Chapter VIII. Empirical Results: Is the Patrilineal/Fraternal Syndrome Linked to Worse Outcomes on Measures of National Outcomes?

"The findings are clear, consistent, and statistically robust across the board. In fact, the results are the kind of thing most social scientists strive for but almost never find in the course of their careers. If these findings were about something not related to women, chances are that they would be treated as revolutionary in international relations theory; indeed, the effects are much stronger than those supporting the notion of the democratic peace that has spawned an entire cottage industry of inquiry. I leave it to the reader to ponder why powerful effects regarding the treatment of women on the health and security of states do not receive such extensive attention."

--Rose McDermott on polygyny[1]

In this chapter, we identify both dependent variables and control variables that will enable multivariate analysis through general linear models (GLM) and logistic regression, with the purpose of discovering statistically significant relationships pertinent to our hypotheses. In envisioning how to best present the empirical results, we have chosen to identify clusters of dependent variables for ease in reader comprehension.

In order to trace whether the propositions we have put forward in Part Two have any empirical support, we must first identify variables to operationalize the concepts we have been discussing. The Syndrome scale itself was operationalized, coded, and validated in Chapter Three. We additionally note that the Syndrome score was imputed for four countries whose values were missing for some of the variables used in the Syndrome algorithm, as noted in Chapter 3.[2] The IRMI package in R was used for imputation because of non-random missing ordinal data.

We adopt as our level of significance $\alpha \leq .001$, which is a very strict standard for social science analysis meaning there is a 1/1000 chance of observing a pattern as extreme or more extreme than what we have observe if the pattern is not actually present. We use this value to guard against an inflated significance level when we do multiple analyses, using a Bonferoni adjustment for inflated significance level.

A Note on Causal Inference

Because this is a cross-sectional analysis due to the lack of panel data on the Patrilineal/Fraternal Syndrome, some readers might raise the issues of causality and/or causal directionality. We remind the readers that this stage of our research is still in the exploratory phase. Because of the nature of the statistical methods used, we do not make any causal claims regarding the Syndrome and our dependent variables at present, just association. However, there are four reasons to anticipate that further research will advance such claims. First, given the results to be presented in this chapter, we are heartened by the remarkably consistent findings of high significance for the Syndrome in well over a hundred model runs, as well as the Syndrome's consistently substantial effect sizes. Second, these consistent, significant, strong findings are buttressed by our extensive theoretical framework for directionality outlined in Part One. Third, in Part Three of the manuscript, we offer historical process-tracing exploration on the dynamics of change that also speak to the issue of causal direction. Last, we found, as it were, "dose dependent" effects when comparing Post-Syndrome, Transition, and Syndrome societies, finding that amelioration of some of the Syndrome components offered significant amelioration of national outcomes (this analysis will be discussed Chapter in 10). In the future, as we and others develop longitudinal data showing the progression/regression of Syndrome symptoms and the resulting effects on national outcomes, such data developments would enable the use of causal inference analysis, allowing for greater confidence in assessing both causality and causal direction.

Control Variables

Our choice of control variables for multivariate modeling was based on what was *not* identified as a possible ramification or effect of the Syndrome as adumbrated in Part Two. The astute reader will know by this time that our conception of the effects of the Syndrome is quite broad. So, for example, our theoretical framework asserts economic prosperity will be tied to a country's score on the Syndrome scale. As a result, some variables commonly used as control variables, such as GDP per capita, will be reserved for use as dependent variables in our modeling analyses, though we do conduct several ancillary analyses to investigate results when GDP per capita is included in the model.

We turned first to Chapter Seven on "intersections" to identify mediating factors that could suggest control variables. In that chapter, we posited urbanization as just such a mediating factor, and so we use Percent Urban Population from the World Bank, 2015 as a control variable. The second variable identified in that chapter was whether the state provided pensions for the elderly, but this variable is also usefully seen as a dependent variable; that is, where the Syndrome is strong, states do not feel any need to provide such pensions. We therefore prefer to examine the effect of the Syndrome on this variable in this chapter, but will examine the reverse proposition in Chapter 10 where we discuss the dynamics of change. The third variable identified in Chapter 7 was internet access, but as we noted there, this indicator correlates too highly with urbanization rates to be included, and therefore urbanization will, in a sense, also function as a proxy for that variable. The fourth variable noted in Chapter 7 was "shocks," including natural disasters, wars, climate change, etc. However, we could find no index that encompassed all the many forms of exigency we conceptualized. Furthermore, the indices we did find included other types of risk, such as inadequate public infrastructure, which were not part of our conceptualization. For example, the World Risk Index from the University of Stuttgart examines poverty, nutrition, public infrastructure, governance, education, investment, and even gender equity.[3] Furthermore, given that most risk indicators include war, we chose to retain conflict-related variables as dependent variables in the model, not as control variables. We therefore leave it to others to probe the relationship between shocks/exigency and the Syndrome when an appropriate variable measuring such shocks has been developed.

In the search for additional appropriate control variables, we thus turned to other variables that are not part of the Syndrome scale and which are not hypothesized to be effects of the Syndrome as outlined in Part Two. Our other stipulation was that the bivariate correlation between any two control variables had to be less than 0.70 to avoid issues with phenomena such as multicollinearity.[4] Furthermore, the variance inflation factors (VIFs) had to be low; all variance inflation factors (VIFs) computed vis a vis Syndrome ranged from 1.065 to 1.294, allowing for the retention of all the following variables in the model.[5] The variables chosen to serve as control variables, along with their rational for inclusion, are:

- Percent Urban Population.[6] As noted in Chapter Seven, urbanization can weaken the Patrilineal/Fraternal Syndrome's hold over family members by breaking kin ties to land which in turn undercuts patrilocal marriage. The correlation with the Syndrome is -.496 ($p<.001$), which is not high enough to introduce multicollinearity into our modeling efforts, especially since the variance inflation factor (VIF) used as an indicator of multicollinearity, is a low 1.21. While Percent Urban Population is partially a function of the wealth of the nation (measures of which are part of our dependent variable cluster), the bivariate correlation between GDP per capita and Percent Urban Population in our dataset is high but not overwhelming, at .662 (N=168, p-value .001), suggesting that with proper precaution, such as examining variance inflation factors, we may still use Percent Urban when modeling national wealth. Urbanization is significantly correlated with another of our control variables, Religious Fractionalization, but the correlation coefficient is only -.260.
- Aggregated Civilization Identification, based on the work of Samuel Huntington.[7] Some, such as Huntington, have opined that it is civilizational identity that drives conflict and instability, and therefore we include an aggregated measure based on Huntington's classification scheme as a control variable for our multivariate modeling. This regionally-based variable also addresses Galton's Problem, a known issue in cross-national research. Specifically, we have four categories of civilization: 1) if the nation belongs to the group of Western/Orthodox/Latin civilizations as identified by Huntington; 2) if majority Muslim; 3) if the nations are identified with

Hindu/Sinic/Buddhist civilizations; and 4) African countries without majority Muslim adherents. This variable will be treated as nominal/categorical in the data analysis. There were significant differences between these categories in terms of Syndrome score, but the variance inflation factor was only 1.10, so we included this theoretically important variable in the model. Since we believe Syndrome and Civilization are conceptually different—one could theoretically see Syndrome components in any civilization given their historical near-universality—we felt it was appropriate to keep Civilization in the model despite this finding. Indeed, this choice should make it more difficult for Syndrome to emerge as significant in modeling analysis. Using a one-way ANOVA test for continuous variables and Chi-Squared test for the other categorical variable, we found that Civilization was not significantly correlated with the other control variables included in the analysis.

- Colonial Heritage.[8] It is also possible that a history of colonization might influence security and stability outcomes, and the presumption is that such a history might negatively impact such outcomes.[9] We developed our own dichotomous variable coding whether a nation has or has not been colonized, with the temporal delimitation being 1700-2017. For full information and data, see Appendix II. Colonial Status is not significantly related to the Syndrome score or any of the control variables included in the analysis (tested with two-sample t tests for equality of means for the continuous variables and Chi-square for the other categorical variable).
- Percent Arable Land.[10] The idea that terrain and land capacity have some bearing on security outcomes is longstanding, manifesting itself as the study of geopolitics by

scholars such as Sir Halford Mackinder and Nicholas Spykman. More recently, an emphasis on the effect of hard-scrabble environments, such as mountains and deserts, on security and stability has been posited.[11] We therefore include a measure of terrain, specifically the percent of land that is arable from the World Bank, for inclusion in our modeling efforts. This variable is not significantly related to the Syndrome score, nor to any of the other control variables.

