IT'S THE WEATHER, STUPID!

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May Day demonstrations

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It's the weather, stupid!

Individual participation in collective May Day demonstrations[1]

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Abstract. We investigate the possible explanations of variations in aggregate levels of participation in large-scale political demonstrations. A simple public choice inspired model is applied to data derived from the annual May Day demonstrations of the Danish socialist parties and labour movement taking place in Copenhagen in the period 1980-2009. The most important explanatory variables are variation in the weather conditions. Political variables exhibit few or no robust effects and socio-economic variables none.

Keywords. Collective action; demonstrations; free-riding.

1. Introduction

The number of participants taking part in political demonstrations is usually seen as an indication of the extent of popular support for the cause addressed by the demonstration. If there are many, "the people" supports it, and if there are few they do not; if there are more than last time a comparable demonstration took place, popular support is on the rise, and if there are fewer it is waning.

Or so the popular logic would seem to go. However, demonstrations are instances of large-scale collective action where the participation of the average supporter will make no difference for the outcome, and where the benefits produced by the demonstration itself constitute a "public good" which will be shared by all sympathizers, irrespective of whether they themselves take part or not. In contrast, the costs of participating in the demonstration will be concentrated and private. So, why should rational individuals demonstrate, when they know that there at least some personal costs involved and when their own participation will have no discernible net-effect on the outcome? Public choice theorists have been asking such questions for more than five decades, in the case of,

e.g., voting (Downs 1957), interest group behaviour (Olson [1965] 1971) and revolutions (Tullock 1971; Tullock 1974). The answer given by Mancur Olson and scholars of his ilk is that rational individuals should not participate in large-scale collective action—at least not in the absence of what he termed "selective incentives", i.e., carrots and sticks (private benefits attached to participation itself or private costs attached to non-participation). We should, in other words, not expect political variables to have any significant impact on, say, political demonstrations, but with these rather being driven by changes in the private costs and benefits of potential participants.

Many attempts have been made at applying Olson's logic to demonstrations and protests (e.g., DeNardo 1985; Finkel, Muller and Opp 1989; Opp 1989; Kuran 1989; Kuran 1991; Opp 1991; Oberschall 1993; Oberschall 1994; Kuran 1995; Kurrild-Klitgaard 1997; cf. Lichbach 1995; Kurrild-Klitgaard 2004). However, there are at least two serious methodological problems with regard to investigating whether Olson's theory holds up empirically: (1) Micro-level data are usually not accessible, and (2) it is very difficult to replicate demonstrations, i.e., to find two (or more) demonstrations that are comparable. The first problem is particularly hard to solve, especially ex post. The second problem could ideally be addressed if there were demonstrations which occur repeatedly, with the same stated objectives and at similar locations, but such examples are difficult to come by. As a consequence, most studies seeking to empirically analyze participation in demonstrations have tended to be either somewhat anecdotal macro-narratives (e.g., Tullock 1971; Tullock 1974) or have relied on survey data which given the nature of demonstrations will tend to be ex post and potentially with considerable problems of either representativity or ex post rationalization (e.g., Finkel, Muller and Opp 1989).

In the present study we shall try to tackle this in a new way and with a novel type of data, namely by looking at May Day demonstrations such as those organized by labour unions and socialist parties in many countries each year on May 1st since the late 19th century.[2] These share the rather unique feature that they have been taking place regularly, over long time periods, organized by groups with basically very similar ideological beliefs, under the same set of symbols, at the exact same time of the year, and often at the same locations. What vary then are the socio-economic and political contexts, as well as the more accidental circumstances that may affect individual participation.

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[2] May 1st was chosen as the "International Workers' Day" at the first Congress of the Second Socialist International (1889). The specific reason was to officially mark the Haymarket Massacre in Chicago, May 4th 1886, which took place following a number of rallies and strikes across the US set for May 1st 1886. The Danish labour unions followed immediately (1890), although May Day was long before that—since at least the medieval period—used as a celebration for the coming of the spring.

2. The data

In the following we seek to test alternative explanations of variation in the extent of collective participation in a particular type of political demonstrations, namely May Day demonstrations—specifically the annual May Day demonstrations organized by the Danish left-wing parties and labour unions in the capital Copenhagen, which is the country's largest May Day celebration. These are a highly institutionalized, ritual phenomenon which has been taking place since 1890 at *Nørre Fælled* ("Northern Commons"), later *Fælledparken* ("The Commons Park"), which for decades had been the meeting place of left-wing demonstrators and where on the 5th of May 1872 a rather dramatic clash took place between socialist agitators and armed police. May Day is not a public holiday, but many employees have the half or full day off due to agreements with the employers, and at many Danish workplaces—including the public sector—it is informally functioning as a half day off, with many workers leaving before noon. The size and character of the meetings have indeed frequently been used as an indicator of the political strength of the labour movement and of its positive or negative attitudes towards governments, employers or right-wing parties. Even to this day participation is sought justified by appealing to the difference participation may make with regard to achieving the public good of a "better" society, as evidenced from a recent historical overview by Danish national labour movement (LO):

> "May 1st is the most important day of demonstration and celebration of the labour movement. On May 1st workers in most parts of the world demonstrate and express opinions about better working and living conditions, cleaner working environment and greater political freedom. … It is still the day where you express your solidarity with the oppressed and opposition to war. … Under all circumstances, it is good to show up. The world is constantly changing, and there will always be a need for political and organization action in order to change it to a better and more just world." (LO 2006: 2 & 11; author's translation)

