Coalitions

A coalition is the temporary cooperation of different individuals, groups or political parties to achieve a common purpose which can be short term or long term. Almost all politics can be conceived as involving the formation of some kind of coalition: pressure groups, social movements and political parties are coalitions of individuals with a common interest; governments can be formed by coalitions of political parties, not only in parliamentary regimes, but also in regimes of division of powers; maintaining political stability or resolving political or ethnic conflicts can induce the formation of broad coalitions committed to support a new regime; different governments and states can form military coalitions unified under a single command. A coalition implies cooperation among its members. A relationship of conflict usually develops between different coalitions whose members have opposite interests.

The most usual analyses of coalitions in politics deal with the formation of multiparty cabinets in parliamentary regimes. In government coalitions, several political parties cooperate, usually during a legislative term between two elections. Coalition governments are the most usual form in most parliamentary regimes using electoral rules of proportional representation which typically do not produce a single party majority of seats. This includes most countries in continental Europe, as well as other democratic countries such as India, Israel, and New Zealand. However, other broad coalitions have resulted from political settlements or conflict resolution, such as in South Africa, Zimbabwe, Kenya or Madagascar, often involving international or external moderators.

For government formation in parliamentary regimes, let us take the example of Germany, where all cabinets since the end of World War II have been multiparty coalitions. The chancellor or prime minister has always been either a Christian-democrat or a Social-democrat, but government coalitions include several formulas: rightist Christian-democrats (always with their allies, the Bavarian Social-Christians) with center-right Free-democrats, center-left Social-democrats with Free-democrats, Social-democrats with left Greens, and the so called 'grand coalition' of Christian-democrats and Social-democrats. All these governmental formulas have had majority support in terms of both popular votes and parliamentary seats. Due to the long-term participation of a few parties in government and other institutional mechanisms, the degree of stability in major public policies in Germany is very high. In contrast, the alternation of single party cabinets when different parties receive a majority of seats in successive elections, as in Britain, may provoke periodic shifts in major public policy making.

Within political science, the formation and termination of cabinet coalitions has been analyzed as cooperative games in game theory. Both the search for office and the search for policy or ideological goals can be presumed to be realistic and legitimate motivations of politicians when they try to form a multiparty coalition. At the time of forming government, the interest of members of parliament in enjoying as much power as possible translates into the aspiration to accumulate as many government portfolios

or ministries as possible for their party. This becomes a criterion to form a coalition with the minimum viable size. The explanation for this is that if a government is formed of a multi-party coalition without superfluous members, it can give each party a relatively high share of power to exert and enjoy. In a minimum winning coalition, each of its party members is pivotal, in the sense that the loss of a party would render the coalition no longer a winning coalition. In the particular case that a party has an absolute majority of seats in parliament, the minimum winning 'coalition' is the majority single-party government without additional partners.

For parties interested in policy, a criterion to select potential partners in a government coalition is the minimization of policy-ideology distance. Specifically, parties may try to form a coalition with 'connected' parties, for example on the left-right dimension, that is, with parties that are contiguous to their positions, and then devoid of unnecessary parties. Closeness can facilitate the negotiation of a government program and diminish internal policy conflicts within the coalition. For instance, social-democratic, leftist and green parties are more likely to form coalitions among themselves than with liberal, christian-democratic or conservative parties, which in turn can be prone to unite themselves in some governmental coalition.

A minimal connected winning coalition with more than two parties may include some superfluous partners in terms of size that are located on intermediate ideological positions and are thus necessary to maintain the ideological connection between its members. But also in a minimal connected winning coalition, each party is pivotal because the loss of a party would render the coalition either no longer winning or no longer connected. On a single-dimension policy space such as the left-right axis, the median party will always be included in a connected winning coalition. The median is the position having less than half positions on each side and is, thus, necessary to form a consistent majority along the issue space. Empirical analyses show that government coalitions containing the median party in parliament are more likely to form.

When different winning coalitions can be formed in a parliament, the party composition of the government may depend on the bargaining power of each party and the presence, or not, of a dominant party. We have several tools to analyze these points. Different political parties may have bargaining power to form a government coalition which does not mechanically correspond to their numbers of seats. A relatively minor party which is 'pivotal' to form a majority, that is, a party able to contribute with the necessary number of seats to make a coalition winning, may have relatively high power to negotiate cabinet membership or policy decisions. For example, some center, agrarian, ethnic, radical or democratic parties may be located in a central place able to form coalitions, at different moments, with either the parties on their left or those on their right. In contrast, a relatively large party whose contribution can be easily replaced with that of a smaller party may have relatively low bargaining power in comparison to its size. A party's bargaining power in parliament can be measured, thus, not by its number of seats, but by the proportion of potential winning coalitions in which the party is pivotal. There are several 'power indices' available to measure a party's bargaining power. They slightly differ in their assumptions regarding actors' criteria, coalition models and decision rules, but most of them produce similar results.

In certain configurations, the largest party in parliament, even if it does not have a majority of seats, can be dominant if its central position makes it able to block any coalition cabinet and take all portfolios. In other words, a party is dominant if the other parties cannot form a winning coalition without that party. If the non-dominant parties are unable to form a majority coalition among themselves due to their ideological distance, then the dominant party can block any coalition and form a minority cabinet.

