Int J Game Theory (2007) 35:205–221
DOI 10.1007/s00182-006-0040-7

ORIGINAL PAPER

Rationally constructing the dimensions of the political sphere

Michael Suk-Young Chwe

Published online: 1 November 2006

Abstract I construct a game-theoretic model in which people have preferences over two issues, but in which people rationally and endogenously choose to reveal their preferences over only one of them, leaving the other private and irrelevant for political action. In this way, people "construct" the political sphere to include one issue and not the other.

Keywords Social construction · Political dimensions · Voting

1 Introduction

The most obvious kind of political activity is people contesting the issues of the day. But at a deeper level, profound political changes have resulted not from electoral or legislative contests but from broad changes in what issues are considered political, changes in the "dimensions" of the sphere of political activity. For example, recently we have seen the emergence of issues of gender and sexual orientation, which were previously considered completely private matters. In this paper, I use a game theoretic model to show how people rationally and endogenously "construct" the political sphere so that some issues are politicized and some are not.

To understand how an issue becomes politicized, in other words how a political "interest" forms and how people form a collective identity in fighting for that interest, it might seem that rational choice methods are not appropriate,

M. S.-Y. Chwe (✉)
Department of Political Science, UCLA,
Los Angeles, CA 90095-1472, USA
e-mail: michael@chwe.net
URL: http://www.chwe.net

simply because rational choice models start with individuals whose identities and interests are already defined. In fact, some observers see this as one of the defining limitations of rational choice theory. For example, Wendt (1994, p. 394) argues that "the essence of rationalism. . . is that the identities and interests that constitute games are exogenous and constant. Rationalism has many uses and virtues, but its conceptual tool kit is not designed to explain identities and interests, the reproduction and/or transformation of which is a key determinant of structural change." Correspondingly, most approaches to this issue explicitly avoid the framework of rational choice. Simon (1985, p. 303) says that "the theory of the generation of alternatives deserves, and requires, a treatment that is just as definitive and thorough as the treatment we give to the theory of choice among prespecified alternatives" and suggests an approach based on "human bounded rationality," including "attention directing, situation defining, and evoking." Similarly, Bourdieu (Bourdieu and Wacquant 1992, p. 126) writes that "the individual is always, whether he likes it or not, trapped—save to the extent that he becomes aware of it—'within the limits of his brain,' as Marx said, that is, within the limits of the system of categories he owes to his upbringing and training." The term "preference formation," which is understood to be an entirely extrarational process, also sometimes comes up in this context. For example, Thelen and Steinmo (1992, p. 9) find that the "core difference between rational choice institutionalism and historical institutionalism lies in the question of preference formation, whether treated as exogenous (rational choice) or endogenous (historical institutionalism)." Similarly, Legro (1996, p. 118) recommends a "two-step" approach: "one step involves the formation of preferences of actors, the second, interaction among actors that leads to an outcome."

The main motivation for this paper therefore is to see if rational choice theory can help look at an issue considered by some to be beyond its scope. Another is to show that social construction of the political sphere, the politicization of some issues and not others, can in some limited form arise even in the stark conceptual world of completely rational and asocialized actors. Richer understandings of human thought, action, and historical processes are obviously invaluable in understanding social construction, but are not logically necessary to demonstrate its existence and suggest a mechanism by which it occurs. The goal here is obviously not to posit some overarching theory of how the political sphere is constructed, but to model a very limited aspect of it in a context which is simple and not too strained. Methodologically speaking, I want to suggest that the entrenched dichotomy between "constructivist" and "rationalist" approaches to political action should not be so easily accepted (see also Clark 1998).

This paper is not the first attempt along these lines: Riker (1984, 1986) coined the term "heresthetics" to refer to techniques of political manipulation in which, for example, by politicizing a new issue, a politician splits her opposition and thereby emerges victorious. The emergence and politicization of a new issue is thus understood as a maneuver by a skilled politician who can forsee a tactical advantage. My paper focuses on politicization not as a tactical maneuver but as the formation of a collective interest, the emergence of "collective consciousness." In Riker's examples, an unpoliticized issue is an issue which does not give anyone any tactical advantage; in our model, an unpoliticized issue is a "hidden" issue upon which no political action can possibly be based. Bawn (1999) presents a model in which people act politically on issues which do not affect them directly (for example, civilians caring about gays in the military) because of "ideology": they belong to a coalition which understands it as their "collective" interest. Bawn's model illustrates social construction in coalition politics: what exactly an ideology is, and what coalition it supports, is to some extent arbitrary and does not follow directly from individual self-interest. My paper focuses on the informational basis behind coalitional action, and models explicitly the communicative process by which an individual tries to politicize a given issue and the incentives she has for doing so. Several papers model how office-seeking candidates choose whether to make their own positions public or leave them ambiguous (for example, Shepsle 1972; McKelvey 1980; Glazer 1990). In these papers, risk preferences of voters and candidates are crucial: for example, if voters are risk-loving, then they would prefer a candidate who has an uncertain position. In my paper, there are no candidates, people choose the policy directly, and any person can try to make an issue salient. Berliant and Konishi (2004) present a model in which candidates generally want to make their own positions completely unambiguous, and conclude that departing from the standard expected utility framework is necessary to understand why some issues do not become salient. In my paper, we remain within the standard expected utility framework.

