A Game Theoretic Analysis

of Democracy, Tyranny,

and Terrorism

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In this paper, elementary theory of games is used to study the interactions between a government and a minority group within the society that the government controls. The first part of the study will assume that the division between the majority group and the minority group is stable. In the second part, this stability will not be assumed. The first case shows that, in agreement with a widely recognized problem of democracy, government/minority interactions are likely to lead to escalating violence that could end with the destruction of democracy or the annihilation of the minority. On the other hand, these interactions are more likely to lead to cooperation when the majority/minority division varies from one issue to another, indicating that this type of flexibility is a necessary condition for democracy to exist. The paper ends with some suggestions for future research.

First, before setting up the two game theoretical models, it is important to begin with a discussion of historical criticisms of democracy.

I. BACKGROUND: CRITICISMS OF DEMOCRACY

Frank Cunningham indicates that Winston Churchill's frequently repeated remark that democracy is a bad form of government that has the redeeming quality of being better than any of the alternatives is simply a variation of an idea that Aristotle expressed more than 2,000 years ago.[1] Jay Shafritz states that Aristotle believed that democracies tend to degenerate into tyranny. One reason for this is that democracies do not have sufficient safeguards to protect the minorities within them.[2] Alexis de Tocqueville and John Stuart Mill also forcefully call attention to

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this defect.[3] James L. Hyland is a contemporary supporter of this point of view.[4] Robert A. Dahl clearly shows that whether a majority is permanent or not has important consequences for the viability of a democratic system.[5]

Paul Gilbert discusses the implications of the lack of protection of minority rights for democracy and terrorism, and David Gosling indicates that John Rawls considered civil disobedience to be "justified when there is a substantial and clear injustice" in the rules imposed by the majority.[6] Gosling also argues that Rawls's opinion about when disobedience should be acceptable imposes excessive restrictions on the minority.

Tocqueville refers mainly to numerical minorities. However, tyrannical forms of government can be established in a democracy by any segment of the society with sufficient power. Karl Marx and Friedrich Engels generalize Tocqueville's and Mill's points of view when they observe that the state is an instrument used by the powerful groups in a society to exploit the weaker groups.[7]

Tocqueville's and Mill's points of view have an important refinement and confirmation in Kenneth Arrow's impossibility theorem. David Austen-Smith and Jeffrey S. Banks, as well as Alan D. Taylor, provide detailed and pedagogic presentations of this theorem.[8] It can be interpreted to mean that there is no voting procedure that makes it possible in every case to specify objectives for a society that reflect the preferences of all of its individual members. Taylor shows that a substantial amount of work has been done to identify special cases where the impossibility theorem is not valid.[9] Despite this, its basic conclusion has not been and cannot be modified.

Democracies do not have sufficient safeguards to protect the minorities within them.

It is important to emphasize that the criticisms of democracy just summarized are extremely damaging. They basically indicate that, under certain conditions, democracy cannot exist. Any society with a stable division into a majority and a minority, in which the majority does not voluntarily behave in agreement with ethical principles and does not respect the rights and interests of the minority, would be an oligarchy.

All the criticisms mentioned above implicitly or explicitly assume that the division of a society into a majority and a minority is stable over time. This means that the individuals that make up these two groups are permanently attached to them and cannot move from one to the other when different issues are considered. Geoff Payne indicates that the main reason for this stability appears to be that the division into groups is based on characteristics that cannot be easily changed—such as race, ethnicity, gender, sexual preference, language, religion, and place of birth, among others.[10] This means that societies without these or

similar structural characteristics may have non-stable or flexible majority/minority divisions. A different position is taken in the constructivist approach as presented by, for instance, Aletta J. Norval.[11] This approach maintains the point of view that the stability of majority/minority divisions is a consequence of historical and political processes rather than the traits or attributes mentioned above. This implies that flexibility can be achieved in any society.

The two alternative points of view presented above are used as bases to study interactions between a government and a less powerful group that is part of the society controlled by the government. This analysis is done in Section 2, assuming that the majority/minority division is stable, and in Section 3, assuming that this is not the case. Some conclusions and suggestions for future research are presented in Section 4.

