# SOCIAL IDENTITY AND COLLECTIVE ACTION IN REBEL ARMIES

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# 1 Introduction

Since Olson's (1971) major thesis, collective action problems have been at the heart of the social sciences. Fundamentally, groups striving for non-excludable reward face a challenge in extracting effort from their members - since the costs of exerting that effort are privately borne. This is apparent nowhere more so than in cases of civil war. Rebels face the direst challenges in pursuit of political goals that often their individual toils make little contribution towards. Yet the successful formation, proliferation, and persistent exertion of rebel groups is an undeniable, and important, feature of history and current events.

Although prevailing theories offer opportunity for material reward as the primary explanation, the literature has consistently found this insufficient. Indeed, Tezcür (2016) examined PKK recruits and found that selective incentives could only predict recruitment to some degree – other factors were also important. More dramatically, Wood (2003) interviewed hundreds of *campesinos* in post-war El Salvador and found that selective incentives were never offered to those who supported guerrillas. Thus, understanding and explaining rebel collective action remains a crucial puzzle of human behaviour.

This paper will frame *social identity* as a major piece of that puzzle. Individuals have a preference to conform with a socially constructed ideal of their own behaviour, and that ideal evolves over time. This desire to minimise the *perceived distance* between one's actual and idealised behaviour can alleviate collective action problems. Social identity has been a subject of exploration in economics since Akerlof and Kranton's (2005) introduction, but has yet to be applied to the specific issue of rebel army collective action.

To make this application, I construct a simple repeated game in which group members choose whether to join a group and then choose an effort level. Following Shayo (2009), I modify the players' preferences to account for social identity. I demonstrate that a unique sub-game perfect equilibrium exists in which a rebel group forms, with no free riders, even as group sizes approach infinity.

# 2 Theories of Rebel Collective Action

## 2.1 Economics and Selective Incentives

The prevailing paradigm amongst economists' *micro-foundations* of rebellion is the ability of the rebel group to provide selective material incentives to members. Collier (2000) has rebel recruitment possible only by offering wages to a trustworthy (co-ethnic) substratum of the population. Grossman (1991) sees peasants dedicate some time to insurrection should it increase their expected incomes. In his 1999 extension, he explicitly introduces a leader who offers excludable benefits to insurgents. Gates (2002) exploits a principal-agent framework in which leaders provide selective incentives for cooperation (and disincentives for shirking).

A parallel approach is found in *non-cooperative coalition formation* models (Ray, 2007; Ray and Vohra, 2015). These construct sequential games in which players can form coalitions to compete for some private good. Applications to conflict introduce a second stage in which members of the winning coalition compete amongst themselves for a share of the prize (Garfinkel and Skaperdas, 2007). It is potential for prize-share that motivates participation.

## 2.2 Non-Material Motivations

That selective incentives are of some importance is undeniable. Various studies have confirmed that potential for material gain is a strong predictor of civil wars (Blattman and Miguel, 2010). However, it cannot explain the entire story.

Humphreys and Weinstein (2008) find that, in Sierra Leone, having members of your social group in the rebel army was a determinant of joining personally. Tezcür (2016) finds that those in dense social networks close to insurgents are more likely to join themselves. Krueger and Malečková (2003) demonstrate that something beyond material opportunity motivates political violence in Israel.

Outside of economics, ethnographic studies de-emphasise material motivation, and place social effects as central. In her aforementioned El-Salvador ethnography, interviewees made clear to Wood (2003) that moral commitments were their main motivation. Scott (1977) puts strong emphasis on the presence of communal norms in generating the ability of peasants in Southeast Asia to respond to exploitation.

In other social sciences, social identity is seen as the key mechanism behind collective action. van Zomeren et al. (2008) conduct a meta-analysis of 182 psychology studies and find that social identity is a crucial predictor of collective participation. In military sociology, the ability of an army to generate a salient identity is a requirement for sustained collective participation (Kenny, 2008).