- Number of Unique Land Neighbors.[12] Other scholars, for example Harvey Starr, have argued that the number of land neighbors a country has will influence its security and stability.[13] The assumption here is that the greater the number of neighbors, the less secure and less stable a nation will be. We include the count of land neighbors as given in Wikipedia. This variable is not significantly related to the Syndrome score, nor to any of the other control variables in the model.
- Ethnic Fractionalization.[14] Population heterogeneity has long been identified as a risk factor for insecurity and instability in national affairs.[15] While we do believe that there is a linkage between the Syndrome and Ethnic Fractionalization--that is, lineage groups cannot maintain a separate existence without Syndrome-like tactics--how ethnically fractionalized a *particular* nation is should be orthogonal to the existence of the Syndrome, and may add additional insight in multivariate modeling. The correlation between this indicator and the Syndrome score is .520 ($p<.001$), which suggests that patrilineal loyalty is enhanced in the presence of ethnic fractionalization. However, the correlation was not high enough to cause exclusion from the model, with the VIF calculated as only 1.29. As noted above, this variable is

significantly correlated with Urbanization, but the correlation coefficient is only -.260.

- Religious Fractionalization.[16] The Alesina group's scores for Religious Fractionalization do not load on the same factor as the other fractionalization scores they developed. We therefore include the religious fractionalization score separately from the aggregated racial/ethnic/linguistic fractionalization score, noting that this specific type of fractionalization has long been linked to stability and security outcomes by scholars.[17] The religious fractionalization score is not significantly related to the Syndrome score, nor to the other control variables.

The Syndrome and Nine Dimensions of Nation-State Security/Stability

We have identified nine dimensions of nation-state macro-phenomena that we believe are measures of national outcomes that may be significantly associated with the degree to which the country encodes the Syndrome within its society. These include:

1. Political Stability and Governance
2. Security and Conflict
3. Economic Performance
4. Economic Rentierism
5. Health and Wellbeing
6. Demographic Security
7. Education of the Population
8. Social Progress
9. Environmental Protection

In general, and according to propositions elucidated in Part Two of this volume, we expect to see worse outcomes in all of these nine dimensions of national security, governance, and stability the higher the score on the Syndrome scale. Our method to ascertain whether these expectations were borne out in empirical analysis was to comprehensively survey outcome variables related to each of the nine dimensions. Once these were compiled, we examined whether the N size for each variable would allow us to roughly match that of our dataset of 176 nations; if the N size was below 140, we searched for a similarly conceptualized alternative variable with a higher N size or, in some special cases, ran an ancillary analysis. If there were more than a handful of variables identified as pertinent to a given dimension, we also attempted to reduce that number through factor analysis, reserving variables that did not load highly on the identified factors for separate analysis. Before including variables in the factor analysis, we eliminated certain dependent variables that were highly correlated (i.e., $r \geq .90$) with other variables in the same dimension. When several dependent variables loaded highly on a given factor, we combined the country-level Z-scores on the component variables (keeping directionality consistent across the variables) to provide a score for that factor for each nation before running our multivariate models.

In presenting the results, we will first identify what specific variables were examined for the clusters, noting in endnotes which variables were of potential interest but had to be excluded for reasons of N size or overly high inter-correlations with other variables in the same cluster. If a factor analysis was used to reduce the number of variables in the cluster, those factor analysis results are presented next, and variables reserved for separate analysis will also be noted. All of our factor analysis used the

Principal Axis factoring and Promax oblique rotation methods. All of the results had a Kaiser-Meyer-Olkin (KMO) sampling adequacy measures in the good range (greater than .800) and explained at least 50% of the common variance.

After this presentation, the results of the multivariate modeling will be displayed and discussed for each dimension. Because of space considerations, we identify certain variables in each dimension as "primary," and others as "secondary." The full table of results and scatterplots are only presented for each primary variable; the tables and scatterplots for all secondary variables can be found at http://womanstats.org/fpo.html , as can the full replication data sheet for all analyses. If the general linear model (GLM) analysis for a dependent variable found the Syndrome significant, we performed these follow-up analyses: a) calculated a bivariate correlation between the Syndrome and the quantitative dependent variable and generated a scatterplot for these two variables (with shaded points so that darker points indicate higher clustering) or performed an ANOVA test between the Syndrome and categorical or ordinal dependent variables with less than five levels and presented a jittered scatterplot, and b) where model assumptions are met, we also performed a logistic regression analysis to evaluate the effect of a one unit increase in Syndrome score on a country's likelihood to be in the "worse outcome" category for the dependent variable in question.

In order to perform these follow-up logistic regression analyses, the method required dichotomization of each of these dependent variables where Syndrome is significant. We split the values for these variables into a 0 or 1, where for every variable, 0 indicates a good outcome and 1 indicates a worse outcome. We chose a split for each variable by examining histograms, means and standard deviations to determine what range of scores would indicate a "worse outcome." For most quantitative variables, we use the mean as the cut-off and "worse outcome" is defined as worse than average. For a few variables, we look at a natural split in the histogram of the data and most of these splits occurred around the mean value. For ordinal variables, we use the upper values of the worse outcomes for cut-off points. The details of the justifications for the cut-off for each logistic regression variable are presented in Appendix III. We report the logistic results at the α=0.01 level because the purpose in these logistic analyses was to report on risk levels, as a follow-up on significant multivariate modeling results at the more stringent α value of 0.001. The logistic regression model is as follows:

$Y_i = \beta_0 + \beta_1$ Syndrome + β_2 Urbanization + β_3 Type of civilization + β_4 Colonization status + β_5 Percent arable land + β_6 Number of unique land neighbors + β_7 Aggregated Ethnic Racial Linguistic Fractionalization + β_8 Religious Fractionalization + ε_i

where Yi is the logit for worse outcomes (e.g., target group is a worse level of violence and instability). We checked for model validity for the logistic regression models and only used results with: 1) a significant Omnibus test of model coefficients which indicate that the variables in the model collectively influence the logits, 2) a non-significant Hosmer and Lemeshow test which indicates a good fit, and 3) a Nagelkerke R-squared of 0.30 or higher.

A note on GLM multivariate modeling issues is also in order. The possible effects of both multicollinearity and model dependency were of concern to us. As noted previously, we avoided control variables with intercorrelations higher than 0.70, and we also examined VIFs (variance inflation factors) when running our multivariate models. To guard against model dependency, we sought to limit the number of control variables to avoid what Christopher Achen has called "garbage can" multivariate models,[18] where, as Phil

Schrodt picturesquely describes, "even minor changes in model specification can lead to coefficient estimates that bounce around like a box full of gerbils on methamphetamines."[19] We also probed for robustness in model specification by swapping out theoretically related variables, such as examining for certain models whether results changed if we substituted, say, GNP per capita in place of urbanization. In addition, we examined consistency of statistical significance and magnitude of effect size across the numerous dependent variables in these nine broad dimensions of outcomes so that idiosyncratic operationalizations could not be used to cherry-pick results. While no statistical analysis can ever completely avoid the uncertainty inherent in multivariate modeling, we feel these measures offered some tangible mitigation.

We systematize the categorization of both the adjusted R-squared values and the Pearson correlation (r) values. The Adjusted R-squared categorization is as follows: below .2 is considered weak, .2 to .4 is considered moderate, .4 to .6 is considered strong, and .6 and above is considered remarkably strong. The Pearson correlation (r) categorization is as follows: 0 to .4 is considered weak, .4 to .7 is considered moderately strong, and .7 to 1 is considered very strong (note that all of these values are the absolute values for the correlations). We also included the effect sizes for each independent variable in the GLM analysis, using partial eta-squared values from SPSS 23.

1. **Political Stability and Governance Dimension**

In accordance with Part Two of this volume, we hypothesize that nations with higher Syndrome scores will have lower levels of political stability, higher levels of corruption, lower levels of democracy and civil rights, and lower levels of government effectiveness and rule of law.

