

The Socioecology of Territory Size: A comparison farmers and human foragers

Jacob Freeman^{*1},

1 Anthropology Program, Utah State University, Logan, UT 84322.

Supporting Information

Table 1. All regression models run for the explanatory variables on the territory size of agricultural societies.

| | (Intercept) | AE | Foraging | log(Population) | R ² | df | logLik | AIC | delta | weight |
|---|-------------|-------|----------|-----------------|----------------|----|--------|-------|-------|--------|
| 7 | -1.46 | | 0.07 | 0.81 | 0.66 | 4 | -117.5 | 243.0 | 0.0 | 0.72 |
| 8 | -1.79 | 0.00 | 0.07 | 0.82 | 0.66 | 5 | -117.4 | 244.9 | 1.9 | 0.28 |
| 5 | 0.94 | | | 0.72 | 0.38 | 3 | -135.5 | 277.1 | 34.1 | 0.00 |
| 6 | 1.72 | -0.00 | | 0.70 | 0.39 | 4 | -135.3 | 278.6 | 35.6 | 0.00 |
| 4 | 7.43 | -0.00 | 0.06 | | 0.20 | 4 | -143.2 | 294.5 | 51.5 | 0.00 |
| 3 | 6.00 | | 0.06 | | 0.18 | 3 | -144.3 | 294.5 | 51.5 | 0.00 |
| 2 | 9.05 | -0.00 | | | 0.05 | 3 | -148.7 | 303.4 | 60.4 | 0.00 |
| 1 | 7.24 | | | | 0.00 | 2 | -150.2 | 304.5 | 61.5 | 0.00 |

Table 2. All regression models run for the explanatory variables on the territory size off forager societies.

| | (Intercept) | HUNTING | log(CRR) | log(TLPOP) | MCM | R ² | df | logLik | AIC | delta | weight |
|----|-------------|---------|----------|------------|-------|----------------|----|--------|--------|-------|--------|
| 16 | 2.23 | 0.03 | -0.54 | 0.70 | -0.02 | 0.65 | 6 | -498.9 | 1009.7 | 0.0 | 1.00 |
| 8 | 2.65 | 0.04 | -0.69 | 0.75 | | 0.64 | 5 | -507.4 | 1024.8 | 15.1 | 0.00 |
| 14 | -0.96 | 0.04 | | 0.66 | -0.04 | 0.61 | 5 | -520.8 | 1051.6 | 41.9 | 0.00 |
| 15 | 4.58 | | -0.67 | 0.64 | -0.04 | 0.57 | 5 | -537.5 | 1085.0 | 75.3 | 0.00 |
| 6 | -2.06 | 0.05 | | 0.74 | | 0.54 | 4 | -548.7 | 1105.4 | 95.7 | 0.00 |
| 7 | 6.20 | | -1.03 | 0.72 | | 0.50 | 4 | -561.4 | 1130.7 | 121.0 | 0.00 |
| 13 | 0.84 | | | 0.58 | -0.06 | 0.49 | 4 | -565.5 | 1139.1 | 129.4 | 0.00 |
| 12 | 6.20 | 0.02 | -0.38 | | -0.04 | 0.43 | 5 | -583.8 | 1177.6 | 167.9 | 0.00 |
| 10 | 3.74 | 0.03 | | | -0.05 | 0.41 | 4 | -590.7 | 1189.4 | 179.7 | 0.00 |
| 11 | 7.82 | | -0.50 | | -0.05 | 0.37 | 4 | -599.7 | 1207.3 | 197.6 | 0.00 |
| 4 | 7.58 | 0.03 | -0.66 | | | 0.36 | 4 | -602.5 | 1213.0 | 203.3 | 0.00 |
| 9 | 4.72 | | | | -0.07 | 0.33 | 3 | -611.1 | 1228.1 | 218.4 | 0.00 |
| 2 | 3.00 | 0.05 | | | | 0.27 | 3 | -625.1 | 1256.3 | 246.6 | 0.00 |
| 3 | 10.72 | | -0.98 | | | 0.25 | 3 | -631.3 | 1268.5 | 258.8 | 0.00 |
| 5 | -0.04 | | | 0.68 | | 0.23 | 3 | -635.5 | 1277.0 | 267.3 | 0.00 |
| 1 | 4.55 | | | | | 0.00 | 2 | -679.1 | 1362.3 | 352.6 | 0.00 |

Note below is a spatial lag model meant to account for spatial autocorrelation among agricultural societies. Note that the population coefficient is statistically indistinguishable from the OLS models presented above.