## 2.3 Economics and "The Social"

Economics has had a literature dedicated to social determinants of collective action for decades, thanks primarily to the work of Elinor Ostrom (1998; 2000; 2009). For Ostrom, rational choice models of collective action were insufficient because they ignored group heterogeneity and the (then) emergent literature on non-rational behaviour. Ostrom emphasised that humans have evolved to quickly pick up social norms such as trust and reciprocity, specifically to overcome collective action problems. As such, *second-generation* models need to consider that agents are embedded in pre-existing social networks.

This emphasis on the impact of pre-existing social commitments has enjoyed a theoretical prominence since Akerlof and Kranton (2000)[1]. These models follow the Becker method of modifying standard utility functions to encompass social effects (Becker, 1993). Specifically, Akerlof and Kranton saw *social identity theory* (Tajfel and Turner, 1979) as the major social determinant of behaviour; that people have a social identity they seek to satisfy, constructed from social interactions.

Akerlof and Kranton (2005) extend this idea to the context of organisations, where agents seek to minimise the gap between their idealised and actualised effort level. This is generalised to many dimensions (i.e. many facets of identity) by Shayo (2009), who introduces *distance functions*. Sambanis and Shayo (2013) apply this to conflict, analysing how different structures of social groups in a nation can result in peaceful and non-peaceful equilibria. It is their model of social identity that I borrow from.

[1] For a summary of work on "Identity Economics", see Akerlof and Kranton (2010) and Kranton (2016)

# 3 The Model

## 3.1 Political Economy

There are many individual actors, $i = 1, \ldots, N_J$ in social group $J$. There is also an Autocratic ruler, who has set policy rule $\theta$. We take this as exogenous - and do not allow for political change[2]. A policy rule results, for each individual, in material payoff $\pi_i(\theta)$. It also results in payoff, $S_J(\theta)$, for the social group. We can interpret this as the status of the group - for example political representation. All members of the group experience this payoff, modified by their preference for the group's status, $\gamma$.

Summarising;

$$U_i(\theta) = \pi_i(\theta) + \gamma S_j(\theta) \tag{1}$$

There is some other policy rule, $\theta^R$, and for social group $J$:

$$U_i(\theta^R) > U_i(\theta) \tag{2}$$

We consider an armed group forming to enact this policy rule.

The choice of a public reward here maximises the *recruitment problem*. That is, with a non-excludable reward the incentive for individuals to *join* the group is low. As Esteban and Ray (2001) note, this public reward actually helps to alleviate the *free-rider problem*. The selection of a private reward (whose share enjoyed by group members decreases in group size) would instead maximise the free-rider problem and alleviate some of the recruitment problem. Regardless, to emphasise the lack of need for material incentive, a public reward has been chosen.

## 3.2 Social Identity

Agents suffer disutility from acting outside of their constructed social identity. Following Shayo's (2009) lead, I represent this via weighted Euclidean distance functions. Agents are characterised by a vector of qualities, $q_J = \left(q_J^1, q_J^2, \ldots, q_J^H\right)$. Social groups are defined by the "typical" attributes of their members, $q_J$. For simplicity, we will consider the mean across group members: $q_J = \frac{1}{|N_J|}\sum_{i \in J} q_i$.

The *perceived distance* between individual $i$ and group $J$ is thus:

$$d_{iJ} = \left(\sum_{h=1}^{H} w_h\left(q_i^h - q_J^h\right)^2\right)^{\frac{1}{2}} \tag{3}$$

The weights $w_i$ represent differences in salience of each quality. Thus, our agents' utility functions are, bringing together (1) and (3):

$$U_i(\theta) = \pi_i(\theta) + \gamma S_j(\theta) - \beta d_{iJ} \tag{4}$$

Here, $\beta > 0$ represents individuals differing in importance put on perceived distance from the group.

[2] The absence of potential for non-violent change is likely to be important in creating the circumstances for rebellion. See Walter (2004).

### 3.3 Structure

We consider a game of individuals $i$, each receiving a random, independent assignment of γ and β, as defined in (1) and (3) respectively. The game proceeds thusly;

1. Players observe their assignment for γ and β
2. Players assess the benefits of joining/forming a group
3. The most-incentivised player forms/joins the group.
4. All players in the group decide on an effort level to exert[3]
5. Social norms update
6. Repeat. If no players were incentivised to join, the game stops.

