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Welfare policies: the interaction effects of collective demands and liberal democracy in a cross-national analysis of 115 countries

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netwerk te reduceren tot uitspraken over de totale relatie tussen een tweetal, maar ook om het complexe netwerk te vereenvoudigen tot een netwerk waarin een aantal tussenliggende attitude-elementen zijn samengebond. De oorspronkelijke formules van Osgood (1956) voldeden niet aan de eis, volgorde-onafhankelijk te zijn (zie Lisch & Kriz, 1978, p. 149).

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Welfare policies: the interaction effects of collective demands and liberal democracy in a cross-sectional analysis of 115 countries*

J. W. Letterie and R. A. G. van Puyenbroek

I. Introduction

Political factors as autonomous determinants—Interest in the study of welfare policy, such as social security policy, and levels of social welfare, such as income equality, at the subnational as well as the crossnational level, has been increasing rapidly in the last twenty five years. A central concern thereby has been the relative role of politics and wealth in accounting for the variations in these phenomena. It would be carrying it too far to review here the most important studies and research findings. Some of such reviews can be found in: Cnudde and McCrone (1969), Jackman (1975), Alber (1979), Bertrand (1981), and Van Snippenburg and Letterie (1983). In this paper we will confine ourselves to a brief and sketchy characterization of the cross-national studies.

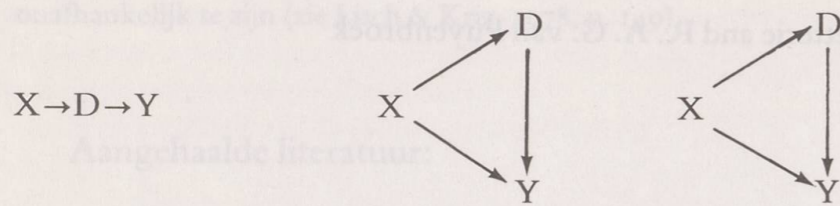
Three types of basic models or main hypotheses have been investigated. The causal structure of these types is rather simple; they have been presented in Figure 1 (See: Cnudde and McCrone, 1969). Viewed from a political systems perspective, X in the figure stands for environmental characteristics of a system, especially the socio-economic traits of a society at large or so-called input variables, D refers to aspects of the political structure or political process variables, and Y stands for social policy outputs and/or aspects of social welfare.

The developmental model has played a prominent role in the theoretical and empirical literature (Lenski, 1966; Cutright, 1967). Political factors, such as the democratic nature of a system, are hypothesized to fulfill an intervening function. In the spurious model socio-economic variables, such as per capita income, are considered to be common-cause variables (Wilensky, 1975). The hybrid model implies that socio-economic factors have a direct, as well as an indirect effect through the

* This is a revised version of an earlier paper (Letterie and Van Puyenbroek, 1984)

Figure 1: Types of conceptual models

a. development model b. spurious model c. hybrid model



political system upon the dependent variables. It has been investigated by, among others, Jackman (1975) and Bertrand (1981).

As far as the explanation of welfare policies as such is concerned two observations can be made about these studies. Firstly, whatever the structure of the conceptual model or the nature of the operationalizations employed, the overall trend in the empirical results of the studies pertaining to Western as well as Non-Western countries cannot be interpreted to indicate much support for the rather common belief that 'politics makes a difference'. Although there are some clear exceptions (Bertrand, 1981), most empirical results show that the political characteristics considered are at the very best of only marginal importance in accounting for cross-national differences in welfare policies, if their effect is controlled for and compared to that of levels of socio-economic development. It should be noted however, that this cannot be said about studies which primarily dealt with Anglo-Saxon countries. Their results often indicate that political factors are quite important (Peters, 1972; Alber, 1979; Kohl, 1981). Secondly, as Peters (1975) observed, the vast majority of the recent literature on the correlates of public policies has been based on a linear additive regression model. Socio-economic and political variables are on the whole treated as autonomous determinants of policy, as direct independent causal factors (Stonecash, 1980).

Political factors as conditioning variables – The second observation has been the point of departure of this study. It raised the question as to whether or not the models that have in fact been empirically investigated adequately reflect our chief theoretical notions about the relative explanatory role of the political phenomena concerned. A number of investigators (Strouse and Williams, 1972; Peters, 1975; Godwin and Shepard, 1976 and Stonecash, 1980) have pointed out that this is clearly not the case, that these models have been misspecified. According to Godwin and Shepard (1976) for instance, the concept of linkage is a central theme in theories

on representative government. The idea implies that governmental process variables (as linkages) influence conformity or disparity between preferences and outputs. This means that process variables cannot be statistically treated as autonomous determinants of policy. Stonecash (1980) observed a similar discrepancy in most studies about the relative role of politics and wealth at the level of states in the United States. He therefore dismissed the findings of such investigations as largely meaningless.

