, \bar{c}_J)] = \frac{8(1 - \Theta)(1 - 2\theta_J)}{\Theta(8 - \theta_J \bar{c}_J)} \quad (6)$$

Equilibrium occurs at  $\theta_J^* \in (0, 1)$  such that  $\dot{\theta}_A(\Theta, \theta_J^*, \bar{c}_A) = \hat{\theta}_A(\Theta, \theta_J^*, \bar{c}_J) = \theta_J^* \in (0, 1)$ . Equations [1] and [2] imply part i) of the proposition. As individual cost are strictly less than



### Changes in Population Shares

8, i.e.  $\bar{c}_e < 8$  for  $e \in \{A, J\}$  these equations are strictly positive for  $\theta_e \geq \frac{1}{2}$ . After noting that  $\frac{\partial \dot{\theta}_A}{\partial \theta_J} < 0$ ,  $\frac{\partial \dot{\theta}_A}{\partial \theta_J} < 0$  and  $\frac{\partial \dot{\theta}_A}{\partial \theta_J} > \frac{\partial \dot{\theta}_A}{\partial \theta_J}$  for  $0 < \theta_J < \min\{\frac{\Theta}{1-\Theta}, \frac{1}{2}\}$  it is clear that if there is a  $\theta_J$  such that  $\dot{\theta}_A = \dot{\theta}_A$  it is unique in the relevant range. Also note that  $\dot{\theta}_A(\Theta, 0, \bar{c}_J) = \frac{\Theta}{1-\Theta}$  and  $\dot{\theta}_A(\Theta, \frac{1}{2}, \bar{c}_J) = \frac{1}{2}$  while  $\dot{\theta}_A(\Theta, 0, \bar{c}_A) = \frac{1}{2}$  and  $\dot{\theta}_A(\Theta, \frac{1}{2}, \bar{c}_A) = \frac{1-\Theta}{\Theta}$  with  $\frac{\partial \dot{\theta}_A}{\partial \theta_J} > \frac{\partial \dot{\theta}_A}{\partial \theta_J}$  implies for equilibrium  $\frac{1-\Theta}{\Theta} < \frac{1}{2} < \frac{\Theta}{1-\Theta}$  which implies  $\frac{1}{3} < \Theta < \frac{2}{3}$  ■

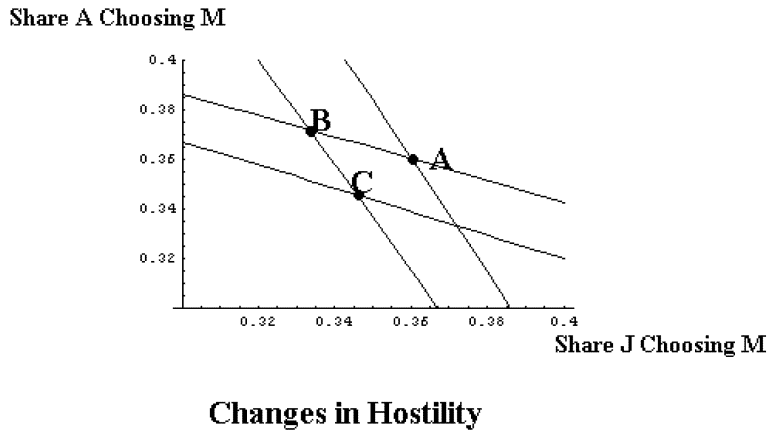
**Proof.** To prove parts ii) and iii) note the equilibrium shares are  $\theta_A^*$  and  $\theta_J^*$ . The envelope theorem gives

$$\frac{\partial \theta_A^*}{\partial v} \Big|_{\theta_A^*, \theta_J^*, \bar{c}_A} = \frac{\frac{\partial F_1}{\partial v} \frac{\partial F_2}{\partial \theta_J} - \frac{\partial F_1}{\partial \theta_J} \frac{\partial F_2}{\partial v}}{-\sqrt{d}} \quad \text{and} \quad \frac{\partial \theta_J^*}{\partial v} \Big|_{\theta_A^*, \theta_J^*, \bar{c}_J} = \frac{\frac{\partial F_1}{\partial v} \frac{\partial F_2}{\partial \theta_J} - \frac{\partial F_1}{\partial \theta_J} \frac{\partial F_2}{\partial v}}{-\sqrt{d}} \quad (7)$$

Parts ii) and iii) are direct implications of equation [7]. ■

The parameters of the model are such that mutual cooperation is always Pareto superior to mutual aggression. Basu has demonstrated how the fear mongering and prejudice of a few extreme individuals can ignite hostilities between people. When the politicized trait divides the population evenly, the stereotypes are extremely difficult to overcome. Inter-ethnic cooperation comes at the expense of division within each ethnic group. Families are divided as individuals choose either the traditional or modern way of life.