An important assumption is that of *within-group-symmetry* of effort. Since probability of winning depends on total group effort, rather than individual effort, group effort can be uniquely determined; individual effort cannot. This assumption is analytically convenient, and since our players are almost identical, seems reasonable[4].

### 3.4 Evolution of Social Norms

There are two *qualities* relevant to the game: "rebel group membership" and "effort exerted". Firstly, as an analytical departure from Sambanis and Shayo (2013) and Shayo (2009), we will endogenize our quality weights from (3).

For members of the group yet to join the rebel army, we allow the weight on group membership to evolve in a simple ratio.

$$w_M = \frac{N_R}{N_J} \tag{5}$$

The weight on effort exertion will be zero for non-rebel members. They pay no attention to an irrelevant norm.

Secondly, we allow the *typical qualities* to evolve. For rebel membership, we consider a binary variable, taking the value 1 if you are in the rebel group, and 0 otherwise. The "typical quality" therefore evolves in the manner defined in section 3:

$$q_J^M = \frac{N_R}{N_J} \tag{6}$$

For effort exerted, we presume that the norm for effort is the average effort exerted by the group in the previous iteration of the game (see section 3.3). Having assumed symmetry of effort, this will be the effort choice of the group in the previous period.

[3] The first player (who forms the army), becomes the leader and plays one turn with no disutility of effort, simply selecting an effort norm. The importance of distinctive leaders is not new to the literature - see Roemer (1985) for an early example. For further discussion of this, see section 4.

[4] This follows the approach of Garfinkel and Skaperdas (2007).

Rebel army members' group changes such that $J = R$. Therefore, the weights on effort and membership, and the quality for membership, are simply one - that is, evolving as in (5), but with $N_J$ exchanged for $N_R$.

The difference in norm behaviour for rebel group members and non-members reflects that members who join the rebel army have their social identity altered such that they put importance on group membership. Wood (2008) makes clear that military recruits have their social ties substituted by those of the army. Ugarriza and Craig (2013) emphasises that rebels' ideology is determined in large part by post-enlistment experience. Kenny (2008) observes multiple militaries and finds that, although they all used various methods, the common denominator in ensuring group cohesion was appeals to a new social identity framed around the group.

### 3.5 Payoffs

Members of the armed group choose an effort level $g_i \in [0,1]$. We define λ as the probability of the armed group winning a conflict. For an armed group of members $i = 1, \dots, R$:

$$\lambda = \frac{\sum_i^R g_i}{\sum_i^R g_i + G_G} \tag{7}$$

Thus the probability of an armed group winning a war depends on the sum total of their efforts, as well as the endowment of the government's armies $G_G$. Now we define:

$$A_i = U_i(\theta^R) - U_i(\theta) \tag{8}$$

This is the *prize*, for any given individual, of the rebel group winning. Therefore we write the payoff of not being a member of the rebel army as:

$$V_i^N = U_i(\theta) + \frac{\sum_{i'}^R g_i}{\sum_{i'}^R g_i + G_G} A_i - \beta\left(\frac{N_R}{N_J}\right)^{\frac{3}{2}} \tag{9}$$

And the payoff of being a member of the rebel army as:

$$V_i^R = U_i(\theta) + \frac{\sum_i^R g_i}{\sum_i^R g_i + G_G} A_i - C_i^R - \beta[(g_i - \overline{g_R})^2]^{\frac{1}{2}} - g_i \tag{10}$$

This is similar to (9), except the probability of the group winning is marginally higher, there is a cost associated with warfare $C_i^R$, and exerting effort is costly. Note the difference in social identity modification due to section 3.4.

### 3.6 Equilibrium Conditions

We are searching for a sub-game perfect equilibrium in which all members of social group $J$ join, and exert maximum effort in, the rebel army - even as group sizes approach infinity. First, we verify that social identity is necessary.