2. GOVERNMENT/MINORITY INTERACTIONS IN SOCIETIES WITH A STABLE MAJORITY/MINORITY DIVISION

2-1. Introduction

The basis for the analysis in this section is the assumption that a society has a stable division between a powerful group, to be called the majority, and a weak group, to be called the minority. It is further assumed that the majority controls the government. The interactions between the government and the minority are studied below with the aid of elementary game theoretic concepts.

A model of one isolated government/minority interaction is developed in Section 2-2. Its equilibrium is determined and studied in Section 2-3. The analysis is extended to the case of repeated interactions in Section 2-4.

2-2. A Representation as a Game of the Interactions Between a Government and the Stable Minority in a Society that Government Controls

An attempt to describe the conceptual foundations of the analysis below would involve an extensive analysis of topics studied in political science and the growing number of studies proposing conceptual frameworks for the study of terrorism, which is clearly beyond the scope of one paper. For reference, Alex P. Schmid and Albert J. Jongman present a useful summary of the theories available to explain terrorism.[12]

In the game theoretic model to be presented below, as in most game theoretic models dealing with human beings, it is assumed that the actors are rational. This assumption has also been used in the study of terrorism, for instance, by Martha Crenshaw.[13] The conceptual term of reference to be used below is inspired by the studies by Irwin Fetscher, Harry R. Targ, and Martin Wagner and Roger Crisp—authors that present comprehensive analyses of the problem that are consistent with the rationality assumption.[14]

In this presentation, basic concepts such as democracy, majority, minority, ter-

rorism, tyranny, and violence are not defined. These and similar terms are used with the meaning generally attached to them as presented, for instance, by Frank Bealey.[15] A justification for this is that there does not seem to be complete agreement on what can be called their technical definitions.

The first step in the development of a game is the specification of the participating actors or players. In order to simplify the analysis as much as possible, the only actors to be considered are the government and the stable minority in the state that the government controls. As already observed, the term *minority* is used to refer not only to a numerical minority, but to any group that lacks the power to influence the government.

Under certain conditions, democracy cannot exist.

Continuing with the development of the basic game, and again, simplifying things as much as possible, it is assumed here that each of the two actors has only two strategies. Those in the government are inclined either to maintain the status quo in which the rights and interests of the minority are not recognized, or to recognize the minority's rights and interests. The strategies of the minorities are to use either legal or illegal instruments to induce the government to recognize its rights and interests.

Some observations are needed to better describe the two sets of strategies introduced above. First, the legal instruments that the minority can use are, in principle, determined by decision of the majority-controlled government. This implies that the effectiveness of these instruments is likely to be, at best, rather limited. Another point that should be emphasized is that the use of illegal instruments by the minority, which may include terrorist actions, is likely to bring about costly sanctions by the government. These may range from relatively minor obstacles to substantial retaliations that endanger the well-being and even the lives of the members of the minority; that is, actions that may be considered state-sponsored terrorism.

It is also important to keep in mind that there is no reason why the rights and interests whose recognition motivates the minority and the legal and illegal instruments that it can use should be frozen in time. In fact, they are likely to be changing continuously. The possibility of such changes is initially ignored in the presentation below. The existence of this possibility and its implications will be analyzed in Section 2-4.

Even with these explanations, it should be clear that the sets of strategies assigned to the government and the minority substantially simplify reality. In most actual situations there are a large number of intermediate levels between complete recognition and non-recognition of the rights and interests of the minority. One reason for this is that a large variety of rights and interests are likely to be under discussion at any given time. As a consequence, a large number of partial recognitions are possible.

Similarly, legal and illegal instruments are not well-defined. For example, illegal instruments range from passive resistance, which can be considered an acceptable way of conducting a struggle against tyrannical forms of government, to terrorist actions, including the killing of innocent civilians.

The final step in the development of the game between the government and the minority is the specification of the preference rankings assigned by the two actors to the outcomes generated by their choice of strategies. A prerequisite for this is an analysis of their motivations. It is assumed here that, as their first priority, government officials pursue the service of the rights and interests of the majority that constitute the bases of their power. If this were not the case, the officials would lose the support of the majority and would be replaced. On the other hand, the minority pursues the recognition of its rights and interests, even if this constrains or overrides the rights and interests of the majority.

In the presentation below it will be assumed that the actors rank their preferences as best (B), second best (S), third (T), and least preferred or worst (W).