Minority cabinets of a dominant party are viable and likely to form the greater the policy-ideology divisions and the smaller the size of the parties in the opposition. The Congress party in India, the Christian-democratic party in Italy, the Liberal-democratic party in Japan, the Social-democratic parties in Denmark, Sweden and Norway, for instance, were dominant single parties for long periods.

Additional analyses deal not only with which parties are more likely to enter a coalition cabinet, but with the allocation of ministries to the parties within the cabinet. The distribution of cabinet portfolios among coalition parties tends to be proportional to the number of seats controlled by each party, that is, with its contribution to making a coalition winning. However, different parties have preferences for different portfolios depending on the policy issues they emphasize the most, which may produce varied allocations. The prime minister's party usually controls most of the portfolios in charge of major policy domains, especially economy, defense and home affairs. Other cabinet portfolios can be allocated to parties with a strong profile on certain issues on which they tend to campaign and attract citizens' votes, such as social policy for Labourites or Social-democrats, education for Christian-democrats, finance for Liberals, agriculture for Agrarians, etcetera.

Different coalition formulas are associated to different durations of cabinets. Regular parliamentary elections are usually scheduled at intervals of three, four or five years, depending on the country. But a significant number of parliamentary cabinets do not last as long as they legally could because there are anticipated dissolutions of parliament and elections, which can usually be called by the prime minister, as well as resignations by prime ministers, successful motions of censure and defeated motions of confidence. Regarding the party composition of cabinets, single-party majority cabinets tend to last longer than multi-party coalition or minority cabinets. In single-party governments, conspiracies among party members to replace the incumbent prime minister are relatively likely, especially if party members expect to have better electoral prospects with a new candidate. In contrast, in multi-party coalition governments, internal party cohesion tends to increase, but coalition partners are more willing to work against the incumbent formula. For coalition cabinets, the higher the number of parties and the broader the ideological distance between them, the more vulnerable to splits and departures and less durable they should be expected to be. This kind of crises is relatively frequent in parliamentary regimes. In a counting for 15 countries of Western Europe since the Second World War, about one sixth of parliamentary governments have not concluded their term due to a change of the prime minister, the party composition of the government coalition, or the dissolution of parliament and the call of an early election.

Multiparty coalition cabinets in parliamentary regimes tend to induce a relative balanced inter-institutional relationship between the prime minister and the parliament. As political parties need to bargain and reach agreements in order to make policy decisions and pass bills, they learn to share power and develop negotiation skills. Cabinet members from different parties need to cooperate as well. The prime minister cannot prevail over the cabinet or the assembly as much as when leading a single-party government because, even if he or she is a member of one of the parties involved, he or she has to negotiate with the other parties and maintain the coalition united. In a parliamentary regime the institutional role of the parliament thrives when no party has an absolute majority of seats.

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See also Cabinets, Cooperation, Game Theory, Parliamentary systems, Parties, Party systems

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Cooperation

Many definitions of politics emphasize the conflict aspect of human relations. But cooperation should be considered the essential element of politics, even if it is not always achieved at the degree that would produce optimum results. Cooperation is action for the common benefit. Only human beings are able to cooperate and abide by collective rules for their common interests. No animals but humans are able to cooperate in forms such as making exchanges in their mutual benefit, forming coalitions and stable organizations, making enforceable decisions on collective affairs and living in large communities under shared norms.

All fundamental problems in politics face the crucial question of how, under what circumstances and to what extent human beings can be motivated to cooperate in their common interest. Cooperation is at the core of the issues of conviviality, democracy, peaceful coexistence between different communities, and the preservation of human living on Earth, as is briefly reviewed in the following paragraphs.

- *Community*. In what certain classical authors called 'the state of nature', conflict is pervading. If human interactions are unconstrained, anybody, with the advantage of surprise, can try to impose his will over the others. But if all do, then people may find themselves living in a state of chaos in which, in Thomas Hobbes' famous words, life tends to be "solitary, poor, nasty, brutish, and short". In such an environment it is not reasonable to risk unilateral cooperation, while cooperation within groups is precarious. However, human beings can do it better. People can agree on creating a government equipped with coercion tools to enforce rules mandating those cooperative actions that individuals find beneficial for all of them. The government may apply sanctions against 'defectors', that is, violators of mutually beneficial rules of conduct, discourage free-riding on public goods and craft incentives for cooperation. People can rationally accept conditional consent. By an agreed 'social contract', the efficient outcome of civilization or 'commonwealth', in which each can live in peace and security, can be attained.

- *Democratization*. In situations of institutional regime crisis in which authoritarian rulers cannot go on as they were accustomed to, actors with opposite political regime preferences can generate violent conflict or a civil war in which both sides may fight to eliminate each other. Eventually, one of the sides can become a single, absolute winner. But choosing confrontation with uncertain outcome also entails the risk of becoming an absolute loser, as well as the costs of significant destruction on both sides. In contrast, by anticipating the foreseeable consequences of their choices, either the rulers or the opposition leaders can offer conditional, retractable cooperation. Negotiations can lead to a provisional compromise including the calling of a multiparty election not securing an absolute winner, which may open further developments in favor of either of the actors involved, as has happened in so many cases of democratization in different parts of the world since the last quarter of the 20th century.