**Proposition 1.** *Without the modifying social identity functions, this sub-game perfect equilibrium does not exist.*

Without social identity, our agents succumb to standard collective action issues. Agents put in less effort as group size increases[5], and there is no incentive to join the group. Proof in Appendix.

**Proposition 2.** *With the modifying social identity functions, this sub-game perfect equilibrium exists when* $\beta > C_i^{R'}$ *and* $\lambda^R A_1 > C_i^{R'}$, *where* $C_i^{R'} = C_i^R + 1$.

The intuition is that, when armies are so large that your additional effort has no bearing on the probability of success, you will only choose to join and exert maximum effort if the benefit of conforming with social identity outweighs the costs. Relaxing this condition narrows the set of constants $(G_G, A_i)$ under which our SPE holds, and would mean our SPE is not robust to infinitely large groups. Furthermore, this entire game will function so long as the total benefit to the first individual of an armed group forming is greater than the personal cost of conflict. This inequality holds for any size rebel army. Proof in Appendix.

## 4 Conclusion

This paper has applied a repeated-game model of coalition formation to shed explicit light on the importance of an evolving, internally enforced social norm to rebel collective action. People have a socially constructed image of themselves that they seek to conform to; this desire overwhelms the incentive to free-ride.

However, a more complete (and compelling) model would relax firstly the lack of effort disutility for the first player, secondly the immediate jump of quality weights when joining the rebel army, and thirdly the rationality of agents. Specifically, I would suggest a model in which players could only "see" the next two or three stages of the game. Consequently, early players (including the first-mover) join the army to increase the probability of success. Later players join due to social identity effects.

Secondly, this approach has ignored another crucial solution to the collective action problem in rebel armies: that "free riding" can often be very costly, due to violence against civilians (Kalyvas and Kocher, 2007; Beber and Blattman, 2013; Wood, 2010). This could be incorporated into the framework presented in this paper with a simple constant in (9), however it might be more interesting to explore how identity can shape this violence.

Similarly, this approach could be extended to examine the interplay between identity and dominant explanations of collective participation in civil wars. Self-enforced societal norms should be a complementary theory, not substitutional, to externally enforced social norms and selective incentives. Although this model was limited in some respects, it should provide a useful jumping-off point for future research on rebel recruitment.

Word Count: 2199

[5] I replicate the finding of Esteban and Ray (2001) that total group effort increases in group size even as individual contributions decrease. Esteban and Ray suggest that this is a resolution of collective action in and of itself. I hope that my equilibrium suggests to the reader a more complete resolution. Furthermore, this fact does not alleviate the *recruitment* problem: that the incentive to join the group disappears.

# Mathematical Appendix

## Proposition 1

*Proof.* We write the utility function and then solve for chosen effort level in the final stage:

$$V_i^N = U_i(\theta) + \frac{\sum_{i'}^{R} g_i}{\sum_{i'}^{R} g_i + G_G} A_i - g_i - C_i^R \tag{11}$$

$$\frac{\delta V}{\delta g_i} = \frac{A_i G_G N_R}{(N_R g_i + G_G)^2} - 1 = 0 \tag{12}$$

$$\frac{\sqrt{A_i G_G N_R} - G_G}{N_R} = g_i \tag{13}$$

Note that $\lim_{N_R \to \infty} g_i = 0$. Therefore our SPE already fails. To reiterate on the recruitment problem, we note that, given this chosen effort level, an individual will choose to join the group in and only if $A_i(\lambda^R - \lambda^N) > g_i$ where $\lambda^R = \frac{N_R g_i}{N_R g_i + G_G}$ and $\lambda^N = \frac{(N_R - 1) g_i}{(N_R - 1) g_i + G_G}$.

$$A_i \left[ \frac{\sqrt{A_i G_G N_R} - G_G}{\sqrt{A_i G_G N_R}} - \frac{\sqrt{A_i G_G (N_R - 1)} - G_G}{\sqrt{A_i G_G (N_R - 1)}} \right] - \frac{\sqrt{A_i G_G N_R} - G_G}{N_R} > 0 \tag{14}$$