The model suggests that when there are hostilities between approximately equally sized ethnic groups, demographic changes have a dramatic impact on the type of cooperation



between individuals of the competing populations. As a group loses its power in numbers, a larger share of its members choose the traditional culture, isolating themselves from both the other ethnic group and the now smaller share of individuals of their ethnicity that choose the modern culture. As a result, individuals that choose the modern culture are more isolated from individuals of their own ethnicity. Figure [2.1] shows the move from equilibrium A to B when the share of J's in the society decreased from 60% to 40% of the total population. The share of J's choosing the moderate culture decreased dramatically while their counterparts in the other ethnicity, A, dramatically increased. Consider the impact the influx of freed slaves had on racial tension in northern cities in America in the late 19th century. Wilson documents, "prior to 1900, one would rarely find a solidly black block, and a significant number of Negroes lived in white neighborhoods...White churches, which had allowed small numbers of blacks to participate in their services in the 1870s and 1880s, attempted to ease out black members altogether" (p 64). Wilson reports that it was during this same period that the black population in northern cities increased from 58.9% in Philadelphia to 148.2% in Chicago. In some cases competition in the the labor marker was sure to have affected the hostility between the groups but the model suggest that the drastic changes in population shares would have been enough to disturb the harmony and have a noticeable impact on the equilibrium attitudes each groups individual's would share

towards the others.

The third part of the proposition demonstrates another difficulty in increasing inter-ethnic cooperation between two almost equally sized ethnicities. Decreases in the hostility one ethnicity has towards the other paradoxically results in a smaller share of the now less hostile group choosing the modern culture. This is demonstrated in Figure [2.1]. Point A is an equilibrium when both ethnicities have large amounts of hostility. When ethnicity  $e = J$  reduces its hostility towards ethnicity  $e = A$  the equilibrium moves to point B with a lower share playing modern and a higher share of A's playing modern. Reducing the cost of cooperation is not enough. The ability to distinguish an individual's act from that of the whole is necessary to achieving inter and intra-ethnic cooperation. If moderate and traditional individuals of the same ethnicity could communicate, there would be a foundation for this cooperation. In equilibrium this communication is impossible.

Jibrin Ibrahim's study of religion and politics in Nigeria is illustrative of this type of equilibrium. He writes, "[Colonialism] has led to the evolution of political strains and conflicts between Nigerian proponents of the two rival universal religions that the Middle East has offered to the world" [Ibrahim 1991]. With Muslims dominating the north and Christians the south, the country as a whole is divided almost evenly. Cooperation between members of the two groups is tenuous at best. Eliza Griswold wrote an article entitled "God's Country" published in the March 2008 issue of *The Atlantic* that describes the start of the chaos that erupted after a Danish cartoon was published that was offensive to Islam. Many things happened but no one knew the individual perpetrators of the actions. A Muslim lawyer said, "Someone shouted arna-infedel, Someone spat the word jihad...Someone picked up a stone" [Griswold 2008],. And so riots and killings ensued. Cooperation between groups was forbidden. Christian girls were not to be seen with Muslim boys. Individuals suffered a penalty for trying to cooperate across groups. The article reports that as the killing increased two leaders of the fighting, an imam and a pastor, changed their message to one of moderation and cooperation. As they teamed up to preach a message of peace their former compatriots now describe them as sellouts.

In his treatise on the historical development of caste in India, *Castes of Mind*, Dirks [1980] provides additional anecdotal evidence that groups with decreasing hostility have

decreased willingness to cooperate across ethnic groups. In what began as a fight against Brahmin privilege Dirk notes the irony in "that the very upper-caste non-Brahman groups who contested Brahman privilege were the ones who sought to keep the depressed classes in their ritual position of inferiority and subservience" [pp. 241]. When ethnicity is interpreted in terms of low and high caste and the culture choice is to follow the caste hierarchy or not the model's relevance is immediate. If concessions to scheduled classes are a sign of reduced hostility from higher castes, then the model predicts a push-back from the share of individuals in the higher caste not in favor of crossing the traditional caste demarcations. Of course the example is only suggestive as concessions to lower caste also provide a cost to higher caste individuals that benefit from lower cast subservience.