Ever since Marx's observation that even though French peasants all share the same material interests, they form a class only to the extent that potatoes in a sack form a sack of potatoes (see Elster 1985, p. 345), it has been recognized that many people simply having the same preferences on an issue is not enough to make that issue politically relevant or give that group of people a political identity. What is also necessary is "class consciousness," which includes at the very least the realization among a group of people that they all share a common interest. Even if everyone in a group shares a common interest, that group cannot collectively act until each member of the group knows that her own interests are commonly shared (see more generally Chwe 2001). Our extremely simple model of how an issue is politicized, of "consciousness raising," relies on a "discursive process" in which people simply tell each other what their preferences are.

The model here tries to be as simple as possible. We start with three people, each having preferences over two issues; thus the "issue space" has two dimensions. Each person has an "ideal point" and wants the policy, chosen by majority rule, to be as close to her ideal point as possible; this is the standard "spatial model." However, at the start of the game, each person only knows his own ideal point. Before voting, people choose whether to publicly reveal their ideal points, either fully, partially, or not at all. Fully revealing one's ideal point means revealing both coordinates, so that people know one's preferences over both issues. Partially revealing it means revealing only one coordinate, so that people know one's preferences on only one issue and not the other. There are several "rounds" of revelations, which allow each person to respond with further revelations. After this process of communication, people vote. Thus, people reveal their preferences in anticipation of how this will affect the final vote.

There exists a "full revelation" equilibrium in which everyone immediately fully reveals their preferences, and this might be considered the "standard" case. However, there exists another "partial revelation" equilibrium, which incidentally gives everyone a higher ex ante expected utility, in which everyone at first reveals their preferences on only one issue (for example, the first). If everyone's preferences on this issue are alike, then there are no further revelations and voting is unanimous and concerns this issue alone. If preferences on this issue are not alike, that is if there is a minority whose preferences differ from the majority, then everyone reveals their preferences on the other issue also.

This equilibrium, in which information is only partially revealed at the start, illustrates social construction in the following sense. If, after everyone reveals their preferences on the first issue, there is unanimous agreement, then the second issue is not "politicized" and preferences along this dimension have absolutely no impact on the vote; it is as if the second issue does not exist. Each person of course has a preference on the second issue, but no one acts on it because no one knows whether her preference is shared by anyone else. In this equilibrium, the reason that a person does not deviate and announce her preference on the second issue is that if she does so, the other people will be "forced" to reveal theirs, which might lead to her no longer being part of a majority. Voting is thus limited by the limited information people have about each other; one issue is present in the "public sphere" while the other is not. But this limited information results from their own purposeful actions (their limited revelations); it is something they actively and rationally constructed.

This is not a model of preference formation; here a person's preferences are fixed at the beginning and never change. However, some preferences become relevant for political decision making and others do not. Which interests are relevant for political decision making, and people's "identities" as majority or minority, are determined by what people know about the preferences of others. What people know about the preferences of others is endogenously and rationally limited by people's discursive actions; people rationally construct the political sphere to include one issue and not the other.

2 The model

We have three people and two issues. Each person has a "for" or "against" preference on each issue: "for" or "against" abortion rights, or "less" or "more" defense spending, for example. As in the standard spatial model, we have an "issue space" with two dimensions (since there are two issues), and each person's ideal point is a point in $\{(0,0),(0,2),(2,0),(2,2)\}$, as shown in Fig. 1. For

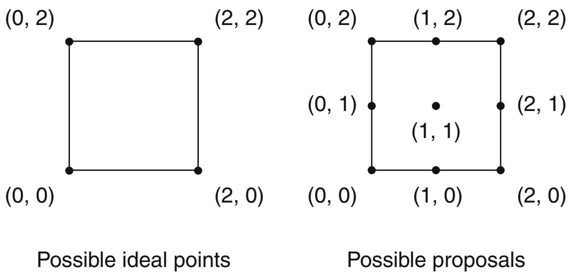


Fig. 1 Possible ideal points and possible proposals

example, a person with ideal point $(0, 0)$ might be a person who is for abortion rights and less defense spending, and a person with ideal point $(2, 0)$ would be a person who is against abortion rights and supports less defense spending. Each of the four possible ideal points are equally likely. Initially, each person knows only her own ideal point. The three people decide what policy to implement in the following manner, which begins with a "revelation" stage and ends with a "voting" stage.

First, in the "revelation" stage, each person simultaneously reveals something about her ideal point; a person might reveal his preference on one issue, such as "the first coordinate of my ideal point is 0" ("I support abortion rights") or "the second coordinate of my ideal point is 2" ("I support more defense spending"), information on both issues, such as "My ideal point is $(0, 2)$" ("I support abortion rights and more defense spending") or no information at all. After this first round of revelations, with some small probability ϵ, the revelation stage ends. Otherwise, there is a second round in which people again can simultaneously make further revelations. With probability ϵ, the revelation stage ends after this second round; otherwise, there is a third round, and so forth. It is assumed that people cannot lie (all revelations are truthful) and once some information is revealed, it is revealed forever and cannot be "taken back." Eventually the revelation stage ends.

The people then enter the final "voting" stage. One person, randomly selected, makes a proposal among any of the nine possible locations $\{(0, 0), (0, 1), (0, 2), (1, 0), (1, 1), (1, 2), (2, 0), (2, 1), (2, 2)\}$. The other two people then simultaneously vote for or against the proposal. If at least one person votes for the proposal, then the proposal has majority backing and is implemented. If both people vote against the proposal, then no proposal is implemented. For simplicity's sake, there are no further proposals; there is only one round of voting.