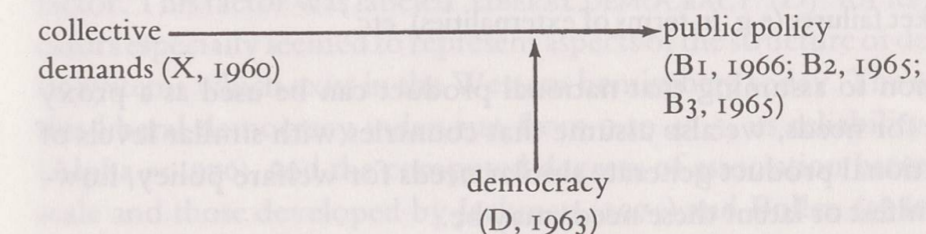
Stonecash (1980: 22–23) reminds us of the fact that a chief function of the political system in Eastonian approaches is considered to be that of the conversion of essentially exogenously determined demands into public policies. From this perspective the political system is first and foremost regarded to be facilitating demand conversion. Therefore, if no demands exist, expenditures upon public policies are highly unlikely. Thus the main function of the political system is not that it causes public policy in a direct sense, but that it affects/conditions the relationship between demands and policy in one way or another (Cnudde and Neubauer, 1969).

Macro-political studies in which conditional relationships have been investigated are scarce. Some exceptions are: Soaris and Hamblin (1967), Burnham and Sprague (1970), Strouse and Williams (1972), Broach (1973), Peters (1975), Jackman (1975), Gobalet and Diamond (1979). The purpose of this study has been to explore the idea of the conditioning role of politics further by empirically investigating the extent to which the liberal democratic nature of a political system influences the conversion of demands for welfare into welfare policies.

II Hypotheses and Research Design

We hypothesized that the more democratic a system is, i.e., the more instruments and structures are available to people to express their preferences and to enforce welfare policies congruent to them, such as through elections, the stronger the positive relationship will be between the level

Figure 2



of collective demands for welfare policies and the realized levels of such policies (see figure 2).

Reformulated in statistical terms the hypothesis states that welfare demands and democracy interact, such that the positive effects of demands on policies increase to the extent the level of democracy increases. This hypothesis has been tested thrice, each time for a different aspect of public policy. Regression analysis was employed in various ways to analyze cross-sectional aggregate data on 115 countries¹), pertaining to different, but close time points (See Figure 2). We were permitted to use data collected by Bertrand (1981)², whose study may be characterized as a replication of the work done by Jackman (1975). The major concepts and indicators we employed will be briefly described in the footnotes. For a more elaborate discussion of the theoretical ideas and measurement procedures involved, see Bertrand (1981), and for additional results Letterie and Bertrand (1982).

Concepts and their indicators – COLLECTIVE DEMANDS for welfare is the exogenous variable in this study. A special but not very successful attempt was made to find indicators of collective demand, such as union strength and strength of leftist and rightist political parties, which would not only satisfy our criteria of face validity, but for which aggregate data would be available as well, so that – as we intended – more than a hundred countries could be taken into account.³ We were eventually compelled to look for a surrogate measure instead. Since socio-economic variables have often been regarded as reasonable, although not entirely satisfying substitute measures (Godwin and Shepard, 1976), we decided to employ gross national product per capita as our indicator.⁴

Thus 'gross national product' is used as a proxy variable of 'collective demands'. This seems to make sense, because changes in the economy have often been considered to give rise to changes in existing needs and the emergence of new ones. As Kristensen (1984: 310) put it:

'The needs accompanying economic growth which may cause increased public expenditures are, for instance, better education, better infrastructure, needs associated with urbanization, needs related to changing roles of women in the labor market, needs caused by increasing importance of market failures (e.g. in terms of externalities), etc.'

In addition to assuming that national product can be used as a proxy variable for needs, we also assume that countries with similar levels of gross national product generate similar needs for welfare policy, however manifest or latent these needs may be.

However, it should be pointed out that gross national product per capita has also often been used as an indicator of economic development (Coulter, 1975). As a matter of fact, Bertrand employed the measure in this fashion as well. Nevertheless, this alternative use need not be considered inconsistent with its employment as an indicator of collective demands. Rimlinger (1971) for instance, presented some rather strong arguments and evidence which support the idea that demands for social security increase to the extent a society becomes more economically developed, that is, more industrialized and urbanized. If one assumes that economic development is usually highly and positively related to demands, it seems justified to substitute one for the other in a study, in case acceptable separate indicators and data for both concepts are lacking.

Still, what should be done if this assumption is not valid? For instance, it would also be theoretically plausible to assume that the level of economic development or wealth of a society modifies the relationship between collective demands and public policies in very much the same fashion as the political system is hypothesized to do in this study. Such a view is rather convincingly expressed by Stonecash (1980), who argues that wealth as a means to realize policies should also be viewed as a necessary condition for the conversion of demands into policy outputs.

It will be clear in the light of this, that we made our decision to use 'product per capita' as an indicator of collective demands with some reluctance. We would have preferred to possess a more adequate measure, so that a more complex model could have been analyzed. Such a model could then have reflected the view that the relationship between demands and outputs is conditioned by the nature of the political system as well as by the wealth a society possesses.