List and description of variables in the Political Stability and Governance Dimension

The variables which are most commonly used in the International Relations field and which the authors deemed as the most valid measures of political stability and governance are listed in alphabetical order below. (Note: Some potential variables of interest had to be excluded due to low N size and/or correlation ≥.9 with the variables in this list; see this endnote.[20]) The list provides the variable name, the source from which the variable was obtained, whether the measure is nominal/ordinal/continuous and the range where applicable, which directionality the variable takes, the N size for the variable, and whether any transformations were used:

1) Civil Liberties (2015), Economist Intelligence Unit (Accessed from The Quality of Government Institute), ordinal (0-10), lower scores are worse, N=165
2) Deliberative Component Index (2017), V-Dem Annual Report Version 7.1, continuous scale (min=.021, max=.989), lower scores are worse, N=169
3) Democratic Political Culture Index (2015), Economist Intelligence Unit (Accessed from The Quality of Government Institute), ordinal (0-10), lower scores are worse, N=165
4) Equal Protection Index (2017), V-Dem Annual Report Version 7.1, continuous scale (min=.042, max=.976), lower scores are worse, N=169
5) Fragile States Index (2016), The Fund for Peace, continuous scale (min=18.8, max=114.0), higher scores are worse, N=172

6) Freedom House Index Political Rights (2016), Freedom House, ordinal (1-7), higher scores are worse (1=most free and 7=least free), N=176
7) Freedom of Religion (2016), Social Progress Index, ordinal (1-4), lower scores are worse, N=171
8) Freedom to Establish Religion (2014), Human Freedom Index, ordinal (0-10), lower scores are worse, N=133 (Note: The N size is too low to include in EFA, so this outcome variable was analyzed separately)
9) Functioning of Government (2015), Economist Intelligence Unit's index of democracy (Accessed from The Quality of Government Institute), ordinal (0-10), lower scores are worse, N=165
10) Global Peace Index (2017), Vision of Humanity, continuous scale (min=1.11, max=3.81), higher scores are worse, N=163
11) Government Participation of Women (2016), The WomanStats Project, ordinal (0-4), higher scores are worse, N=176 seats in parliament and also cabinet positions held by women
12) Percent of seats in parliament held by women (2016), The World Bank, percent, lower scores are worse, N=172
13) Political Instability (2017), Vision of Humanity, ordinal (1-5), higher scores are worse, N=162
14) Political System Type (2013), Freedom Rising (subcomponent of The World Values Survey) (Accessed from The Quality of Government Institute), ordinal (0-1), lower scores are worse (0 = Unbound Autocracy, 1 = Effective Democracy), N=170

15) Press Freedom Index (2016), The Reporters without Borders World Press Freedom Index (Accessed from The Quality of Government Institute), ordinal (0-100), higher scores are worse (0 = total press freedom, 100 = no press freedom), N=170

16) Private Property Rights (2016), Social Progress Index, ordinal (0-100), lower scores are worse, N=170

17) Regime Types (2013), Freedom Rising (subcomponent of The World Values Survey) (Accessed from The Quality of Government Institute), ordinal (1-4), lower scores are worse (1 = Pure Autocracy, 4 = Minimal Democracy), N=168

18) Security Apparatus (2016), subcomponent of the Fragile States Index, continuous scale (min=1.3, max=10.0), higher scores are worse indicating the Security Apparatus lacks a monopoly on the use of force or is used malevolently, N=171

19) State Legitimacy (2016), subcomponent of the Fragile States Index, continuous scale (min=.50, max=9.90), higher scores are worse, N=171

20) World Bank Corruption (2015), The World Bank, continuous scale (min=-1.81, max=2.30), lower scores are worse, N=176

21) World Bank Government Effectiveness (2015), The World Bank, continuous scale (min=-2.26, max=2.21), lower scores are worse, N=176

22) World Bank Rule of Law (2015), The World Bank, continuous scale (min=-2.37, max=2.04), lower scores are worse, N=176

We desired to reduce the number of variables examined through factor analysis in order to find variables which clustered highly on the same factor and thus could be analyzed together. In this manner, we identified four factors and three variables that did not load sufficiently high on either one of these factors.

The EFA extracted the four factors below, discussed in the order they were extracted, and the z-scores of the variables in each factor were added to create the score for the cluster, after checking for consistency in their directionality:

1) Government System and Effectiveness factor (higher scores are considered better, N=158): This factor consists of these five variables with loadings ranging from .447 to 1.121: (1) World Bank Government Effectiveness 2015, (2) Functioning of Government 2017, (3) Democratic Political Culture Index, (4) Political System Type, and (5) Equal Protection Index.

2) Lack of Security, Stability and Legitimacy factor (higher scores are considered worse on these variables, N=158): This factor consists of these four variables with loadings ranging from -.951 to -.775: (1) Security Apparatus, (2) Political Instability, (3) State (Il)Legitimacy, and (4) Global Peace Index.

3) Lack of Freedom factor (higher scores are considered worse, N=170): This factor consists of these two variables with loadings ranging from -.839 to -.668: (1) Press Freedom Index 2017 and (2) Freedom House Index of Political Rights 2016.

4) **Freedom of Religion and Deliberative Component factor** (higher scores are considered better, N=164): This factor consists of these two variables with loadings ranging from .615 to .812: (1) Freedom of Religion and (2) Deliberative Component Index.

Outline of analyses in Political Stability and Governance Dimension

We begin our empirical data analysis with the Fragile States Index. This oft-used index measures the vulnerability of a state across a number of pressures that contribute to the risk of the state failing, becoming subject to ethnic tensions, civil war, and the inability to govern capably and transparently. We utilize two variables as ancillary analyses to test the robustness of our initial analysis. The first ancillary analysis uses our Lack of security, stability and legitimacy factor. This factor has four indicators. The first indicator is Security Apparatus, a subcomponent of the Fragile States Index, which measures to what extent the state has a monopoly on the use of legitimate force and can guarantee the physical security of its citizens. The second indicator is State Legitimacy, also a subcomponent of the Fragile States Index, which measures the extent to which citizens believe that a given regime possesses authority or rightful power. The third indicator is the Political Instability Index which assesses factors that destabilize governments that include the degrees of social unrest, the inability to transfer power following an election, and excessive executive control. The fourth indicator is the Global Peace Index which measures the levels of peacefulness domestically and internationally. It assesses societal safety and security, domestic conflict, involvement in regional or international conflict and militarization within the state. Because the Global Peace Index is widely used, we include it separately as our second ancillary analysis for the Fragile States Index.

Second, we use our Government System and Effectiveness factor as a main analysis. This factor is composed of five indicators. The first indicator is World Bank's Government Effectiveness Index which includes a wide range of factors that contribute to government stability and resilience. It includes institutional effectiveness, quality of basic services such as sanitation, education and health care, taxation, budgeting and financial management.

The second indicator is the Functioning of Government Index which measures the ability of government institutions in a given country to function transparently and fairly and their ability to provide needed services to citizens. The third indicator is the Democratic Political Culture Index which looks at the norms and attitudes regarding what citizens or subjects consider right and authoritative in terms of political regimes and practices. The fourth indicator is Political System Type which ranks regime types from authoritarian to democratic with two categories of autocracy, bounded and unbounded, and two of democracy, ineffective and effective. The fifth indicator is the Equal Protection Index which measures equal protection under the law for minority ethnic, religious, or other groups. We used two ancillary variables as robustness checks: World Bank Government Effectiveness Index which is an indicator in the above factor; and Regime Type, an index that scales political regimes from pure autocracy to minimal democracy with three categories of autocracies, pure, inclusive and liberal.

Third, we look solely at corruption using World Bank's Corruption Index which looks at a number of measures of transparency or corruption in state institutions. Examples include corruption among public officials, irregularity in tax collection or public contracts, bribery, and accountability.

Fourth, we look at the World Bank Rule of Law. This well-regarded indicator of the rule of law across nations measures a host of variables that range from extent of types of crime, judicial independence, and protection for private property. We use Private Property Rights as an ancillary variable. This variable measures to what extent a citizen may contract openly and legally for property or commercial ventures. The inability to do so demonstrates, for example, judicial ineffectiveness, power held by strong group interests and presence of state corruption.

Fifth, we use our Lack of Freedom factor which has two indicators: The Press Freedom Index, prepared by Reporters without Borders, which measures freedom of press worldwide that is a major determinant of rights and liberties within a given country; Freedom House Index of Political Rights, a respected project which measures democratic norms and practice worldwide by surveying competitive elections, the role of parties and interest groups, and the role of the executive. We chose to use Freedom House rather than the Polity dataset because of its larger sample size. We used two variables for our ancillary analysis: Freedom House Index of Political Rights and Civil Liberties Index. The latter surveys a nation's respect for individual rights such as freedom of speech, press, religion, and respect for judicial process, factors which in the U.S. would be termed First Amendment rights, freedoms guaranteed citizens under the law.

Sixth, we take up legal and individual means to demonstrate respect and tolerance for the views of others. Freedom to Establish Religion, our main analysis, looks at a state's openness to new expressions of freedom of conscience beyond what is traditionally accepted. For ancillary analysis we used our Freedom of Religion and Deliberative Component factor. This factor consists of two indicators. The first indicator, Freedom of Religion which guarantees freedom of conscience is a primary measure of individual rights. The second indicator, Deliberative Component Index, is a measure of productive dialogue. It surveys how decisions are reached in a given political system, that is, whether the system is capable of inclusive, respectful, and reasoned dialogue as opposed to coercion to accept a policy advanced by state elites.

Seventh, we look at inclusion of women in government. Our main analysis uses Percent of Seats in Parliament Held by Women which measures the percentage of seats held by women in legislatures. We use Government Participation of Women as an ancillary variable. This WomanStats variable looks at women in legislatures and adds the number of ministerial posts held by women for that given year.

