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

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ACCOMPANYING FILES

(1) Stata command files: *process_bsa.do*; *process_kansas.do*; *process_wvs.do*

(2) Data in three formats: *strikes.xls* (Excel); *strikes.txt* (tab-delimited); *strikes.pdf*

Appendix A: Statistics on strikes

The series plotted in Figures II and III are provided in the accompanying spreadsheet. 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.[1] 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, 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 per cent overall). Referring to columns in the spreadsheet, the resulting subtotal is B - (B × 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}. To this subtotal is added 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 subtracted. Unfortunately, government statistics do not differentiate days lost by workers

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[1] 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.

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 per cent overall). Referring to columns the spreadsheet, the resulting subtotal is (G-H) × C/B. Before 1955, G-H is estimated by G × (1-(H_{1955-9}/G_{1955-9})). To this subtotal is added 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 against the Industrial Relations Act on 8 December 1970, which was denounced by the Trades Union Congress (Gennard 1971: 99).

Appendix B: Determinants of participation

Figure V (inspired by King, Tomz, and Wittenberg 2000) is derived from models in Appendix Table I, 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). Appendix Table II 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.

Gennard, J. 1971 'Chronicle: Industrial Relations in the United Kingdom', *British Journal of Industrial Relations* 9(1): 92-102.

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*.

Appendix Table I: *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		

	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.: robust standard error; p: p-value (two-tailed) *** p < .001, ** p < .01, * p < .05

Appendix Table II: *Determinants of participation in strikes (BSA 1983-87, 1989-90)*

	Strike		
	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.: robust standard error

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