- *Deterrence*. International relations have traditionally been dominated by conflict, which culminated at the Cold War between the United States and the Soviet Union during the second half of the twentieth century. However, a major clash was prevented by underlying cooperation. An arms race triggered by the Soviets choosing to build new weapons, and the United States doing the same, and viceversa, which put both countries at risk. The 'balance of terror' without actual frontal war was durable

because, with nuclear weapons and the possibility of total destruction, the stakes were so high. The United States and the Soviet Union attempted to cooperate to reduce and control arms through negotiations and agreements. Nevertheless, the arms race only stopped with the dissolution of one of the players.

- *Environment.* Climate change has become a broad concern, leading many people to call to stop the planet from overheating. Yet some skepticism persists and few governments are willing to deal with the problem by themselves. The 'Kyoto Protocol' to put a limit on emissions of greenhouse gases was formally accepted by thirty-six developed countries for the period 2005-2012. However, the United States and Australia initially refused to sign. Even some of the protocol signatories, as well as many developing countries, including most prominently China, continue to grow and pollute as much as they liked. If international cooperation did not substantiated, the world might be condemned to an eventual burning, according to the holders of the global warming thesis. Most countries seem to have recently found some incentive to avoid being sanctioned for their misconduct. The Asia-Pacific Partnership 'on clean development and climate' has attained new cooperation on development and technology transfer enabling a reduction in gas emissions. The United Nations held successful talks with virtually all countries in the world to replace the Kyoto protocol after its deadline. If things get bad enough, then cooperation may flourish.

The conditions in which cooperation among different actors for their common interest can emerge and hold up, such as in the cases mentioned above, can be enlightened with the help of some analytical tools provided by game theory. In particular, competitive, non-zero sum games, such as the famous Prisoner's Dilemma, involve different combinations of cooperation and conflict. When mutual cooperation can produce gains for all participants it is said that the sum of the players' benefits is positive. But people may fail to cooperate with others even if cooperation would produce a better collective outcome for all the participants.

The lessons from the prisoner's dilemma can be applied to any group or community facing a cooperation problem among its members. On the one hand, the previously mentioned outcomes of state of nature, civil war, arms race or destruction of natural resources can be conceived as inefficient, equilibrium outcomes of Prisoner's Dilemma-type of interactions. On the other hand, the state of civilization, democracy, peaceful coexistence, and salvation of the atmosphere can correspond to alternative, efficient, although somehow vulnerable outcomes of this type of game produced by mutual cooperation.

Mutual conflict can diminish and mutual cooperation can emerge and sustain the greater the uncertainty as to the length of the collective relationship and the higher the number of interactions, as suggested by game theory models with 'repeated' games. If people are going to do repeated interactions, it may make sense to try to cooperate in order to receive others' cooperation in the future. A community or institutional setting in which everybody can expect to keep interacting with the same people regularly for some time in the future may include a household or a neighborhood, the workplace, a mall or a school, a professional organization or a political party, as well as the city, the state, the empire or the world where one is aware of living in and intends to stay. A reasonable behavior for repeated interactions with other individuals with some common interest can imply conditional cooperation and a positive response to the others' behavior. In the long term, cooperation may spread and become the prevailing way of conduct.

According to this insight, we can observe that cooperation, as can be substantiated in form of collective action or a joint organization, is indeed more intense and sustained among certain groups of people interacting for long periods of indefinite length. Cooperation should be higher, for example, among members of a condominium rather than among motel clients; among town residents rather than among tourists or occasional visitors; among fixed employees rather than among temporarily unemployed people expecting to find a job soon; among civil servants rather than among seasonal workers; among store owners in a commercial mall rather than among sporadic vendors in a street market; among practitioners of professions requiring costly training or implying low opportunity costs, such as miners or physicians, who are likely to stay in the job, rather than among amateurs or aficionados; among three- or four-year program enrolled students rather than among summer-course attendees; as well as among citizens in countries with a sedentary population rather than in those in which many people are likely to emigrate.

If people reciprocate with cooperation to cooperation in repeated interactions, they can build a good reputation for themselves that may move other people to cooperate with them. Feelings of trust may emerge among people having information about others' past action and among new participants obtaining regular positive retribution for their conduct. In the mid or long term, increasing and sustained cooperation among members of a community may induce them to construct institutional environments that limit individual competition and tend to homogenize the population. Internal sanctions against defectors can go together with the promotion of values such as honesty and empathy with the distress of others, thus reinforcing social cooperativeness. Emerging and self-sustaining cooperation in the long term can also solve the problems of conviviality, democracy, peaceful coexistence and earth salvation mentioned before. Indeed a sense of reciprocity and a capacity for empathy seems to have developed over time among human beings.

Nevertheless, the development of cooperation among members of a community requires some mutual commitment to stay within its contours. If, conversely, people living within the same institutional setting consider themselves to belong to different groups with opposite goals, asymmetric relations of cooperation and conflict within the community can develop. The difference between groups can be based on family or tribal traditions, contrary economic interests, adversary preferences for the location of public goods, or alternative ethnic allegiances such as language, race or religion. Thus, high degrees of success or failure in attaining cooperation within a group do not necessarily correspond to socially efficient or inefficient solutions. The collective strength of some groups may indeed provoke conflict with other groups or favor asymmetric and biased redistributions of resources, hindering more satisfactory outcomes for greater numbers of people.