Model specification

The model for each of these dependent variables or factor takes the following form in each case:

Dependent variable or factor$_i$ = Syndrome + Civilization + Colonial status + Urbanization + Terrain + Number of land neighbors + Religious fractionalization + Ethnic fractionalization + ε_i

A general linear model (GLM) procedure was used to investigate the statistical significance and explanatory power of these eight independent variables. We hypothesized that, after controlling for the influence of the other seven control variables, the Patrilineal-Fraternal Syndrome will be a significant predictor of these three factors and four dependent variables for the nations in our study. Significance is defined as $p \leq .001$, a stringent standard for significance in social science research.

Model results

We run 16 general linear models under the Political Stability cluster: seven of these were used in the main analysis and the other nine were used as ancillary variables. We find that the Syndrome was significant in 15 out of these 16 models. The only model where Syndrome was not significant was for our Freedom of Religion and Deliberative Component factor. Table 8.1.1 below summarizes the GLM results of the seven main analyses and the nine ancillary analyses. We discuss the variables in descending order of their R-squared values, which are indicators of the usefulness and explanatory power of the models.

Table 8.1.1 Summary of GLM results for the Political Stability cluster in descending order of R-squared values. Ancillary analysis in italics.

Dependent variables	**Adjusted R-squared (N)**	**Independent variables significant at .001 in descending order of effect size**
1) Fragile States Index (FSI)	.744 (172)	Syndrome Urbanization
Lack of security, stability and legitimacy factor • *FSI's Security Apparatus* • *FSI's State Legitimacy* • *Political Instability* • *Global Peace Index*	*.605 (158)*	*Syndrome* *No. of Land neighbors*
Global Peace Index	*.365 (163)*	*Syndrome* *No. of Land neighbors*
2) Government System and Effectiveness factor • WB Government Effectiveness • Functioning of Government • Democratic Political Culture Index • Political System Type • Equal Protection Index	.565 (158)	Syndrome
World Bank Government Effectiveness	*.612 (176)*	*Syndrome* *Urbanization* *Religious fractionalization*
Regime Type	*.314 (168)*	*Syndrome*
3) World Bank Corruption Score	.563 (176)	Syndrome Urbanization Colonial Status
4) World Bank Rule of Law Score	.561 (176)	Syndrome Urbanization Religious Fractionalization
Private Property Rights	*.513 (170)*	*Syndrome* *Urbanization* *Colonial Status* *No. of Land neighbors*
5) Lack of freedom factor • Press Freedom Index • Freedom House Index of Political Rights	.415 (170)	Syndrome
Freedom House Index of Political Rights	*.426 (176)*	*Syndrome*
Civil Liberties	*.459(165)*	*Syndrome*
6) Freedom to establish religion	.245 (133)	Syndrome Terrain

Freedom of Religion and Deliberative component factor • *Freedom of Religion* • *Deliberative Component Index*	*.276 (164)*	Ethnic Fractionalization *Land Neighbors*
7) Percent of Seats in Parliament held by Women *Government Participation of Women*	.116 (172) *.221 (176)*	Syndrome *Syndrome* *Muslim Civilization*

In this section, we elaborate on the GLM results of the dependent variables used in the seven main analyses.

1) **Fragile States Index** (higher scores are considered worse, N=172): The results are as follows:

Table 8.1.2 General Linear Model Results for Fragile States Index (Adjusted R-squared=.744)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	57.153	6.303	.000	.357
Colonial Status=0 (Never Colonized)	-3.867	3.059	.208	.011
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	2.591	2.704	.340	.006
CIV=2 (Muslim)	-4.406	3.165	.166	.013
CIV=4 (Hindu/Sinic/Buddhist)	5.109	3.900	.192	.011
CIV=5 (Africa)	0			
Syndrome 2017	3.433	.331	.000*	.422
Urbanization 2015	-.315	.053	.000*	.194

Number of Land Neighbors	1.019	.406	.013	.041
Terrain 2014	.066	.074	.372	.005
Religious Fractionalization 2003	-10.562	4.503	.020	.036
Ethnic Fractionalization 2003	8.064	4.837	.098	.018

* significant at 0.001

The adjusted R-squared is a remarkably strong .744, indicating that the specified model explained at least 74.4% of the variability of the Fragile States Index scores, and the only two variables achieving significance are the Syndrome and Percent Urban Population. The coefficients of these two variables are opposite, that is, the higher the Syndrome score, the more fragile the state, but the higher the Urbanization percentage, the less fragile the state. However, the effect size for the Syndrome is more than twice that of Urban Population. The bivariate correlation reveals a very strong association between the Syndrome and State Fragility, with a very strong correlation of .817 ($p<.0001$) and a fairly tight clustering in the scatterplot in Figure 8.1.1.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The cut-off was determined by the mean, and "worse outcome" is defined as worse than average. Details of the cut-off are found in Appendix III. The Syndrome, Urbanization, and Religious Fractionalization are the only variables that are significant in predicting the logits or predicted probabilities of a more fragile state. We specifically find that for every one unit increase in the Syndrome, the odds increase by 113%, or alternatively there is a 2.13 times greater risk, that the country experiences greater fragility, after holding all other control variables constant.

We wanted to perform a robustness on the modeling of the Fragile States Index, by adding in GDP per capita (log transformed PPP) to the model, and then as a secondary check to swap out Urbanization Rate with GDP per capita (log transformed, PPP), and see how Syndrome fares under those circumstances. That is, is wealth a more important predictor of state fragility than the Syndrome? When GDP per capita is added to the model, it renders Urbanization insignificant. Even so, the Syndrome remains significant and its effect size (.419) is larger than that of GDP per capita (.302). We also tried swapping out Urbanization for GDP per capita, and the results were very similar; the Syndrome remained significant and its effect size (.448) remained slightly larger than that of GDP per capita (.432). We find that noteworthy: whether women are disempowered at the household level is more important in explaining state fragility than the nation's level of wealth.

We also used our lack of security, stability, and legitimacy factor as an ancillary analysis for Fragile States Index. The analysis showed a remarkably strong .605 adjusted R-squared, indicating that the specified model explained at least 60.5% of the variability of the Security, Stability, and Legitimacy factor. Consistent with the results for Fragile States Index, the Syndrome is a significant predictor of the stability, peacefulness, and legitimacy of a nation. The only two variables in the model which are significant are the Syndrome and Number of Land Neighbors but the effect size for Syndrome is almost four times larger than that of land neighbors. The coefficient for the Syndrome variable is positive, meaning that the higher the Syndrome score, the more unstable, the less peaceful, and the less legitimate the state. The coefficient for land neighbors is also positive, meaning that having more neighbors predisposes a state to lower levels of stability.

We also used the Global Peace Index as an ancillary variable for the Fragile States Index and again, found that Syndrome is a significant predictor of global peacefulness. The analysis yielded a moderate adjusted R-squared value of .365. The other significant predictor of peacefulness was the number of land neighbors. The more land neighbors a country had, the lower level of peacefulness for the country.

2) **Government System and Effectiveness factor** (lower scores are considered worse, N=158): Recall that this cluster combines several variables (World Bank Government Effectiveness, Functioning of Government, Democratic Political Culture Index, Political System Type, and Equal Protection Index), the results are as follows:

Table 8.1.5: General Linear Model Results for Government System and Effectiveness Factor (Adjusted R-squared= .565)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	2.950	1.468	.047	.028
Colonial Status=0 (Never Colonized)	1.782	.709	.013	.044
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	-.846	.634	.185	.013
CIV=2 (Muslim)	-.541	.750	.471	.004
CIV=4 (Hindu/Sinic/Buddhist)	-1.314	.894	.144	.015
CIV=5 (Africa)	0			
Syndrome 2017	-.566	.077	.000*	.280
Urbanization 2015	.035	.013	.006	.053

Number of Land Neighbors	-.260	.096	.008	.050
Terrain 2014	.003	.017	.850	.000
Religious Fractionalization 2003	2.025	1.068	.060	.025
Ethnic Fractionalization 2003	-.227	1.130	.841	.000