If the policy implemented is distance d away from a person's ideal point, that person gets utility $w(d)$, which decreases in d (each person prefers that the implemented policy be as close to his ideal point as possible). We normalize $w(0) = 0$ and $w(1) = -1$. If no policy is implemented, then everyone gets the "default" payoff of z. We assume that $w(\sqrt{2}) > z > w(2)$; in other words, a person would rather have a policy implemented at distance $\sqrt{2}$ away than no policy implemented at all, but would rather have no policy than one which is distance

Fig. 2 Possible $w(\sqrt{2}), w(2)$ which satisfy the assumptions

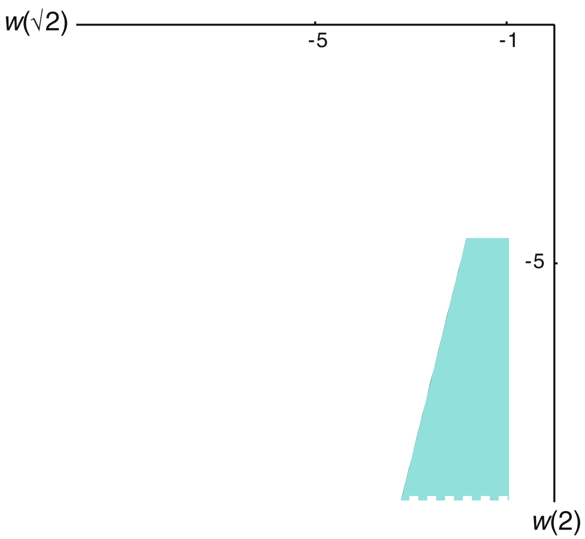
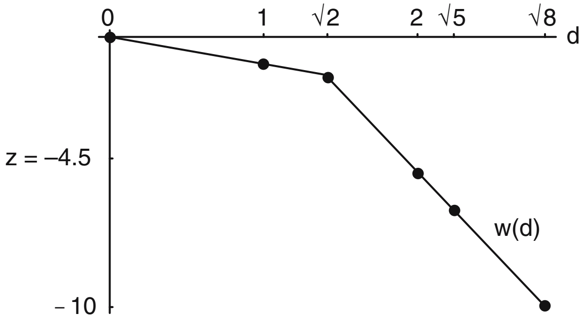


Fig. 3 An example $w(d)$ and z



2 away. We have three further assumptions: (i) $z < -4$, (ii) $w(\sqrt{2}) > z/4 - 3/4$, and (iii) $w(2) < -9/2$.

Many possible $w(\sqrt{2}), w(2)$, and z satisfy these assumptions. Figure 2 shows possible $w(\sqrt{2}), w(2)$, and one can find a possible z by choosing a number slightly greater than $w(2)$.

A convenient piecewise linear example, as shown in Fig. 3, is $w(d) = -d$ if $d \leq 7/5$ and $w(d) = 7 - 6d$ if $d > 7/5$, and $z = -4.5$.

Having one's ideal point implemented is the best possible outcome; having a policy implemented which is only distance 1 away is also pretty good. The "complete compromise" outcome $(1, 1)$, which is distance $\sqrt{2}$ away from any ideal point, is not as good, but better than having no policy at all implemented, in which case everyone gets z. The drop in utility from distance $\sqrt{2}$ to 2, however, is substantial. Since $w(0) = 0$, $w(1) = -1$, and $w(2) < -9/2$, a person is risk averse, preferring an outcome at distance 1 with certainty over the lottery of an outcome at distance 0 with probability 1/2 and an outcome at distance 2 with probability 1/2.

What people do in the voting stage, particularly which proposal is chosen, depends on what people know about each others' preferences. Thus when revealing their preferences, people think ahead as to what impact it will have on the further revelations of other people and finally on the voting stage. This is an extensive form game with incomplete information, and we use the standard concept of perfect Bayesian equilibrium. That is, we start by figuring out what happens at the voting stage, and work our way backward to determine what happens in the revelation stage.

3 The voting stage

The subgame at the voting stage is an extensive form game of incomplete information, where the kind of incomplete information depends on what happened in the revelation stage. If a person has revealed that the first coordinate of his ideal point is 2, we write this as $(2, X)$. If a person has fully revealed his ideal point as $(0, 0)$, we write this as $(0, 0)$. If a person has not revealed anything about his location, we write this as (X, X). Thus we can denote a voting stage subgame as $V(r^1, r^2, r^3)$, where $r^i \in \{0, 2, X\}^2$.

Strictly speaking, $V(r^1, r^2, r^3)$ is not a proper subgame unless there are no Xs in r^1, r^2, r^3; that is, unless all information has been revealed (and hence the subgame is a complete information game). This is because, for example, player 1 when facing the game $V((X, 2), (0, X), (X, X))$, must have beliefs on whether player 2's ideal point is $(0, 0)$ or $(0, 2)$, and these beliefs might depend on player 2's previous moves earlier in the game. Throughout, we assume that when a person's location is not fully revealed, the prior beliefs are such that all ideal points consistent with the revelations are equally likely. For example, in game $V((X, 2), (0, X), (X, X))$, person 2's ideal point is $(0, 0)$ with probability $1/2$ and $(0, 2)$ with probability $1/2$, and person 3's ideal point is each of the four locations with probability $1/4$. When we consider the revelation stage in the next section, this assumption will remain valid in the equilibria we consider.

The subgame $V(r^1, r^2, r^3)$ is particularly simple in that incomplete information affects only the person who makes the proposal. The other two players simply vote for or against the proposal; whether they know anyone else's ideal point does not affect their decision. For these two players, a weakly dominant strategy is simply to vote for any proposal which is at distance $\sqrt{2}$ or less, because of our assumption that $w(\sqrt{2}) > z$. Thus to make a prediction in subgame $V(r^1, r^2, r^3)$, all we have to do is to consider what the proposer does. Note that obviously the proposer never makes a proposal which is more than $\sqrt{2}$ away, because the proposal $(1, 1)$ is always accepted.