## 2.2 Other Types Of Cooperative Equilibria

The above discussion has shown that inter-ethnic cooperation requires intra-ethnic division and that one type of inter-ethnic cooperation is possible given no ethnic group has an overwhelming share of the total population. The equilibrium described has individuals that choose M completely isolated from others in their ethnic group. Fortunately, in the midst of conflict there are pockets, large and small, of inter-cultural and inter-ethnic cooperation across the world. It is this type of situation that is described in the next section. Specifically, we explore an equilibrium in which one ethnicity is divided while the other ethnicity engages in cooperation across cultural types.

Consider an equilibrium with individuals of ethnicity A continue to play the strategy described in the previous section. Thus, A's are divided with those with  $c_i < \hat{c}_A$  choosing M and cooperating only with M's and those with  $c_i \geq 2$  choosing F and only cooperating with other A's that choose F. Consider the strategy for J's in which individuals with cost  $c_i < \hat{c}_J < 2$  choose M for their culture and cooperate in meetings with other M's regardless of ethnicity and cooperate with F's that share her ethnicity. Further, individuals with cost  $\hat{c}_J < c_i < 2$  choose F and cooperate in meetings with anyone from her ethnicity and otherwise does not cooperate. Finally, individuals with  $c_i > 2$  choose F and cooperate only in meetings with individuals from her ethnicity that choose the F culture. A's are best responding in their human interaction game as long as the cutoff cost is less than 2. The

constraints on J's are more complicated. It is clear that M's cooperating with M's, F's cooperating with F's of the same ethnicity and F's with  $c_i < 2$  cooperating with M's of the same ethnicity are best responses given the above strategies. For M's to cooperate with F's of their own ethnicity they must have a high enough expectation of cooperation in return. As individuals with  $c_i > 2$  never best respond by cooperating across culture or ethnicity there need to be enough people with  $c_i < 2$  that choose F. An immediate result is that for this strategy to be optimal in equilibrium there must be individuals that prefer cooperation with cooperators that nevertheless choose the 'non-cooperative' culture. An individual i's best response in a meeting with individual j is cooperation if and only if  $c_i \leq 3p - 1$  where p is the probability j will cooperate. If J's that choose M fully cooperate with J's that choose F the probability a J that chooses F will cooperate with a J that chooses M is  $\frac{2-\hat{c}_j}{\bar{c}_j-\hat{c}_j}$ . Thus J's that choose M best respond by cooperating only if  $2 > \frac{6-\bar{c}_J}{2} > \hat{c}_J$ . For equilibrium, equation[1] must be equal zero at  $c_i = \hat{c}_A$ . For J's to separate in equilibrium, an individual i with  $c_i = \hat{c}_J < 2$  must be indifferent between being an M and cooperating with M's and F's of her own ethnicity and choosing F and only cooperating with F's of her own ethnicity. If  $\nu = \frac{1-\Theta}{\Theta}$ , this is true for J's when

$$F3(\theta_A, \theta_J, \Theta, c_k) = \hat{c}_A \theta_A (\bar{c}_J (8 - \theta_J \bar{c}_J) + (18 + \bar{c}_J (-9 + \theta_J (-1 + 2\theta_J) \bar{c}_J)) \nu) \geq 0 \quad (8)$$

In equilibrium both equation [1] and [8] must equal zero. Solving both equations for  $\theta_A$  gives

