

# **Has Protest Increased Since the 1970s? How a Survey Question Can Construct a Spurious Trend**

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## ***SUPPORTING INFORMATION***

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### **ACCOMPANYING FILES**

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## Appendix S1: Statistics on strikes

The series plotted in Figures II and III are provided in Table S3 and in tab-delimited file *strikes.txt*. The denominator, column M, is the number of people aged 15 and over in Britain. Annual mid-year population estimates are provided by the Office of National Statistics for 1971 to 2010.<sup>1</sup> The series is extended backward by interpolating (exponentially) from the Census of 1931, 1951, and 1961 (Mitchell 1988: 15-16). It is extended to 2012 by extrapolating growth from 2009 to 2010.

Government statistics are restricted to work stoppages concerning terms of employment. This restriction is interpreted loosely and not always consistently (Cronin 1979: 198). But it does exclude several large strikes over government policy, like the massive strike in 1971 against the Industrial Relations Bill. Fortunately, the exclusion can largely be rectified. From 1969 to 1983, the annual reports on work stoppages (published in *Employment and Productivity Gazette*, *Department of Employment Gazette*, and *Employment Gazette* successively) noted prominent strikes over issues other than terms of employment, and for most of them estimated the number of workers involved. These figures, though not entirely complete, enable strikes over policy to be included as described below. (No such strikes in Northern Ireland were listed.) Before the late 1960s and after the mid 1980s, strikes over issues other than terms of employment were almost nonexistent (Durcan, McCarthy and Redman 1983: 401; Lyddon 2007: 346; Office of National Statistics 2012: 20).

In Figure II, the numerator is based on the number of workers *directly* involved in stoppages *beginning* in the year. Both restrictions make for a smaller number than the commonly used series of *total* workers involved in stoppages *in progress* during the year. The first restriction excludes workers *indirectly* involved, who did not choose to strike but rather were involuntarily thrown out of employment by a strike in their firm. The second restriction avoids double counting: if a strike runs from December to January of the following year, the strikers contribute towards stoppages *in progress* in both years. The series preferred here is unfortunately not disaggregated by region. To estimate the series for Britain alone, therefore, the UK series is reduced by the proportion of total workers involved in strikes in progress in that year contributed by Northern Ireland, which is a very small fraction (2.4% overall). Referring to columns in the spreadsheet, the resulting subtotal  $O = B - (B \times F/E)$ . There was no regional tabulation before 1955, and so  $F/E$  is estimated from the fraction of workers involved in Northern Ireland from 1955 to 1959,  $F_{1955-9}/E_{1955-9}$ . Subtotal O is increased by the number of workers involved in strikes over policy, column J.

In Figure III, the numerator is based on the number of working days lost in stoppages in progress during the year. The series is disaggregated by region and so Northern Ireland can be

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<sup>1</sup> File *table\_b\_quinary\_age\_groups\_constituent\_countries.xls*. The ONS website is so difficult to navigate and so rapidly changing that it is not worth identifying the location.

subtracted. Unfortunately, government statistics do not differentiate days lost by workers *directly* involved from those lost by those *indirectly* involved. To exclude the latter – who were not protesting – the total series is reduced by the proportion of total workers involved in strikes beginning in the year contributed by workers indirectly involved (12% overall). Referring to columns the spreadsheet, the resulting subtotal  $S = (G-H) \times C/B$ . Before 1955,  $G-H$  is estimated by  $G \times (1-(H_{1955.9}/G_{1955.9}))$ . Subtotal  $S$  is increased by the number of working days lost in strikes over policy, column  $K$ . Such strikes generally lasted a day, but if a longer duration was reported that is used to calculate the number of working days lost.

The proportion of workers involved in strikes known to be official in the period 1960-1980 is  $(D_{1960-80} + J_{1960-80} - 350000) / (B_{1960-80} + J_{1960-80})$ . Subtracted from the numerator is the massive unofficial strike – it was denounced by the Trades Union Congress – against the Industrial Relations Act on 8 December 1970 (Gennard 1971: 99).

## **Appendix S2: Determinants of participation**

Figure V (inspired by King, Tomz and Wittenberg 2000) is derived from models in Table S1, estimated by logistic regression. The model's ability to discriminate between individuals who have ever participated and those who have not is measured by the area under the Receiver Operating Characteristic (ROC) curve, which ranges from .5 (no discrimination) to 1 (perfect discrimination). Table S2 reports the determinants of having gone on strike, from BSA, estimated by logistic regression. The respondent's highest educational qualification is coded in six ordinal categories (plus foreign and other qualifications), with the reference category being no qualifications. The analyses can be replicated using Stata command files *process\_wvs.do* and *process\_bsa.do*.

## **Supplementary bibliography**

**Cronin, J.E.** 1979 *Industrial Conflict in Modern Britain*, London: Croom Helm.

**Durcan, J.W., McCarthy, W.E.J. and Redman, G.P.** 1983 *Strikes in Post-War Britain: A Study of Stoppages of Work due to Industrial Disputes, 1946-73*, London: George Allen & Unwin.

