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The Missing Main Effect of Welfare State Regimes: A Comment

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Abstract: This article discusses Nate Breznau's critique of Brooks and Manza's "Social Policy Responsiveness in Developed Democracies." Brooks and Manza found that public opinion influenced welfare state spending, but Breznau argued that this conclusion was an artifact of their model, which included an interaction between opinion and welfare state type but omitted the main effect of welfare state type. Breznau is correct in saying that interactions should not be used without including the main effect, except in rare circumstances which do not apply in this case. However, the classification of welfare state type is made partly on the basis of the dependent variable, welfare spending, so it should not be used as an independent variable. There is, however, a case for including a variable for the type of legal system (common law or civil law), which is correlated with welfare state type. The estimates from a regression including both main and interaction effects support Brooks's and Manza's original conclusions about the effect of public opinion. The paper concludes by discussing the strength of the evidence provided by the data.

Keywords: welfare state; replication; interaction effects; policy responsiveness

BROOKS and Manza (2006) find that a measure of public opinion helps to predict the level of social welfare spending in fifteen nations, observed a number of times between 1986 and 1999. Many studies (e. g., Soroka and Wlezien 2010) have found a relationship between public opinion and policy within nations, but Brooks and Manza are among the first to find evidence that public opinion helps to explain policy differences among nations. Comparative research on welfare states had previously paid little attention to public opinion, so it is not surprising that their paper has been widely cited and discussed (see, for example, Myles 2006; Kenworthy 2009). In a recent article in *Sociological Science*, however, Breznau (2015) argues that their central finding is spurious. His key point is that Brooks and Manza (2006) include an interaction between public opinion and type of welfare state but do not include the main effect. If the main effect is included, its estimate is large and highly significant, and the estimate of public opinion is not statistically significant in either type of welfare state.

Breznau (2015) identifies an important flaw in Brooks's and Manza's (2006) model, but follows them by including welfare state type as an independent variable. I argue that the classification of cases on this variable is determined partly by the value of the dependent variable, so by definition it is correlated with the error term and should not be used as an independent variable. There is, however, a case for including a variable distinguishing Britain and its former colonies from other nations; although this variable has a strong overlap with welfare state type, the estimates from a regression including both main and interaction effects support

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Should Main Effects be Included in an Interaction Model?

Suppose that we have two independent variables: x is a dichotomy and z is a covariate. In the case considered here, x is welfare state type and z is a measure of public opinion. An interaction model includes the product xz and normally the 'main effects' x and z as well; however, Brooks and Manza (2006) fit an interaction model without the main effect of the dichotomy:

$$y = \alpha + \beta_2 z + \beta_3 xz + e \tag{1}$$

As Breznau (2015) points out, using model (1) imposes a restriction on the predicted values: specifically, that when $z = 0$ the predicted values of y are the same for both values of x. In this example, when $z = 0$ predicted welfare spending is the same in both types of welfare state. In graphical terms, the restriction means that the lines representing the effect of z on $\hat{y}$ in the two groups defined by the values of x intersect at $z = 0$. Breznau (2015) includes the main effect of welfare state type, producing:

$$y = \alpha + \beta_1 x + \beta_2 z + \beta_3 xz + e \tag{2}$$

In this model, there is no restriction on the point at which the two lines intersect.

The choice between the models can be made by fitting model (2) and testing for the statistical significance of β_1. In many cases, however, there is no need to test the hypothesis. If the zero point of z is arbitrary, then no special interest or credibility can be attached to any statement about what would happen when $z = 0$. The welfare state preference variable used by Brooks and Manza (2006) is the sum of average responses to questions on government responsibility to "provide a job to everyone who wants one" and "reduce income differences between the rich and the poor." Both have response categories of "strongly agree", "agree", "disagree", and "strongly disagree", which were given the values of 1, 2, 3, and 4. Manza and Brooks (2006) centered the variable so that it was zero at the sample mean, a value that clearly is of no wider significance. More generally, the zero point is arbitrary for *any* variable based on these questions, since the categories could equally well have been given values of 0, 1, 2, 3; -2, -1, 1, 2; or any other ordered series of numbers. Different choices would produce different estimates for β_2 and β_3 in model (1), but would not affect the estimates in model (2). Therefore, Breznau (2015) is correct in saying that Brooks's and Manza's (2006) results concerning the effects of public opinion are an artifact of their model specification. If the zero point of the covariate is arbitrary, then both main effects should automatically be included (Nelder 1998).