Defining the LHS as $I(N_R, A_i, G_G)$,we note $\lim_{N_R \to \infty} I(N_R, A_i, G_G) = 0$. Indeed, the reader can verify that this is negative for even very small group sizes. □

## Proposition 2

*Proof.* Again, we begin at the final stage. Since previous-period effort would have been maximum, the payoffs for providing $g_i = 1$ and providing $0 < g_i < 1$ are;

$$V_i^{g_{max}} = U_i(\theta) + \frac{N_R}{N_R + G_G} A_i - C_i^R - 1 \tag{15}$$

$$V_i^{g_{max'}} = U_i(\theta) + \frac{N_R g_i}{N_R g_i + G_G} A_i - C_i^R - \beta[(g_i - 1)^2]^{\frac{1}{2}} - g_i \tag{16}$$

Our players choose to exert maximum effort over any other strategy so long as $V_i^{g_{max}} > V_i^{g_{max'}}$:

$$A_i \left[ \frac{N_R}{N_R + G_G} - \frac{N_R g_i}{N_R g_i + G_G} \right] > 1 - g_i - \beta[(g_i - 1)^2]^{\frac{1}{2}} \tag{17}$$

Since ratio contest functions are increasing in the amount of effort exerted, and since $0 \leq g_i \leq 1$, and $A_i > 0$, the LHS will always be positive. Under the assumption $\beta > 1$, the RHS will always be negative, and thus our final player will always choose to exert maximum effort. As $N_R \to \infty$, the LHS tends to zero but the RHS remains negative.

Now we show that $V_i^R > V_i^N$( and so the final player joins the group);

$$A_i(\lambda^R - \lambda^N) + \beta\left(\frac{N_R - 1}{N_J}\right)^{\frac{3}{2}} > C_i^R + 1 \quad (18)$$

Note that as $N_R, N_J \rightarrow \infty$, (18) tends towards:

$$\beta > C_i^{R'} \quad (19)$$

Where $C_i^{R'} = C_i^R + 1$. This is the first condition in the proposition.

Now we generalise to the intermediate stages. Assuming that non-maximum effort strategies are equilibria[6], our intermediate players play maximum effort under the same conditions that the final players does. They will join the group under these circumstances;

$$A_i\left(\lambda^R - \lambda^{N'}\right) + \beta\left(\frac{N_R - q - 1}{N_J}\right)^{\frac{3}{2}} > C_i^R + 1 \quad (20)$$

$q$ is the number of stages back from the final stage. Note $\lambda^{N'} < \lambda^N$, since not joining the group will end the game (see section 3.3). Once again as $N_R, N_J \rightarrow \infty$ this equation reduces to (19). So long as that condition holds, all our intermediate stages of the game will remain in equilibrium.

In the model, the first player sets the effort norm and experiences no personal disutility of effort. They are the *leader*. A game that has had a social norm other than $g_i = 1$ would result in a payoff similar to (16), but without the cost of betraying a social norm:

$$V_i^{g_{max}'} = U_i(\theta^N) + \frac{N_R g_i}{N_R g_i + G_G} A_i - C_i^R \quad (21)$$

The condition that must hold for our first player to select maximum effort is therefore:

$$A_i[\lambda^{g_{max}} - \lambda^{g_{max}'}] \geq 0 \quad (22)$$

We make this a weak inequality so that, when our first player is indifferent between an effort norm of maximum and another choice, he chooses maximum. This will only occur as $N_R \rightarrow \infty$, and thus this weak inequality ensures that our first player will *always* prefer to set an effort norm of exerting maximum effort - since for finite $N_R$, by similar logic to the analysis of (17), $\lambda^{g_{max}} > \lambda^{g_{max}'}$.

Under what circumstances would he choose to create the group? The payoff for not creating the group is simply:

$$V_i^N = U_i(\theta) \quad (23)$$

Thus we will have a sub-game perfect equilibrium - in which an armed group forms, proliferates, and in which all members exert maximum effort - should the following inequality hold.

$$\lambda^R A_i > C_i' \quad (24)$$

Where $C_i' = C_i + 1$. □

[6] If they are not, then the SPE will only hold for maximum effort anyway.

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