In contrast, a public choice analysis would, as indicated, suggest that variables representing public goods in practice would be of no importance, whereas variables measuring the private benefits and costs of participating would be the important ones (and have positive and negative signs respectively). In order to test these alternative explanations, we will assume that individuals considering whether or not to join a demonstration may be motivated by the value of the public good itself, by the symbolic or "moral" value of participating, and by the private benefits and costs

of participating. Specifically, we will assume that the utility of participation in a demonstration, *P*, may be defined through the function:

$$U(P) = f(V, B, D, C, E, Q),$$

where *V* is the value of the public good, *B* are the private benefits from participating, *D* is the private "moral" satisfaction from doing "the right thing", *C* are the private costs, *E* is a measure of the individual's efficacy, and *Q* is some set of further factors that potentially may influence the utility of participating (cf., e.g., {Mueller, 2003 1337 /id}).

2.1. The dependent variable

The dependent variable of the analysis is the number of participants in the May Day demonstrations in the *Fælledpark* (cf. Table 1, which contains descriptive statistics for all the data considered as well as the sources). These figures are, where possible, obtained from the Copenhagen Police Department, which on a regular basis estimate the number of participants in demonstrations. However, the police do not keep such records for years and so the data have been supplemented with data collected from the coverage of the demonstrations by Danish newspapers, which in turn usually has been based on the estimations of the Police Department. If there is a divergence between the two, the one of the Police has been used. The years included are 1980-2009.[3] The time series is contained in Figure 1. As is evident, the number of participants is never trivial and sometimes very impressive: In 1990 the estimated number of participants was ca. 250,000, corresponding to roughly 5 pct. of the country's population and approximately ¼ of the metropolitan area's total population.

2.2. The independent variables

In order to examine the factors potentially determining the variation in number of participants at the May Day demonstration, a number of independent variables will be considered. The first part

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[3] Data for earlier years could be obtained, but would then create problems vis-à-vis what data could be included for various important control variables.

of the statistical analysis presents simple bi-variate correlations between the dependent variable and all other variables considered. The second part consists of standard ordinary least squares multiple regression analyses. Because of the relatively small number of observations in the data set, the analysis will need to limit the number of variables included in the multiple regression analysis, and we accordingly adopt an estimation strategy, where we first test a baseline model comprised of variables representing the five central operationalizations of the Olsonian calculus. To these, we then add and substitute the various control variables one by one while keeping the baseline model intact.

Following the outlined utility function, the baseline model will include (a) unemployment (as a measure of the "public bad" to be removed by collective action by the unions and the left-wing); (b) the ideological colour of the ruling government (as an indication of the "moral" duty of participation); (b) the weather (as a measure of the private benefits from participating); (d) the day (as a measure of the private costs of participating); (e) the strength of the labour unions (as an inverse proxy of the individual participant's efficacy):

- *Unemployment*, i.e., the number of unemployed Danes. Concerns for achieving as high a level of employment as possible have always been among the stated top-priorities of the labour unions, and indeed of the left-wing parties, and may reasonably be seen as the over-all public good sought after by the organized left. Everything else being equal, a traditional argument would be that high employment is a public good and hence that more unemployed Danes will lead to higher turn-out for May Day demonstrations, whereas an Olsonian analysis would suggest no effect since free-rider effects will kick in.

- *The colour of the government*, specifically whether or not the ruling government is a non-socialist government (which in practice means a right or centre-right government). Conceivably, the ideological colour of the government might mobilize its opponents. Again an Olsonian analysis would suggest that this will be a purpose that is open to free-riding, but for the present purposes, we will assume that left-voting Danes will see it as a form of moral duty—something giving them a participation related satisfaction—to demonstrate against a non-socialist government, irrespective of any political effects. Accordingly, we will expect, everything else being equal, that a non-socialist government is associated with higher number of participants, while the opposite is the case for a socialist government.

- *Weather*: The weather of the day may reasonably be seen as potentially entering into both the private benefits and private costs of the calculus of participants. If the weather is cold and wet,

it will be uncomfortable, while if it is warm and sunny the demonstration itself may be a pleasure. We therefore expect that *temperatures* (daily minimum and maximum temperatures) will be positively correlated with the number of participants.[4] Similar expectations apply to the number of hours of *sunshine*, while the reverse goes for the amount of *rain*.[5]

- *Workday*: May 1st will fall either on an ordinary workday or on a day where employees have the day off (weekends, national and religious holidays, etc.). Participation is always costly, even if the cost is low—either because it conflicts with work, or because it takes time away from other private activities. On the other hand, if leisure is a good, using an opportunity to take time off from work, when such is possible, may actually be a private benefit. For the present purposes we will accordingly expect the private costs to be higher if May 1st falls on a non-workday, because that day will be a holiday either way, while going to a demonstration will prevent people from pursuing other activities. Everything else being equal, we therefore predict more participants on a workday than on a holiday.