On the basis of the information about the actors in the game being developed, their strategies, and their preferences for the outcomes generated with their choice of strategies—and assuming that the actors interact only once—the normal or matrix game in Table 1 can be specified.

TABLE I

AN ISOLATED INTERACTION BETWEEN THE GOVERNMENT OF A STATE AND A STABLE MINORITY

MINORITY

In Table 1, the government chooses between the two rows to its right and the minority chooses between the two columns under it. The payoffs to the two

actors are indicated by the pairs of letters in parenthesis in the main body of the table. The first letter of each pair indicates the payoff for the government, while the second letter shows the payoff for the minority. The letters themselves indicate the ranking that each actor assigns to the outcome obtained with the choice of strategies at the heads of the corresponding row and column.

In agreement with these observations, Table 1 shows that the combination of strategies (status quo, legal) is the one most preferred by the government, but the one least preferred by the minority. That is, it has the payoffs (B, W). This is supported by the observation that, in this case, the government would be serving the rights and interests of the majority with a minimum of cost since the minority would be using the inefficient methods that the government itself, with the support of the majority, has assigned to the minority to express its concerns and dissatisfaction. The combination of strategies is the least preferred by the minority since, by assumption, it is willing to pay some of the consequences of illegal actions in order to achieve recognition of its rights and interests.

The legal instruments that the minority can use are, in principle, determined by decision of the majority-controlled government.

At the other extreme of Table 1, the combination of strategies (recognition, illegal) is assumed to be the least preferred by the government, but the second most preferred by the minority. That is, it has the payoffs (W, S). The reason for this evaluation is that the government is forced by the minority to change its policies, an action that may reduce or eliminate the support it has from the majority. The minority assigns a second ranking to the outcome because the recognition pursued is obtained with illegal, and as a consequence, costly actions.

The recognition of the rights and interests of the minority through legal actions has payoffs (S, B). The reason for this is that the government still has to make undesired concessions, but since they are obtained using the legal instruments the government has provided to the minorities, these concessions are not likely to represent major changes. It is assumed that the minority highly values the progress made, since it is less costly than the use of illegal instruments.

The payoffs assumed for the combination of strategies (status quo, illegal) are (T, T). Under these conditions, the government maintains the status quo but at the cost of the illegal actions of the minority, and the minority bears these costs without receiving any discernible benefits.

2-3. Equilibrium Strategies for the Government and the Minority in the Case of One Isolated Interaction

An analysis of Table 1 shows that the government would choose to main-

tain the status quo regardless of the strategy chosen by the minority. On the other hand, the minority would choose legal behavior if the government recognizes its rights and interests, but illegal behavior if the government maintains the status quo. The consequence of these preferences is that the combination of strategies (status quo, illegal) is selected by the actors and is the equilibrium of the game. This means that the government and the minority are likely to be locked in a long, costly, and hopeless struggle. Unfortunately, reality suggests that this is frequently the case.

At first sight, the equilibrium of the game in Table 1 seems to contradict the assumption that the actors choose their strategies in order to achieve the outcome that maximizes their satisfaction. In the game in Table 1, this outcome would be obtained using the combination of strategies (recognition, legal), whose payoff is (S, B). However, this combination is not an equilibrium, because the government would be motivated to shift to (status quo, legal), with payoffs of (B, W). As a consequence, the minority would shift to (status quo, illegal), with payoffs of (T, T) that improves its payoff from W to T. The game in Table 1 thus leads to a dilemma similar to that in the well-known "prisoners' dilemma" game: the equilibria in these two games are non-Pareto optimal. That is, there are non-equilibrium combinations of strategies in these games that simultaneously increase the satisfaction of the two actors involved in them. Some observations on this point will be presented later.

2-4. Analysis of Repeated Interactions Between the Government and the Minority

One of the assumptions supporting the non-Pareto optimal equilibrium of the game in Table 1 is that the government and the minority interact only once. Instead it will be assumed below that a series of interactions may occur. The assumptions of a stable majority/minority division and that the preferences of these two groups remain constant are retained.