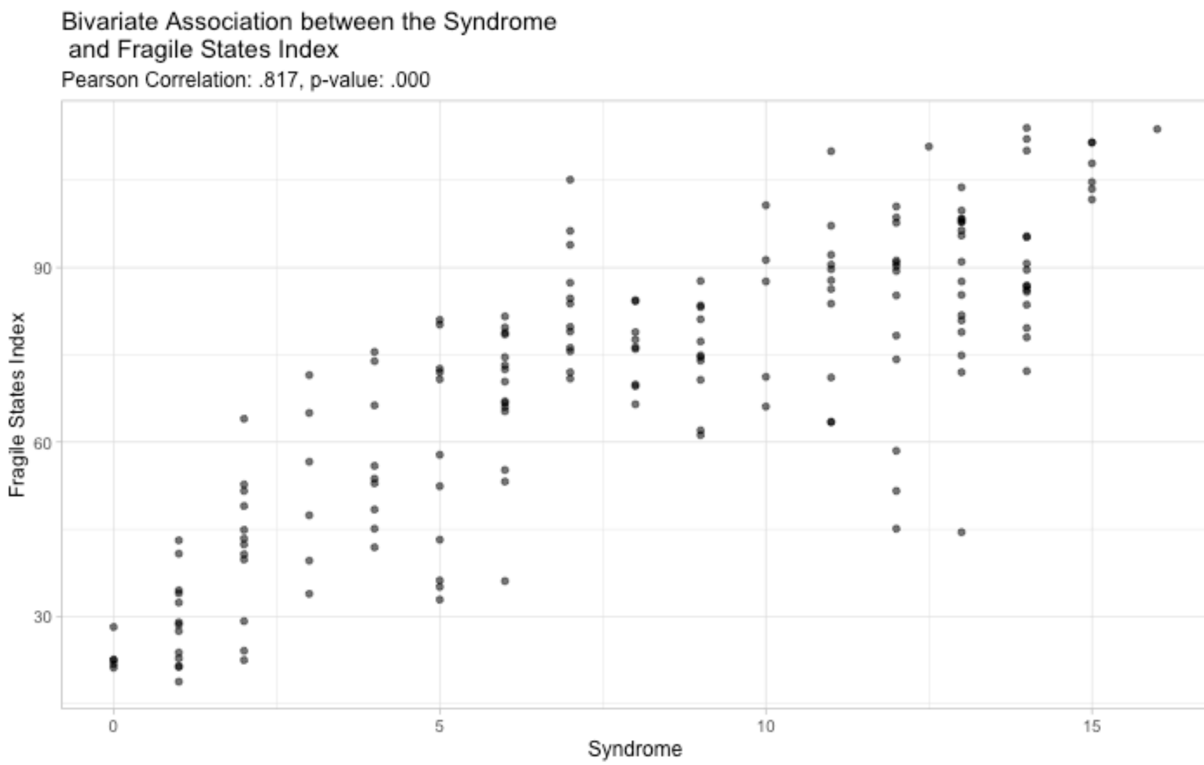
* significant at 0.001

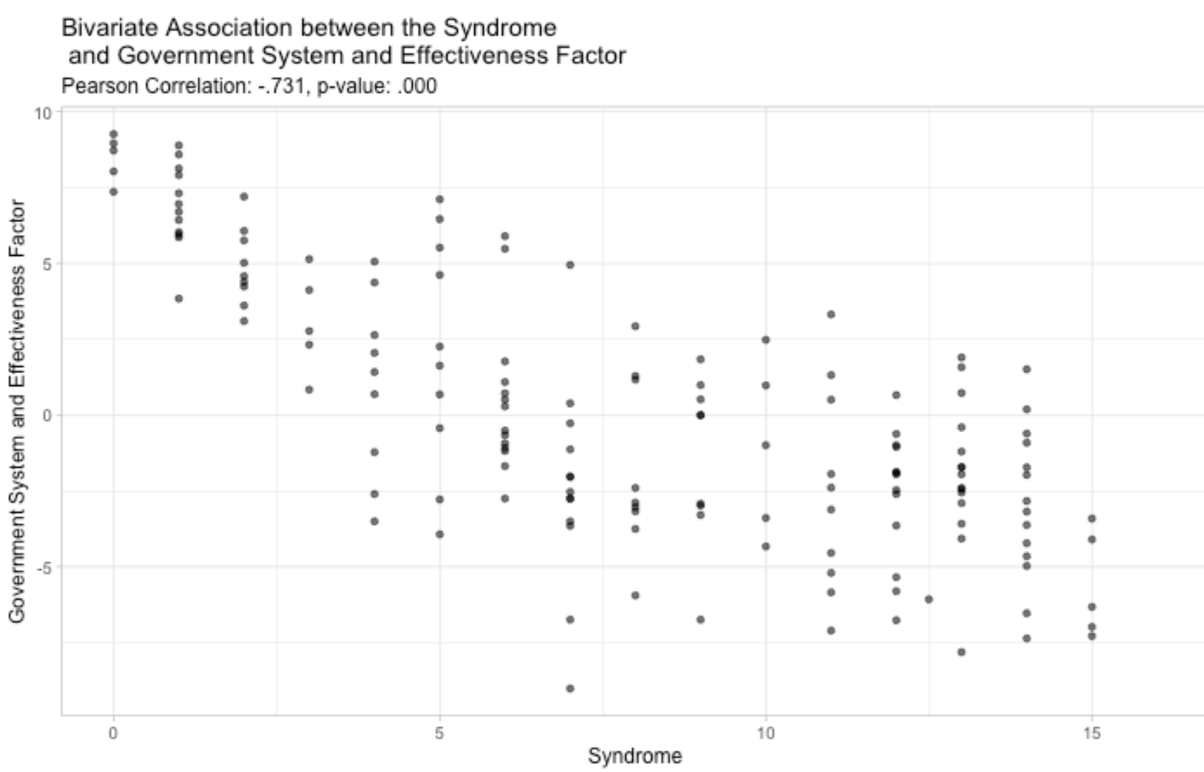
The adjusted R-squared for this model is a strong .565, indicating that the specified model explained at least 56.5% of the variability of the Government System and Effectiveness Cluster. Interestingly, the only significant variable in the model is the Syndrome, and the coefficient is negative, meaning that the higher the Syndrome score, the lower the score on this cluster of variables measuring type of political system and that system's effectiveness. The effect size of the Syndrome is .280, much larger than the effect sizes of any other variable in the model. The bivariate correlation bears out this very strong relationship ($r = -.731$, $p<.000$), as does the bivariate scatterplot in Figure 8.1.1. High Syndrome scores are strongly associated with a lack of democracy and a lack of governmental effectiveness. This large-N analysis corroborates our theoretical framework suggesting the horizon for democracy and for effective governance is constrained by the presence of the Syndrome as the first political order of the society.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome and Religious Fractionalization are the only variables that are significant in predicting the logits or predicted probabilities of worse government systems and lower levels of government effectiveness. We specifically find that for every one unit increase in the Syndrome, the odds increase by 253%, or alternatively there is a 3.53 times higher risk, that the country experiences worse government systems and lower levels of government effectiveness, after holding all other control variables constant.

We examined the World Bank's Government Effectiveness and Regime Type as ancillary analyses for the Government System and Effectiveness factor. The first ancillary analyses showed that the model had a strong adjusted R-squared of .612 with Syndrome, Urbanization, and Religious fractionalization as the three best predictors of government effectiveness. The negative coefficient for Syndrome shows that the higher Syndrome scores are associated with lower levels of government effectiveness. The second ancillary analyses showed that the model had an adjusted R-squared of .314 for Regime Type with Syndrome as the only significant predictor. As signified by its negative coefficient, the higher the Syndrome score, the more autocratic the nation's regime type. Whether women are subordinated has important effects on regime type and regime effectiveness.

Figure 8.1.1 Scatterplots of Syndrome with Fragile States Index and Government System and Effectiveness factor





3) **World Bank Corruption 2015** (Lower scores are considered worse, N=176): The results are as follows:

Table 8.1.6: General Linear Model Results for World Bank Corruption 2015 (Adjusted R-squared=.563)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	.372	.343	.281	.008
Colonial Status=0 (Never Colonized)	.543	.167	.001*	.066
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	-.297	.147	.045	.027
CIV=2 (Muslim)	-.154	.173	.375	.005
CIV=4 (Hindu/Sinic/Buddhist)	-.402	.213	.061	.023
CIV=5 (Africa)	0			
Syndrome 2017	-.106	.018	.000*	.191
Urbanization 2015	.013	.003	.000*	.115
Number of Land Neighbors	-.069	.022	.002	.062
Terrain 2014	-.004	.004	.314	.007
Religious Fractionalization 2003	.549	.244	.026	.033
Ethnic Fractionalization 2003	-.360	.257	.164	.013

* significant at 0.001

The adjusted R-squared is a strong .563, indicating that the specified model explained at least 56.3% of the variability of corruption, and three independent variables are statistically significant: Never Colonized, the Syndrome, and Percent Urban Population.

While never having been colonized and a higher percent of urban population are associated with lower levels of corruption, the Syndrome is associated with higher levels of corruption. Noteworthy is that the effect size for the Syndrome is the largest of the model, consistent with our hypotheses. The bivariate correlation is a moderately strong -.684 ($p<.0001$), and the scatterplot in Figure 8.1.2 shows a distinctive negative slope. Corruption at the household level does indeed appear to be associated with corruption in the larger polity, as predicted by our theoretical framework.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome, Urbanization, and Land Neighbors are the only variables that are significant in predicting the logits or predicted probabilities of a country experiencing high levels of corruption. We specifically find that for every one unit increase in the Syndrome, the odds increase by 23%, or alternatively there is a 1.23 times greater risk, that the country experiences high levels of corruption, after holding all other control variables constant.