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See also Coalitions, Competition, Conflict Resolution, Contract Theory, Coordination, Democratization, Deterrence, Game Theory, Prisoner's Dilemma,

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Election by Lot

The election of public officers by lots, or 'lottery', is a procedure able to prevent the formation of a permanent leading group and diffuse knowledge of public affairs among the members of the community. It can be an appropriate formula in settings in which an assembly of members or a representative council makes decisions by broad consensus or unanimity and public jobs do not require high technical skills. The selection of delegates by turns and the subsequent rotation of people in public offices can have about the same effects as lotteries. There is an old tradition of choosing public officers by drawing lots that can be found in ancient and medieval local democracies, modern private settings and some international organizations. In most cases, it goes together with the central role of the assembly to make decisions on the most relevant issues, typically by consensual agreement, on the assumption that the identification of a common interest should not be too difficult a task.

The most relevant historical experience of selection of delegates, representatives or public officers by lots was developed in Athens during the democratic period from the mid-fifth century to the end of the fourth century BC. On the basis of this experience, the philosopher Aristotle built his concept of democracy, which included the possibility of 'ruling and being ruled by turns'. Aristotle introduced a sharp distinction by which 'the appointment of magistrates by lot is thought to be democratic and the election of them oligarchic'. By 'democratic' he meant self-governed by the people, while 'aristocratic' pointed to the idea of government by the few best, which could also lead to a perverse form of oligarchy. This classical criterion was retaken in the eighteenth century by the French provincial Charles-Louis de Secondat, baron de la Brède et de Montesquieu, for whom 'the suffrage by lot is natural to democracy'. According to Montesquieu, the advantages of making choices by lot are, first, that it 'is unfair to nobody, and [second, that] it leaves each citizen a reasonable hope of serving his country'. Likewise, Genevan philosopher Jean-Jacques Rousseau highlighted the role of lots in an ideal democracy, in which, according to his Athens-inspired, assembly-based model, public offices should be considered 'a burdensome charge' and administrative acts be reduced as much as possible.

The choosing of public officers by lots may have, thus, two types of advantage. First, by holding frequent choosings and establishing short terms of office, it can produce a high rotation of members in administrative or arbitral posts, thus preventing the formation and self-reproduction of permanent and closed elite, whether in the form of an economic oligarchy or a class of professional politicians. By replacing public officials very frequently and opening public jobs to very wide layers of society, no one can be blamed for making or implementing unpleasant decisions, but no one can be praised either. Only the assembly members remain ultimately responsible for the consequences of collective decisions.

The second type of advantage to choosing by lots and the subsequent rotation in public offices is that they produce wide dispersal of knowledge of political and administrative affairs among the citizens. The experience of learning and becoming familiar with the problems of satisfying collective common interests can be a good platform for further occasions of participation in voting and elections, such as the assembly's decision-making and the choice of some other public officials.

Thus a lottery can be an appropriate procedure to select public officers where there is a clear identification of the common interest of the members of the community, there are relatively low technical requirements to fill some public jobs, and there are

alternative solid instruments, such as the assembly of members, by which the community can make other important decisions, including control of those appointed by lots.

In the Athenian democracy, in order to preserve the central role of the assembly to make decisions by acclamation or assent, the Council of 500 members in charge of setting the agenda for the assembly was formed of 50 members selected by lot by each of the ten tribes which had evolved from military into basic administrative units. The permanent committee of the Council and its president were also selected by lots. About 600 of the other 700 public officers were also selected by lots from among candidates previously presented, including: the ten members of the archonship, approximately equivalent to the post of the modern attorney-general, as well as the body in charge of organizing religious ceremonies who were appointed by lots from a pool of candidates previously selected by each tribe, also by lots; the tribunal members, chosen by lots from a pool of all adult citizens, who were in charge of passing judgment on the legality of the conduct of public officials; and a number of administrative jobs, encompassing treasurers, those in charge of settling public contracts and collecting public revenues, and those supervising streets or inspecting markets. The procedure of selecting candidates for public offices by lots was based, initially, on candidates drawing white and black beans from a container with an open top. In a further development, Athenians also used allotment machines, usually a tube in which balls could be inserted at random and released at the other end.

Among further occurrences, the first apostles of Jesus drew lots to select the substitute for the traitor Judas, according to the Acts of the Apostles. On the basis of this precedent, some early non-orthodox Gnostic Christians drew lots at each of their meetings to elect priests, bishops and other officers. This device could also be aimed at preventing a sacerdotal oligarchy from developing. But the Christian Church condemned such a practice as blasphemy and solemnly forbade the choice of priests, bishops or other prelates by lot, more formally after the thirteenth century.

