Status in the World System, Income Inequality, and Economic Growth[1]

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This paper addresses recent challenges to fundamental world-system research findings by using methods and measures suggested by critics of these findings. Reanalysis of income and economic growth data using a categorical indicator of world-system status derived from Snyder and Kick suggests that dependency does increase income inequality and retard per capita economic growth net of initial development. This offers renewed support for world-system theory by rebutting Weede's criticism of Rubinson, and Jackman's criticism of Snyder and Kick.

INTRODUCTION

Two recent challenges have been offered to world-system research. First, findings that dependency increases income inequality have been criticized for their failure to control for the curvilinear effects of development (Weede 1980). Second, the observed effects of dependency on rates of per capita economic growth have been claimed to be artifacts of inadequate measures of growth and resulting heteroscedasticity (Jackman 1980). In this analysis I employ procedures and measures suggested by these and other critics to provide a more adequate test of the original hypotheses. (See Appendix for cases used in this reanalysis.)

Rubinson (1976) and Rubinson and Quinlan (1977) presented evidence that there was significantly greater income inequality in dependent than in core nations. They found that a much greater share of income was concentrated in the upper regions of the income distributions of dependent

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countries, while in core countries, although the upper regions continued to have the largest shares, proportionately more income accrued to the middle regions. This was argued to be evidence of a small labor aristocracy in the periphery and a relatively strong middle class in the core, as predicted in world-system/dependency theory.

Weede (1980), however, has challenged these findings by questioning Rubinson's control for the effects of development on income distribution. According to Weede, a second-order polynomial is necessary, and Rubinson's use of the log of development is inadequate as a control because economists have long maintained that development has a curvilinear nonmonotonic effect on inequality. At low levels of development, growth may actually increase inequality, whereas growth at higher levels reduces it. To demonstrate that dependency has an effect on inequality independent of the simple effects of development, therefore, it is necessary to use a control that will detect this expected reversal in the direction of the relationship. However, when Weede (1980) attempted to replicate Rubinson's (1976) analysis employing polynomial controls, all the regression coefficients for Rubinson's indicators of dependency failed to reach significance at even the .10 level. From this, Weede concluded that Rubinson's results were due to his "misspecification" of the economic model and rejected the hypothesis that position in the world economy affects economic inequality net of economic development.

To address this conclusion, I reanalyzed Paukert's (1973) and the World Bank's (1980) data on income inequality, using a network-based measure of status in the world economy derived from Snyder and Kick (1979), which they argue is conceptually superior to the measures of dependency used by Rubinson and others, and employing Weede's preferred polynomial control for development, the log of energy consumption per capita, and its square.[2] The results of this reanalysis are presented in table 1. The first column reports the results of regressing income inequality and income share on world-system status without controls for development. Clearly these zero-order results resemble Rubinson's.[3] Although it is only for the upper-middle quintile (61%–80%) that both the semiperiphery and the periphery are significantly different from the core (values for the core, as the omitted reference category, are indicated by the intercept), the

[2] In order to detect the effects of "status level," or hierarchical position, in the world political economy, the nine "blocks" found by Snyder and Kick (1979) have been aggregated into three categories on the basis of their correspondence with core, semiperiphery, and periphery "roles" (see Snyder and Kick 1979, pp. 1110–16 and below). For evidence of the construct validity (Selltiz et al. 1959, pp. 159–63) of the aggregated measure, see Nolan (1981, 1982).

[3] This replication is made even more interesting by the fact that the status measure is not related significantly to Rubinson's primary indicators of dependency: state strength, government revenue as a percentage of GNP ($F = 2.166$, $P = .126$); and trade dependence, trade as a percentage of GNP ($F = .603$, $P = .551$).