In this investigation the democratic nature of a political system is not viewed to have an autonomous impact on welfare policy, but to condition the effects of demands on policy. The democratic nature of a system was measured by constructing an index, that is, by selecting at face value as many indicators as possible from various databanks, such as Banks and Textor (1963) and Russett (1964), for each of three dimensions of democracy, namely freedom, tolerance and equality. Factor-analytical procedures were then used. These yielded a strong relatively independent factor. This factor was labeled 'LIBERAL DEMOCRACY' (D)⁵ for its 15 indicators especially seemed to represent aspects of the structure of democratic systems which exist in the Western hemisphere today. The scores of this liberal democracy index run from 0 to 43,5, its reliability is high (Alpha = .976), and the computed degrees of association between this scale and those developed by Jackman (1975) and Bollen (1980) to get

some indication of its validity, turned out to be strong as well.

Changes in the economy and needs generated by these changes are usually viewed to belong to the environment of the political system in Eastonian type of approaches. In the Eastonian conception of the political system (Easton, 1965) to which we adhere here, these needs would first have to be converted into political demands (and support), that is, they would somehow have to be perceived and acted upon in the political system, before they can be viewed as genuine inputs into the system. This notion implies that needs as an environmental factor cannot be considered to cause public policy independently of some political transformation process. Changes in needs or preferences would have to be expressed, perceived, articulated, aggregated, and so forth, before these can be expected to cause changes in public policy. In short, if 'environmental' needs lead to welfare policy, politics must have mattered! However, this conception of the political system also implies that not all environmental needs will always and under all conditions give rise to public action. As far as the 'politics-does-not-matter' thesis is concerned, Kristensen (1984: 316) seems to have formulated the issue correctly when he observed:

'So the important questions are related to how, when, and under what circumstances does the political system react to such needs'.

In this study the conversion of needs associated with economic change into welfare policy is only viewed under more or less democratic conditions. No other aspect of a political system, such as, its political culture, or environmental factors, such as, demographic developments have been considered. We hypothesized that 'liberal democracy' as measured, is one set of important characteristics of political systems, which facilitates the conversion of environmental needs into public policy.

The hypothesis about the role of liberal democracy is based on two assumptions. This first one is that people living in more democratic systems can express their needs for welfare policies more easily in political terms, as political demands, than in less democratic systems, due to the higher level of political freedom in the more democratic ones. The second is that political demands are more easily realized, that is, they are more easily converted into welfare policies, in the more democratic than in the less democratic systems, due to the more fully developed mechanisms of withholding or granting political support in the more democratic ones.

Three aspects of PUBLIC POLICY were used as dependent variables. Very

much the same procedures were followed as in the case of liberal democracy. Much work had to be done in expanding existing data bases in order to tackle the problem of missing data. Eventually three measures of welfare policy were obtained, SOCIAL INSURANCE PROGRAM EXPERIENCE (B1) (CUTRIGHT, 1967), EDUCATIONAL EXPENDITURES (B2) AND HUMAN RIGHTS POLICY (B3).⁶

The SIPE-index (B1) '... is defined as the result achieved by a comprehensive and successful series of measures for protecting the public (or a large sector of it) from the economic stress that, in the absence of such measures, would result from the stoppage of earnings, in sickness, unemployment, or old age, and after death of main earner; for making available to the same public medical care as needed; and for subsidizing families bringing up children' (Jackman, 1975: 12).

Educational expenditures (B2) is made up of data referring to: '... public expenditures on both current and capital accounts for preschool, primary, secondary, and higher education. Whenever possible expenditures of all government levels are included ...' (Taylor and Hudson, 1972: 18). Human rights policy (B3) consists of an ordinal scale measuring the tolerant character of a regime vis-à-vis various categories of citizens in terms of, among other things, imprisonment and torture for political reasons (Walton, 1965: 48-51).

III Statistical analysis: an intermezzo

Our data were analyzed with the help of two types of statistical regression models: (1) additive models; and (2) a non-additive linear model with a product term. Although only the latter type specifies a form of interaction, we employed both for comparative purposes. They will be briefly described here. The emphasis thereby will be on the second approach, because it specifies the form of interaction which is formulated in our hypothesis. Moreover, some serious problems, such as those pertaining to the interpretation of results, have until recently often been associated with its use. To be sure, many more types of interaction have been discussed in the methodological literature (Southwood, 1978; Stolzenberg, 1979; Jagodzinski and Weede, 1981), but these will not be considered.

1. *The additive model* – An example of additive relationships in the case of a conceptual model with three variables is the following equation:

$$Y = b_0 + b_1X_1 + b_2X_2 + e \quad (1)$$

The partial derivatives, i.e. the parameters, of this equation are:

$$\delta Y/\delta X_1 = b_1 \text{ and } \delta Y/\delta X_2 = b_2 \quad (2)$$

Generally, partial derivatives provide insight into the type of relationships that certain regression equations imply (Stolzenberg, 1979: 471; Tate, 1984: 259). Here, the derivatives (2) show that the effect of one independent variable on Y does not vary with the effect of the other, that is, the effect is additive (constant) and the effect of an independent variable on Y does not vary with its own values, that is, the effect is linear.