Under these assumptions, the relations between the government and the minority will move in the direction of escalating violence. This move is justified by observing that neither the government nor the minority have reached their objectives after any round of the game in Table 1 in which the combination of strategies (status quo, illegal) is used. A reasonable reaction of the government would be to assume that it has not used sufficiently strong sanctions to deter the minority from using the illegal strategies it has used in the past. A similarly reasonable reaction of the minority is that it has not used illegal actions sufficiently damaging enough to force the government to recognize its rights and interests. In principle, this escalating violence could proceed until one of the opposing parties is destroyed. This means that the pessimistic conclusion reached in the case of one isolated interaction between the government and the minority is reinforced when several interactions are assumed to take place.

The escalation process generated by repetitions of government/minority interactions is similar to that encountered when two or more states are involved in an arms race. Hector Correa, Wolfgang Leininger, and Barry O'Neil call attention to the fact that behavior in arms races also takes place in what is called a Dollar-Auction game.[16] In this game, two players bid for a prize of one dollar. The higher bidder receives the prize but both pay their bids. Each bidder increases their bid to avoid a complete loss of the payments they have to make. It can be shown, and has been experimentally observed, that bids higher than the expected prize are possible and that bids can proceed up to the point where financial capabilities impose a limit.

The combination of strategies (status quo, legal) is the one most preferred by the government, but the one least preferred by the minority.

It is interesting to consider the consequences of repeated government/minority interactions in a prisoners' dilemma game. As previously observed, actors involved in an isolated prisoners' dilemma interaction choose a non-Pareto optimal equilibrium. However, as shown by Phillip Straffin, a series without a certain termination of prisoners' dilemma interactions may lead to cooperative behavior among the actors involved and a Pareto optimal equilibrium.[17] Unfortunately, a similar conclusion may not be valid for repeated interactions of the government/minority game. The reason for this is that the result for the prisoners' dilemma is based on the symmetry of the payoffs of the two players, and the game in Table 1 does not have this property.

To summarize the previous analyses: repeated interactions between the government and the minority are likely to be characterized by increasing violence, despite that in the somewhat similar case of repeated prisoners' dilemma interactions it can be shown that cooperation between the actors could develop. The possibility of generalizing these results to the case of government/minority interactions is not fully explored here. Such an analysis should take into consideration the transcendence of the real social problems that the model in Table 1 represents.

Historical processes support the conclusion that progressive cooperation or increasing conflict are possible in repeated government/minority interactions. The French/Algerian and the Israeli/Palestinian conflicts are examples of these historical processes. These two cases include periods of cooperative and conflictive interactions. A superficial study of these and similar cases suggests that extraordinary events are needed to transform interactions with increasing cooperation into those with escalating violence or vice versa. As indicated by Crenshaw, the escalating violence between Algeria and France ended with the fall of the Fourth French Republic and the establishment of the Fifth Republic with de Gaulle as

its president, whose policies led to Algerian independence.[18] Israeli/Palestinian violence, as indicated by Oded Balaban and Paul Wilkinson, subsided with Rabin's election and his cooperation with Arafat.[19] This process ended with Rabin's assassination. It is important to observe that Ted Robert Gurr does not support these observations in his study of terrorism. Gurr states "that in a number of respects the evidence of the 1960s contradicts some common views about the nature of political terrorism. Most campaigns were very brief, involved very few activists, and caused more noise than injury."[20]

At present, game theory does not suggest ways to generate the extraordinary events needed to detour escalating violence and generate cooperative interactions in government/minority interactions. The previous observations suggest that this is another area in which research could produce valuable results.

2-5. Overall Conclusions from the Analyses of Interactions in Societies with a Stable Majority/Minority Division

Numerous, perhaps a majority of, political scientists do not accept the conclusions presented in Sections 2-3 and 2-4. The point of view of at least some of them can be interpreted to be that the validity of the previous analyses is at best limited because they are based on the assumption that each of the two interacting actors only have two extreme strategies. For instance, Wilkinson indicated that the government and the minority, in practice, have several intermediate strategies between the two extremes used above.[21] The model presented here can be easily modified to include this possibility, but this extension is left as an avenue for future research. In this respect, the study by Pippa Norris is particularly useful, in spite of the fact that it considers only one intermediate strategy.[22] This author analyzes a sample of 20,361 respondents in 12 countries and concludes that "the claim that proportional representation...systems are directly associated with higher levels of political support among ethnic minorities is not confirmed."[23] This means that this statistical study supports the conclusions presented above. However, the final determination of whether these conclusions or the alternatives suggested by other authors should be accepted is left here as a suggestion for further research.