TABLE 1

HOUSEHOLD INCOME REGRESSED ON STATUS AND DEVELOPMENT POLYNOMIAL

	Zero-Order Semiperiphery and Periphery Contrasts with Core	Semiperiphery and Periphery Contrasts with Core Controlling Development	Periphery Contrasts with Core and Semiperiphery Controlling Development
	Paukert Data Circa 1965 ($N = 48$)		
Gini index of inequality:			
Intercept	.398***	−.121 N.S.	−.120 N.S.
Ldev	. . .	.431***	.428***
Ldev²	. . .	−.080**	−.080***
Semiperiphery	.032 N.S.	−.003 N.S.	. . .
Periphery	.092**	.074 N.S.	.076**
R^2 change	. . .	.108*	.108**
Multiple R^2	.171**	.369***	.369***
Equalization percentage:			
Intercept	29.538***	−15.838 N.S.	−14.795 N.S.
Ldev	. . .	38.661***	37.501***
Ldev²	. . .	−7.358***	−7.072***
Semiperiphery	2.831 N.S.	−1.020 N.S.	. . .
Periphery	8.598**	5.937 N.S.	6.746**
R^2 change	. . .	.119*	.118**
Multiple R^2	.209**	.420***	.418***
81–100 percentile:			
Intercept	46.762***	−3.639 N.S.	−3.343 N.S.
Ldev	. . .	45.800***	44.381***
Ldev²	. . .	−8.911***	−8.561***
Semiperiphery	4.277 N.S.	−1.247 N.S.	. . .
Periphery	10.648***	6.184 N.S.	7.173**
R^2 change	. . .	.107*	.106*
Multiple R^2	.245**	.473***	.471***
61–80 percentile:			
Intercept	22.608***	37.245***	37.182***
Ldev	. . .	−16.087***	−15.785***
Ldev²	. . .	3.378***	3.303***
Semiperiphery	−2.900*	.266 N.S.	. .
Periphery	−4.662***	−1.420 N.S.	1.881 N.S.
R^2 change	. .	.035 N.S.	.035 N.S.
Multiple R^2	281***	.481***	.480***
41–60 percentile:			
Intercept	15.715***	28.140***	27.898***
Ldev	. . .	−13.517***	−12.359***
Ldev²	. . .	2.828***	2.543***
Semiperiphery	−1.592 N.S.	1.018 N.S.	. . .
Periphery	−4.274***	−1.623 N.S.	−2.430**
R^2 change	. .	.104*	.096**
Multiple R^2	.318***	.493***	.485***

NOTE.—Ldev and Ldev² = logarithm of 1965 energy consumption per capita in kilograms coal equivalent (from Taylor and Hudson 1973, p. 84 [V157]) and its square. Semiperiphery and periphery = status in the world economy (from Snyder and Kick 1979), see Appendix. N.S. = nonsignificant.

* Significant at .05.

** Significant at .01.

*** Significant at .001.

TABLE 1 (*Continued*)

	Zero-Order Semiperiphery and Periphery Contrasts with Core	Semiperiphery and Periphery Contrasts with Core Controlling Development	Periphery Contrasts with Core and Semiperiphery Controlling Development
	Paukert Data Circa 1965 ($N=48$)		
21–40 percentile:			
Intercept	10.131***	22.885***	22.836***
Ldev	. . .	−10.575**	−10.341**
$Ldev^2$	. . .	1.967**	1.910**
Semiperiphery	−.623 N.S.	.206 N.S.	. . .
Periphery	−1.990*	−1.568 N.S.	−1.731*
R^2 change	. . .	.081 N.S.	.081*
Multiple R^2	.118 N.S.	.292*	.291**
0–20 percentile:			
Intercept	4.931***	15.630***	15.747***
Ldev	. . .	−5.680*	−6.241*
$Ldev^2$	. . .	.746 N.S.	.884 N.S.
Semiperiphery	.600 N.S.	−.494 N.S.	. . .
Periphery	.124 N.S.	−1.746 N.S.	−1.354*
R^2 change	. . .	.077 N.S.	.073*
Multiple R^2	.013 N S.	.302**	.297***
	World Bank Data 1970		
96–100 percentile ($N=38$):			
Intercept	15.900***	.335 N.S.	2.156 N.S.
Ldev	. . .	22.618 N.S.	19.092 N.S.
$Ldev^2$	. . .	−4.976 N.S.	−4.193 N.S.
Semiperiphery	5.922 N.S.	−2.361 N.S.	. . .
Periphery	14.325***	5.822 N.S.	7.712*
R^2 change	. . .	.100 N.S.	.097*
Multiple R^2	.329***	.385**	.382***
0–20 percentile ($N=54$):			
Intercept	5.923***	12.584**	13.253**
Ldev	. . .	−3.754 N.S.	−5.158 N.S.
$Ldev^2$	. . .	.525 N.S.	.841 N.S.
Semiperiphery	−.464 N.S.	−.941 N.S.	. . .
Periphery	−1.690**	−2.356***	−1.562**
R^2 change	. . .	.160**	.143*
Multiple R^2	.163**	.230**	.212**

