

**Sociology 7704: Regression Models for Categorical Data**  
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**Answers to the Questions for the OLS Article Example**

**Kenworthy, Lane, and Melissa Malami. 1999. "Gender Inequality in Political Representation: A Worldwide Comparative Analysis." *Social Forces*, 78: 235-268.**

**1. What are the dependent and the independent variables in this analysis, and what type of variables are these (continuous, categorical, dichotomous)?**

See Table 2 on pp. 248-9.

Dependent variable: share of seats in the main national legislative body held by women in 1998 (as of January 1); in countries with bicameral legislatures, the share in the lower house was used. It is a continuous variable ranging from 0 to 40 (but since it is a percentage, it is not truly unbounded).

Independent variables:

Electoral system: ordinal (0-2); the authors also tried to use it as two dichotomies and claim the results did not differ.

Left party government: continuous (0.2-71.7); only available for 20 affluent democracies.

Timing of women's suffrage: Continuous (1893-1990)

Degree of democracy: ordinal (1-7)

Marxist-Leninist government: dichotomy (0/1)

Women's educational attainment: continuous (13-60)

Women's share of the labor force: continuous (10-50)

Women in professional occupations: continuous (12-70) (only available

Strength of the women's movement: continuous (0-17), logged

Level of economic development: continuous (427-34,155), logged

Religion: nominal, used as a set of dummies (Protestantism—omitted category, Catholicism, Islam, other) – in a reduced sample analysis, Other religion is dropped so it becomes a part of the omitted category

Ratification of UN convention: dichotomy (0/1)

Abortion rights: dichotomy (0/1)

Region: nominal, used as a set of dummies (Western block—omitted category, Sub-Saharan Africa, the Middle East and North Africa, Asia and the Pacific, Latin America and the Caribbean, Eastern Europe, Scandinavia).

**2. How did the authors decide which variables to use in their models?**

The original set of variables is identified based on theory and prior research; then for some models, all variables are used, but later, backward stepwise elimination is used based on the minimal t-value of 1 (p. 250). They also did some sensitivity tests in terms of how having certain variables in the model affects the results of other variables –e.g., dropped religion and region dummies from Model D of table 3 (as described on p. 252), and tried dropping other variables

one at a time. Overall, they pay a lot of attention to model specification and try alternative measures and codings for a number of variables.

### **3. Have the authors applied transformations to any of the variables?**

Yes, two variables were logged (strength of the women's movement and the level of economic development)

### **4. What is the sample size in this study? How did the authors select the observations to include? What population is this sample supposed to represent? Is the ratio of the number of variables to the number of cases acceptable?**

They selected 146 out of 191 independent nations based on whether they had directly elected national legislatures (17 were omitted because they do not) and based on data availability (28 countries were omitted for that reason) (p. 244 and endnote 3, p. 263).

They first conduct analyses for those 146 cases, then for a reduced sample of 116 in order to use the women's share in professional occupations variable, and then a separate analysis on 20 richest longstanding democracies.

The 146 cases are supposed to represent the entire population of 191 as the authors argue that the omitted cases are not much different from the included ones (endnote 3, p. 263).

The ratio of variables to cases is acceptable in all models except for the one for 20 cases (typically, there should be at least 5 cases per variable, but better 10).

### **5. How did the authors handle the missing data?**

For the female share in secondary education variable, data from 1970 and 1990 is used to fill the missing 1980 values.

Data on women in professional occupations were only available for 116 countries, so this variable was included in an analysis on a reduced sample. They also omitted Iceland from their sample of wealthy nations because of its missing value on women in professional occupations.

For the number of national women's political organizations, the authors substituted regional mean values for missing data for 10 countries.

### **6. What kind of data screening and diagnostics did the authors report conducting and what were the results?**

They checked variable distributions and logged two variables, which suggests they checked for normality. Not clear whether any linearity diagnostics were used. They checked for influential observations using the jackknife diagnostic (p. 251) and found one influential observation - Djibouti.

They did the analysis omitting the poorest 10% of the sample because they suspected they might have more measurement error; another one omitting the smallest 15% of the nations; and another one dropping the 20 wealthiest democracies; the findings largely stayed the same (p. 251). They also tried omitting variables one at a time. The biggest change in findings across sensitivity checks was for the ratification variable (here, a measure of culture).

They also discuss that when they entered an additional variable for electoral system, they detected multicollinearity, so presumably they checked for that for other models as well, but they do not mention that.

They also evaluated a specific interaction (between electoral system and a dummy variable for economic development – it is not clear why the original continuous variable was not used for that; the results are not presented, and it is not reported whether the interaction term was significant, and whether a dummy was also used for the main effect of development)

### **7. What diagnostics and potential problems did the authors not address?**

They did not discuss homoscedasticity; little discussion of multicollinearity; no reports of multivariate normality or linearity diagnostics. With the exception of one interaction, additivity was not assessed either.

### **8. How did the authors choose to present their results? What else could they have presented? Why did the authors choose to conduct one-tailed tests for statistical significance?**

They present standardized and unstandardized OLS coefficients, with absolute t-values in parentheses. In addition, they could have reported standard errors, but t-values allow us to calculate them if we would like to do so. Significance is marked by stars: \*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$ . They use one-tailed tests because they presented directional hypotheses for each variable (i.e., specified whether they expect a positive or a negative effect). They also report adjusted R squared for their models.