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Diffusion, Development, and Democracy, 1800–1999

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Table 1a. Importance of Democratic Growth in the World 1800-1999

Estimates of Variances	Percent of Explained Variances, %	
	The World	
	Dev	Diff
Variance between regions' intercepts	51%	83.7% ¹
Variance between regions' slopes	0% ¹	40% ¹
Variance between countries intercepts	8%	41.9%
Variance between countries slopes	0%	25%
Covariance between countries intercepts & slopes	0%	0%
Residual	2.5%	28.2%

Note: Dev = development model; Diff = diffusion model.

Table 1b. Importance of Democratic Growth in Regions 1800-1999 (continued)

Estimates of Variances	Percent of Explained Variances, %									
	Americas		Europe		Africa		Middle East		Asia	
	Dev	Diff	Dev	Diff	Dev	Diff	Dev	Diff	Dev	Diff
Variance between countries intercepts	17.4%	36%	0% ¹	90%	0%	0%	46.2%	44.6%	8.6%	43.2%
Variance between countries slopes	0%	0%	0%	0%	0%	0%	0%	80%	0%	0%
Covariance between intercepts & slopes	70% ¹	0%	0%	53.8%	0%	0%	80% ¹	80% ¹	0%	0%
Residual	5.8%	44.1%	7.8%	25.5%	16.1%	29%	11.5%	96.9%	11.1%	46.3%

Note: Dev = development model; Diff = diffusion model. The predictive power of development model was calculated by subtracting the estimate of variances of the development model from variances of the unconditional model and dividing this by the value of the variance of the development model, and multiplying by 100 (see bottom of Table 1 and 2). The same procedure was applied to estimate the power of diffusion. Parameters that were not significant.

Table 2a. Fixed Effects Estimates of Evolution of Democracy in the World in 1800-1999

Model	Fixed Effects Estimates		
	Intercept	Year	Year ²
A: Unconditional model	3.8074 ¹	.008877 ¹	-.00012 ¹
<i>p</i>	<.0001	<.0001	<.0001
B: Two-level model	3.2128 ¹	.01581 ¹	.000092 ¹
<i>p</i>	<.0001	.002	<.0001
C: Three-level model	3.7095 ¹	.01014 ¹	.000093 ¹
<i>p</i>	.018	.247	<.0001
SE	(1.07)	(.008)	(.0078)

Note: Data obtained while using two- and three-level growth models.

Model A: Hierarchical growth model depicting residual, Model B: Hierarchical growth model depicting variance between countries and residual; Model C: Hierarchical growth model depicting variance between countries and regions. Goodness of fit parameters of Akaike's Information Criterion (AIC), Akaike's Information Criterion corrected for a sample size (AICC), Bayesian Information Criterion (BIC) and Log Likelihood (-2LL) for the models.

Model A: AIC = 72583.6, AICC = 72583.6, BIC = 72591.1, -2LL = 72581.6 (df = 12000);

Model B: AIC = 54526.9, AICC = 54526.9, BIC = 54539.5, -2LL = 54518.9 (df = 12000);

Model C: AIC = 54488.9, AICC = 54488.9, BIC = 54487.4, -2LL = 54474.9. (df = 12000)

The smaller the obtained value, the better is the fit of the model to the data (SAS Manual, 1996).

¹-2LL used to assess probability *p* by comparing the difference in -2 RLL between two competing models to a χ^2 distribution (Singer 1998).

Table 2b. Covariance Parameter Estimates of Evolution of Democracy in the World 1800–1999

Model	Covariance Parameter Estimates						
	Variation Between Regions Intercepts	Variation Between Regions Slopes	Covariance Between Regions Intercept/ Slopes	Variation Between Countries Intercepts	Variation Between Countries Slopes	Covariance Countries Intercepts/ Slopes	Residual
A: Unconditional model							13.9003 ¹
<i>p</i>							<.0001
B: Two-level model				14.3447 ¹	.00322 ¹	-.09822 ¹	3.1925 ¹
<i>p</i>				<.0001	<.0001	<.0001	<.0001
C: Three-level model	6.2311 ¹	.0002 ¹	.000983 ¹	10.9957 ¹	.0029 ¹	-.1046 ¹	3.1879 ¹
<i>p</i>	.10	.1934	.9754	<.0001	<.0001	<.0001	<.0001
SE	(4.871)	(.0003)	(.03194)	(1.302)	(.0004)	(.02257)	(.03968)

Note: Data obtained while using two- and three-level growth models. Model A: Hierarchical growth model depicting residual, Model B: Hierarchical growth model depicting variance between countries and residual; Model C: Hierarchical growth model depicting variance between countries and regions. Goodness of fit parameters of Akaike's Information Criterion (AIC), Akaike's Information Criterion corrected for a sample size (AICC), Bayesian Information Criterion (BIC) and Log Likelihood (-2LL) for the models.