NOTE —Ldev and $Ldev^2$ = logarithm of 1965 energy consumption per capita in kilograms coal equivalent (from Taylor and Hudson 1973, p 84 [V157]) and its square Semiperiphery and periphery = status in the world economy (from Snyder and Kick 1979), see Appendix N S = nonsignificant

* Significant at 05

** Significant at 01

*** Significant at 001

statuses are appropriately rank ordered for both summary measures and in four of the five income quintiles.[4] The lowest quintile (0%–20%) constitutes the exception. The status dummies also explain a significant proportion of variance in both summary measures and in three of the five quintiles (41%–60%, 61%–80%, 81%–100%). Similar patterns are found with data on the tails of income distributions reported by the World Bank (1980) presented in the bottom panels of table 1.

The increase in explained variance that accompanies introduction of a polynomial control for development, which can be seen by comparing the first and second columns, supports Weede's "specification of development" argument, but use of it as a control does not eliminate the effects of status on inequality. When entered after the polynomial development control, the status dummies continue to produce a significant increment in explained variance in both summary measures, 10.8%, 11.9%; and in two income quintiles (41–60, and 81–100 percentiles), 10.4%, 10.7%. The major effect of the control is to reduce further, and nominally reverse, the contrast of semiperiphery and the core without substantially affecting the differences between the core and periphery. This suggests that whatever differences exist between core and semiperiphery are due primarily to differences in their levels of development and do not reflect any fundamental consequence of their differing world-economic roles. Since this is the case, it makes sense to combine the two into a single reference category with which the periphery can be compared, net of the effects of development. Examination of the third column indicates that when this is done the effects of periphery status emerge even more strongly. In four of the five quintiles, and for both summary measures, there is a significant increase in explained variance. Ironically, it is only in the fourth quintile (61%–80%), where both status coefficients were significant before controls, that the increase in explained variance is nonsignificant. Similar results are also found using the more restricted World Bank (1980) data.

Thus it is evident that, although controls do reduce the already smaller semiperiphery/core differences, they do not alter significantly the contrasts of the periphery and the core. It must be concluded, therefore, that the effect of status, or dependency, on income inequality is not simply an artifact of failure to control adequately for economic development. When

[4] Since cases in this analysis do not constitute a probability sample because all nations for which comparable data were available were included, significance values do not have their conventional meaning. In fact, the population character of the data led Snyder and Kick (1979) to deemphasize the significance and stress the size of their unstandardized regression coefficients in their analysis. Jackman (1980) and Weede (1980), however, relied much more on significance values in making decisions about the importance of relationships. Without taking a position on the general issue, the present analysis examines significance values because they have been used by these critics to challenge some of the research reexamined here.

the network-derived measure of status is employed, position is found to have significant and substantial effects on income distribution, net of the curvilinear effects of simple development. Fundamental differences in income distribution and inequality between the core and periphery remain when development is controlled.

The relationship between world economic position and rate of economic growth is perhaps even more controversial than that between position and inequality. Most recently, Jackman (1980) has questioned the findings of Snyder and Kick (1979) and others (e.g., Chase-Dunn 1975) that, in recent decades, noncore nations have experienced lower rates of economic growth than core nations. Jackman argues these results may be an artifact of the measure of economic growth used by these researchers, GNP per capita differences at two time points, the use of which also produces heteroscedastic disturbance in their regression analyses. According to Jackman, both of these interrelated problems can be avoided by using a continuous measure of economic growth rate. However, when he attempted to replicate Snyder and Kick's analysis using such a measure, he found that, despite the fact that all nine noncore blocks grew more slowly than the core, not a single regression coefficient was "significant." He concluded, therefore, that no convincing evidence of a relationship between world economic position and rate of economic growth had yet been offered.