Interaction implies non-additivity. Thus we are not able to use this model to test our hypothesis, unless subpopulation analyses could be undertaken, whereby the results of the regression of demands on policy within two or more categories of democracy would be compared across categories of democracy to study interaction. However, the method of employing separate analyses for subpopulations to study interaction (Gobalet and Diamond, 1979; Weede, 1983; Wright, 1976) displays some important disadvantages, especially in our case, since our total population is relatively small. Among other things, the procedure reduces the variation in our variables and thus results in loss of information, and the regression coefficients obtained for the small subpopulations which this procedure would produce may be highly unstable.

2. *Model with a product term* – A regression model with a product term seems to be a more appropriate alternative to the analysis of subpopulations (Friedrich, 1982). Equation 3 specifies a non-additive model by incorporating the product term X_1X_2 .

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_1X_2 + e \quad (3)$$

Its partial derivatives are:

$$\delta Y/\delta X_1 = b_1 + b_3X_2 \text{ and } \delta Y/\delta X_2 = b_2 + b_3X_1 \quad (4)$$

The derivatives show that the effect of X_1 (or X_2) on Y is non-additive, because this effect varies with the values of the other independent variable X_2 (or X_1). By substituting Z for X_1X_2 the equation can be estimated by the method of ordinary least squares.

In view of the structure it specifies, this statistical model appeared to be the most suitable to test our hypothesis, in spite of the fact that criticism has often been leveled against its use. The critique has focused on three

issues: (1) the interpretation of results, (2) the instability of regression coefficients due to multicollinearity (Jackman, 1975: 82; Smith and Sasaki, 1979; Tate, 1984), and (3) problems related to the level of measurement of variables (Allison, 1977; Cohen, 1978; Smith and Sasaki, 1979; Stolzenberg, 1979). Our position in these matters is based on Friedrich (1982), who has shown that such problems can be handled satisfactorily. In our view Friedrich has made an important contribution to the study of interaction by means of regression analysis with product terms. We will only briefly discuss some of his arguments pertaining to the interpretation of results, in order to be able to present the findings of this investigation in a comprehensible fashion.

In interpreting the results obtained with model 3, one has often tried to make a distinction between the main (additive) effects of X_1 and X_2 , and the interaction effect of the product term X_1X_2 . Basically, one compared the results obtained from equation 1 with those obtained from equation 3. However, adding a product term to equation 1 may not only change the shape of the relationship between an independent and the dependent variable, but also the strength and the direction of the relationship (Smith and Sasaki, 1979). Not knowing how to interpret these results, investigators have tended to abstain from using a model with one or more product terms.

According to Friedrich (1982) however, investigators are on the wrong track if they attempt to make a distinction between main and interaction effects. This distinction cannot be made precisely because adding a product term to equation (1) changes the coefficients of the regressors, that is, of X_1 and X_2 , which are also included in the product term X_1X_2 . He argued that the various coefficients can only be meaningfully interpreted if the coefficients of the product term and those of the separate variables which are included in it are considered simultaneously. See also Marsden, 1981. This simultaneous interpretation can take place by rewriting equation 3 as follows:

$$Y = (b_0 + b_2X_2) + (b_1 + b_3X_2) X_1 + e \quad (5)$$

and

$$Y = (b_0 + b_1X_1) + (b_2 + b_3X_1) X_2 + e \quad (6)$$

The conditional characteristic of the effect of X_1 or X_2 on Y now becomes explicit. The effect of an X-variable is dependent on the values of the other X-variable. Moreover, the coefficient of X_1 , i.e., $(b_1 + b_3X_2)$ in equation 5 or of X_2 , i.e. $(b_2 + b_3X_1)$ in equation 6, can also be used to test for the relative importance of interaction as will be shown later.

IV. Results

The following statistical models were initially employed to investigate the hypothesis that the influence of collective demands (X) on governmental policies in the areas of social security (B1), education (B2) and human rights (B3) is facilitated by the level of liberal democracy (D) in a society:

$$B = b_0 + b_1X + e \quad (7)$$

$$B = b_0 + b_1X + b_2D + e \quad (8)$$

$$B = b_0 + b_1X + b_2D + b_3DX + e \quad (9)$$

The overall results are presented in Table 1, the appendix contains the matrix of correlations. In evaluating the degree of fit between our data and a statistical model we employed the 'explained' variance corrected for degrees of freedom (R^2) and the significance of b-coefficients (t-value is equal to or larger than 2.0) as our evaluation criteria.

It follows from the table that our theoretically preferred specification, the product-term model (model 9), fares quite well in describing the data. In all three instances of public policy we find statistically significant interaction terms. On the basis of these results our main hypothesis could not be rejected to the extent that it is only interpreted to state that the effect of demands on welfare policy is somehow conditioned by the degree of democracy.

If this latter finding is compared with the ones obtained by means of the other two models (7 and 8) in terms of the explained variances only, and if we arbitrarily assume that only differences equal to or greater than 5 percent are theoretically interesting differences, we arrive at the following observations.

The product-term model is superior to models 7 and 8 in explaining the variance in two of the three dependent variables. It explains at least 7 percent more of the variance in the case of social security policy (B1) and at least 8 percent more in the instance of human rights policy (B3) than any one of the other two models.