A number of late medieval and renaissance city-republics and communes around the Mediterranean Sea used lots for choosing magistrates and allocating officers in charge of implementing assembly decisions. This was, in particular, the case in Venice for the indirect election of the Duke (*Doge*) from the thirteenth century following direct election by the people's assembly from the end of the seventh century. The popularly elected Great Council adopted an increasingly complicated procedure lasting for five days to choose the Duke with up to nine stages of approval ballots and lots, which was conceived with the aim of making manipulative maneuvers impossible. Likewise, the Florentine republics during the fourteenth and fifteenth centuries, and again in the late fifteenth and early sixteenth centuries, elected its main governmental body, the Lordship (*Signoria*), chaired by the standard-bearer of justice (*Gonfaloniere*), by means of a complex system of approval ballots and very frequent lots. Again, the aim was to prevent fraud, manipulation and the commune's domination by a few powerful families. Also, in Barcelona, at least from the fifteenth century, the popularly elected Council of 100 chose the members of the Consulate of the Sea, the judicial body for commercial and maritime affairs, by an indirect procedure involving lots.

Finally, lots were still being used, in combination with several stages of indirect elections, in Spain and the Spanish colonies in the Americas in the early nineteenth century. First, elections called by the central Junta formed to organize the resistance against Napoleon's troops were held in 1809, with municipalities electing candidates for deputies that were finally selected by lot. New elections in 1810 to form an extraordinary assembly ('Cortes'), which gathered in Cádiz and produced a new

constitution, were also held by a combination of indirect elections in three stages and a final selection of one deputy in each district by lots among the two or three candidates previously chosen. After the approval of the so-called constitution of Cádiz in 1812, this type of procedure was not used again in Spain, but it was followed in some further elections in Spanish America. Specifically, in Buenos Aires, indirect elections of colleges (usually called 'juntas') led to the final selection of members of the provincial assembly by lots in 1811, while a mixed procedure of voting, lots and final popular vote by plurality was used for the election of governors in 1815. In Mexico, local elections in 1812 involved some stage of selection of candidates by lots. In Chile a combination of lots and plurality voting was still being used in 1822. Lots remained the usual practice in indigenous communities that were not politically integrated into the new independent states' political institutions. Ironically, they became part of the supposedly traditional 'usages and customs' of the indigenous people to be preserved in the twenty-first century –although were actually the most visible legacy of Spanish colonial rule.

The choice of public officers by lots was replaced by election of representatives based on popular votes as new, increasingly large communities and modern states addressed collective issues of higher complexity and different interests and values developed among their citizens. In current times, lots are used as a method to distribute goods and responsibilities in some private corporations, as well as for allocating temporary jobs, vacation periods or household tasks in other private settings. For public affairs, they are used in some countries for certain sectoral or relatively minor tasks, such as selecting jurors for jury trials, appointing election administrators, breaking election ties or selecting candidates for military service.

At larger political level, similar procedures are used in certain institutional settings in confederal or international organizations whose members require that decisions can be made only by near-unanimity of broad consensus. Some of them use, in particular, procedures of rotation by turns of high public offices which, a priori and in the long term, produce the same effect of random selection as lotteries. A major example is the Helvetic Confederation of Switzerland, which is still mainly an instrument for preserving popular self-government of the communes and the cantons, where the presidency of the Federal Council is filled in rotation among the Council members by turns. Likewise, for a long period the Chairmanship of the European Council was held by six-month turns among the member states. The United Nations Organization also distributes some high offices by informal rotation and turns among its member states. The Presidency of the General Assembly is filled by 'symmetric rotation' among countries of the five regional groups (Africa, Asia, Latin America and the Caribbean, Western Europe and other developed countries, and Eastern Europe). The Security Council, which works by near-unanimity decisions of the five permanent members, is also formed by a number of temporary members rotating in post for periods of two years. They are formally elected by the Assembly, but they must also be distributed fairly from among the different world regions, including two for Latin America and the Caribbean, two for Western Europe, one for Eastern Europe and five for Africa and Asia. Similar proportions are used for filling, by informal turns, the posts in the Economic and Social Council and other committees.

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See also Consensus, Democracy Direct, Democracy Origins, Electoral Systems

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Social Choice Theory

The theory of social choice aims to explain collective outcomes as derived from individual decisions and institutional rules. The founding contributions in the 1950s and 1960s eroded a previously unquestioned confidence in the capability of certain common aggregative procedures, including majority rule, to guarantee consistent social choices satisfying individuals' preferences. According to several 'impossibility' theorems, no decision procedure can guarantee social choices fulfilling some apparently simple requirements of fairness, but all of them are vulnerable to strategic manipulation and may produce arbitrary or unstable results.

The problem of aggregation of individual preferences into a social welfare function or a collective decision by voting moved to revisions of certain traditional utilitarian assumptions in welfare economics and democratic theory. The study of institutions, decision and voting rules became of paramount interest to explain inefficiencies and undesirable collective results. In more recent developments, social choice theorists have also contributed to distributive justice theory by approaching classical topics such as auctions, negotiations, 'fair division' and other resource allocation procedures. The explanation of unsatisfactory social choices has open room to normative concerns for better institutional and mechanism design.

In a foundational theorem, Kenneth Arrow proposes a set of normative conditions to make a social choice acceptable. They include, for individual preferences: (i) transitivity or internal consistency (if somebody prefers A to B, and B to C, he must prefer A to C); and (ii) universal domain, or admission of all preferences without previous restrictions. For social choices his conditions are: (i) monotonicity, or the requirement of a consistent relation between individuals' preferences and the social choice (which contains the Pareto criterion favoring unanimous decisions); (ii) independence of the social choice from individual preferences regarding irrelevant alternatives that cannot win; and (iii) 'no dictatorship,' or the nonexistence of an automatically decisive actor. According to Arrow's theorem, no decision rule can fulfill all these conditions all the time.