- *Labour union strength*: Two opposing hypotheses may be compared by considering labour union strength. A more classic, pluralist approach would suggest that larger special interest groups would lead to more participation, while the Olsonian analyses would suggest that the larger a group is, the less effect a typical participant will have, and the more rational it will be to free-ride. Everything else being equal, one would expect larger labour unions to be better at mobilizing large number of demonstrators—or alternatively that larger labour unions would make free-riding more attractive (and easier).

2.3. The control variables

In order to control for spurious correlations, the analysis also includes a number of alternative control variables, which conceivably could be of importance, although they do not all fit specifically with any particular theoretical explanation of collective action:

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[4] A case could be made that we might expect a curve-linear (inverted U) relationship between temperatures and number of participants, since at some point it might become so warm that other activities (e.g., going to the beach) might become preferable. For that purpose tests have been made with inclusion of both daily minimum and daily maximum temperatures, as well as squared versions of these variables. No robust results of this nature appear.
[5] According to a 2009 survey 21.1 pct. of Danes say that they will reconsider attending a May Day demonstration if the weather is bad (Wilke 2009).

- *Left-wing electoral strength*: The left-wing vote at the most recent national parliamentary election is an obvious explanatory variable, assuming that there would be a positive correlation between the number of people voting for left-wing parties and the number of people participating in the most important annual event of the political left.

- *Number of left-wing parties*: While the strength of the left-wing can be important, its organizational basis may also be. Everything else being equal, one would expect a larger number of parties to be better at mobilizing potential participants. We therefore expect a positive correlation between the number of left-wing parties and the number of May Day demonstrators.

- *Labour conflict*: A large number of work-days lost to labour conflicts indicate a high level of social conflict and a well-organized labour movement, and a case of the latter will be better able to mobilize many demonstrators. We therefore expect a positive correlation between number of days lost to strikes and number of May Day participants.

- *Prosperity*: A standard theory in much of 20th century voting analysis has been that if living standards are poor, voters may be seen as being more willing to protest (and perhaps especially to support the political left), while higher living standards might make voters more complacent. Everything else being equal, we will expect higher living standards (here measured by GDP per capita in constant prices) to associate with lower turnout on May Day.

- *Economic growth*: Similarly it is plausible to hypothesize that current economic conditions and changes therein might affect participation in May Day demonstrations. We accordingly hypothesize that lower (higher) economic growth (measured as change from previous year's GDP) will result in higher (lower) turnout.

- *Government size*: Conceivably the left's demonstrations may be influenced by the extent to which the public sector satisfies its political program. We therefore expect that public sector size (measured by the tax levels, i.e., total taxes and percentage of GDP) will exhibit a negative correlation with the number of May Day demonstrators.

- *Fall of the Soviet Union*: Since at least one prominent left-wing party, the Danish Communist Party (DKP), was financed partly by a foreign state, and simultaneously hosted one of the largest factions of the annual May Day demonstrations, the collapse of the Communist regimes that took place 1989-1991 may be seen as potentially having had a negative effect.[6] Also, the fall of so many regimes having an at least self-proclaimed socialist nature might be seen as potentially depressing effect on the left-wing in general. We have here included a dummy-variable for

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[6] At least five other Danish left-wing parties have been known to or been suspected of receiving smaller or larger amounts in funding from socialist states such as the Soviet Union, China, Albania et al.

whether or not the May Day demonstration in question took part before or after the Fall/Winter 1991, when the Soviet Union disintegrated, and our expectation is a negative correlation.

- *Democratic satisfaction*: Demonstrations can be seen as one way of expressing political satisfaction. Eurobarometer has for decades surveyed the citizens of Europe about the extent of their satisfaction with the democracies they live in. Such data should not be taken too literally for the present purposes, since satisfaction/dissatisfaction with democracy cannot be seen as inherently characteristic of the left exclusively, but the numbers may be seen as an expression of the relative satisfaction/dissatisfaction with political life in general. Our expectation is that there will be a negative relationship between satisfaction and participation.

- *Bandwagon effect*: Collective action may exhibit so-called "bandwagon effects",[7] where participants make their own participation dependent on their expectations of how many others will participate, and where these expectations are formed on the basis of prior events. In such situations participation may be influenced more prior participation levels than by other factors. For the present purposes we expect that the number of participants in a given year will be related to the number of participants in the previous year, so that a high (low) level in year t_2 will correlate with a high (low) level in year t_1.

- *Trend*: There are well-known potential problems related to the use of time-series data in OLS-multiple regression analysis. For that purpose we have included a trend-line as a simple control of whether participation has systematically declined with time.

3. The analysis

The simple bi-variate correlations are presented in Table 2 and may be interpreted in various ways. Looking simply at the signs of the coefficients, a large number of them have the expected signs. More rain, post-Soviet Union, higher living standards, higher economic growth and more democratic satisfaction go with lower turn-out. More sunshine, higher temperatures, a strong and well-organized left-wing, more union members, more unemployed and high turn-out the previous year all go with bigger crowds. But a number of variables do not have the expected signs—for example higher labour conflict levels, more right-leaning governments, and whether May 1st falls on a workday go with lower participation, while bigger government goes with higher.

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[7] On such bandwagon effects in collective action, including political protests, see, e.g., Granovetter 1978; Kuran 1989.