The easiest case to figure out is when everyone has fully revealed their preferences and thus $D(r^1, r^2, r^3)$ is a complete information game. Say that person 1 is chosen to be the proposer; some examples are shown below.

Game	Person 1 proposes
V((2,2),(2,2),(2,2))	(2,2)
V((2,2),(2,2),(0,0))	(2,2)
V((2,2),(2,0),(0,0))	(2,1)
V((2,2),(2,0),(2,0))	(2,1)
V((2,2),(2,0),(0,2))	(2,1) or (1,2)
V((2,2),(0,0),(0,0))	(1,1)

If the proposer finds that one or more other people share her preferences on both issues, as in $V((2,2),(2,2),(2,2))$ or $V((2,2),(2,2),(0,0))$, then she proposes her ideal point and it is implemented. If the proposer finds that one or more other people share her opinion on the same single issue, as in $V((2,2),(2,0),(0,0))$ and $V((2,2),(2,0),(2,0))$, then she proposes a policy which implements the majority opinion on that issue but takes a "middle of the road" position on the other issue. For example, in $V((2,2),(2,0),(0,0))$, by proposing $(2,1)$, person 1 gets person 2's support; if person 1 were to instead propose her ideal $(2,2)$, then person 2 would not vote for it and would prefer not to implement any policy (since $z > w(2)$). The interesting case is when the proposer finds that each other person shares her opinion on one issue, but on different issues for each (there are "cross cutting majorities"), as in $V((2,2),(2,0),(0,2))$. Then the proposer forms a majority on the first issue or on the second issue, but is indifferent over which issue. In this case, we assume that the proposer selects randomly, and each of the two proposals are equally likely. Finally, if the proposer finds that no one else shares her preference on either issue, then she proposes the completely "middle of the road" policy of $(1,1)$; no policy closer to her ideal point would receive any support.

When preferences have not been completely revealed, things are only slightly more complicated. As noted before, incomplete information only affects what the proposer does, since the other two people simply accept or reject the proposal. The only thing that matters is how the proposer's knowledge of the others' ideal points affects her proposal. Remember that our assumption about prior beliefs is that all ideal points consistent with the revelations are equally likely.

First consider the cases in which a majority preference is known to exist, either on both issues or a single issue. Again, say that person 1 is the proposer, and has ideal point $(2,2)$.

Game	Person 1 proposes
$V((2,2),(2,2),(X,X))$	(2,2)
$V((2,2),(2,X),(2,X))$	(2,1)
$V((2,2),(2,X),(X,X))$	(2,1)
$V((2,2),(2,X),(X,0))$	(2,1)
$V((2,2),(2,X),(X,2))$	(2,1) or (1,2)
$V((2,2),(0,X),(0,X))$	(1,1)

If the proposer knows that one other person shares her ideal point, as in $V((2,2),(2,2),\ (X,X))$, then the proposer proposes that ideal point and it is implemented; what the third person's ideal point is or how he votes is irrelevant. If the proposer finds that everyone shares her opinion on one issue, and knows nothing about preferences on the other issue, as in $V((2,2),(2,X),(2,X))$, then she implements the majority opinion on the issue that she knows has majority support and takes a "middle of the road" position on the other issue. To see why, note that if person 1 proposes $(2,1)$ in $V((2,2),(2,X),(2,X))$, she gets $w(1) = -1$ for sure, since the proposal is surely accepted: regardless of whether the others have ideal point $(2,0)$ or $(2,2)$, they will accept $(2,1)$. If person 1 proposes $(2,2)$ instead, then with probability 1/4 the other two people both have ideal point $(2,0)$ and will not support the proposal, and person 1 will get z; with probability 3/4 some other person has ideal point $(2,2)$ and person 1 will get $w(0) = 0$ (these probabilities come from our assumption about prior beliefs, that all ideal points consistent with the revelations are equally likely). So person 1's expected utility from proposing $(2,2)$ is $z/4$, which by assumption (i) is less than $w(1) = -1$. Similarly, in any situation in which the proposer knows that her opinion is shared by some other person on only one issue, such as $V((2,2),(2,X),(X,X))$ or $V((2,2),(2,X),(X,0))$, the proposer implements a preference only on that one issue; making a more "aggressive" proposal which tries to implement her ideal point has at least a probability of 1/4 of not receiving any support. When the proposer can create two different majorities, one on the first issue and one on the second issue, as in $V((2,2),(2,X),(X,2))$, then as before, she is indifferent about which majority to create and we assume that both are equally likely. Finally, when a majority preference is known to exist on one issue, but this preference is not shared by the proposer, then the best the proposer can do is to propose the complete compromise $(1,1)$.

Now consider the cases in which a majority preference is not known to exist, as in the examples below.