A typical example of inconsistency and instability is the so-called Condorcet cycle. Assume that three voters, A, B, and C, have different preferences over three alternatives, X, Y, and Z, as shown in these profiles:

A: X > Y > Z
B: Y > Z > X
C: Z > X > Y
(where '>' means 'is preferred to')

If we apply majority rule to comparisons of the three alternatives by pairs, we find that X is socially preferred by majority to Y (because a majority formed by A and C prefers X to Y), Y is preferred to Z (because A and B prefer Y to Z), and Z is preferred to X (because B and C prefer Z to X). Thus we have a cycle of successive social choices: X > Y > Z > X .... Even if the individual preferences are complete and transitive, the social choice by majority rule is not transitive, but unpredictable –in practice, any choice would be arbitrary and potentially unstable.

However, this and other paradoxes do not mean that all social choices made by majority or any other rule are never fair or always arbitrary and, thus, vulnerable to instability. They mean that no decision rule can guarantee that, under any distribution of individuals' preferences, the social choice will always fulfill a set of normative conditions. In particular, the distribution of preferences in the above example is prone to

haphazard results because it implies that the alternatives are located on two 'dimensions' (since some of the preferences are and some are not consistent with the alphabetical order). Generally, it is not the case that social choices are always unstable, but that they can be unstable.

In further developments, certain conditions regarding individuals' preferences have been identified that guarantee consistent and stable social choices. Many exercises to test instability have used simulations in which it is assumed an 'impartial culture' or 'random society' involving an equal probability of each conceivable individual order of preferences. This assumption, however, maximizes the probability of inconsistent and unstable social choices.

An alternative is to relax the founding theorems' prescription that no restrictions should be imposed on individuals' preferences (or 'universal domain'). Specifically, a sufficient (although not necessary) condition for social choice stability is 'single-peakedness' of individual preference curves, which is formally equivalent to the condition that all individuals' preferences can be ordered along a single linear dimension (such as the left-right axis, for example). More in tune, it has been found that arbitrary and potentially unstable social choices are more likely the higher are the dispersion of individuals' preferences (the proportion of multi-peaked individual curves or the number of issue dimensions) and the dispersion of alternatives (the number of alternatives and the distance between them).

These contributions suggest the advantages of relatively harmonious societies in producing consistent and stable social choices, even with potentially manipulable procedures. Yet, the restriction of relevant preferences may also result from the decision process itself, ultimately depending on the institutional rules of the game.

Institutional rules

A subsequent line of research promoted by social choice theory attempts to evaluate the relative performance of different institutional and decision rules in satisfying individuals' preferences and producing acceptable social choices. The 'impossibility' theorems tell us that it is impossible to guarantee fair and stable social choices with any rule. But certain rules tend to produce inconsistent choices more frequently than others. In a world of uncertainty, the likelihood of consistency and stability may be a useful guide to institutional evaluation and design.

With these lenses, some decision procedures based on the majority principle can be reviewed. The 'spatial' theory of voting shows that if there are only two alternatives along a single issue or value dimension (such as the left-right axis), majority rule tends to make the alternative closer to the median voter's preference the social choice. By definition, the median voter—that is, the voter whose preference is located in an intermediate position with less than half of voters on each of the two sides—is always necessary to form a consistent majority on a single dimension. Since the median position has the property of minimizing the sum of the distances from all other positions, the winner by majority rule in a two-alternative contest can not only be stable, but minimize aggregate distance from all individual preferences and thus maximize social utility.

However, this model relies on two strong assumptions: only two alternatives and a single-dimensional issue space. If the set of alternatives submitted to majority decision is not bound, interested actors can manipulate the social choice by the introduction of new alternatives —such as a party or candidate's platform that includes a 'package' of proposals on several issues— or new issue or value dimensions. If there are more than two alternatives, even in a single-dimensional space, no alternative may obtain more

than half the votes, thus making majority rule indecisive and unable to produce a social choice. In a multidimensional space, even with only two alternatives, the majority winner can be unpredictable, depending on which issue or value takes higher salience in voter choice; in the long term, there can be a series of successive winners relying on different salient issues and values, with no foreseeable 'trajectory.'

Several procedures loosely related to the majority principle can then be adopted. With plurality or relative majority rule, the winner is the alternative that obtains a higher number of votes than any other alternative while not requiring a particular proportion of votes. It guarantees a winner (except for a tie), but it may imply minority support. For example, the winner by simple plurality rule among three alternatives may be the one most rejected by an absolute majority of voters having split their votes among the other two alternatives. From a social choice perspective, simple plurality is usually considered the least desirable decision rule.

The procedure of majority runoff requires an absolute majority of votes in the first round of voting, while in a second round the choice can be reduced to the two alternatives receiving the highest number of votes in the first round, so as to secure majority support for the winner. A majority-preferential or instant-runoff voting also requires an absolute majority of voters' first preferences, while successive counts of further preferences are made to find an alternative with majority support. In contrast to what can happen with plurality rule, these procedures prevent the most rejected alternative from winning, since if it has not been eliminated at the first round, it will be defeated at the second round.