However, more importantly, if we look not simply at signs but at statistical significance, almost none of the correlations are statistically significant—that is, except the measure for satisfaction with Danish democracy and, in particular, two of the weather measures (daily minimum temperature and number of sunshine hours).[8] All other correlations are statistically insignificant. In contrast, the scatter plot of Figure 2 correlates minimum temperatures and number of participants and gives a bird's eye perspective on the possible effect of the weather on turn-out.

Turning to the multiple regression analyses (Table 3), we first test our baseline model (model 1), consisting of the unemployment, government colour, daily minimum temperature, sunshine, workday and labour union strength variables. Over-all the coefficients have the hypothesized signs: More unemployed, non-left governments, more sunshine hours and higher temperatures, and whether May 1st falls on a regular workday all correlate with higher turnout, while more labour union members associates with less turnout. The total amount of variation explained is non-trivial (adj. $R^2 = 0.38$). However, virtually all explanatory power of the baseline model belongs to the two only variables whose coefficients are statistically significant: The temperature and the sunshine. This is illustrated by a regression analysis with only these two variables included (model 2), which has only a slightly less good fit (adj. $R^2 = 0.32$). In most or all subsequent models the four other variables of the baseline model are statistically insignificant: Unemployment, labour union strength and workday are never significant and the colour of the government only occasionally so. These results, in other words, cannot be seen as corroborating any public goods explanation of political participation: Neither the ideology of the government nor unemployment—the chief foe of the left—plays any systematic, significant role in explaining May Day turnout, and neither does labour union strength. In fact, if anything the (negative) sign of the latter's coefficient suggests that there might be some free-riding going on, just as the (positive) sign of the workday coefficient suggests that while workers may prefer to demonstrate if it will get them away from work, they will prefer to do other things if May 1st falls on a holiday.

The following regression models all retain the baseline model variables but one-by-one tries another control variable. With a few exceptions (models 3 and 4) all models increase the explanatory power—which is no surprise—but several of them display statistically insignificant coefficients. signs??For example, the level of labour conflict is unrelated to May Day turnout (model 3) as is government size (model 4) and participation in the previous year (model 5), while an assumption that there simply has been an over-all systematic trend of lower participation as time goes by (model 6) or that there is a relationship with income levels (model 7) only barely are

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[8] Daily minimum temperatures and number of sunshine hours are not highly, positively correlated, as one would perhaps have expected ($r = 0.33$; $p = 0.08$).

statistically significant. Economic growth has the expected (negative) relationship with turn-out at a statistically significant level (model 8), just as May Day turn-out has been lower after the collapse of the Soviet Union in 1991, and possibly of a rather noticeable magnitude: Adding the latter dummy to the baseline model increases the over-all explanation to 47 pct. (model 9). There are also indications that changes in the strength of the left-wing, either electorally (model 10) or organizationally (model 11), may have an impact on May Day turn-out; both are statistically significant and raises the over-all explanation to 49 pct. and 50 pct. respectively.

However, none of the previous variables that come out statistically significant when added to the baseline model, although both are not robust when other variables are included in the regressions. A significant and robust boost in the explanatory power only comes when survey data for the voters' satisfaction with Danish democracy is included (models 12-13), thereby raising the explained variation to 70 pct. or higher, and with the variable being statistically significant and having the expected sign, i.e., with more democratic satisfaction going hand in hand with lower participation (and reverse).

The best fitting model, in the sense of the model with the highest explanatory power and with all coefficients statistically significant, is one relying solely on temperatures, sunshine, democracy satisfaction and government colour (model 13), which over-all explains 73 pct. of the variation in turnout, and with all coefficients having the expected signs: Better weather and a non-socialist government increases turn-out, while more satisfaction with democracy decreases it. No variable can be added that will result in the model having a statistically significant coefficient, so with the exception of democracy satisfaction none of the control variables seriously affects the over-all explanatory power of the baseline model.

It is difficult to see democracy satisfaction per se as being what really drives a large part of May Day demonstrators; after all, the demonstrations themselves may be seen as a part of democracy rather than as an alternative, and since the respondents cover the whole ideological spectrum, whereas both left-wingers and right-wingers may be satisfied/dissatisfied with how a democracy operates. It also cannot be seen as simply a substitute for current economic conditions.[9] The survey data behind the variable should therefore in the present context probably be interpreted as an imperfect expression of how the general "mood" is among the citizens, rather than as something particularly expressive of specific labour and left-wing concerns.

It is important to stress that of the variables of the baseline model only temperatures and sunshine remain statistically significant across all model specifications where they are included, and

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[9] The bivariate correlation between democracy satisfaction and, e.g., economic growth is neither large nor statistically significant ($r = 0.12$; $p = 0.56$).

of the other baseline model variables only government colour occasionally appears to be statistically significant but not consistently so and with somewhat erratic coefficients.[10] In fact, over a large set of regressions (not reported but obtainable from the author) only weather-related variables and democracy satisfaction remain statistically significant, irrespective of what other variables are included. As such, democracy satisfaction, as measured by survey data rather than the underlying, more objective factors themselves, is the only "political" variable that is robust.

All in all, the analysis suggests that there will always be some turn-out at May Day demonstrations, by the dedicated idealists—but how many will turn out in total depend not least on the weather—but relatively little on political factors and not at all on socio-economic factors. Specifically, the models suggest one degree change in minimum temperature will result in a change in turnout of ca. 4,600-8,200 participants, while one hour of sunshine more or less will affect turnout by ca. 4,400-7,600, depending on the specific model.