**King, G., Tomz, M. and Wittenberg, J.** 2000 'Making the Most of Statistical Analyses: Improving Interpretation and Presentation', *American Journal of Political Science* 44(2): 347-61.

**Mitchell, B.R.** 1988 *British Historical Statistics*, Cambridge University Press.

**Office of National Statistics**, 2012, *Labour Disputes: Annual Article, 2011*.

**Table S1: Determinants of participation in protest (WVS 1990)**

	Boycott			Lawful demonstration			Unofficial strike			Occupation of building/factory		
	odds	s.e.	p	odds	s.e.	p	odds	s.e.	p	odds	s.e.	p
Male	1.42	.25	.05 *	2.30	.43	.00 ***	3.25	.78	.00 ***	1.97	.87	.13
Age	1.05	.03	.07	1.04	.03	.18	1.17	.05	.00 ***	1.09	.07	.16
Age, squared	1.00	.00	.09	1.00	.00	.17	1.00	.00	.00 ***	1.00	.00	.11
Age at completion of education	2.17	.73	.02 *	2.96	.99	.00 **	.54	.24	.17	.58	.35	.36
Age at completion of education, squared	.98	.01	.05 *	.98	.01	.00 **	1.01	.01	.25	1.01	.01	.31
ROC area		.64			.67			.68				.68
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	Any of four			Any of four—with all strikes			Any of four—with all strikes—or petition					
	odds	s.e.	p	odds	s.e.	p	odds	s.e.	p			
Male	1.93	.28	.00 ***	2.71	.38	.00 ***	1.24	.19	.17			
Age	1.07	.03	.01 **	1.12	.03	.00 ***	1.06	.03	.01 **			
Age, squared	1.00	.00	.01 **	1.00	.00	.00 ***	1.00	.00	.00 ***			
Age at completion of education	2.03	.56	.01 *	.75	.25	.40	1.16	.38	.66			
Age at completion of education, squared	.98	.01	.03 *	1.01	.01	.34	1.00	.01	.64			
ROC area		.63			.67			.63				

n = 1356; odds: odds ratio; s.e.: linearized standard error; p: p-value (two-tailed) \*\*\* p < .001, \*\* p < .01, \* p < .05

**Table S2:** *Determinants of participation in strikes (BSA 1983–87, 1989–90)*

	<i>Strike</i>		
	odds	s.e.	p
Male	3.31	.17	.00 ***
Age	1.16	.01	.00 ***
Age, squared	1.00	.00	.00 ***
Education: CSE or equivalent	1.01	.09	.93
Education: O-level or equivalent	.84	.06	.02 *
Education: A-level or equivalent	.73	.07	.00 ***
Education: below degree	.70	.05	.00 ***
Education: degree	.80	.08	.03 *
Education: other or foreign	.68	.20	.18
Year	1.00	.01	.94
ROC area		.70	

n = 13471; odds: odds ratio; s.e.: linearized standard error

p: p-value (two-tailed) \*\*\* p < .001, \*\* p < .01, \* p < .05





1973	1,513	1,103	396	1,528	22	7,197	76	2,270	2,270
1974	1,622	1,161	467	1,626	31	14,750	267	330	330
1975	789	570	80	809	28	6,012	245	6	6
1976	666	444	46	668	12	3,284	45	0	0
1977	1,155	785	205	1,166	24	10,142	146	0	0
1978	1,001	725	123	1,042	15	9,405	264	1	6
1979	4,583	4,120	3,648	4,608	121	29,474	730	0	0
1980	830	702	404	834	11	11,964	49	4	28
1981	1,499	1,326	.	1,513	44	4,266	69	131	141
1982	2,101	1,974	.	2,103	46	5,313	97	58	58
1983	573	502	.	574	14	3,754	79	8	15
1984	1,391	1,272	.	1,464	20	27,135	52	.	.
1985	621	589	.	791	15	6,402	40	.	.
1986	520	507	.	720	12	1,920	30	.	.
1987	884	845	.	887	28	3,546	115	.	.
1988	759	704	.	790	36	3,702	54	.	.
1989	727	671	.	727	18	4,128	36	.	.
1990	282	249	.	298	10	1,903	18	.	.
1991	171	167	.	176	16	761	17	.	.
1992	142	140	.	148	3	528	8	.	.
1993	383	381	.	385	16	649	16	.	.
1994	87	83	.	107	4	278	5	.	.
1995	169	166	.	174	4	415	5	.	.
1996	339	332	.	364	4	1,303	20	.	.
1997	129	124	.	130	6	235	14	.	.
1998	90	87	.	93	3	282	4	.	.
1999	140	130	.	141	7	242	6	.	.
2000	181	180	.	183	7	499	21	.	.
2001	165	164	.	180	1	525	1	.	.
2002	918	903	.	943	19	1,323	23	.	.
2003	123	118	.	151	27	499	67	.	.
2004	272	272	.	293	19	905	67	.	.
2005	92	92	.	93	12	157	11	.	.
2006	711	688	.	713	8	755	21	.	.
2007	740	740	.	745	18	1,041	32	.	.
2008	509	507	.	511	2	759	3	.	.
2009	209	208	.	209	3	455	2	.	.
2010	132	132	.	133	1	365	3	.	.
2011	1,527	1,509	.	1,530	40	1,390	37	.	.
2012	237	235	.	237	1	249	1	.	.