However, the product-term model does not explain the variance in educational policy (B2) much better than any one of the other two models. Moreover, the total amount of variance it explains itself, namely 20 percent, is hardly impressive to begin with.

Finally, we observe that the model without democracy (model 7) provides a more parsimonious description of the data on educational policy than the product-term specification. On the basis of only one

Table 1: Additive and non-additive models: overall results in terms of intercepts (c), parameter estimates (b), t-values (t), variances explained (R^2 adjusted), and sizes of population (N).

Linear model without liberal democracy: $B = b_0 + b_1X + e$ (model 7)

	c	X	\bar{R}^2	N
B1 b	31.84*	.04*	.54	115
t	9.28	11.54		
B2 b	2.91*	.00094*	.17	115
t	16.27	4.92		
B3 b	1.27*	.0013*	.37	108
t	8.54	8.07		

Linear model with liberal democracy: $B = b_0 + b_1X + b_2D + e$ (model 8)

	c	X	D	\bar{R}^2	N
B1 b	25.85*	.04*	.44*	.55	115
t	5.85	8.44	2.09		
B2 b	3.15*	.0012*	-.02	.18	115
t	13.50	4.95	1.55		
B3 b	0.39*	.00051*	.07*	.66	108
t	2.71	3.60	9.57		

Model with productterm: $B = b_0 + b_1X + b_2D + b_3DX + e$ (model 9)

	c	X	D	DX	\bar{R}^2	N
B1 b	9.36	.08*	1.12*	-.0014*	.62	115
t	1.72	7.68	4.59	4.58		
B2 b	2.74*	.0023*	-.00023*	-.000034*	.20	115
t	8.92	3.75	.02	2.02		
B3 b	1.02*	-.0013*	.04*	.000053*	.74	108
t	6.12	3.78	5.18	5.74		

Starred (*) estimates are more than twice their standard error, i.e. t 2.00. Note: pairwise deletion for B3.

independent variable, collective demands, 17 percent of the variance in educational policy can be explained.

It seems justified to summarize these results with one general conclusion. Our general hypothesis that the effect of collective democracy cannot be rejected on the basis of the analysis so far.

Re-analysis—An important objection might be raised against the statistical models we have employed. All three models contain gross national product per capita (X). However, in cross-national research investiga-

tors often use the logarithm of this variable. They do this mainly for two reasons. (1) Although regression analysis does not require that the scores on independent variables be normally distributed, one often prefers to work with normal distributions. If the distribution of X (GNPC) is skewed, as is the case in this study, one usually takes the logarithm of X (log X) to normalize this variable. (2) The logarithmic transformation of X has also been employed to replace supposedly curvilinear relationships by linear ones. For instance, Bertrand (1981) hypothesized that the effect of economic development as measured by GNPC on social welfare policy decreases to the extent that the level of economic development increases. He formalized this hypothesis in terms of model 10.

$$Y = b_0 + b_1 (\log X) + e \quad (10)$$

with the derivative:

$$\delta Y / \delta X = b_1 X^{-1} \quad (11)$$

Derivative 11 shows that we are also dealing with a form of interaction here, for X is in fact interacting with itself. A new variable X_3 can be created by computing the logarithm of X. By substituting X_3 for log X in equation 10, the relationship becomes additive and linear, and the parameters can be estimated in a straightforward manner.

In view of the fact that the logarithm of X has been employed by other investigators and, more importantly, to avoid having the interactions we found being interpreted as spurious effects resulting from misspecification (Southwood, 1978: 1174), it was decided to re-estimate the parameters of equations 7, 8 and 9 by employing $\log X = X_3$. Thus the following equations were analyzed for all three instances of welfare policy:

$$B = b_0 + b_1 X_3 + e \quad (12)$$

$$B = b_0 + b_1 X_3 + b_2 D + e \quad (13)$$

$$B = b_0 + b_1 X_3 + b_2 D + b_3 DX_3 + e \quad (14)$$

The estimation results are presented in Table 2. If we again consider the results in terms of significant parameter estimates and explained variances, we come to the following observations as far as the revised product term model (14) is concerned.

Table 2: Revised models with $X_3 = \log X$: results in terms of intercepts (c), parameter estimates (b), t-values (t), variances explained (R^2 adjusted) and sizes of population (N)

Revised model without liberal democracy: $B = b_0 + b_1 X_3 + e$ (model 12)						
	c	X_3		\bar{R}^2	N	
B1 b	-111.36*	67.58*		.67	115	
t	9.88	15.25				
B2 b	0.15	1.33*		.17	115	
t	0.21	4.86				
B3 b	-1.09*	1.58*		.27	108	
t	3.03	6.43				
Revised model with liberal democracy: $B = b_0 + b_1 X_3 + b_2 D + e$ (model 13)						
	c	X_3	D	\bar{R}^2	N	
B1 b	-108.37*	65.37*	.12	.67	115	
t	8.88	11.69	.65			
B2 b	-.36	1.71*	-.02	.18	115	
t	.48	4.99	1.81			
B3 b	-0.06	.23	.07*	.62	108	
t	0.13	1.02	10.01			
Revised model with product term: $B = b_0 + b_1 X_3 + b_2 D + b_3 DX_3 + e$ (model 14)						
	c	X_3	D	DX_3	\bar{R}^2	N
B1 b	-106.38*	64.54*	.02	.04	.67	115
t	5.27	7.40	.02	.12		
B2 b	-0.88	1.93*	.006	-.01	.18	115
t	.72	3.62	.12	.53		
B3 b	3.19*	-1.12*	-.09*	.06*	.72	108
t	4.58	3.74	3.15	5.88		

Starred (*) estimates are more than twice their standard error, i.e. $t > 2.00$. Pairwise deletion for B3.