Game	Person 1 proposes
$V((2,2),(X,X),(X,X))$	(1,1)
$V((2,2),(0,X),(X,0))$	(1,1)
$V((2,2),(0,X),(0,0))$	(1,1)

When the proposer knows nothing at all about the others' preferences, as in $V((2,2),(X,X),(X,X))$, then the proposer has basically three options. The first is to propose her ideal point, in this case $(2,2)$; with probability 7/16 someone else has the same ideal point and thus the proposer will get $w(0) = 0$, but with probability 9/16 no one will have the same ideal point and the proposal is rejected. So the expected utility from proposing one's ideal point is $9z/16$. The second is to propose her preference on one issue (say the first) but take a middle position on the second, in this case $(2,1)$; with probability 3/4 at least one person shares this preference on the first issue and the proposer gets $w(1) = -1$, but with probability 1/4 no one shares this preference and the proposal is rejected. So the expected utility from proposing a preference on a single issue is $z/4 - 3/4$. The third is to propose the complete compromise $(1,1)$, which is accepted for sure and gives the proposer utility $w(\sqrt{2})$. By assumption (ii) we have $w(\sqrt{2}) > z/4 - 3/4$ and by assumptions (i) and (ii) we have $w(\sqrt{2}) > 9z/16$. Hence proposing the compromise $(1,1)$ yields the highest expected utility. The utiltiy z of not implementing any policy at all is sufficiently low as to make the proposer not want to risk it. Finally, when the proposer knows something about the other's preferences, but that information is all unfavorable, as in $V((2,2),(0,X),(X,0))$ and $V((2,2),(0,X),(0,0))$, then the proposer offers the complete compromise.

To figure out what happens in $V(r^1,r^2,r^3)$ in general, use the following procedure. If the proposer knows that at least one other person shares her preferences on both issues, then these preferences on both issues are implemented. If the proposer knows that her preference on one issue is shared by someone else, then the preference on that one issue is implemented and a middle position is implemented on the other issue (in the "overlapping majorities" case there are two possible outcomes, both considered equally likely). If the proposer does not know that anyone shares her preference on either issue, a middle position is implemented on both issues.

Of course, when anticipating the voting stage $V(r^1,r^2,r^3)$, a player does not know who will be the proposer, and calculates his expected utility from $V(r^1,r^2,r^3)$ knowing that each person will be the proposer with probability 1/3. As mentioned earlier, if a person turns out to be the proposer, it does not matter what anyone else knows about his preferences. However, if a person turns out not to be the proposer, by revealing his preferences, a person thereby "empowers" himself, roughly speaking. If you reveal nothing about your preferences, no proposer can count on your support and hence no proposer forms a majority with you. If you reveal your preferences on only one issue, a like-minded proposer can count on your support on that issue but not on the other. Here implementing a position requires "consciousness raising": for a position to be implemented, it is not enough for two people to simply share the same preference; at least one of them must know that they share the same preference. Without this knowledge of a commonly shared preference, a person cannot confidently propose it.

4 The revelation stage

Now that we have made predictions for every possible decision stage, we can think about what people do in the revelation stage. Recall that in each round, each person simultaneously reveals something about their type. In general, a person's strategy of what to reveal at a given round can depend on a person's type and all possible past histories of play. However, for simplicity we consider strategies which depend only on a person's type and what information has been already revealed. Of course, when considering whether such simple strategies might be an equilibrium, we must consider all possible deviant strategies, including those which are fully "history-dependent." Also remember that once some information has been revealed, it has been revealed "forever" and cannot be taken back. So we write a node of the game tree as $(t^1, t^2, t^3, r^1, r^2, r^3)$, where $t^1, t^2, t^3 \in \{0, 2\}^2$ are people's types, and r^1, r^2, r^3 are the current revelations, where $r^i \in \{(t_1^i, t_2^i), (t_1^i, X), (X, t_2^i), (X, X)\}$. The subgame which starts at this node (strictly speaking, it is not a proper subgame, since there is incomplete information about types) we write as $C(t^1, t^2, t^3, r^1, r^2, r^3)$, or more simply $C(t, r)$. Person i's action at this subgame we write as $f^i(t, r)$. If $r^i = (t_1^i, t_2^i)$, person i has already revealed everything and thus can take only one action; hence $f^i(t, r) = (t_1^i, t_2^i)$. If $r^i = (t_1^i, X)$, person i, who has revealed the first coordinate, can either reveal both coordinates or reveal nothing more; hence $f^i(t, r) \in \{(t_1^i, t_2^i), (t_1^i, X)\}$. If $r^i = (X, t_2^i)$, person i, who has revealed the second coordinate, can either reveal both coordinates or reveal nothing more; hence $f^i(t, r) \in \{(t_1^i, t_2^i), (X, t_2^i)\}$. Finally, if $r^i = (X, X)$, person i has not yet revealed anything and hence $f^i(t, r) \in \{(t_1^i, t_2^i), (t_1^i, X), (X, t_2^i), (X, X)\}$. With probability ϵ, the revelation stage ends and they proceed to the decision stage $D(f^1(t, r), f^2(t, r), f^3(t, r))$. With probability $1 - \epsilon$, there is another round of revelations and they proceed to the subgame $C(t^1, t^2, t^3, f^1(t, r), f^2(t, r), f^3(t, r))$.

Even with our simplifying assumptions, there are still many perfect Bayesian equilibria of this game. We consider just two of them. The first is the "full revelation" equilibrium.

Result 1 *Let $f^i(t, r) = (t_1^i, t_2^i)$ for all t, r. This is a perfect Bayesian strategy profile with ex ante expected utility* $-3/8 + w(\sqrt{2})/16 + w(2)/12 + w(\sqrt{5})/8 + w(\sqrt{8})/24$.

To verify that this is an equilibrium, one simply must check if someone can gain by deviating. Say we are at some subgame $C(t, r)$ and say that person 1 is considering whether to deviate. If the revelation stage were to end immediately, given that person 2 and person 3 fully reveal, it is easy to show that person 1's best response is to also fully reveal (if he plays (t_1^1, X) or (X, t_2^1), he gets $-7/16 + 5w(\sqrt{2})/48 + w(2)/12 + 7w(\sqrt{5})/48 + w(\sqrt{8})/24$, and if he plays (X, X), he gets $-1/3 + 3w(\sqrt{2})/16 + w(2)/12 + w(\sqrt{5})/6 + w(\sqrt{8})/24$, which are both strictly less than what he gets if he fully reveals). Thus, the only reason that person 1 might deviate from the equilibrium is if doing so would influence the revelations of person 2 and person 3 in future rounds. However, since person 2 and person 3 have already fully revealed, for them the game is effectively over; information once revealed cannot be taken back. So person 1 cannot gain by deviating.