Figure II		Figure III				
Population of Britain aged 15 and over, thousands	M	Workers directly involved in strikes in Britain over employment		Days lost by workers directly involved in strikes in Britain over employment		Year
		O	P	S	T	
			Plus additional stoppages	Plus additional stoppages	Divided by population 15+	A
			Q	U		
36,877	391	391	1.06%	1,939	.053	1946
37,079	472	472	1.27%	2,186	.059	1947
37,282	313	313	0.84%	1,747	.047	1948
37,487	302	302	0.81%	1,624	.043	1949
37,693	260	260	0.69%	1,248	.033	1950
37,900	324	324	0.86%	1,522	.040	1951
38,043	292	292	0.77%	1,610	.042	1952
38,187	1,282	1,282	3.36%	1,963	.051	1953
38,332	388	388	1.01%	2,208	.058	1954
38,477	596	596	1.55%	3,430	.089	1955
38,623	435	435	1.13%	1,866	.048	1956
38,769	1,215	1,215	3.13%	7,378	.190	1957
38,916	446	446	1.15%	2,794	.072	1958
39,064	505	505	1.29%	4,191	.107	1959
39,212	682	682	1.74%	2,459	.063	1960
39,360	631	631	1.60%	2,625	.067	1961
39,557	4,226	4,226	10.68%	5,519	.140	1962
39,755	445	445	1.12%	1,332	.034	1963
39,954	684	684	1.71%	1,801	.045	1964
40,154	656	656	1.63%	2,159	.054	1965
40,355	401	401	0.99%	1,786	.044	1966
40,557	534	534	1.32%	2,056	.051	1967
40,760	2,022	2,022	4.96%	4,227	.104	1968
40,964	1,402	2,252	5.50%	5,797	.162	1969
41,170	1,429	1,801	4.37%	8,848	.224	1970
41,376	850	3,810	9.21%	9,818	.309	1971
41,520	1,435	1,830	4.41%	19,847	.496	1972

41,692	1,087	3,357	8.05%	5,191	7,461	.179	1973
41,839	1,139	1,469	3.51%	10,367	10,697	.256	1974
42,012	550	556	1.32%	4,166	4,172	.099	1975
42,238	436	436	1.03%	2,159	2,159	.051	1976
42,497	769	769	1.81%	6,794	6,794	.160	1977
42,762	714	716	1.67%	6,621	6,627	.155	1978
43,067	4,012	4,012	9.32%	25,840	25,840	.600	1979
43,388	693	697	1.61%	10,078	10,106	.233	1980
43,626	1,288	1,419	3.25%	3,713	3,854	.088	1981
43,797	1,930	1,988	4.54%	4,901	4,959	.113	1982
44,014	490	497	1.13%	3,220	3,235	.073	1983
44,275	1,255	1,255	2.83%	24,772	24,772	.560	1984
44,513	577	577	1.30%	6,031	6,031	.135	1985
44,728	499	499	1.12%	1,845	1,845	.041	1986
44,893	818	818	1.82%	3,282	3,282	.073	1987
44,994	672	672	1.49%	3,382	3,382	.075	1988
45,088	654	654	1.45%	3,777	3,777	.084	1989
45,157	240	240	0.53%	1,665	1,665	.037	1990
45,215	152	152	0.34%	728	728	.016	1991
45,210	137	137	0.30%	510	510	.011	1992
45,228	365	365	0.81%	630	630	.014	1993
45,319	80	80	0.18%	259	259	.006	1994
45,474	162	162	0.36%	402	402	.009	1995
45,609	328	328	0.72%	1,257	1,257	.028	1996
45,735	118	118	0.26%	212	212	.005	1997
45,891	85	85	0.18%	268	268	.006	1998
46,102	124	124	0.27%	220	220	.005	1999
46,376	173	173	0.37%	475	475	.010	2000
46,688	163	163	0.35%	520	520	.011	2001
46,972	885	885	1.88%	1,280	1,280	.027	2002
47,283	97	97	0.21%	417	417	.009	2003
47,626	254	254	0.53%	836	836	.018	2004
48,068	79	79	0.17%	146	146	.003	2005
48,463	680	680	1.40%	710	710	.015	2006
48,861	722	722	1.48%	1,008	1,008	.021	2007
49,228	506	506	1.03%	753	753	.015	2008
49,565	205	205	0.41%	451	451	.009	2009
49,949	131	131	0.26%	362	362	.007	2010
50,335	1,470	1,470	2.92%	1,337	1,337	.027	2011
51,118	234	234	0.46%	246	246	.005	2012