Jackman's (1980) argument for the superiority of a continuous over a simple difference measure of growth is well founded, but when he continued to use all nine noncore blocks as regressors in his reanalysis, he perpetuated another theoretical weakness in Snyder and Kick's original analysis. Use of the nine blocks that *constitute* the statuses may, in fact, obscure the effect of the statuses. Since the theory maintains, and Snyder and Kick claim to have confirmed, that there are three statuses in the world system, it is important and necessary to compare the *statuses* with one another, rather than compare the smaller clusters of nations that, together, constitute them. To test the hypothesis properly, therefore, it is necessary not only to take Jackman's advice and use the continuous measure of growth (cf. World Bank 1980, p. 5, n. 2), and to focus on the time period he considers more reliable statistically (1960–70), but, in addition, to abandon the false precision of entering all nine subgroups as predictors and, instead, use the status levels they constitute. It is also important to consider the possibility that, as was the case with inequality, development may be curvilinearly (and nonmonotonically) related to growth.

The first column of table 2 displays the results of regressing average annual rate of economic growth, GNP per capita, and total GNP with population as a predictor, on controls for school enrollment, initial development, the log of energy consumed per capita, and status. There is a significant increment to variance explained when the status dummies are entered after controls (8.1%), but only the regression coefficients for the periphery are significant. However, the fact that initial development has a nonsignificant effect on growth rate, as in Jackman's reanalysis, leads to the suspicion that the log of development is not sufficient to detect the relationship between level of development and rate of economic growth. A simple way to test this possibility is to enter power terms of development hierarchically and determine if they increase the explained variance significantly (Cohen and Cohen 1975; Jagodzinski and Weede 1981). When this is done, both the square and the cube of development can be seen to have significant effects, indicating that a cubic function best describes the relationship between initial development and the rate of economic growth. The most *conservative* test of the effect of status, therefore, would be provided by entering the status dummies only after school enrollment

TABLE 2

AVERAGE ANNUAL RATE OF ECONOMIC GROWTH REGRESSED ON INITIAL DEVELOPMENT, SCHOOL ENROLLMENT, AND POPULATION GROWTH RATE 1960–70 ($N=95$)

	Controlling Simple Function of Development	Controlling Quadratic Function of Development	Controlling Cubic Function of Development
GNP per capita growth rate:			
Intercept	2.938*	−.003 N.S.	5.748*
Ldev	−.004 N.S.	3.933**	−5.730 N.S.
$Ldev^2$	...	−.927**	3.901 N.S.
$Ldev^3$	...	...	−.718*
School enrollment 1960	.019 N.S.	.022 N.S.	.018 N.S.
Semiperiphery	−.404 N.S.	−1.425*	−1.656**
Periphery	−1.775**	−2.685***	−2.751***
R^2 change status	.081**	.123***	.123***
Multiple R^2	.320**	.396***	.432***
Adjusted R^2	.290**	.362***	.393***
GNP growth rate:			
Intercept	2.859*	−.034 N.S.	5.732*
Ldev	.003 N.S.	4.049**	−5.788 N.S.
$Ldev^2$	...	−.947**	3.948 N.S.
$Ldev^3$	...	...	−.727*
School enrollment 1960	.019 N.S.	.021 N.S.	.018 N.S.
Population growth rate 1960–70	1.061***	.965***	1.037***
Semiperiphery	−.426 N.S.	−1.350 N.S.	−1.663*
Periphery	−1.831***	−2.640***	−2.788***
R^2 change status	.081**	.111***	.114***
Multiple R^2	.278***	.356***	.394***
Adjusted R^2	.238***	.314***	.346***

NOTE —Ldev = log of energy consumption per capita in kilograms coal equivalent Adjusted school enrollment 1960 and energy consumption 1960 data from Taylor and Hudson (1973, p 63 [V109], p 83 [V156]), GNP growth rate from the World Bank (1980), GNP per capita growth rate = 1 + GNP GR/1 + POP GR $Ldev^3$ significantly increases R^2 in all equations ($P <$ 05) N S = nonsignificant

* Significant at 05

** Significant at 01

*** Significant at 001

and the (quadratic and) cubic functions of development have been allowed to explain as much variance as they can.