4) **World Bank Rule of Law 2015** (Lower scores are considered worse, N=176): The results are as follows:

Table 8.1.7: General Linear Model Results for World Bank Rule of Law 2015 (Adjusted R-squared=.561)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	.173	.341	.612	.002
Colonial Status=0 (Never Colonized)	.523	.166	.002	.062
Colonial Status=1 (Ever Colonized)	0			

CIV=1 (West/Orthodox/Latin)	-.187	.146	.203	.011
CIV=2 (Muslim)	.033	.172	.850	.000
CIV=4 (Hindu/Sinic/Buddhist)	-.364	.212	.088	.019
CIV=5 (Africa)	0			
Syndrome 2017	-.104	.018	.000*	.186
Urbanization 2015	.011	.003	.000*	.096
Number of Land Neighbors	-.059	.022	.008	.046
Terrain 2014	.000	.004	.935	.000
Religious Fractionalization 2003	.832	.243	.001*	.073
Ethnic Fractionalization 2003	-.495	.256	.055	.024

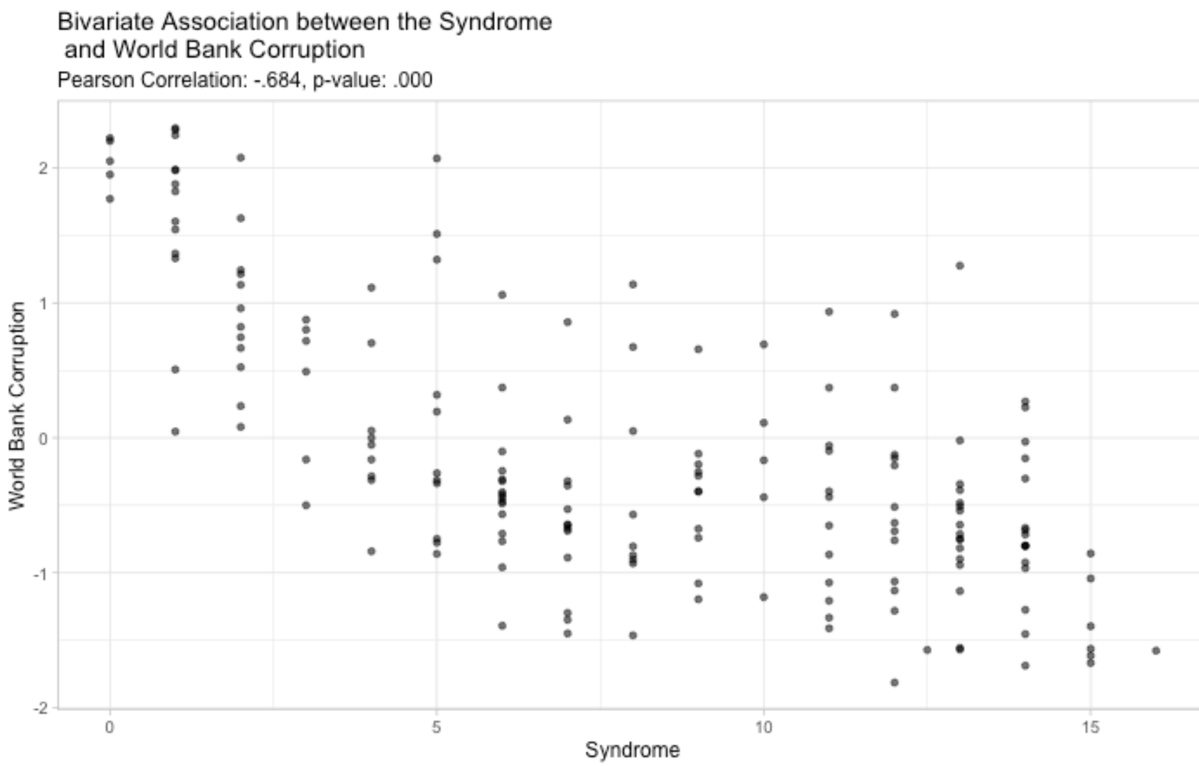
* significant at 0.001

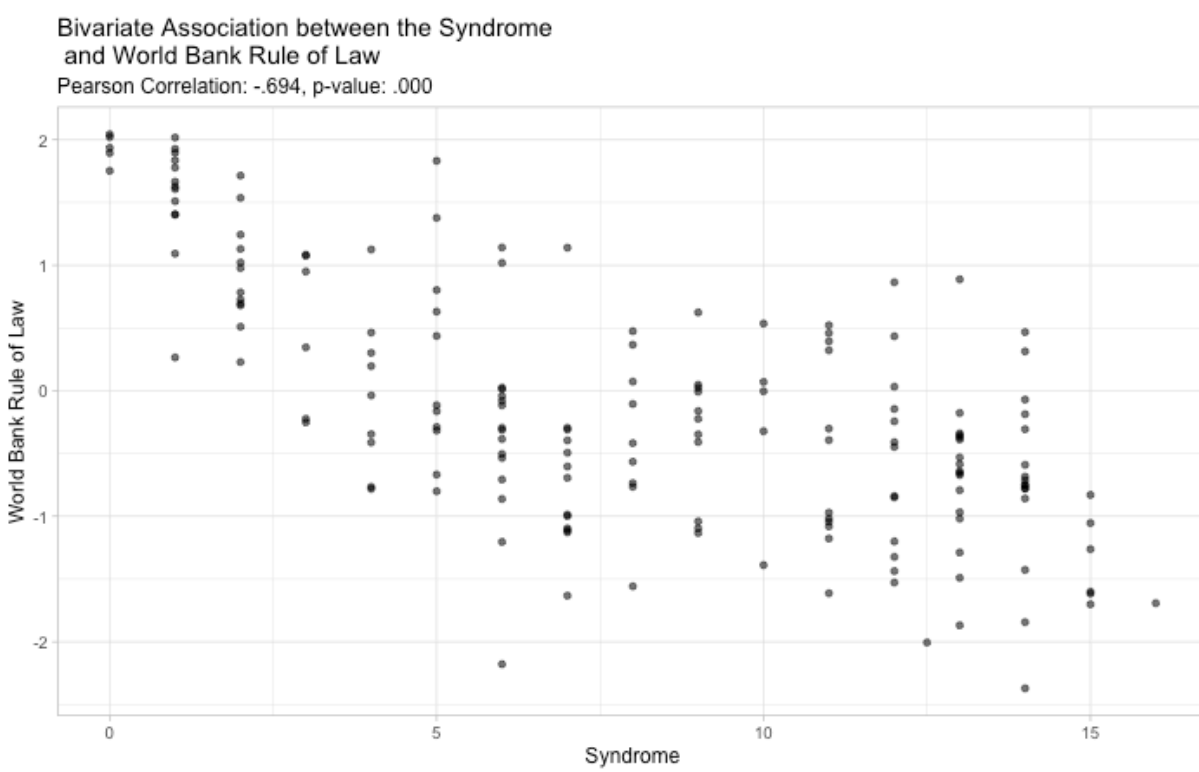
The adjusted R-squared is a strong .561, indicating that the specified model explained at least 56.1% of the variability of rule of law, and three variables achieve significance: the Syndrome, Percent Urban Population, and Religious Fractionalization. Religious Fractionalization and Percent Urban Population have positive coefficients, meaning they are associated with better rule of law. However, the Syndrome's coefficient is negative, meaning the higher the Syndrome score, the lower the more diminished the rule of law. The effect size for the Syndrome is the highest of the three significant variables, and the bivariate correlation is a moderately strong -.694 (p<.0001), with a distinctive negative slope as shown in the scatterplot in Figure 8.1.2. Again, we consider this a very significant finding from a theoretical standpoint: a lack of rule of law at the household level for women is strongly and significantly associated with lack of rule of law at the level of the polity.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome, Urbanization, and Religious Fractionalization are the only variables that are significant in predicting the logits or predicted probabilities of a country experiencing a diminished rule of law. We specifically find that for every one unit increase in the Syndrome, the odds increase by 22%, or alternatively there is a 1.22 times greater risk, that the country experiences a diminished rule of law, after holding all other control variables constant.

We used Private Property Rights as an ancillary variable for the Rule of Law and the ancillary analysis showed a strong adjusted R-squared of .513, indicating that the specified model explained at least 51.3% of the variability of the private property rights, and the four variables that achieve significance are Colonial Status, the Syndrome, Percent Urban Population/Urbanization, and Number of Land Neighbors. The effect size for Syndrome is a bit larger than any of the other significant variables. The coefficients indicate that both countries that were never colonized and those with greater Urbanization are associated with greater property rights; higher scores on both the Syndrome and the number of land neighbors are associated with significantly lower levels of property rights.