Welfare State Type and Legal Tradition

Esping-Andersen (1991) proposed distinguishing among universalistic, conservative/Christian Democratic, and liberal welfare states, and variants of this classifi-

cation have been widely adopted. Brooks and Manza (2006) use a dichotomous classification of liberal welfare states versus all others; the liberal group includes Australia, Canada, Ireland, New Zealand, the United Kingdom, the United States, and Japan. They note that some observers have classified Japan as a conservative/Christian Democratic welfare state, but decide to count it as liberal. One of the points that they offer in support of their decision is that "in 1997, Japanese welfare state effort was 13.8 percent, well below the Christian Democratic average of 26.1 percent" (Brooks and Manza 2006:481). That is, the classification was made partly on the basis of the value of the dependent variable. As a result, the welfare state type variable is correlated with the error term, so its parameter estimate will be biased upwards.

Even if welfare state type is defined without reference to the level of spending, it can be thought of as an intervening variable between public opinion and and welfare spending: strong popular support for an active government role could increase the chance that a nation would adopt universal benefit programs. This point means that any estimated effects of public opinion in model (2) should be understood as direct effects net of welfare state type. The general claim that public opinion affects welfare spending, however, involves total effects: welfare state type is merely one of the paths through which any effects may take place.

At the same time, it is possible that pre-existing historical differences between nations may have influenced the development of the welfare state. Except for Japan, all of the nations in the "liberal" group have historical ties to Britain. The legal system in these nations is based on common law, while in most other countries of the world, including all of the others in this sample, it is based on civil law. In recent years, there has been a good deal of research on the effects of legal origins, which is reviewed in La Porta, Lopez-de-Silanes, and Shleifer (2008). One important difference involves the typical style of government intervention: in common-law systems, regulation "aims to facilitate private contracting rather than to direct particular outcomes" (La Porta et al. 2008:305). Instead of replacing the market, regulation is designed to steer the market in some direction. For example, in the United States, the government had a major impact on the housing market by making mortgage interest tax-deductible and establishing "Fannie Mae" and "Freddie Mac", publicly-traded companies that do not receive direct subsidies but benefit from other forms of support. Given this preference for working through the market, nations with a common-law heritage could be expected to spend less on the direct provision of welfare benefits. The difference in legal systems can be traced back to the Middle Ages, so it is safe to regard this variable as causally prior to public opinion.

Results

Table 1 shows estimates from three models: the first is the specification of Manza and Brooks, the second adds the main effect of liberal welfare states, and the third substitutes common law tradition for liberal welfare states.[1] In model 3, common law tradition has a substantial and highly significant negative effect on welfare spending, the estimated effects of public opinion are positive and statistically

Table 1: Estimated Effects of Public Opinion on Welfare Spending

	(1)	(2)	(3)
Constant	6.0	17.8	11.3
	(6.9)	(4.6)	(5.9)
Year	0.36*	0.29†	0.26†
	(0.14)	(0.09)	(0.12)
GDP	−0.87†	−0.59†	−0.62†
	(0.22)	(0.15)	(0.20)
Unemployment	−0.33	−0.35*	−0.59†
	(0.23)	(0.15)	(0.22)
Aged	0.60*	−0.00	−0.10
	(0.30)	(0.20)	(0.31)
Female Labor Participation	0.33†	0.29†	0.36†
	(0.09)	(0.06)	(0.07)
Veto Points	1.57*	−0.06	0.59
	(0.59)	(0.14)	(0.54)
Liberal		−9.37†	
		(1.29)	
Common			−6.42†
			(1.66)
Opinion	4.63†	0.45	2.58†
	(0.77)	(0.75)	(0.76)
Liberal*Opinion	−3.72†	−.35	
	(0.90)	(0.73)	
Common*Opinion			−2.05*
			(0.82)

Notes: Standard errors in parentheses. * $p < .05$; † $p < .01$

significant, and the interaction of opinion with common law nations is negative and statistically significant.[2] The estimated effect of opinion in common law countries is 2.58-2.05=0.53 with a standard error of 0.46. Thus, the key results parallel Brooks's and Manza's (2006) original findings: public opinion helps to predict welfare spending in one group of nations, but has a smaller impact, and possibly no impact, in another. Although the estimated effects of opinion are somewhat smaller than those found by Brooks and Manza, they are still large enough to be of substantive importance. It should be noted that the similarity of results is no more than a coincidence: it does not give a lesson about when it is "safe" to omit a main effect.

Brooks and Manza (2006:485) did not offer an explanation of the apparent difference in the effects of public opinion between welfare state types, saying merely that they "may vary in their degree of incorporation of mass opinion into policy-making, particularly in light of different patterns of social group-related influence." In contrast, it is possible to offer a definite reason for the difference between common law and civil-law nations: in common-law nations, the government may respond