In this equilibrium, everyone reveals everything immediately. This is natural, since there does not seem any reason not to reveal your preferences and "empower" yourself for the decision stage immediately; the more one reveals about one's preferences, the more likely it is that someone will make a proposal counting on your support. In fact, if a given round were certain to be the last, it would be a weakly dominant strategy to fully reveal in that round.

Does there exist an equilibrium in which people do not immediately reveal everything? Since full revelation is a weakly dominant strategy if the current round were certain to be the last, there would have to be some reason why full revelation in the current stage might adversely affect people's actions in future stages.

It turns out that such a "partial revelation" equilibrium exists (see the appendix for the proof), and gives people a higher ex ante expected utility than the full revelation equilibrium (it is easy to show this by assumption (iii)).

Result 2 *Let*

$$f^i(t,r) = \begin{cases} (t_1^i, X) & \text{if } r^1 = r^2 = r^3 = (X,X) \\ & \text{or if } r^1 = r^2 = r^3 = (t_1, X) \\ (t_1^i, t_2^i) & \text{otherwise.} \end{cases}$$

This is a perfect Bayesian strategy profile with ex ante expected utility $\epsilon(-7/12 + w(\sqrt{2})/4 + w(\sqrt{5})/6) + (1-\epsilon)(-9/16 + w(\sqrt{2})/16 + w(2)/24 + w(\sqrt{5})/8 + w(\sqrt{8})/24)$.

In other words, person i reveals everything except in two circumstances: if no one has revealed anything (at the beginning of the game) or if everyone has revealed preferences only on the first issue and these preferences are unanimous. Thus there are two possible equilibrium paths, as shown in the following table. In the beginning, everyone reveals their preferences only on the first issue. If these turn out to be unanimous, then there are no further revelations. If preferences on the first issue turn out not to be unanimous, then everyone fully reveals in the second round and thereafter.

Round	Person 1	Person 2	Person 3
1	$(2, X)$	$(2, X)$	$(2, X)$
2	$(2, X)$	$(2, X)$	$(2, X)$
⋮	⋮	⋮	⋮
Round	Person 1	Person 2	Person 3
1	$(0, X)$	$(2, X)$	$(2, X)$
2	(0,2)	(2,2)	(2,0)
3	(0,2)	(2,2)	(2,0)
⋮	⋮	⋮	⋮

If preferences are unanimous on the first issue, why does a person choose not to reveal his preference on the second? Say that in the first round, everyone reveals that the first coordinate of their ideal point is 2. If there are no further revelations, then whoever becomes the proposer proposes $(2, 1)$ and everyone gets the payoff $w(1) = -1$. Does person 1, for example, gain by completely revealing her ideal point? Say that person 1's ideal point is (2, 2) and she reveals this. Given their strategies, person 2 and person 3 thus also fully reveal. To calculate person 1's expected utility once everyone fully reveals, we have to consider the four possible voting games and who will be the proposer, as in the following table.

Game	Person 1 proposes	Person 2 proposes	Person 3 proposes
$V((2,2),(2,0),(2,0))$	(2,1)	(2,0)	(2,0)
$V((2,2),(2,0),(2,2))$	(2,2)	(2,1)	(2,2)
$V((2,2),(2,2),(2,0))$	(2,2)	(2,2)	(2,1)
$V((2,2),(2,2),(2,2))$	(2,2)	(2,2)	(2,2)

If two people at least have ideal point $(2,2)$ and a person with ideal point $(2,2)$ becomes the proposer, then $(2,2)$ is implemented and person 1 gets a payoff of $w(0) = 0$ (this happens with probability 7/12). If person 2 has ideal point $(2,2)$ and person 3 has ideal point $(2,0)$ (or vice versa) and the person with ideal point $(2,0)$ becomes the proposer, then $(2,1)$ is implemented and person 1 gets a payoff of $w(1) = -1$ (this happens with probability 1/6). If both person 2 and person 3 have ideal point $(2,0)$ and person 1 becomes the proposer, then $(2,1)$ is implemented and person 1 gets a payoff of $w(1) = -1$ (this happens with probability 1/12). Finally, if both person 2 and person 3 have ideal point $(2,0)$ and either person 2 or person 3 becomes the proposer, then $(2,0)$ is implemented and person 1 gets a payoff of $w(2)$ (this happens with probability 1/6). Summing over all these possibilities, if person 1 fully reveals, and thereby causes everyone else to reveal, she ends up getting an expected utility of $-1/4 + w(2)/6$. By assumption (iii), this is less than $w(1) = -1$, her utility if she reveals her preferences on only the first issue.

When person 1 fully reveals, the strategy of person 2, for example, is to fully reveal also. Why is this action reasonable? One way to think about it is that if person 2 also has ideal point $(2,2)$, then he will surely reveal this, because if either person 1 or person 2 becomes the proposer, this would let persons 1 and 2 implement their ideal point $(2,2)$ and get the best possible payoff (if person 3 becomes the proposer, then person 3 will propose $(2,1)$ as before). If person 2 has ideal point $(2,0)$, he might reveal this. But even if he does not, he would still "signal" this fact because if his ideal point were $(2,2)$, he would have surely revealed it. So if person 1 reveals that her ideal point is $(2,2)$, person 2 (and similarly person 3) are "forced" into revealing everything also.

