Measuring alertness

The readiness of a social group to participate in protest activity

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***Abstract*—In this paper, we propose a theory-based measure of alertness, the ability of a protest event to facilitate further contentious activity and attract higher numbers of protesters for further events. Our measure allows to pinpoint key features of contentious events and distinguish protest that leads to political instability. We use political protest in Ukraine as an empirical example to demonstrate our measure's sensitivity to protest scale, activity and the nature of protesters' demands[i].**

Keywords—contentious politics; political protest; alertness

I. Introduction

The subject of political instability, protest activity and civil conflict has long been a popular subject of study in social sciences. Goldstone's classic paper [1] laid out key features of this subject field, including the fundamental nature of conflict studies in political science, by examining key stages of scientific inquiry into political conflict and instability: from step-by-step descriptions of protest events and revolutions based on "weakly specified" theories [2, 3, 4] to more recent evaluations of factors of instability.

The term "contentious politics", first introduced by Tilly in the 1970s [5], aims to encompass a broad range of political phenomena ranging from social movements and identity groups to full-scale civil war. Studies that may be classified in this category deal with factors of political instability that include social (imbalances between functions and needs of different social groups, social frustration and deprivation, economic inequality, ethnic and religious cleavages), demographic (imbalances between gender and age groups) and political (institutions, political regimes, the role of the military). Contentious politics remain a popular subject in political science until present day and, due to encompassing nature of the term itself, vary in topic and methods: from detailed case-studies into the structure, identitites and agency of political conflict [6] and the role of information and communicative technology in violent insurgency [7] to large-N comparative analysis of civil war determinants [8] and computational experiments on the mechanisms of political instability [9]. For the sake of simplicity, we will be utilizing the terms "protest" and "political contention" interchangeably for the rest of the paper.

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II. Theoretical Framework

Most theoretical explanations of contentious politics usually fall into two broad categories: structural approach and collective action approach [10].

The collective action approach to political contention has raised multiple methodological debates in the literature. While explaining collective action through individual choices by relatively rational actors offers multiple opportunities for inquiry such as game theory and micro-level recruitment, it usually falls short in accounting for the bigger picture, such as social and historical context. The classic understanding of collective action usually fails to explain an individual's desire to participate in protest due to high risks involved [11]: a given individual would be better off if he or she resorted to "free-riding" [12], while political apathy and inaction would only support the existing social order [10]. This also falls in line with the "Five Per Cent Rule": among the supporters of a political cause, only 1 in 20 are likely to be activists and not passive supporters [14]. In addition, from a micro-level point of view it might be difficult to distinguish between an activist and a non-activist in a given social movement, which further limits a researcher's ability to define group goals and resources [15].

Still, viewing political contention as a series of repeated games between actors could lead to a clear definition of possible strategies, thus shaping a "repertoire of contention" [5], with collective action solutions being equilibrium possibilities leading to both wanted and unwanted consequences of conflict. Moreover, in the absence of perfect information about actor preference, possible outcomes and their maintainability, "bargaining while fighting" might be the only option to find out the true solutions to the conflict [11].

Despite its theoretical shortcomings, there are a number of studies performed within the rational choice paradigm which utilize mathematical models and may offer unique insight into patterns and outcomes of political conflict. Of note are J. Epstein's computational experiment dealing with the grievance-risk balance that employs agent-based modelling to explain how individual preferences in conjunction with spatial structure affect contention [16]; and MIT's model of state stability and insurgent recruitment that uses informational network structure to test a society's resistance to conflict [9].

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The structural approach, also referred to as opportunity theory, aims to explain protest and political conflict through social structure. In his classic paper, Tarrow introduces the term "contentious collective action" [17] by differentiating protesting social groups from interest groups (due to initial lack of strict formal structure, long-term political goals and unified utility functions) and mobs (due to being relatively organized, with clearer identities). A contending group's key structural features are political opportunity from which it sprung to life, mobilizational structure that defines its dynamics and cultural frames that shape its identity. McAdam, Tarrow and Tilly [6] offer a theoretical framework for studying contentious collective action, which includes describing a group's actors, identities and available actions, the latter varying in group attachment, scale and possibility of mediation in the process of conflict. Therefore, the main unit of analysis within the structural approach is a social group, with its structure shaping modes of mobilization, which in turn affect possible outcomes of protest.