Figure 8.1.2 Scatterplots of Syndrome with World Bank Corruption Score and World Bank Rule of Law Score





5) **Lack of Freedom factor** (higher scores are considered worse, N=170): Recall that this cluster combines two variables (Press Freedom Index 2017 and Freedom House Index Political Rights 2016), the results are as follows:

Table 8.1.8: General Linear Model Results for Lack of Freedom Factor (Adjusted R-squared=.415)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	-1.761	.734	.018	.038
Colonial Status=0 (Never Colonized)	-.522	.353	.142	.015
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	.386	.313	.220	.010
CIV=2 (Muslim)	1.022	.366	.006	.051
CIV=4 (Hindu/Sinic/Buddhist)	1.071	.451	.019	.037
CIV=5 (Africa)	0			
Syndrome 2017	.231	.038	.000*	.199
Urbanization 2015	-.005	.006	.449	.004
Number of Land Neighbors	.128	.047	.008	.048
Terrain 2014	-.008	.009	.365	.006
Religious Fractionalization 2003	-.560	.524	.286	.008
Ethnic Fractionalization 2003	-.759	.560	.177	.012

* significant at 0.001

The adjusted R-squared is a strong .415, indicating that the specified model explained at least 41.5% of the variability of the Lack of Freedom Cluster, and the only variable in the model that was significant was the Syndrome. The coefficient for the Syndrome was positive, meaning that the worse the Syndrome score, the worse the situation of political rights and press freedom in a nation. The bivariate correlation with Syndrome was a moderately strong .625 ($p<.000$), but the scatterplot in Figure 8.1.3 shows quite a bit of "scatter" for middle range Syndrome countries. So, for example, some of the countries in the central part of the graph, being middling on the Syndrome scale but scoring high on this factor indicating lack of freedom, include North Korea, Cuba, and Belarus. It is interesting that these are former communist countries where the Syndrome was nominally ameliorated at least in formal law, but nevertheless still lack these political freedoms.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome is the only variable that is significant in predicting the logits or predicted probabilities of low levels of press freedom and political rights. We specifically find that for every one unit increase in the Syndrome, the odds increase by 49%, or alternatively there is a 1.49 times greater risk, that the country experiences low levels of press freedom and political rights, after holding all other control variables constant.

Note that we used Civil Liberties and Freedom House's Index of Political Rights as ancillary variables for the Lack of freedom factor. The results of the former ancillary analysis also showed a strong adjusted R-squared of .459, indicating that the specified model explained at least 45.9% of the variability of the Civil Liberties, and the only significant variable in the model was also the Syndrome, with a noteworthy effect size. The coefficient for the Syndrome was negative, meaning that higher Syndrome scores are associated with lower levels of civil liberties.

The second ancillary analysis also showed a strong adjusted R-squared value of .426 and, consistent with the previous findings, Syndrome is the only significant predictor of the political rights a country bestows on its citizens: the higher the Syndrome score, the lower the level of political rights for a country's citizens, on average.

6) **Freedom to Establish Religion** (lower scores are considered worse, N=133): The results of the GLM analysis are given in the table below:

Table 8.1.9: General Linear Model Results for Freedom to Establish Religion (Adjusted R-squared=.245)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	6.323	1.570	.000	.123
Colonial Status=0 (Never Colonized)	-.145	.627	.818	.000
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	-.094	.610	.878	.000
CIV=2 (Muslim)	-1.320	.721	.070	.028
CIV=4 (Hindu/Sinic/Buddhist)	.913	.900	.312	.009
CIV=5 (Africa)	0			
Syndrome 2017	-.259	.075	.001*	.092
Urbanization 2015	.012	.013	.381	.007
Number of Land Neighbors	-.049	.089	.582	.003
Terrain 2014	.060	.017	.001*	.092
Religious Fractionalization 2003	.113	1.024	.913	.000
Ethnic Fractionalization 2003	3.749	1.145	.001*	.085