The coefficient of the interaction term (DX_3) is not statistically significant in two instances of welfare policy, i.e. social security policy (B1) and educational policy (B2). These results contradict the previous findings which were obtained with the product term model specified in terms of just X, instead of X_3 (see model 9).⁷

Moreover, if we also compare these results with those pertaining to the revised model without liberal democracy (Table 2, model 12), we observe that by using X_3 as the only independent variable about as much of the variance in social security and educational policy can be explained

as when the revised product-term model is employed.

Further, the revised model with democracy (model 13) has to be rejected in these two instances of policy, because liberal democracy does not significantly contribute to their explanation.

Finally, the variance explained in both instances of policy is virtually the same across the three specifications.

These results taken together indicate to us that the product term model has to be rejected in the cases of social security policy and educational policy. In these instances the model: $B = b_0 + b_1X_3 + e$ provides the best fit; liberal democracy (D) in addition to or in interaction with collective demands (X) does not seem to add anything to the variances which are already explained by collective demands.

A quite different picture presents itself regarding human rights policy (B3). The estimations of both product-term models (models 9 and 14) yield significant b-coefficients for the interaction term DX_3 and yield about the same explained variances, namely 74 and 72 percent respectively (compare Tables 1 and 2). Thus in this instance of welfare policy it does not really make much difference whether we use X or X_3 for collective demands. Moreover the amount of variance explained by the models is far greater than the amount explained by any other model which survived the statistical tests.

The outcome of this re-analysis is that our previous conclusion has to be corrected. The hypothesis that the effect of collective demands on welfare policy is somehow conditioned by liberal democracy has after all only been upheld in the case of human rights policy. In the cases of social security and educational policy the curvilinear model: $B = b_1 + b_2 \log X + e$ seems to provide the most parsimonious description of the data.

Analysis of residuals – The next to last step in our analysis consisted of looking more closely at the estimation results obtained with the two versions of the product-term model on the basis of an analysis of the residuals, that is, of the differences between the actual values on the dependent variable and the values predicted by the estimated equations.

Firstly, we investigated by means of the distance measures of Mahalanobis and Cook (Cook, 1977; Cook and Weisberg, 1982) whether our population of countries contained cases which exerted a disproportionate influence on the parameter estimates. Such an influence was found in only one equation. When the estimates of equation: $B = b_0 + b_1X + b_2D + b_3XD + e$ were used, a standardized residual of -2.90 was obtained for the United States. This means that the actual

score of the United States on social security policy considerably deviates from the predicted value. To see what the effect of this case was, the parameters of this equation were estimated anew, but this time without the data on the United States. This new estimation resulted in a very small rise of the earlier explained variance from 62 to 64 percent. Moreover, the b-coefficients and their t-values hardly changed.

Thus leaving the United States in the sample did not distort our results as much as first expected. The results concerning the other estimated product-term models did not point at the existence of influential cases either.

Secondly, we looked for the existence of relationships between residuals and regressors. Correlations between these might be indicating curvilinearity. However, such indications could not be found.

Thirdly, we tested for the assumption of homoscedasticity. To do this the predicted values of the dependent variables B1, B2 and B3 were plotted against the standardized residuals. Inspection of the plots did not suggest any violation of this assumption.

Finally, we investigated whether or not the distributions of residuals were normal. We found that the distributions approximate normality quite well, especially as far as these distributions followed from equations specified in terms of X_3 .

The results of this analysis of residuals did not seem to warrant a modification of our earlier conclusions.

Interpretation – So far we have presented one positive finding. The hypothesis that demands and democracy interact in their effects on policy could not be rejected in the instance of human rights policy. However, nothing has as yet been said about the direction of this interaction effect. In other words, we still have to present evidence which gives credence to the idea that the effect of demands on human rights policy increases to the extent the level of democracy in a society increases. To test for the direction of effects however, we had to interpret the estimation results by looking at the combined effect of demands and democracy for different values of democracy. This required following the procedure which was outlined earlier (paragraph 2), the results of which will be described at some length, mainly because it has often been believed that the effects of product-terms are difficult to interpret.