There are non-equilibrium combinations of strategies in these games that simultaneously increase the satisfaction of the two actors involved in them.

3. ANALYSIS OF THE CASE IN WHICH THE STRUCTURAL MAJORITY/MINORITY DIVISION IS NOT STABLE

The analyses presented so far are based on the assumption of stability of

the division in majority and minority groups. In other words, they are based on the assumption that all members of the society remain permanently in either one of these groups. As observed in Section 1, this is likely to happen when the division is based on race, gender, language, wealth distribution, religion, or other characteristics. It is also mentioned in Section 1 that in constructivism, it is assumed that stable majority/minority divisions are generated by cultural processes rather than by the traits or attributes mentioned above. On this basis it is reasonable to assume that there can be societies in which majority/minority divisions are flexible; that is, in which some majority members in one interaction become minority members in another interaction, and vice versa. This definition can also be applied to what Dahl calls "pluralistic" societies, which are those that include numerous minority groups that form coalitions to obtain from the government the specific benefits they pursue.[24] Flexibility in this case means that no minority groups are permanently excluded from the coalitions that achieve government recognition of their rights and interests.

There can be societies in which some majority members in one interaction become minority members in another interaction, and vice versa.

An immediate implication of the flexibility assumption is that different majority/minority divisions form when the issues being considered change. It follows that control of the government by "the majority" and repeated interactions between the majority-controlled government and "the minority" are not possible. This implies that the relationship between government and minorities takes the form of a sequence of isolated or non-repeated interactions. These interactions cannot be analyzed with the model presented in Table 1 because the assumptions used to construct it are not applicable to the case of flexible majority/minority division. Specifically, in this case it is unreasonable to assume that the rights and interests of the minorities are never recognized, and that the minorities do not have efficient instruments to change government decisions when appropriate.

To justify these statements it should be observed that every member, or group of members, of a flexible society participates in the majority on some occasions and in the minority on other occasions. In this way, some rights and interests of all members of the society are recognized in the status quo, and are maintained by any established government. As a consequence, every member of the society has some reason to support the government, regardless of whether they find themselves in the majority or minority with respect to a specific issue. It follows from this that the individuals in a specific minority are not motivated to use extreme instruments in their interactions with the government in order to obtain the results they pursue.

An additional consequence of these conditions is that the legal instruments that any minority can use in attempting to correct what its members consider unacceptable government behavior are likely to be more effective than those the minority can use in a non-flexible society. This is true because effective legal instruments are specified by a majority whose members are well aware that eventually they will be in the minority, and may need to use those same instruments to obtain what they consider acceptable government decisions.

The interactions characterized by the previous observations can be represented with the game in Table 2. A comparison of Tables 1 and 2 shows that only the minority changes its rankings of the outcomes resulting from the combinations of strategies. The most important modification is with respect to the improved acceptance of legal actions, even when the government retains the status quo. At the same time, the minority substantially downgrades illegal actions. These rankings are justified, on the one hand, by the basic support that the minority gives to the government even if it opposes its rights and interests in the issue being considered, and on the other hand, by the availability of legal actions to redress government decisions that the minority considers unacceptable.

TABLE 2

AN ISOLATED INTERACTION BETWEEN THE GOVERNMENT OF A STATE AND A VARIABLE MINORITY WITHIN IT

<div align="center">

MINORITY

</div>

	Legal	Illegal
Status quo	(B, S) ⇐	(T, W)
	⇑	⇑
Recognition	(S, B) ⇐	(W, T)

GOVERNMENT

The equilibrium combination of strategies in Table 2 is (Status quo, Legal). Intuitively, this is a reasonable result. A minority does not have the power or influence needed to modify the status quo. The majority votes override the minority point of view. The government would not risk any major problems,

since the members of the minority in any specific case will be ready to fight other battles in which they may find themselves in the majority.

A limitation of the previous analysis is that it does not deal with the real situation in which a minority legally challenges a government and obtains recognition of its rights and interests, thus achieving an equilibrium of (recognition, legal) in the Table 2 game.