However, with both plurality and majority-runoff rules, the median voter's preference can be defeated or eliminated in the first or successive rounds. This implies that the non-median winner by any of these procedures might be defeated by another alternative by absolute majority if the choice between the two were available. These procedures are, thus, dependent on irrelevant alternatives; they encourage strategies aimed at altering the number of alternatives, such as 'divide and win' and 'merge and win', as well as non-sincere or strategic votes in favor of a less-preferred but more-likely-to-win alternative.

Additional voting procedures based on the majority principle were invented by several Christian philosophers and Enlightened academics. The thirteenth-century Catalan philosopher Ramon Llull and the eighteenth-century French marquis de Condorcet almost coincided in proposing variants of pair-wise comparisons. By these procedures, an election requires multiple rounds of voting between all possible pairs of alternatives. In Llull's version, the winner is the alternative having won the greatest number of pair-wise comparisons, while in Condorcet's version, an alternative is required to win all pair-wise comparisons—that is, the majority winner is the alternative able to win by majority against every other alternative. When the alternatives are perceived by the voters as ordered along a single linear dimension, the winner by Condorcet procedure is always the one preferred by the median voter. The 'Condorcet winner' can be considered highly satisfactory for the electorate and can be used as a positive reference for comparison with the results obtained with other procedures. However, in multidimensional spaces, such an alternative may not exist, as shown with the example at the beginning of this article.

Another sophisticated procedure, known as rank-order count, was devised independently by both the fifteenth-century German cardinal Nicholas of Cusa and the eighteenth-century French academic Jean-Charles de Borda. This procedure requires that the voter order all the alternatives and award them 1, 2, 3, etc. points, ranking them from the least to the most preferred. The winner is the alternative having collected the

highest sum of points. The 'Borda winner' can also be considered highly satisfactory for the electorate and can be used as a normative reference. Yet this voting procedure can be manipulated because some voters can award lower points to rival alternatives than would actually correspond to their sincere preferences, in order to prevent their victory. For this reason, Cusanus warned that electors should 'act according to conscience,' and Borda remarked that his procedure was conceived 'only for honest men.' Nevertheless, the likelihood of making a sincere loser a strategic winner is lower the higher the differences in votes and ranks between the two alternatives, as had already been shown by Joseph Isidoro Morales in Seville in late eighteenth century.

Approval voting has also remote origins in medieval times. It allows the voters to vote for those alternatives that they consider acceptable, from a minimum of one to a maximum of all minus one, and the alternative with a plurality of votes becomes the winner. Approval voting tends to produce broadly consensual social choices. Yet it is still vulnerable to strategic manipulation since voters with information regarding others' preferences and whose preferred alternatives have wide support can concentrate their votes on one or a few alternatives and present their intermediate preferences as unacceptable.

Finally, according to classical utilitarian assumptions about cardinal utilities, as foundationally presented by English philosopher Jeremy Bentham in the early nineteenth century, range voting gives voters the opportunity to give different numbers of votes (or scores) to alternatives. As voters have both incentive and opportunity to provide detailed information about their preferences, this procedure may produce the most satisfactory outcome for the greatest number of voters. All in all, all the above mentioned procedures tend to produce results that are more consistent with individuals' preferences than plurality rule.

Certain formal findings in voting theory can also enlighten performances of institutional formulas implying different degrees of fusion or division of powers. According to the 'spatial theory', the 'single-package' social choice in a policy 'space' formed by multiple issues and dimensions can be highly unpredictable, as mentioned. This may correspond to single-party governments in parliamentary regimes, as well as presidential regimes with a president's party majority in the assembly, where a single election may become decisive for all the multiple policy issues that may enter the government's agenda. These institutional frameworks tend to produce relatively changing and unstable policies.

In contrast, in multi-party elections producing coalition cabinets, different issues, roughly corresponding to different government portfolios, can be dealt with separately on single-issue 'spaces'. Also, in regimes of separation of powers, each separate election for a different office can focus on one or a few issues and favor the consistency and stability of social choices. In these institutional frameworks, each issue can be the subject of a broad multi-party or inter-institutional agreement around the median voter's position, which can preclude drastic changes and induce policy stability in the mid- or long term.

A Model of Social Choice
A simple geometrical model can illustrate the relevance of social choice models for the analysis of institutions and their performance. Let us use the simplest case of an electorate composed of three voters with different preferences (or three voters' groups with the same preferences and a similar number of members). If the voters' preferences can be located on a single issue-dimension, such as A, B, and C on the horizontal axis in

Fig. 1, the median voters' preference, B, may win any election by majority rule against each of the other alternatives.
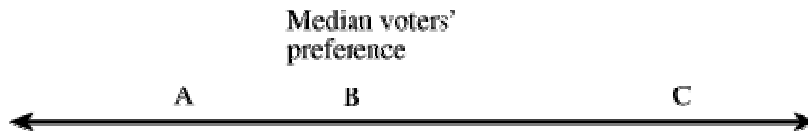

Fig. 1. A single-dimensional electorate

     If, alternatively, there are two issue dimensions, the three voters, A, B, and C, can hold different preferences on issue 1 (a_1, b_1, and c_1) and on issue 2 (a_2, b_2, and c_2), as presented in Fig. 2. Then different institutional formulas involving separate and joint elections can produce different social choices.