The procedure was applied to both versions of the product-term model, the one with X and the one with X_3 . By specifying the parameter estimates (See Tables 1 and 2) and re-arranging terms, we arrive at equations 15 and 16.

$$B_3 = (1.02 + 0.04D) + (-0.0013 + 0.000053D)X \quad (15)$$

$$B_3 = (3.19 - 0.09D) + (-1.12 + 0.06D)X_3 \quad (16)$$

The next task was to substitute values for liberal democracy (D) in these equations to see how these values condition/change the effect of demands (X) on human rights policy (B₃). To establish the direction of change it seemed sufficient to obtain these values by dividing the population of countries into two subsamples with the midpoint of the democracy scale as our dividing criterion, and then computing the average score on liberal democracy for each subsample.⁸ The lower average (DL) turned out to be 8.375 and was based on the scores of 64 countries, while the higher average (DH) was 36.069 and was based on the scores of 51 countries.

Substituting these two averages for D in each equation yielded two separate equations for each, namely:

$$\text{DL: } B_3 = 1.35 - 0.0008 X \quad (t = 3.11) \quad (17)$$

$$\text{DH: } B_3 = 2.43 + 0.0006 X \quad (t = 5.03) \quad (18)$$

and

$$\text{DL: } B_3 = 2.42 - 0.59 X_3 \quad (t = 2.48) \quad (19)$$

$$\text{DH: } B_3 = -0.12 + 1.17 X_3 \quad (t = 4.63) \quad (20)$$

As the t-values show, the slope coefficient of demands (X) in each equation may be considered statistically significant. Moreover, testing for the difference between two slopes of each pair of equations (see Gobalet and Diamond, 1979) resulted in significant t-values in both instances, namely $t_{B_3} = 6.8$ for the pair with X and $t_{B_3} = 7.19$ for the pair with X₃.⁹

The significant differences between slopes clearly demonstrate once again that we have found significant interaction in the data concerning human rights policy, irrespective of the version of product-term model considered. Moreover, we can also infer from these results that the direction of the effects is in accordance with our hypothesis. If we compare the equations of each pair by regarding the change in sign of X or X₃, we note that the effect of demands (X) on human rights policy (B₃) increases as we move from less democratic to more democratic countries.

Finally, if we compare the signs of the parameters of one pair of equations with the corresponding signs of the other pair, we notice that these signs are fully in accord with each other.

On the whole these results were interpreted by us to render strong support for our hypothesis concerning human rights policy. Moreover, they clearly showed that if we had limited our analysis to one version of the product-term model, say the one with X, our conclusion would not have been different from the ones we would have drawn if the model with X₃ had been employed.¹⁰

Summary – Our hypothesis that collective demands (X) and liberal democracy (D) interact in their effects upon aspects of welfare policy, namely those pertaining to social security (B₁), education (B₂) and human rights (B₃), was tested by using two versions of a statistical model with a product term.

This hypothesis could not be rejected on the basis of an analysis of the data in terms of the product-term model which contained X, instead of the natural logarithm of X, as an explanatory variable. When the model with the natural logarithm of X was used, the hypothesis had to be rejected for two instances of welfare policy, namely social security policy and educational policy. The hypothesis could not be rejected as far as human rights policy was concerned.

In the light of this and other statistical results we concluded that our hypothesis was only confirmed in the case of human rights policy. Irrespective of the specification of X which was used, the product-term model was found to possess considerable explanatory power, explaining at least 72 percent of the variance in human rights policy.

Discussion – Our conclusions cannot be but very tentative. The conceptual model we have investigated is quite simple; the possible influence of other theoretically important factors, such as those associated with the international, political and economic position of countries has not been considered. Moreover we are uncertain about the validity of at least one indicator, namely the one used for collective demands, and the reliability of some of the data, especially as far as those on the African countries are concerned. Also, we have been engaged in the tricky business of testing causal hypotheses on the basis of cross-sectional data. Among other things, this type of cross-sectional analysis is based on the assumption that the countries concerned display variations in certain characteristics at one point in time which are similar to the variation which would be found if one country was studied through time. If this assumption is in no way valid, our results might well be an artifact of the statistical methods employed.

If we do assume that our findings are reasonably valid, a comparison

can be made with the results of Bertrand (1981), and to a far lesser extent with those of Jackman (1975).

As far as Bertrand's study is concerned it should be kept in mind that he used gross national product per capita as an indicator of economic development instead of collective demands, and that, as in this study, he used the logarithm of X , next to just X , in the specification of his models. However, he did not test for the existence of interaction among explanatory variables; he primarily worked with additive model specifications. In the light of our interaction pertaining to human rights policy, it seems to us that his results require modification (Compare 'mensenrechten' in: Bertrand, 1981: 225, Table 8.5). For instance, we found strong support for the idea that the effect of demands (specified as X) is not positive on the whole, but negative at first and becomes positive to the extent liberal democracy increases.

Jackman's findings regarding social security policy may also be compared to ours, since he used the same dependent variable and an interaction specification. However, the comparison is weakened by the fact that he studied 60 instead of 115 countries, leaving the socialist countries out of the picture, and that in this specification he employed energy consumption per capita instead of gross national product per capita, and an index called 'democratic performance' instead of our index of liberal democracy. As in our case, he found that his interaction model is not supported for social security policy by his data.

Perhaps the most striking result of our study is that liberal democracy, as it increases, does not facilitate the conversion of demands into social security and educational policies. In our opinion, this finding should receive special attention in the future.