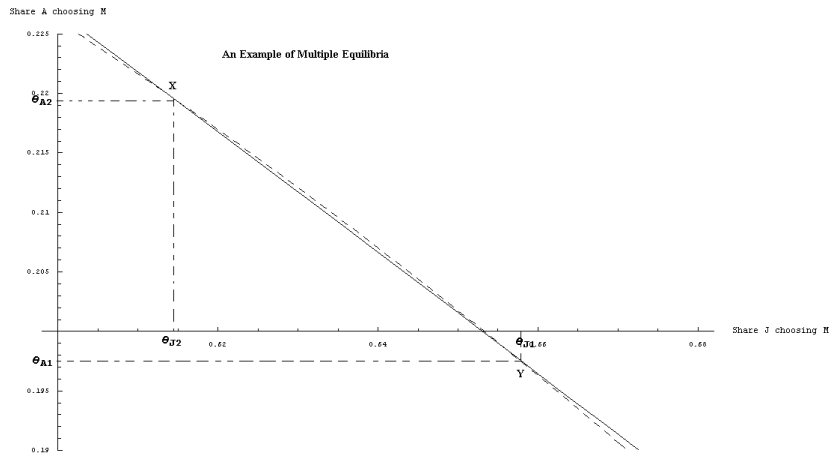
$$\dot{\theta}_A(\Theta, \theta_J, \bar{c}_A) = \frac{8(1 - \nu\theta_J)}{16 - \theta_J \bar{c}_A \nu} \quad (9)$$

$$\dot{\theta}_A(\Theta, \theta_J, \bar{c}_J) = \frac{(18 + \bar{c}_J (-9 + \bar{c}_J \theta_J (-1 + 2\theta_J)) \nu}{\bar{c}_J (-8 + \theta_J \bar{c}_J)} \quad (10)$$

Equilibrium requires

$$\dot{\theta}_A(\Theta, \theta_J, \bar{c}_A) - \dot{\theta}_A(\Theta, \theta_J, \bar{c}_J) = 0 \quad (11)$$

A little algebra shows that equation[11] is a cubic equation in  $\theta_J$ . As a result there may be multiple real roots and the possibility of multiple equilibria. Although it is difficult to



characterize the entire range of parameters that are possible figure, [2.2] demonstrates this possibility when  $\nu = 1$  and  $\bar{c}_J = \bar{c}_A = 2.5$ . The solid line represents equation [9] and the dashed equation [10]. In equilibrium X a higher share of A's and lower share of J's choose the 'moderate' culture than in equilibrium Y but in both cases less A's choose the cooperative culture than when both ethnicities restrict inter-culture cooperation. It is easy to show that many comparative statics, depend on the initial equilibrium, i.e. whether starting from X or Y.

For the purpose of comparison, a third type of equilibrium strategy is also worth discussing. Consider an equilibrium in which both ethnicities engage in inter-cultural cooperation. The problem for the J ethnicity was worked out in the previous case. The share of A's that choose M for this type of equilibrium is given by equation[10] and a symmetric equation holds for the share of J's choosing M. Using the same parameters as before,  $\nu = 1, \bar{c}_J = \bar{c}_A = 2.5$ , an equilibrium of this type results in a unique outcome of 28.9% of each ethnicity choosing the moderate culture. If neither ethnicity cooperates across cultures then the outcome would involve 34.5% of each ethnicity choosing the moderate culture. Both of these equilibria result in less J's benefiting from inter-ethnic cooperation and more A's benefiting from inter-ethnic cooperation than in the asymmetric case where 60%-67% J's choose M and cooperate across culture while 19%-21% of A's choose M and are isolated from about 80% of her ethnic population. Whether those that choose M are better off

with inter-cultural cooperation or not is uncertain, but it is clear that if one ethnicity can restrict the other ethnic groups intra-ethnic relations, i.e. divide and conquer, while maintaining their cohesion enough to cooperate across cultures, they will make extreme gains at the other ethnicity's expense. Beliefs of which type of equilibrium will fall outside the model but their importance in determining equilibrium well-being suggest how culture and inter-cultural relations are intrinsically political in nature.

## 2.3 Conclusion

In highlighting an individual's choice of culture the model demonstrates the social constraints to that choice. The result of those constraints is that in different social environments, two otherwise identical individuals may choose extremely different life paths. The child soldier of Somalia may have been a doctor or lawyer given a different social environment. In another place, the white supremacist and black nationalist might be business partners, and the truant gang member could, in different circumstances, be an honors student.

Although there are many types of equilibria that have not been flushed out, the three cases presented demonstrate how beliefs influence the type of equilibrium a society reaches and is suggestive as to the types of support a cooperation building institution might prefer. Institutions that allow individual recognition would make it possible for stereotypes to be replaced with knowledge of the individual. When individual accountability replaces discriminatory practices the payoff to choosing a 'cooperative' culture and cooperation in meetings should increase for all non-extremists in society.

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