Model A: AIC = 72583.6, AICC = 72583.6, BIC = 72591.1, -2LL = 72581.6 (df = 12000);

Model B: AIC = 54526.9, AICC = 54526.9, BIC = 54539.5, -2LL = 54518.9 (df = 12000);

Model C: AIC = 54488.9, AICC = 54488.9, BIC = 54487.4, -2LL = 54474.9. (df = 12000)

The smaller the obtained value, the better is the fit of the model to the data (SAS Manual, 1996).

¹-2LL used to assess probability *p* by comparing the difference in -2 RLL between two competing models to a χ^2 distribution (Singer 1998).

Table 3. Hierarchical Growth Models with Socioeconomic and Diffusion Predictors of Democratic Growth 1800–1999

	Americas: 1820-1999 (N = 3,066)			Europe: 1800-1999 (N = 3,693)			Africa: 1949-1999 (N = 1,648)		
	Uncon	Dev	Diff	Uncon	Dev	Diff	Uncon	Dev	Diff
Variance Estimates									
Residual	3.4*	3.2*	1.9*	5.5*	5.07*	4.1*	3.1*	2.6*	2.2*
SE	(.08)	(.07)	(.04)	(.1)	(.1)	(.09)	(.1)	(.09)	(.07)
Variance Between Countries Intercepts	8.6*	7.1*	5.5*	11.7*	12.7*	5.4*	9.9*	10.9*	11.7*
SE	(2.5)	(2.2)	(1.7)	(2.5)	(2.9)	(1.4)	(2.3)	(2.6)	(2.8)
Variance Between Countries Slopes	.0005*	.0009*	.002*	.001	.003*	.002*	.006*	.008*	.009*
SE	(.0001)	(.0003)	(.0005)	(.0004)	(.0006)	(.0004)	(.001)	(.002)	(.002)
Covariance Countries' Intercept & Slopes	.01	-.003	-.06*	.04	.04	-.004	-.19*	-.22*	-.26*
SE	(.01)	(.02)	(.02)	(.02)	(.2)	(.017)	(.06)	(.07)	(.07)
Fit Statistics									
AIC	15288.7	15145.7	11235	22139.2	21877.8	16288.1	6844.1	6664.5	6428.8
AICC	15296.7	15153.7	11243.8	22147.2	21885.8	16296.1	6852.1	6672.5	6436.8
BIC	15296.7	15153.7	11243.8	22147.2	21885.8	16296.1	6852.2	6672.6	6436.8
-2LL	15301.6	15158.6	11248.7	22154.9	21893.5	16303.5	6859.0	6679.4	6443.7

Note: Uncon = unconditional model; Dev = development model; Diff = diffusion model. The temporal rate (slope) is assessed differently for different regions; for Europe it is year, for Americas is year² and for Africa, Middle East and Asia it is a year³.

* $p < .05$.

Table 3. (continued)

	Middle East: 1917-1999 (N = 1,124)			Asia: 1900-1999 (N = 1,602)		
	Uncon	Dev	Diff	Uncon	Dev	Diff
Variance Estimates						
Residual	2.6	2.3*	.08*	2.7*	2.4*	1.45*
SE	(.1)	(.09)	(.03)	(.1)	(.08)	(.05)
Variance between countries intercepts	6.5*	3.5*	3.6*	13.03*	11.9*	7.4*
SE	(2.1)	(1.3)	(1.3)	(3.6)	(3.4)	(2.2)
Variance between countries slopes	.002*	.002*	.0004*	.007*	.008*	.007*
SE	(.0008)	(.0006)	(.0002)	(.002)	(.002)	(.002)
Covariance Countries' intercept & slopes	-.05	-.01	-.01	-.19*	-.3*	-.2*
SE	(.03)	(.02)	(.01)	(.07)	(.08)	(.06)
Fit Statistics						
AIC	4427.1	4357.3	3299.3	6419.8	6343.9	5612.6
AICC	4435.1	4365.3	3307.3	6427.8	6351.9	5620.6
BIC	4435.1	4365.3	3307.4	6427.8	6352.0	5620.6
-2LL	4439.2	4369.4	3311.5	6433.2	6357.4	5626.1

Note: Uncon = unconditional model; Dev = development model; Diff = diffusion model. The temporal rate (slope) is assessed differently for different regions; for Europe it is year, for Americas is year² and for Africa, Middle East and Asia it is a year³.

* $p < .05$.