     Let us assume, first, that there are two separate elections for different offices, such as congress and presidency or two chambers in parliament, dealing with different sets of issues or issue dimensions. On each separate election, the intermediate alternative close to the median voter is advantaged and may win. In Fig. 2, b_1 wins in the election on issue 1 and a_2 wins in the election on issue 2. The social choice is represented by the intersection point of the winning positions on each issue, b_1-a_2. As can be seen, the social choice of separate elections on different issues under the above assumptions is a somewhat centrist point located inside the minimal set containing all voters' preferences, or the Pareto-set (the triangle A B C in the figure).
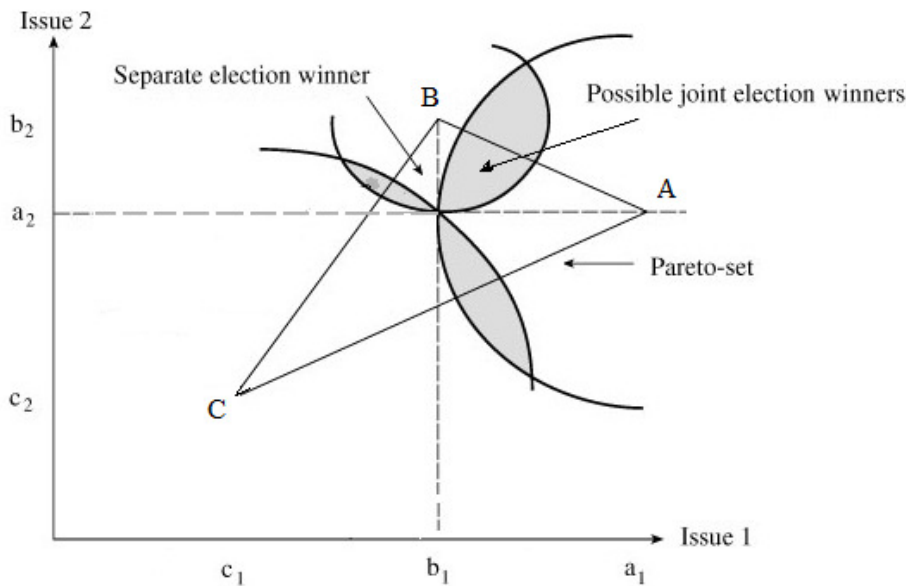

Fig. 2. Joint and separate elections

     Now, let us assume, alternatively, that the social choice on all the issues is made in a single election, as would correspond to a simple institutional framework, such as a unicameral parliamentary regime by plurality rule. The institutional setting forces the

voters to choose, not between alternatives on separate issues, but between 'packages' of alternatives on all the issues at the same time.

The set of possible winners, or 'win-set', in such a joint election depends on the status quo. Let us adopt the hypothesis that the status quo is the social choice previously produced by two separate elections, the point b_1-a_2 in Fig. 2. The set of possible winners in a single, two-dimensional election from this point is represented by the multipetal shaded area in the figure. This is formed by circular indifference curves around the voters' preferences and crossing the status quo. It is assumed that every voter prefers the alternatives that are closer to the voter's preference and in particular prefers those inside the indifference curve to those outside. Accordingly, the set of possible majority winners in a joint election is formed by all the points at which a majority of voters (any majority of two voters out of three in the example) is more satisfied than they would be in the status quo—that is, the win-set is formed by the intersections of pairs of indifference curves.

As can be seen, the set of possible winners in a joint election is relatively large, which makes the prediction of results difficult. A number of possible social choices are located outside the Pareto-set and even beyond the rank of voters' preferences (for example, the set includes some points located beyond the extreme preference, b_2, on issue 2). The possibility that many different alternatives can win may generate instability in a series of successive social choices, since any winning point can be further beaten by some other point in the corresponding win-set.

This analysis allows us to state that a joint election on a multidimensional set of issues, as a model for the typical single election in a simple regime, can be more uncertain and unstable over time than separate elections on different issues, such as elections for different offices in regimes with division of powers.

How to choose

The analysis of relative successes and pitfalls of different institutional rules has moved social choice theorists to study how institutions are chosen and how they ought to be chosen in order to favor fair and stable developments –or the problem of 'choosing how to choose'. Game theoretical models have also been used for the analysis of strategic behavior in such a field.

In consistency with the assumptions regarding human behavior within institutional constraints, it can be assumed that people may prefer, choose and support those institutional formulas producing satisfactory results for themselves and reject those making them permanently excluded and defeated. As a consequence, those institutions producing widely-distributed satisfactory social choices should be more able to develop endogenous support and endure. In general, widely representative social choices should feed support for the corresponding institutions, while exclusionary, biased, or arbitrary outcomes might foster rejection of the institutions producing such results. These findings have led to establish a positive relation between institutional pluralism, social efficiency and democratic stability.

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See also Democracy (theory of), Economic theory of politics, Electoral systems, Fair division, Institution, Voting rules.

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