4. Conclusion

The previous analysis suggests that the factors usually assumed to rationalize individual participation in collective demonstrations such as May Day are, at best, trivial. There is no solid support for claims that turn-out at such demonstrations can be explained by the conditions of the workers (i.e. unemployment, living standards and economic growth) or by the over-all strength of the labour unions or by purely partisan or ideological factors (e.g., the strength of the left-wing parties). In other words, politics largely disappears, although the over-all national political mood plays some role, as may the colour of the ruling government. While also statistically insignificant, there are indications that free-rider effects exist, just as May 1st occurring on non-workdays lowers participation. The most important factors for the explanation of turn-out seems to be whether the weather is sufficiently pleasant for people to fight for what they believe is a better and more just society.

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[10] There is no evidence of multicollinearity problems, but the inconsistent behaviour of the government colour coefficients may be due to a relatively high and statistically significant, but spurious, correlation with sunshine ($r = -0.43$; $p = 0.02$).

Table 1. Variables and descriptive statistics.

Variables		Description	N	Mean	Standard deviation	Min.	Max.	Sources
Dependent variable	Participation	Participants in May Day celebrations in Fælledparken, Copenhagen, number	30	72,500	61,542.67	15,000	250,000	1980-2000: Berlingske Tidende (newspaper); 2001-2009: Copenhagen Police Department.
Independent variables	Colour of government	Dummy (centre-right government: 1; no: 0)	30	0.60	0.50	0	1	Parliament Hansard
	Unemployment	Unemployed, number on annual basis	29	189,332.17	68,788.83	80,270	323,437	Danmarks Statistik (Statistisk Tiårsoversigt 1991, 1992, 1997, 2007; Statistikbanken online)
	Min. temperature	Minimum number of degrees, Celsius	30	11.12	4.81	4.00	22.30	Danish Meteorological Institute
	Max. temperature	Maximum number of degrees, Celsius	30	10.92	3.93	2.90	18.10	Danish Meteorological Institute
	Sunshine	Sunshine, number of hours	30	7.28	4.66	0	13.90	Danish Meteorological Institute
	Rain	Rain, millimetres	30	0.75	1.65	0	7.00	Danish Meteorological Institute
	Workday	Dummy (no: 0; yes: 1)	30	0.73	0.45	0	1	
Control variables	Left-wing vote share	Votes for left-wing parties§ as pct. of all votes cast in most recent national parliamentary election	30	45.03	4.88	35.50	50.10	Parliament website
	Left-wing parties	Number of left-wing parties§ participating in most recent national parliamentary election	30	4.93	1.62	3	9	Parliament website
	Labour union strength	Members of the national Labour Union (LO), millions.	30	1.40	0.08	1.22	1.51	Danmarks Statistik (Statistisk Tiårsoversigt 1981, 1997, 2007; Statistikbanken online)
	Labour conflict	Workdays lost to labour conflicts, number on annual basis	29	362,755.17	753,607.71	51,300	3,173,000	Danmarks Statistik (Statistisk Tiårsoversigt 1991, 1997, 2007; Nyt fra Danmarks Statistik 2009)
	Prosperity	Real GDP per cap., Danish Kroner (constant 1990 prices)	30	215,028.21	34,860.65	157,726	270,403	IMF World Economic Outlook 2008
	Economic growth	Year-to-year change in real GDP per cap., Danish Kroner (constant 1990 prices)	29	1.86	1.66	-0.93	5,20	IMF World Economic Outlook 2008
	Government size	Total taxes, etc., as pct. of GDP	30	47.65	2.37	41.60	51.00	Danish Treasury, August 2009
	Fall of the Soviet Union	Dummy (prior to December 1991: 0; after: 1)	30	0.60	0.50	0	1	
	Democratic satisfaction	Voter satisfaction with Danish democracy, pct. "very" satisfied and "fairly" minus "not very" and "not at all"	26	53.65	21.27	8	88	Eurobarometer 1980ff
	Bandwagon	Participants in May Day demonstrations in Fælledparken, Copenhagen, previous year, number	29	71,206.90	62,215.86	15,000	250,000	Cf. above.
	Trend	Monotonically increasing value	30	15.50	8.80	1	30	

§ Social Democrats, Socialist People's Party (SF), Danish Communist Party (DKP), Left-Socialists (VS), Socialist Unity List (EL), Socialist Workers' Party (SAP), Communist Workers' Party (KAP), Marxist-Leninist Party (MLP), Common Course (FK), etc.