In other words, by revealing her preferences on the second issue, person 1 "politicizes" it and makes everyone else reveal their preferences on the second issue also. Although person 1 might gain from doing this, there is the possibility that person 2 and person 3 will form their own new majority around both issues and that one of them will have the power to propose. Payoffs are such that a person would rather be part of a majority on a single issue than run the risk of not being in a majority at all. Hence if everyone is part of a majority on the first issue (in other words, preferences on that issue are unanimous), no one politicizes the second issue.

To summarize, if preferences on the first issue are unanimous, then everyone ex ante prefers not politicizing the second issue; no one wants to "rock the boat" and politicize the second issue for fear of being left out of a majority. Hence at the start, people try to make this happen by initially only revealing preferences on the first issue; no individual wants to ruin things by unnecessarily politicizing both issues. There is little “downside risk” in partially revealing at the start, since if preferences on the first issue are not unanimous, everything is soon revealed anyway.

5 Remarks

Since there exists an equilibrium in which people’s preferences are only partially revealed, it is natural to ask whether there exists an equilibrium in which preferences are not revealed at all. For example, say each person plays a “trigger” strategy of not revealing anything at first, but revealing fully if anyone ever reveals anything. If no one reveals anything, then the outcome is the complete compromise $(1, 1)$ and everyone gets $w(\sqrt{2})$; if someone reveals, then the outcome is the same as the full revelation equilibrium, with expected utility $-3/8 + w(\sqrt{2})/16 + w(2)/12 + w(\sqrt{5})/8 + w(\sqrt{8})/24$. Depending on the definition of $w(d)$, it is possible that this expected utility is less than $w(\sqrt{2})$, and thus these strategies would be an equilibrium; this is true, for example, when $w(d)$ is defined as in Figure 3. In such an equilibrium, people are so worried about being left out of a majority that they do not express any preference at all. However, if $w(d)$ decreases more slowly, for example if $w(\sqrt{2}) = -2$, $w(2) = -5.5$, $w(\sqrt{5}) = -6$, $w(\sqrt{8}) = -6.5$, then this expected utility can be greater than $w(\sqrt{2})$ and thus the “trigger” strategies are not an equilibrium. Regardless, the partial revelation equilibrium is always an equilibrium and is always ex ante better for everyone than the full revelation equilibrium.

Two aspects of our model are crucial. The first is the assumptions on z, the utility from having no policy implemented, and $w(d)$, a person’s utility as a function of the distance d between his ideal point and the decision. The utility z from not having any policy implemented must be sufficiently low as to make proposers want to offer the complete compromise $(0, 0)$ in the absence of information about the others’ preferences. If z were higher, an uninformed proposer might not mind taking the risk of having no policy implemented, and might propose her own preference on one or both issues. Our assumption on z ensures that what people know about each other’s preferences makes a difference in the voting outcome. Our assumption that $w(2)$ is much worse than $w(1)$ and $w(\sqrt{2})$ is also important. If $w(2)$ were not much worse than $w(1)$ and $w(\sqrt{2})$, then people would always reveal everything, hoping to put together a majority on both issues, undeterred by the possibility of being left out.

The second important aspect of the model is that in the revelation process there is almost always another round. In other words, when a person reveals something, there is almost always the chance that others will get to respond by revelations of their own. If there were a predetermined final round, then it would be weakly dominant for everyone to reveal everything at the final round, since there would be no implication for future rounds. This assumption is not unreasonable, since in “real life” it is almost always possible to respond to others’ statements.

The assumption that people can only reveal truthfully is mainly for convenience; the consideration of possibly untruthful revelation would be fairly complicated in our context. It is possible that a person might want to falsify his revelation (for example, if ideal points are $(2,2)$, $(0,0)$, and $(0,2)$, the person with ideal point $(2,2)$ might say that he has ideal point $(0,2)$ and thereby get $(0,2)$ implemented instead of $(0,1)$), but it is also true that there are powerful incentives for being truthful (for example, if I reveal untruthfully and everyone else believes me, then it is much less likely that my ideal point will be implemented). This paper demonstrates that social construction can occur even assuming that people cannot misrepresent themselves.

This paper is not meant to be much more than suggestive. It suggests that there are "hidden" issues, dimensions of the political sphere which can be politicized but are not because no individual wants to politicize them. People have diverse preferences on these issues, but they play no role in political expression or decision making, and are not visible to the outside observer. Individuals here do not "keep quiet" out of social conditioning, conformity, direct costs of communicating, or an inability to conceive of a different political reality, but because they are well aware that politicizing new issues has potentially risky real effects. To create a new majority on a new dimension, it is not a matter of changing people's preferences but of creating "class consciousness," so that people know that others feel the same way they do. The preferences which people use when voting, and their identity as majority or minority, are determined by constraints in people's knowledge of each other. These constraints are not exogenous but actively and rationally constructed by people through communication.

The model illustrates how the dimensions of the political sphere can be in some sense arbitrary, and how this arbitrariness can be created by individual rational action. But the model perhaps allows for too much arbitrariness; the creation of the political sphere is really the result of a complicated and historically grounded process. With a more realistic and less symmetric model, we might be able to predict which dimensions of the political sphere arise, and change over time. A model might help illustrate include how conceptions of the political sphere persist and and how they can be altered by discursive strategies such as "cultural struggles," "identity politics," and "consciousness raising."