When this is done, instead of attenuating, the effects of status actually increase. Both regression coefficients are significant and appropriately rank ordered, and the status dummies together explain 12% of the variance in per capita rates and a little over 11% in the total growth rates. This is so despite the fact that the polynomial of development has a significant and sizable effect on growth rates. The originally nonsignificant effect of development appears to have been the result of attempting to fit a monotonic function to a nonmonotonic relationship. The better fitting development function does not "explain away" the effect of status, but it does confirm Jagodzinski's and Weede's (1981) suspicion that many important sociological relationships are not simple linear or curvilinear functions.

DISCUSSION AND CONCLUSIONS

Reexamination of recently controversial world-system research findings using improved measures and models has provided support for the original world-system/dependency predictions. A substantial relationship is found between income inequality and position in the world system despite a more rigorous polynomial control for development. Reanalysis of the effects of position on relative rates of economic growth has also provided reconfirmation of Snyder and Kick (1979) and rebutted Jackman's (1980) challenge. Although the criticisms were well founded in both cases, the network-based measure of status revealed a continuing effect after more reliable measures and more rigorous specifications of controls were used. Certainly much more research is needed to test these theoretical predictions fully, but the present analysis indicates that it would be premature to dismiss them on the basis of existing criticism. It also clearly indicates that it is important to examine the possibility of nonlinearity and nonmonotonicity before specifying controls for basic structural and developmental features of nations in cross-national research.

APPENDIX

Listing of Nations by Status (after Snyder and Kick 1979, p. 1110)

Blocks are designated by the first capital letter in each paragraph. If cases are included in only some of the analyses, letters indicate which analyses they are in: E = economic growth, P = Paukert, B = bottom 20% World Bank, T = top 5% World Bank.

Core

C: Canada, United States, United Kingdom, Netherlands, Belgium (E), Luxembourg (E), France, Switzerland (E), Spain (E), Portugal (B), West Germany (E, B), Austria (E), Italy (E, P, B), Yugoslavia (E, B, T), Greece (E, P), Sweden, Norway, Denmark, South Africa (E, P), Japan, Australia.

Semiperiphery

C′: Venezuela (E, B, P), Peru (E, B, P), Argentina (E, B, P), Uruguay (E, B), South Korea.

D: Ireland (E), Cyprus (E, B, T), Kenya (E, B, T), Iran (E, B, T), Turkey (E, B, T), Iraq (E, P), Lebanon (P), Israel.

D′: Finland (E, P), Saudi Arabia (E), Taiwan (E, B), India, Pakistan, Burma (E, B, T), Ceylon (E, B, P), Malaysia (E, B, T), Philippines (E, B, P).

Periphery

A: Chad (E, P), Congo (Brazzaville) (E), Congo (Kinshasa) (E), Uganda (E, B, T), Burundi (E), Ruanda (E), Somalia (E), Ethiopia (E), Morocco, Algeria (E), Tunisia (E, P), Sudan (E, B, P), United Arab Republic (E, B, T).

B: Mali (E, B, T), Mauritania (E), Ghana (E), Upper Volta (E), Senegal (E, P), Dahomey (P), Niger (E, P), Ivory Coast (E, P), Republic of Guinea (E), Liberia (E, B, T), Sierra Leone, Togo (E), Cameroon (E), Nigeria (E, P), Gabon, Central African Republic (E).

E: Panama, Colombia, Ecuador (E, P), Brazil (E, B, P), Bolivia, Paraguay (E, B, T), Chile (E, B, P).

E′: Haiti (E), Dominican Republic (E, B, T), Mexico, Guatemala (E, B, T), Honduras (E, B), El Salvador (E, P), Nicaragua (E, B, T), Costa Rica.

F: Jamaica (E, P), Trinidad and Tobago, Malta (E), Nepal (E), Thailand (E, B, T), New Zealand (E, B, T), Iceland (E).

F′: Syria (E), Afghanistan (E), Indonesia (E, B, T).

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