SUMMARY OF OUTPUT: SPATIAL LAG MODEL - MAXIMUM LIKELIHOOD ESTIMATION FOR THE AGRICULTURAL SOCIETIES

Data set : AGPOP
 Spatial Weight : AGPOP2.gwt
 Dependent Variable : LNArea Number of Observations: 61
 Mean dependent var : 2.62295 Number of Variables : 4
 S.D. dependent var : 1.21687 Degrees of Freedom : 57
 Lag coeff. (Rho) : 0.934426

R-squared : 0.591494 Log likelihood : -69.571
 Sq. Correlation : - Akaike info criterion : 147.142
 Sigma-square : 0.604909 Schwarz criterion : 155.585
 S.E of regression : 0.777759

| Variable | Coefficient | Std.Error | z-value | Probability |
|----------|-------------|-------------|-----------|-------------|
| W_LNArea | 0.9344262 | 0.0467022 | 20.00818 | 0.00000 |
| CONSTANT | -3.446972 | 0.4227135 | -8.154394 | 0.00000 |
| LNPop | 0.7788503 | 0.09480808 | 8.21502 | 0.00000 |
| FORAGE | 0.03100545 | 0.004936569 | 6.280768 | 0.00000 |

REGRESSION DIAGNOSTICS
 DIAGNOSTICS FOR HETEROSKEDASTICITY
 RANDOM COEFFICIENTS

| TEST | DF | VALUE | PROB |
|--------------------|----|--------|---------|
| Breusch-Pagan test | 2 | 7.7154 | 0.02112 |

DIAGNOSTICS FOR SPATIAL DEPENDENCE

| SPATIAL LAG DEPENDENCE FOR WEIGHT MATRIX : AGPOP2.gwt | | | |
|---|----|--------|---------|
| TEST | DF | VALUE | PROB |
| Likelihood Ratio Test | 1 | 1.4199 | 0.23342 |

COEFFICIENTS VARIANCE MATRIX

| CONSTANT | LNPop | FORAGE | W_LNArea |
|-----------|-----------|-----------|-----------|
| 0.178687 | -0.035880 | -0.000794 | -0.005850 |
| -0.035880 | 0.008989 | 0.000074 | 0.000028 |
| -0.000794 | 0.000074 | 0.000024 | 0.000001 |
| -0.005850 | 0.000028 | 0.000001 | 0.002181 |

| OBS | LNArea | PREDICTED | RESIDUAL | PRED ERROR |
|-----|--------|-----------|----------|------------|
| 1 | 4 | 3.46688 | 0.54142 | 0.53312 |
| 2 | 2 | 3.40160 | -1.42343 | -1.40160 |
| 3 | 4 | 4.34607 | -0.35146 | -0.34607 |
| 4 | 3 | 3.32704 | -0.33214 | -0.32704 |
| 5 | 4 | 3.99065 | 0.00950 | 0.00935 |