In this paper, we remain within the structural approach, also taking into account the methodological debate offered by studies of contentious politics: we acknowledge that political protest is not limited to studies of social movements; that particular attention should be directed toward individual protest events and different forms of conflict, as well as internal processes within a given event; and that other actors besides protesting individuals and groups may be involved [18]. Following Meyer, we note that "prospects of political activism are context-dependent" [19] and thus include political context in our theoretical model of contentious politics. Building on Lichbach's attempt to formulate a unifying theory that bridges collective action research and opportunity theory [10], we propose that social and political context (in a simplistic sense, social and political institutions) shapes a group's opportunities, mobilizing structures and identity frames, which in turn lead to a strategic choice of action and, ultimately, to social and political outcomes. Presently, we focus on the first interaction in the model by proposing a measure of a group's participation in protest activity and its influence on future protest events.

The aim of the present paper is to develop a measure of alertness, i.e. the extent of a social movement's participation in contentious political activity (rallies, demonstrations, strikes etc.). We assume that a successful protest event demonstrates the group's potential and leads to higher participation in future events due to inspiring more potential participants (however, over time the inspiration fades away). Furthermore, existing protesters not only are inspired, but also better integrated into the protest's network structure [15]: individuals are more likely to see familiar faces within a given protest group and accept the group's behavioural norms, which in turn increases their willingness to participate in further activity (or to accept more violent modes of contentious behaviour). This idea also falls in line with the research into modular political change: existing protest events serve as "models" or "examples" for future events, which borrow modes of political contention not from rational analysis of abstract "repertoire of contention" [5], but from real-life experience in a similar context [20].

III. Proposed Measure of Alertness

A. Alertness overview

We view an event's alertness as a scalar function of time, dependent on previous protest events. The time is measured discreetly in days. Alertness increases drastically on the day of the event, dependent on the event's properties: the more violent and numerous the protest, the higher the initial alertness surge – and deteriorates over time between events. On the one hand, high alertness values show that the group's members are ready to participate in consecutive protest events. On the other hand, to reach the group's goals it is necessary to keep the members alert by continuing with the protest activity. We therefore assume that high alertness values are capable of leading to high protest participation in the future.

While many studies look into distinct factors leading to high participation, it is always problematic to build a comprehensive list of such factors due to data limitations. We propose that the aforementioned factors are already in play during previous events, and thus continue to influence individuals' decision to participate in consecutive protests. The overarching goal is to build from the alertness indicator toward a mechanism of protest development which also includes latent propensity toward protest and ideological cleavages.

To measure alertness, we combine data on protest intensity, scale and the severity of the group's demands. Empirical data show that the most organized groups are usually relatively small in number and follow radical ideological views. Therefore, our measure focuses more on protest intensity than its scale by assigning smaller weight to the number of participants.

B. Event Codes

To measure alertness, we construct an event dataset that encompasses two main categories: activity (i.e. the actions taken by the protesters), number of protesters and their demands. Below is the coding scheme that we used for the dataset. We denote ordinal values of the relevant variables (activity, demand) for each category.

Activity codes:

- AA. Symbolic activity (activity = 1): one-person protests, people with banners, public performances and other public forms of open discontent, including leaflet distribution and hunger strikes. Usually very low in scale and unthreatening for the state, localized and unlikely to spread.
- AB. Peaceful protest (activity = 3): peaceful rallies, marches, gatherings and demonstrations lasting less than a day and not part of an event chain (see also AC, AE). Differs from AA by larger scale and media coverage.
- AC. Peaceful protest that is a part of an event chain (activity = 4): we define a protest as a part of an event chain if subsequent events are announced beforehand and are no more than a week later than previous ones.

- AD. One-day boycott or strike (activity = 4): social and political groups hindering the operation of economic agents; also organized strikes by discriminated groups declining to participate in everyday social or political activity.
- AE. Day-long peaceful protest (activity = 5): Tent protests, marches that don't threaten the operation of social and state institutions. We measure protest numbers using peak daily numbers of protesters.
- AF. Protest including clashes with non-state actors (activity = 5 for small-scale clashes; activity = 6 for large-scale clashes): also includes protesters-against-protesters clashes, with the activity lasting no more than a day.
- AH. Unorganized violent protest (activity = 6): unorganized or weakly organized violent activity, vandalism, disruptions of traffic, clashes against the police. Entails material harm for bystanders and necessary response from state officials.
- AJ. Unorganized violence (activity = 7), including direct provocations aimed at the police and clashes with government forces.
- AK. Organized violence (activity = 8): same as AH, but with organized combat groups. Also includes political terror and violence against government officials.
- AL. Organized and violent political struggle (activity = 9 or 10): violent capture of government buildings, open clashes against the police, politically-motivated murder, establishment of alternative institutions.