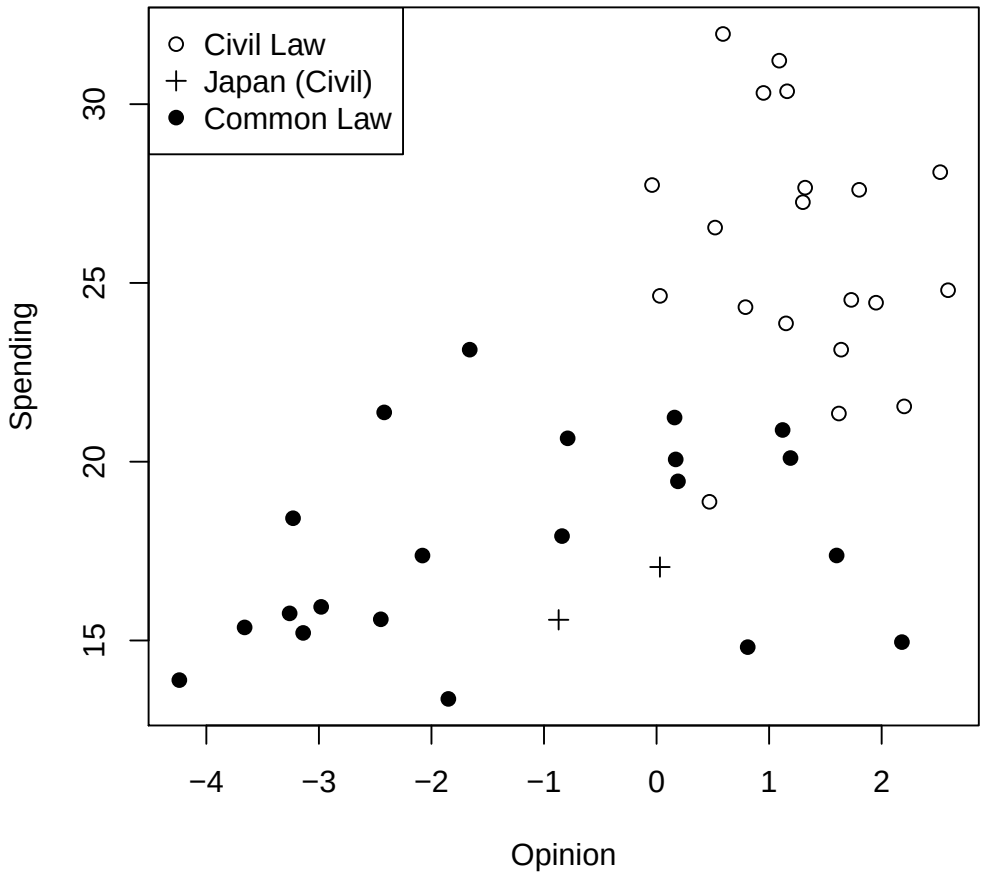

Figure 1: Public Opinion and Welfare Spending

to a demand for action with a policy that does not involve direct expenditure of money.

Although there is a striking difference between the estimates in models (2) and (3), the welfare state and legal origin classifications are identical except for one nation, Japan. The treatment of this case makes a substantial difference because, compared to other civil law nations, public opinion is unfavorable to government responsibility and welfare spending is low. This point can be seen in Figure 1, which shows the scatterplot of public opinion and welfare spending.

How strong is the evidence?

Although the estimates of public opinion are robust against obvious changes in specification like removing variables with non-significant parameter estimates or using the logarithm of GDP, it is certainly possible that some additional control variable could be found that would overturn the results. Moreover, arguments can be made for alternative classifications of nations. For example, the American occupation of Japan after the Second World War might have influenced its welfare policy in the direction of the common-law group.[3]

Therefore, someone who started with a belief that public opinion made little or no difference to welfare spending could reasonably remain unconvinced. But is there a good reason to start with such a belief? Myles (2006:497) says that "sociologists have ignored public opinion for theoretical reasons", but the reasons he offers amount to saying that the hypothesis of a link between public opinion and policy comes from political science and economics. Merton (1945:464) observed that in sociology, "theory" sometimes means no more than an inclination to regard some types of variables as more important than others. It is necessary to begin with some beliefs about the relative importance of different kinds of variables in order to organize an investigation, but one should not put too much faith in them. Since there is already strong evidence that public opinion influences policies within nations, the claim that it affects national differences in welfare spending should not face a high burden of proof. The implication is that research on the welfare state should take account of public opinion, whether as a potentially important control variable or an object of theoretical investigation.

More generally, the amount of information in the data is very limited. Although there are forty-three observations, almost 95% of the variation in the dependent variable is cross-sectional, so the effective number of observations is closer to fifteen, the number of nations. Moreover, the nations are not independent cases: their histories are intertwined in a variety of ways. As a result, statistical analysis of these data cannot yield definitive evidence on any but the most basic points. To be convincing, a study must draw on evidence from several different sources.

Notes

1 Estimates from the first two models are shown in Breznau (2015) as Model $1B$ and Model $1B_M$. Breznau also shows results using a recalculated version of the public opinion measure, but I use the original one in order to focus on the influence of the specification.

2 The table reports ordinary standard errors. The robust clustered standard errors are 1.29 for the main effect of opinion and and 1.16 for the interaction.

3 I am indebted to Nate Breznau for this observation.

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