Figure 1. Estimated number of participants in Copenhagen May Day demonstrations, 1980-2009.
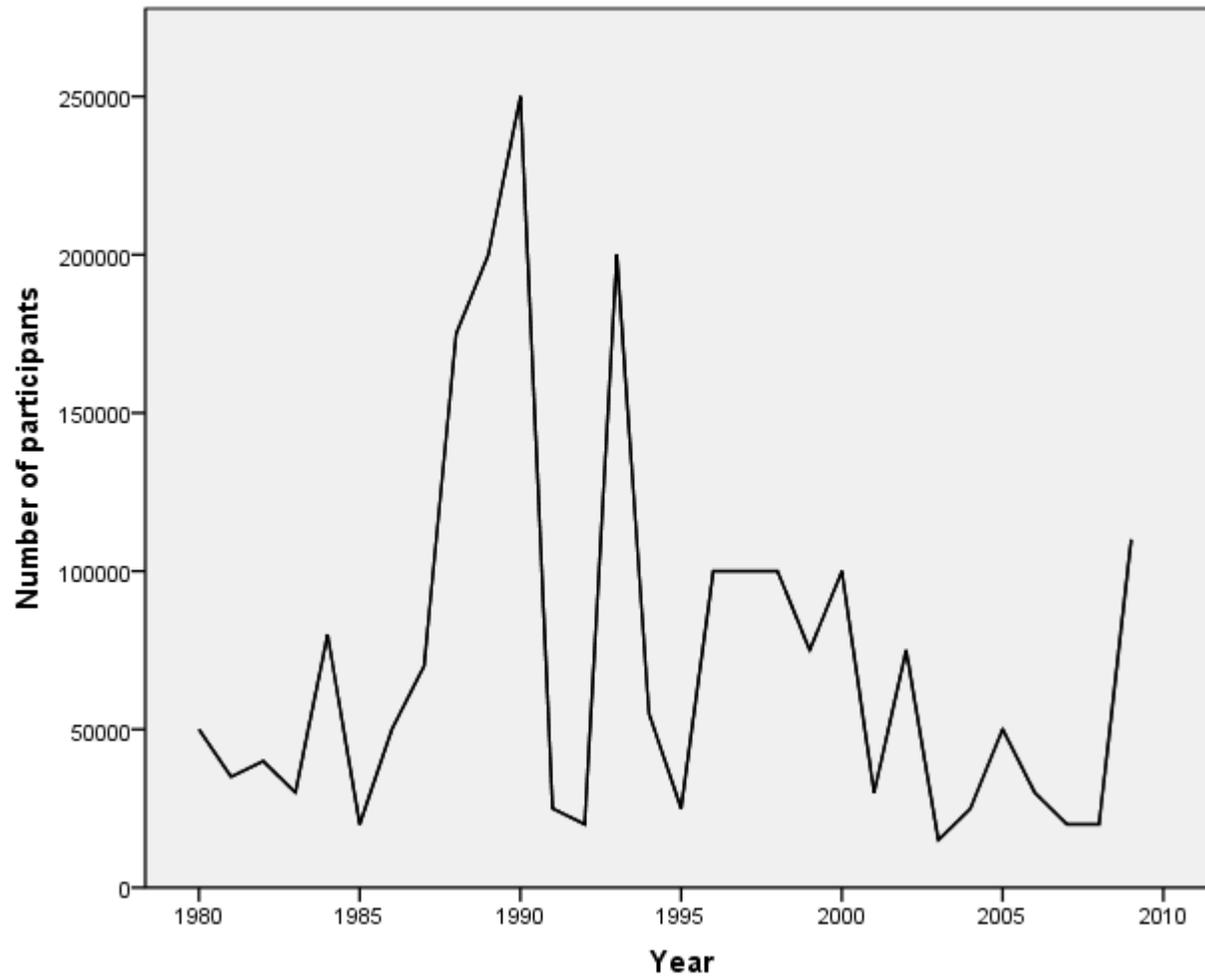
Table 2. Bi-variate correlation analyses, all variables considered: Correlation with no. of participants.

Variable	Pearson correlation coefficient (significance, 2-tailed)	N
Min. temperature	0.512 (0.004)***	30
Sunshine	0.468 (0.009)**	30
Democratic satisfaction	-0.425 (0.030)*	26
Left-wing parties	0.305 (0.101)	30
Left-wing vote share	0.297 (0.111)	30
Bandwagon	0.295 (0.120)	29
Economic growth	-0.272 (0.152)	29
Rain	-0.255 (0.174)	30
Labour union strength	0.231 (0.219)	30
Max. temperature	0.225 (0.233)	30
Unemployment	0.224 (0.243)	29
Fall of the Soviet Union	-0.174 (0.357)	30
Government size	0.158 (0.405)	30
Prosperity	-0.151 (0.424)	30
Trend	-0.133 (0.483)	30
Labour conflict	-0.103 (0.596)	29
Workday	-0.087 (0.647)	30
Colour of government	-0.045 (0.813)	30

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.005$.