Demand codes:

- DA. No particular demands (demand = 1): a protest in support of the opposition, public expression of discontent – aimed at attracting public attention.
- DB. Economic demands (demand = 2): demands for increased wages and pensions and for changes in laws that cause public discontent.
- DC. Anti-war and pro-war demands, demands for policy change (demand = 3): demands for change in specific laws or policies; demands for respect toward the rights of discriminated groups; demands to free political prisoners or victims of repression.
- DD. Political demands (demand = 4): demands for specific politicians to leave office; protest against regional governments in favour of federal government and vice versa.
- DE. Demands for large-scale political change (demand = 5): demands for changes in fundamental political institutions such as the Constitution, changes in foreign policy; demands for re-elections or referendums.
- DF. Demands for change of government (demand =6).
- DG. Demands representing fundamental social, political, ethnic or religious cleavages (demand = 7).

C. *Measuring Alertness*

Our measure of alertness is a function of protesters' activity and demands over time:

$$L = a\left(1 + 0.1d\right)\lg n,$$

where L denotes alertness level, a denotes activity, d denotes demands and n denotes the number of protesters (i.e. the event's scale).

Activity ranges from 1 to 10, demands introduce a small variance into the measure, while the scale ranges from about 1.7 at $n = 50$ to about 5.3 at $n = 200000$.

We use logged event scale to give more weight to activity: a relatively small number of trained insurgents would lead to a more resonant event than several thousand peaceful protesters.

We also consciously forego measuring the event's location: while an armed protest in the state's capital might in theory be more devastating to political stability than an armed protest in a backwater town, our key concern is how a given event influences future events, so we assume that groups use all available means to spread information about their protest activity regardless of location.

Suppose an event takes place on Day 1, adding its value to the alertness measure. Beginning with Day 2 alertness remains at its initial level for a period of time defined by the event's impact, then decreases linearly to half of its value by Day 4, then decreases exponentially until it reaches zero or is renewed by a new event. If the protesters set up a camp, the deterioration speed is reduced depending on the size of the camp: alertness decreases twice as slowly if it's a big camp (1000 people or more), 30% slower for a medium camp and 10% slower for a small camp. This represents that a protest camp is a constant reminder of the event.

To provide an example, on the eve of an event alertness equaled $A(0)$. On Day 1, Alertness equals $A(1) = A(0) + L$. The period T_1 during which alertness remains at initial levels equals $\sqrt{L}$ (rounded down to an integer). Therefore, at $2 \le t \le T_1 + 1$ we have $A(t) = A(1)$. The period of linear deterioration $T_2 = 28\left(1 + 0.001N_{occ}\right)$, where N_{occ} is the size of the protest camp. If there's no camp, $T_2 = 28$. During this period $T_1 + 2 \le t \le T_1 + T_2 + 1$,

$$A(t) = A(T_1 + 1)\left[1 - \frac{t - T_1 - 1}{2T_2}\right] = A(1)\left[1 - \frac{t - T_1 - 1}{2T_2}\right].$$

At $t = T_1 + T_2 + 1$ we assume that

$$A(T_1 + T_2 + 1) = 0.5A(T_1 + 1) = 0.5A(1).$$

At $t \ge T_1 + T_2 + 1$ we calculate an exponent that smoothly follows from the previous period:

$$y(t) = A(T_1 + T_2 + 1)e^{-\alpha(t-T_1-T_2-1)},$$

where

$$y(T_1 + T_2 + 1) = A(T_1 + T_2 + 1)$$

that is

$$y'(T_1 + T_2 + 1) = -\alpha A(T_1 + T_2 + 1) = -\frac{A(T_1 + 1)}{2T_2},$$

$$\alpha = \frac{A(T_1 + 1)}{2T_2 A(T_1 + T_2 + 1)} = \frac{A(1)}{2T_2 \cdot 0.5A(1)} = \frac{1}{T_2}$$

Therefore,

$$A(t) = A(T_1 + T_2 + 1)e^{-(t-T_1-T_2-1)/T_2} = 0.5A(1)e^{-(t-T_1-T_2-1)/T_2}$$

That is,

$$A(t) = 0.5A(1)e^{-(t-T_1-T_2-1)/T_2}$$

D. Alertness Sensitivity

In this section we demonstrate the discriminative power of our alertness measure by assessing three examples of protest.