Acknowledgements I am grateful for suggestions from Kathleen Bawn, Jonathan Bendor, Rachel Kranton, Barry O'Neill, John Zaller, and for comments received at the Cognition, Emotion, and Rational Choice conference at UCLA, George Mason University, and the University of Southern California. I am also grateful for very helpful comments from anonymous referees.

Appendix

Result 2 *Let*

$$f^i(t,r) = \begin{cases} (t_1^i, X) & \text{if } r^1 = r^2 = r^3 = (X,X) \\ & \text{or if } r^1 = r^2 = r^3 = (t_1, X) \\ (t_1^i, t_2^i) & \text{otherwise.} \end{cases}$$

This is a perfect Bayesian strategy profile with ex ante expected utility $\epsilon(-7/12 + w(\sqrt{2})/4 + w(\sqrt{5})/6) + (1-\epsilon)(-9/16 + w(\sqrt{2})/16 + w(2)/24 + w(\sqrt{5})/8 + w(\sqrt{8})/24)$.

Proof As argued earlier, if in any subgame, everyone else reveals fully, then it is a best response to reveal fully, and hence everyone revealing fully is a Nash equilibrium. Hence we only have to check those subgames in which it is not the case that everyone fully reveals. There are only two such subgames: $C(t, (X, X), (X, X), (X, X))$ at the start of the game and $C(t, (t_1, X), (t_1, X), (t_1, X))$, when everyone reveals only their preferences on the first issue and these preferences are identical.

First consider the subgame $C(t, (X, X), (X, X), (X, X))$, at the start of the game. Show that person 1's best response is to play (t_1^1, X) given that person 2 plays (t_1^2, X) and person 3 plays (t_1^3, X). To show this, it suffices to show that person 1 strictly loses by deviating assuming that the communication stage lasts at least 2 rounds, because the probability ϵ that the communication stage lasts just 1 round can be made arbitrarily small. So assume that the communication stage lasts at least 2 rounds. There are two cases. The first case is that $t_1^1 = t_1^2 = t_1^3$, in which case everyone reveals only their first preference in all rounds. In this case, in the equilibrium person 1 gets $w(1) = -1$. If person 1 were to deviate (in the first round) and play either (t_1^1, t_2^1) or (X, X), by the definition of f^i persons 2 and 3 would fully reveal in the second and subsequent rounds. Given this, as argued earlier, in the second and subsequent rounds, person 1 cannot do better than by also fully revealing. Thus person 1 would get $-1/4 + w(2)/6$, which is less than $w(1) = -1$ by assumption (iii). The second case is that t_1^1, t_1^2, t_1^3 are not all equal. In this case, by the definition of f^i, everyone would reveal everything in the second and subsequent rounds. If person 1 were to deviate (in the first round) and play either (t_1^1, t_2^1) or (X, X), by the definition of f^i persons 2 and 3 would again fully reveal in the second and subsequent rounds, and given this, again person 1 cannot do better than by also fully revealing in the second and subsequent rounds. Since we assume that there are at least 2 rounds, by deviating person 1 cannot make himself better off. Since a deviation by person 1 makes him strictly worse off in the first case and leaves him unchanged in the second case, and both cases happen with positive probability, person 1 strictly loses by deviating.

Second, consider the subgame $C(t, (t_1, X), (t_1, X), (t_1, X))$. Show that person 1's best response is to play (t_1^1, X) given that person 2 plays (t_1^2, X) and person 3 plays (t_1^3, X). Again, it suffices to show that person 1 strictly loses by deviating conditional on there being at least one more round. In the equilibrium, person 1 gets $w(1) = -1$. If person 1 deviates and plays (t_1^1, t_2^1), in the subsequent rounds, persons 2 and 3 reveal everything and thus person 1 cannot do better than by also revealing everything in the subsequent rounds. Person 1 would get expected utility $-1/4 + w(2)/6$, which is less than $w(1) = -1$ by assumption (iii).

References

Bawn K (1999) Constructing 'us': ideology, coalition politics, and false consciousness. Am Politi Sci Rev 43:303–334
Berliant M, Konishi H (2005) Salience: agenda choices by competing candidates. Publ Choice 125:129–149
Bourdieu P, Wacquant LJD (1992) An invitation to reflexive sociology. University of Chicago Press, Chicago
Chwe MS-Y (2001) Rational ritual: culture, coordination, and common knowledge. Princeton University Press, Princeton
Clark WR (1998) Agents and structures: two views of preferences, two views of institutions. Int Stud Quart 42:245–270
Elster J (1985) Making sense of Marx. Cambridge University Press, Cambridge
Glazer A (1990) The strategy of candidate ambiguity. Am Politi Sci Rev 84:237–241
Legro JW (1996) Culture and preferences in the international cooperation two-step. Am Politi Sci Rev 90:118–137
McKelvey R (1980) Ambiguity in spatial models of policy formation. Publ Choice 35:385–402
Riker WH (1984) The heresthetics of constitution-making: the presidency in 1787, with comments on determinism and rational choice. Am Politi Sci Rev 78:1–16
Riker WH (1986) The art of political manipulation. Yale University Press, New Haven, CN
Shepsle KA (1972) The strategy of ambiguity: uncertainty and electoral competition. Am Politi Sci Rev 66:555–568
Simon HA (1985) Human nature in politics: the dialogue of psychology with political science. Am Politi Sci Rev 79:293–304
Thelen K and Steinmo S (1992) Historical institutionalism in comparative politics. In: Structuring politics: Historical institutionalism in comparative analysis. Cambridge University Press, Cambridge
Wendt A (1994) Collective identity formation and the international state. Am Politi Sci Rev 88:384–396