| | | | | |
|----|---|---------|----------|----------|
| 6 | 3 | 2.73027 | 0.27393 | 0.26973 |
| 7 | 4 | 3.98299 | 0.01728 | 0.01701 |
| 8 | 3 | 3.52407 | -0.53223 | -0.52407 |
| 9 | 4 | 3.42274 | 0.58625 | 0.57726 |
| 10 | 4 | 3.34842 | 0.66173 | 0.65158 |
| 11 | 3 | 3.25260 | -0.25654 | -0.25260 |
| 12 | 2 | 2.53104 | -0.53931 | -0.53104 |
| 13 | 4 | 3.40072 | 0.60861 | 0.59928 |
| 14 | 4 | 3.56746 | 0.43928 | 0.43254 |
| 15 | 3 | 3.70414 | -0.71510 | -0.70414 |
| 16 | 3 | 3.33493 | -0.34014 | -0.33493 |
| 17 | 0 | 1.20767 | -1.22647 | -1.20767 |
| 18 | 3 | 2.67771 | 0.32731 | 0.32229 |
| 19 | 2 | 1.54293 | 0.46419 | 0.45707 |
| 20 | 3 | 2.84088 | 0.16160 | 0.15912 |
| 21 | 3 | 3.24794 | -0.25180 | -0.24794 |
| 22 | 1 | 0.95473 | 0.04598 | 0.04527 |
| 23 | 3 | 3.25653 | -0.26052 | -0.25653 |
| 24 | 3 | 3.03228 | -0.03278 | -0.03228 |
| 25 | 3 | 3.19511 | -0.19814 | -0.19511 |
| 26 | 2 | 2.88992 | -0.90378 | -0.88992 |
| 27 | 4 | 3.45438 | 0.55412 | 0.54562 |
| 28 | 1 | 1.94322 | -0.95791 | -0.94322 |
| 29 | 2 | 2.07942 | -0.08066 | -0.07942 |
| 30 | 3 | 1.60444 | 1.41730 | 1.39556 |
| 31 | 4 | 3.57958 | 0.42697 | 0.42042 |
| 32 | 3 | 3.48740 | -0.49499 | -0.48740 |
| 33 | 4 | 3.68702 | 0.31785 | 0.31298 |
| 34 | 3 | 3.08612 | -0.08747 | -0.08612 |
| 35 | 1 | 1.23380 | -0.23744 | -0.23380 |
| 36 | 2 | 3.09433 | -1.11137 | -1.09433 |
| 37 | 4 | 2.30174 | 1.72470 | 1.69826 |
| 38 | 0 | 1.43375 | -1.45608 | -1.43375 |
| 39 | 4 | 3.02540 | 0.98978 | 0.97460 |
| 40 | 4 | 4.32835 | -0.33347 | -0.32835 |
| 41 | 3 | 1.75300 | 1.26642 | 1.24700 |
| 42 | 2 | 1.63441 | 0.37128 | 0.36559 |
| 43 | 1 | 1.01538 | -0.01562 | -0.01538 |
| 44 | 0 | 1.04356 | -1.05981 | -1.04356 |
| 45 | 4 | 2.36680 | 1.65864 | 1.63320 |
| 46 | 0 | 1.07499 | -1.09173 | -1.07499 |
| 47 | 2 | 2.56056 | -0.56929 | -0.56056 |
| 48 | 3 | 2.87807 | 0.12382 | 0.12193 |
| 49 | 3 | 2.08075 | 0.93356 | 0.91925 |
| 50 | 3 | 2.56336 | 0.44344 | 0.43664 |
| 51 | 3 | 2.54815 | 0.45889 | 0.45185 |
| 52 | 2 | 2.43240 | -0.43914 | -0.43240 |
| 53 | 3 | 2.34228 | 0.66796 | 0.65772 |
| 54 | 1 | 0.85922 | 0.14297 | 0.14078 |
| 55 | 3 | 3.52543 | -0.53361 | -0.52543 |
| 56 | 3 | 2.01380 | 1.00156 | 0.98620 |
| 57 | 3 | 3.30607 | -0.31084 | -0.30607 |

| | | | | |
|---------------------------|---|---------|----------|----------|
| 58 | 0 | 1.56480 | -1.58917 | -1.56480 |
| 59 | 0 | 1.22471 | -1.24378 | -1.22471 |
| 60 | 3 | 1.47811 | 1.54559 | 1.52189 |
| 61 | 2 | 1.21787 | 0.79431 | 0.78213 |
| ===== END OF REPORT ===== | | | | |