To study this problem, it should be observed that the equilibrium of (recognition, legal) could be obtained if the rankings B and S that the government assigns to its strategies in Table 2 are inverted. However, it seems unreasonable to assume that the government would voluntarily recognize the rights and interests of the minority rather than maintain the status quo. This implies that the combination of (recognition, legal) would have to be imposed by an authority higher than the government. This case can be studied with a three-actor game, and this is left for future research.

The flexibility of the majority/minority division is a necessary condition for the existence of a workable democracy.

To summarize the previous analysis: the final result of the basic support of an established government, the lack of motivation of any minority to use illegal and extreme instruments to achieve its objectives, and the availability of effective legal instruments for this purpose is that the equilibrium of any specific government/minority interaction is the combination of strategies (status quo, legal) with payoffs of (B, S). A generalization of this conclusion is that the flexibility of the majority/minority division is a necessary condition for the existence of a workable democracy.

Conclusions similar to those presented above are reached, for instance, by Ian Shapiro.[25] Shapiro indicates that a "perpetual vulnerability" of what, in terms of this paper, is the prevailing majority, "is desirable."[26]

Unfortunately, societies do not seem to be able to choose between having or not having this type of flexibility. As already indicated, inflexibility is likely to be based on characteristics outside the control of policymakers and members of a society in general. Societies in these conditions are likely to harbor internal escalating conflicts unless the majority behaves in agreement with the principles of morality and justice.

On the other hand, it should be observed that the model analyzed in this section and the conclusions reached in it are vulnerable to the criticisms that in principle can be leveled against the presentation in Section 2. In particular, the possibility that the conclusions reached are modified when it is assumed that the government and the minority each have more than two extreme strategies deserves special attention. However, as already observed, this is left for future research.

4. SUMMARY, CONCLUSIONS, AND SUGGESTIONS FOR FUTURE RESEARCH

The interactions between a government and a minority within a society that the government controls are analyzed in this paper. First, the majority/minority division is assumed to be stable, and then this stability is assumed not to exist.

In the case characterized by a stable majority/minority division, it is assumed that the government cannot recognize the rights and interests of the minority without losing the support of the majority, and that it cannot concede effective instruments to the minority that would allow it to change these conditions. As a consequence, the best alternative for the government is to defend the status quo at all costs, and for the minority to oppose the government using illegal means, despite the sanctions that the government may impose. These conditions will tend to deteriorate in repeated interactions, leading to a process of escalating violence.

Substantially different conclusions are reached when it is assumed that the majority/minority division is flexible and this varies from one issue to another. In this case, the entire population is motivated to support the government, and any minority formed with respect to a specific issue has effective legal instruments to attempt to redress any governmental decision it considers unacceptable. It follows from this that the best alternative for the government and the minority is to choose the combination of strategies (status quo, legal). This result justifies the statement that flexibility in the majority/minority division of the population is a precondition for democracy.

Although the conclusions of this paper are intuitively appealing, they should not be accepted without further study. There are numerous issues that require additional conceptual study and empirical verification but are left as topics for future research. A list of them touches all the aspects of the previous analyses, and should include:

a) a generalization of the models used here to consider other social actors in addition to the government and minorities;

b) the characterization of stable and flexible majority/minority divisions and the social capacity to shift from one to the other;

c) the strategies available to whatever actors are being considered;

d) the payoffs assumed for them, and;

e) the ways to generate the special events that transform a process of escalating violence into one of increasing cooperation, and to avoid those events that bring about transformations in the opposite direction.

These suggestions do not exhaust all the alternatives. For instance, the important extensions of the problems considered here dealing with the burning question of international terrorism can and should be scrutinized with the methods and instruments applied in the sections above.

This paper does not profess to provide a definitive analysis of topics that have been studied for as long as governments, in general, and democratic governments, in particular, have existed. Rather, it is an attempt to react to the frustration created by the feeling that humanity is losing control of its future. My hope is that this paper may shed some light to the use and application of analytical tools that are already available, but not often used. ■

NOTES

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24 Robert A. Dahl, *Toward Democracy: A Journey – Reflections: 1940-1997* (Berkeley, CA: Institute of Governmental Studies Press, 1997), 286.

25 Ian Shapiro, "Three Fallacies Concerning Majorities, Minorities and Democratic Politics," in John W. Chapman and Alan Wertheimer, *Majorities and Minorities* (New York, NY: New York University Press, 1990), 106-113.

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