This study underscores the fact that we still stand just at the beginning of explaining cross-national differences in social welfare policies both in conceptual and empirical terms. The debate about the relative explanatory importance of certain political and socio-economic factors can be and, in our opinion, ought to be carried a step further by studying the interaction effects of such factors empirically, if our conceptual notions imply conditional relationships. No doubt, the researcher who follows this line of investigation will among other things, be confronted with lots of methodological pitfalls. Perhaps these risks have to be taken, if we wish to make progress.

Notes

1. Region Anglo-European: Albania, Australia, Austria, Belgium, Bulgaria, Canada, Cyprus, Czechoslovakia, Denmark, East Germany, Finland, France, Great Britain, Greece, Hungary, Iceland, Ireland, Israel, Italy, Luxembourg, Netherlands, New Zealand, Norway, Poland, Portugal, Rumania, South Africa, Spain, Sweden, Switzerland, Soviet Union, Turkey, United States, West Germany, Yugoslavia.

Region Latin America: Argentina, Bolivia, Brazil, Chili, Columbia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Peru, Trinidad, Uruguay, Venezuela.

Region Middle East and Asia: Afghanistan, Algeria, Burma, Cambodia, China, Egypt, India, Indonesia, Iran, Irak, Japan, Jordan, Laos, Lebanon, Liberia, Libya, Malaysia, Mongolia, Morocco, Nepal, North Korea, North Vietnam, Pakistan, Philippines, Saudi Arabia, Sri Lanka, Syria, South Korea, South Vietnam, Thailand, Tunisia, Yemen.

Region Africa: Benin, Burundi, Cameroun, Central Africa, Chad, Congo, Ethiopia, Gabon, Ghana, Guinea, Ivory Coast, Liberia, Madagascar, Mali, Mauretania, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Somalia, Sudan, Tanzania, Togo, Uganda, Upper Volta, Zaïre.

2. These data can be obtained from: Steinmetz Archives, Herengracht 410-412, 1017 BX Amsterdam, (mentioning P-number P0615).

3. For an indication of the difficulties involved in defining and measuring demands, see: O. P. Kristensen, 1984.

4. Collective demands (X). Indicator: gross national product per capita in U.S.-dollars for 1960 (Taylor and Hudson, 1972: table 5.5, recalculated by growth rates and compared with Rummel, 1972: table 11.3).

5. Index of liberal democracy (D) for 1963. Source: Bertrand, 1981. Indicators: constitutional status of regime, separation of powers, freedom of the press, freedom of group opposition, free elections, polyarchic regime, no party ban, multiparty system, interest articulation by political parties, interest aggregation by legislature, fully effective legislature, weak status of executive, no dominant largest party, legislative coalitions, restrictions on minority parties.

6. Source of data: Bertrand, 1981.

7. It should be noted that the existence of a non-significant t -value for an interaction term does not mean that interaction is absent by definition. According to Friedrich (1982) every equation should be interpreted conditionally anyway.

8. For similar approach, see: T. Hansen, 1981.

9. We employ this significance test (standard error larger or equal to 2) to assess whether or not there exist a relatively important interaction effect, although we are not dealing with a random sample of countries here.

10. The latter observation cannot be made with respect to social security policy (B_1) and educational policy (B_2). When we repeated the same interpretation procedure for these aspects of welfare policy, we did find significant differences between slopes (an indication of interaction) for each of these instances of policy in case the product-term model X was considered. However, non-significant differences between slopes were found for each of these instances when the version with X_3 was analyzed.

Appendix

Table 3: Matrix of correlations

	X ₁	X ₃ *	D	B ₁	B ₂	B ₃	DX ₁	DX ₃
X ₁	517550							
X ₃ *	0.889	0.253						
D	0.569	0.608	224.585					
B ₁	0.735	0.820	0.526	1713.817				
B ₂	0.420	0.416	0.131	0.373	2.604			
B ₃	0.617	0.530	0.793	0.462	0.140	2.250		
DX ₁	0.942	0.787	0.704	0.649	0.324	0.766	915858188	
DX ₃	0.723	0.734	0.972	0.626	0.197	0.827	0.837	2221.503

Correlations below the diagonal. Variances on the diagonal (in boldface)

* X₃ = ¹⁰LOG (X₁)

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DE OVERHEID EEN ZORG

A. B. Ringeling

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Inleiding

Elke periode houdt opruiming onder wat duidelijk en zonder twijfel leek. Het doet er weinig toe hoe optimistisch of pessimistisch die periode is, hoe hoog de verwachtingen zijn gespannen. Want op hetzelfde moment wordt met een aantal inzichten van oudere datum afgerekend. De jaren tachtig vormen de periode waarin wordt afgerekend met heilsverwachtingen over overheidsop treden. In de jaren zestig en zeventig lag dat anders. Zodra een maatschappelijk probleem was onderkend, dan werd het in de richting van de staat geschoven. Of beter nog, begerig werd het door politici omarmd en tot onderwerp van zorg van de overheid verklaard. En de meeste ambtenaren waren daarover al even weinig terughoudend. Uitbreiding van taken betekende groei, groei van de organisatie, de stijging van promotiekansen, betere vooruitzichten op een hoger salaris.