Figure 2. Correlation between daily min. temperatures in Copenhagen and estimated number of participants in May Day demonstrations, 1980-2009.
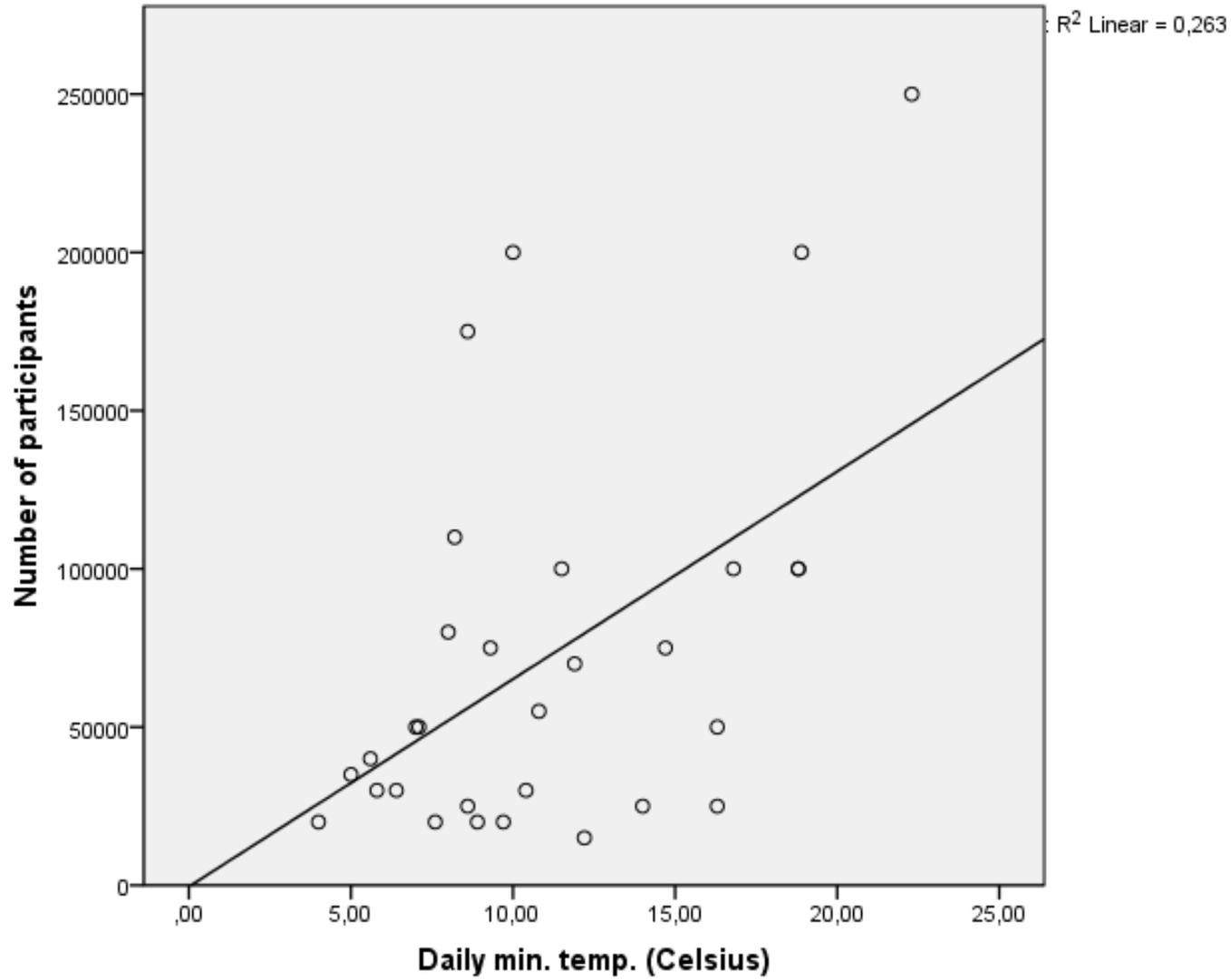
Table 3. OLS multiple regression analyses. Dependent variable: Number of participants in May Day protests in Fælledparken, Copenhagen, 1980-2009. Unstandardized coefficients (t-values).