Example A: a peaceful demonstration by 10 000 people (AB, activity = 3) with demands for policy change (DC, demand = 3) is held every 30 days with no protest camp.

Example B: Same as Example A, but with only 400 people.

Example C: Same as Example A, but with violent activity instead of a peaceful demonstration (AH, activity = 6).

Table 1 shows that violence drastically raises average alertness levels for protest events. Despite considerable differences in event scale, Example A shows only a 50% increase in alertness over Example B; whereas event levels in Example C are twice as high compared to event A despite similar scale.

TABLE I. EXAMPLE ALERTNESS MEASURES

	Protest Example		
	A	***B***	***C***
Activity	AB: peaceful protest	AB: peaceful protest	AH: moderate violence
Scale	10 000	400	10 000
Event level	15.6	10.1	31.2
Mean alertness measure	28.2	17.3	63.5

E. Empirical Example

To further illustrate our measure of alertness, we provide an empirical example based on our own event dataset. We looked at public protest in Ukraine during the first year of the Yanukovich presidency, specifically – at demonstrations staged by the nationalist movement "Svoboda" between April 24th, 2010 and April 24th, 2011. During this period, "Svoboda" organized 21 contentious events both by themselves and together with other opposition parties. Event scale ranged from mere 20 people to over 15 000 people, with demand codes ranging from 2 (economic demands) to 7 (demands representing fundamental cleavages), and activity codes ranging from 3 (peaceful standalone protest) to 5 (violent clashes with non-state actors).

The highest-level events during this period happened in 2010: May 18th peaceful protest in Lviv against Yanukovich's "anti-Ukrainian policy" (5 000 protesters, demands for large-scale political change) and the December 3rd peaceful protest in Kyiv against the government's tax reform (15 000 protesters gathered jointly by "Svoboda", "Batkivshina" and the European Party of Ukraine, demands for changes in specific institutions). However, despite relatively large numbers of protesters, alertness levels for these two events remained comparable with the chain of small peaceful protests in August-September 2010: the latter had relatively small scale, never exceeding 3 000 protesters, but happened in quick succession and were characterized by high-level demands.

Figure 1 demonstrates alertness dynamics for the chosen dataset. The graph shows how consecutive medium-scale protest activity allows for higher event alertness than standalone large-scale or more violent activity, whereas a large gap between contentious events leads to a more drastic decrease in alertness than a change in demands or activity. As we mentioned above, a high-level protest tends to fade out of popularity relatively quickly, while a chain of close small-scale events reaches levels of alertness comparable to a single large-scale one.

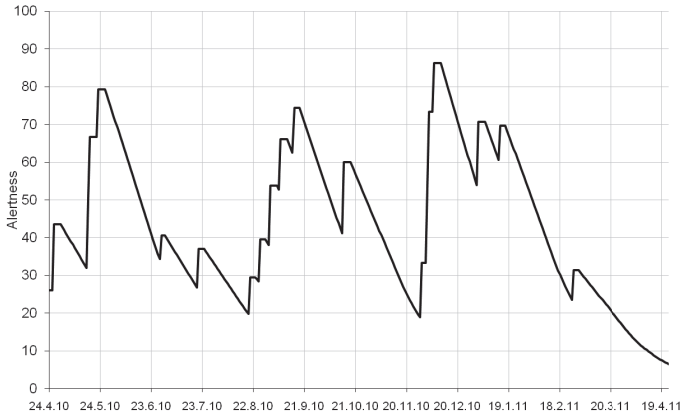

Fig. 1. Alertness dynamics of "Svoboda" protests in 2010 Ukraine

IV. Conclusion

In this paper we proposed a theory-based measure of protest alertness that takes into account the scale, the amount of violence and the nature of demands by the protesters. The measure uses event data on protest activity and puts additional emphasis on the repeated (or cascade) nature of consecutive contentious events as opposed to just measuring the number of protesters. Our approach to coding and measuring protest allows us to create a quantitative time-series event database for a given country and use dynamical data to further measure the effect of contentious activity on political stability.

We argue that using a complex measure of alertness allows us to utilize the advantages of the structural approach to contentious politics and also apply the logic of collective action to contentious politics. In our view, repeated protest events lead to higher availability of information about protest, which in turn helps motivate people to take part in further events by strengthening social interaction.

We use the example of 2010 Ukrainian peaceful protests to illustrate the way our measure handles different types of protest. In our dataset, large-scale events with moderate demands and a series of small-scale events with high demands lead to comparable measures of alertness, since none of the above are an actual threat to state stability.

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