Variables	Model 1 (Baseline model)	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13
Colour of government	40,844.55 (1.57)	-	38,677.84 (1.38)	43,480.39 (1.50)	36,993.40 (1.38)	42,605.58 (1.72)	44,724.54* (1.82)	45,793.01* (1.90)	23,893.42 (0.95)	59,596.80** (2.45)	16,005.54 (0.65)	45,338.51** (2.33)	48,296.93** (2.83)
Unemployment	0.24 (1.38)	-	0.24 (1.33)	0.20 (0.83)	0.22 (1.22)	-0.04 (-0.17)	-0.10 (-0.42)	0.27 (1.70)	0.05 (0.25)	-0.11 (-0.56)	0.03 (0.17)	-0.02 (-0.26)	-
Min. temperature	6,189.75** (2.52)	5,141.89** (2.47)	6,264.31** (2.43)	6,273.39** (2.48)	6,236.12** (2.51)	7,708.76*** (3.12)	7,508.94*** (3.12)	4,631.56* (1.96)	7,615.16*** (3.24)	7,449.76*** (3.33)	7,546.65*** (3.40)	8,201.81**** (4.46)	7,844.89**** (5.29)
Sunshine hours	6,657.88** (2.51)	4,426.14** (2.08)	6,376.87* (2.04)	6,846.29** (2.41)	6,231.81** (2.27)	6,901.70** (2.73)	7,151.14** (2.84)	7,644.30*** (3.07)	6,202.49** (2.52)	6,366.92** (2.69)	6,118.58** (2.60)	5,904.44** (2.65)	5,642.23** (2.78)
Workday	6,985.42 (0.32)	-	7,953.96 (0.33)	6,450.91 (0.29)	3,976.04 (0.18)	5,795.28 (0.28)	7,664.73 (0.37)	4,295.88 (0.21)	3,563.21 (0.18)	2,093.70 (0.11)	17,906.16 (0.91)	7,228.82 (0.44)	-
Labour union strength	-58,211.74 (-0.30)	-	-57,876.30 (-0.26)	-21,232.38 (-0.08)	-99,951.65 (-0.49)	-48,011.69 (-0.26)	-19,084.52 (-0.10)	32,998.63 (0.18)	-12,480.77 (-0.07)	-78,443.49 (-0.45)	-74,345.22 (-0.43)	-76,195.22 (-0.43)	-
Labour conflict	-	-	-0.04 (-0.29)	-	-	-	-	-	-	-	-	-	-
Government size	-	-	-	-1,587.59 (-0.23)	-	-	-	-	-	-	-	-	-
Bandwagon	-	-	-	-	0.13 (0.72)	-	-	-	-	-	-	-	-
Trend	-	-	-	-	-	-3,057.41* (-1.85)	-	-	-	-	-	-	-
Prosperity	-	-	-	-	-	-	-0.86* (-1.96)	-	-	-	-	-	-
Economic growth	-	-	-	-	-	-	-	-12,942.55** (-2.22)	-	-	-	-	-
Fall of the Soviet Union	-	-	-	-	-	-	-	-	-51,465.62** (-2.20)	-	-	-	-
Left-wing vote share	-	-	-	-	-	-	-	-	-	7,394.97** (2.61)	-	-	-
Left-wing parties	-	-	-	-	-	-	-	-	-	-	18,136.42** (2.70)	-	-
Democratic satisfaction	-	-	-	-	-	-	-	-	-	-	-	-1,917.48**** (-4.82)	-1,862.09**** (-5.45)
Constant	-39,666.94 (-0.15)	-16,882.99 (-0.67)	-37,441.95 (-0.13)	-12,460.12 (-0.04)	21,294.50 (0.08)	-27,328.01 (-0.11)	134,464.33 (0.52)	-141,487.55 (-0.58)	-35,518.50 (-0.15)	-296,688.88 (-1.19)	-70,817.16 (-0.31)	120,402.43 (0.52)	15,238.23 (0.49)
N	29	30	28	29	29	29	29	29	29	29	29	25	26
R^2 (adjust.)	0.35	0.32	0.31	0.32	0.34	0.41	0.42	0.45	0.45	0.49	0.50	0.69	0.73
Std. errors	50,385.99	50,911.49	52,704.76	51,508.83	50,940.54	47,831.13	47,425.69	46,404.79	46,507.89	44,831.98	44,423.54	36,120.98	33,766.42
F-test	3.51**	6.51***	2.69**	2.89**	3.02**	3.83***	3.94***	4.25***	4.22***	4.77***	4.91***	8.62****	17.13****

$* \, p < 0.1. \; ** \, p < 0.05. \; *** \, p < 0.01. \; **** \, p < 0.001.$

References

DeNardo, J. (1985). *Powers in numbers: The political strategy of protest and rebellion*. Princeton: Princeton University Press.

Downs, A. (1957). *An economic theory of democracy*. New York: Harper Collins.

Finkel, S. E., Muller, E. N., & Opp, K.-D. (1989). Personal influence, collective rationality and mass political action. *American Political Science Review 83*(3), 885-903.

Granovetter, M. (1978). Treshold models of collective behavior. *American Journal of Sociology 83*(6), 1420-1443.

Kuran, T. (1989). Sparks and prairie fires: A theory of unanticipated political revolution. *Public Choice 61*(1), 41-74.

Kuran, T. (1991). The East European revolution of 1989: Is it surprising that we were surprised? *American Economic Review 81 (Papers and Procedings)*(2), 121-125.

Kuran, T. (1995). *Privat truths, public lies: The social consequences of preference falsification*. Cambridge: Harvard University Press.

Kurrild-Klitgaard, P. (1997). *Rational choice, collective action and the paradox of rebellion*. Copenhagen: Institute of Political Science, University of Copenhagen & Copenhagen Political Studies Press.

Kurrild-Klitgaard, P. (2004). The paradox of rebellion. In C. K. Rowley & F. Schneider (Eds.), *The encyclopedia of public choice* (pp. 403-406), *Vol. 2*. Dordrecht: Kluwer.

Lichbach, M. I. (1995). *The rebel's dilemma*. Ann Arbor: University of Michigan Press.

LO. (2006). *1. maj - derfor*. København: Landsorganisationen i Danmark (LO), http://www.ugebreveta4.dk/~/media/LO/Fokus/1maj2009/1majderfor2006pdf.ashx.

Mueller, D. C. (2003). *Public choice III*. Cambridge: Cambridge University Press.

Oberschall, A. R. (1993). *Social movements: Ideologies, interests, and identities*. New Brunswick: Transaction Publishers.

Oberschall, A. R. (1994). Rational choice in collective protests. *Rationality and Society 6*(1), 79-100.

Olson, M. ([1965] 1971). *The logic of collective action: Public goods and the theory of groups* (2. ed.). Cambridge: Harvard University Press.

Opp, K.-D. (1989). *The rationality of political protest: A comparative analysis of rational choice theory*. Boulder: Westview Press.

Opp, K.-D. (1991). Processes of collective political action. *Rationality and Society 3*(2), 215-251.

Tullock, G. (1971). The paradox of revolution. *Public Choice 11*, 89-100.

Tullock, G. (1974). *The social dilemma: The economics of war and revolution*. Blacksburg: Center for Study of Public Choice.

Wilke. (2009). Arbejdernes Internationale Kampdag Lever Endnu. *Wilke Nyhedsbrev,*(maj).