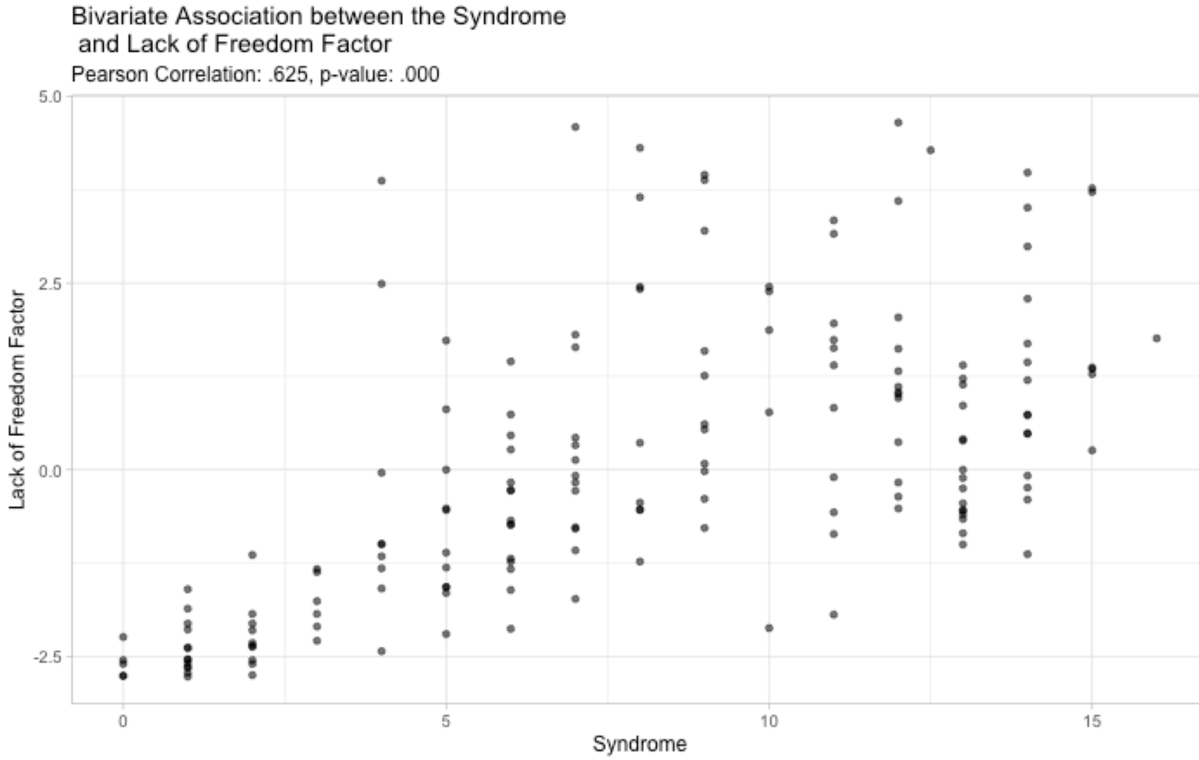
* significant at 0.001

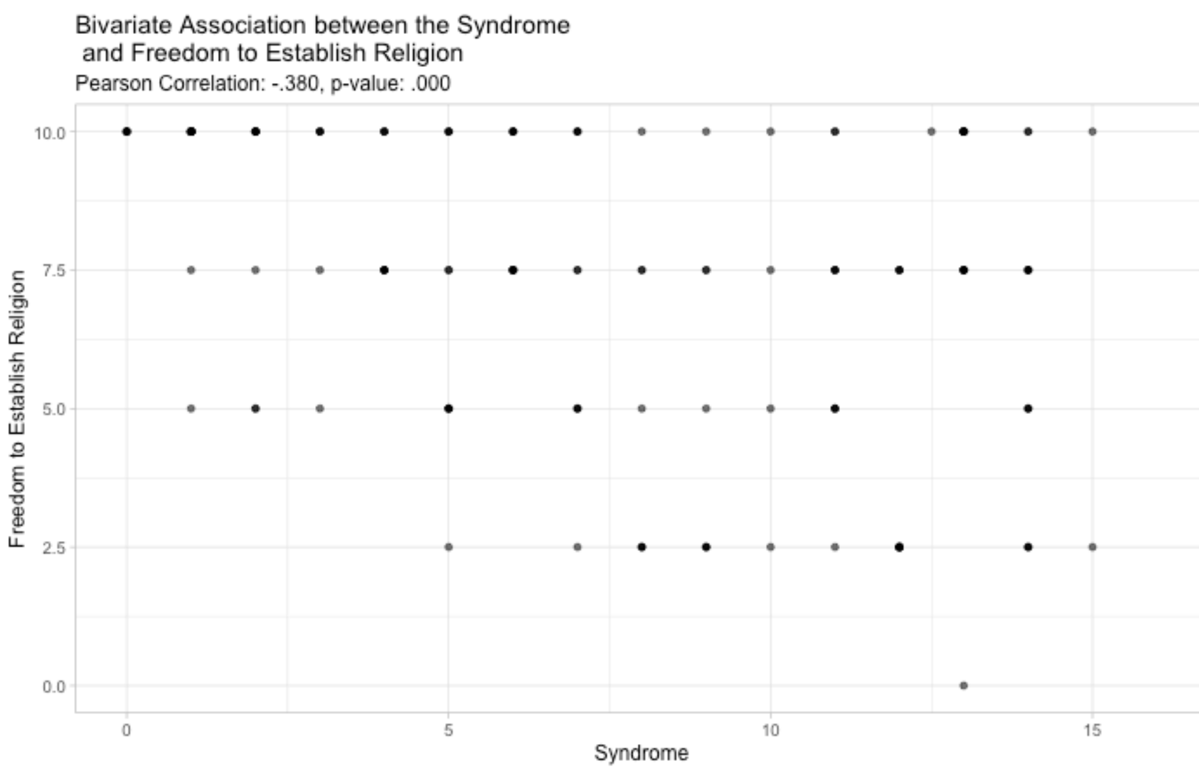
The adjusted R-squared is a moderate .245, indicating that the specified model explained at least 24.5% of the variability of the freedom to establish religion, and three variables in the model were significant: the Syndrome, Percent Arable Land, and Ethnic Fractionalization. Both Percent Arable Land and Ethnic Fractionalization have positive coefficients, meaning the higher the Percent of Arable Land and the higher the ethnic fractionalization, the more likely the nation offered the freedom to establish religion. The coefficient for Syndrome is negative, indicating that countries with higher Syndrome are on average less likely to offer the freedom to establish religion. The effect sizes for the three variables are essentially the same. The bivariate correlation with Syndrome is a weak -.380, and the scatterplot in Figure 8.1.3, and reveals that the nations with the worst levels of freedom of religion also have higher Syndrome scores. The lowest country in the graph, with a high Syndrome score and very low Freedom to Establish Religion (the only one in the lowest category), is the United Arab Emirates.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome, Terrain, and Ethnic Fractionalization are the only variables that are significant in predicting the logits or predicted probabilities of a country having less freedom to establish religion. We specifically find that for every one unit increase in the Syndrome, the odds increase by 26%, or alternatively there is a 1.26 times greater risk, that the country experiences less freedom to establish religion, after holding all other control variables constant.

We used our Freedom of Religion and Deliberative Component factor as an ancillary variable and we obtained an adjusted R-squared of .276 in the ancillary analysis. The only significant predictor of this factor is the number of land neighbors.

Figure 8.1.3 Scatterplots of Syndrome with Lack of freedom factor and Freedom to establish religion





7) **Percent of Seats in Parliament Held by Women** (lower scores are considered worse, N=172): The results are as follows:

Table 8.1.10: General Linear Model Results for Percent of Seats in Parliament Held by Women (Adjusted R-squared=.116)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	35.160	5.841	.000	.197
Colonial Status=0 (Never Colonized)	3.357	2.844	.240	.009
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	-2.278	2.510	.366	.006
CIV=2 (Muslim)	-3.955	2.944	.181	.012
CIV=4 (Hindu/Sinic/Buddhist)	-3.006	3.627	.409	.005
CIV=5 (Africa)	0			
Syndrome 2017	-1.214	.304	.000*	.097
Urbanization 2015	-.058	.049	.234	.010
Number of Land Neighbors	.344	.375	.360	.006
Terrain 2014	.000	.068	.998	.000
Religious Fractionalization 2003	-6.281	4.168	.134	.015
Ethnic Fractionalization 2003	5.270	4.377	.230	.010

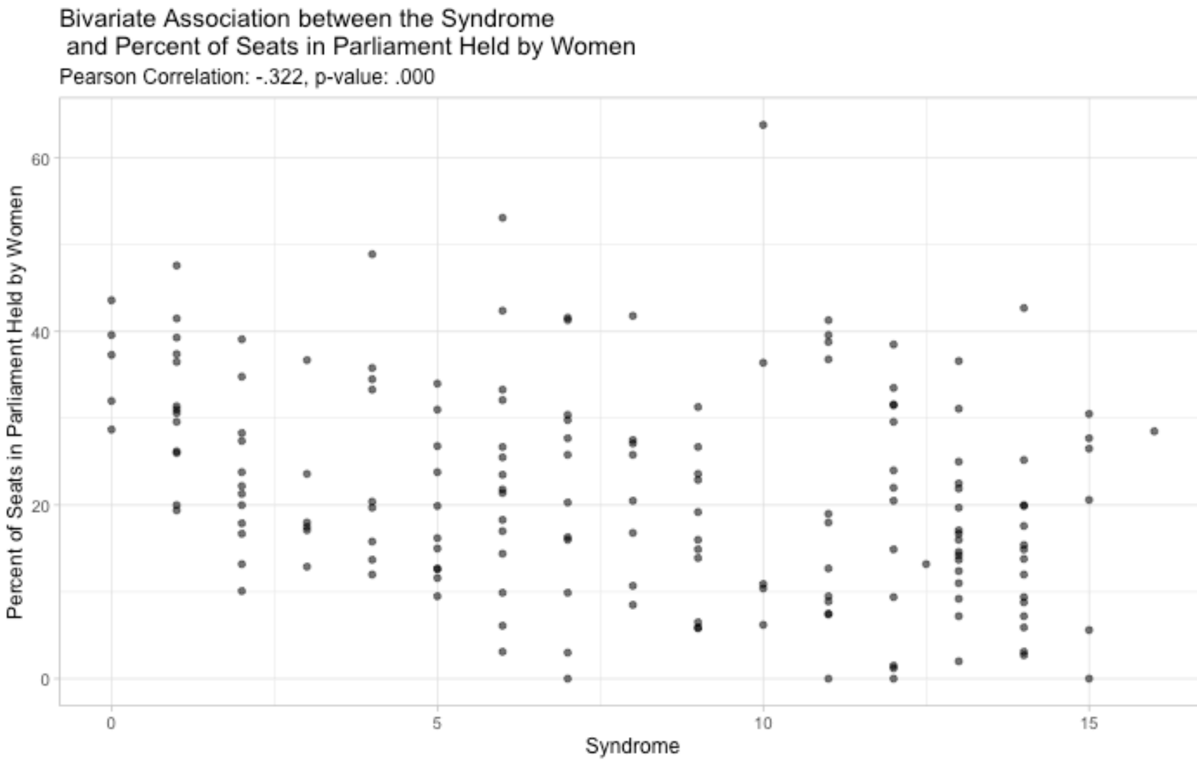
* significant at 0.001

The adjusted R-squared is a weak .116, indicating that the specified model explained only 11.6% of the variability of the percentage of parliament seats held by women, and the only significant variable in the model was the Syndrome. This suggests that the percent of seats women in government may have very little to do with personal empowerment of women at the household level, as Hudson's Afghan MP acquaintance mentioned in the Preface. The coefficient was negative, meaning the higher the Syndrome score, the lower the percentage of women in parliament. The bivariate correlation was a weak -.322 ($p<.0001$), with quite a bit of spread across the distribution, as shown in the scatterplot in Figure 8.1.4. The outlier in the top middle of the plot is Rwanda, where the situation of women is still not very good, despite excellent levels of female representation in parliament (see also Townley, 2017, on this point).

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable), but find that the model does not meet the validity requirements, so we do not report the results.

We also used Government Participation of Women as an ancillary variable for Percent of Seats in Parliament held by Women. The WomanStats scale of the participation of women in government looks not only at seats in parliament, but also women in top posts in the executive branch. The adjusted R-squared is a moderate .221, indicating that the specified model explained only at least 22.1% of the variability of the government participation by women, again showing that governmental participation by women does not necessarily associate with personal empowerment of women in households, and the two variables of significance in the model are the Syndrome and Muslim Civilization, each of which have a positive coefficient because higher scores on this Government Participation scale are considered worse. The effect size for the Syndrome was almost twice that of Muslim Civilization.

Figure 8.1.4 Scatterplot of Syndrome with Percent of seats in Parliament held by women



Concluding Discussion for the Political Stability and Governance Dimension

For our Political Stability dimension empirical probe, we ran 16 separate GLM analyses. Of those 16 models, the Syndrome was significant in 15, was the *only* significant variable in 6 of those 15, and was the significant variable with the largest effect size in another 8 of the GLM analyses. The findings are quite robust and consistent across models: the single best determinant of Political Stability overall was the Syndrome. If you wished to understand the political stability of a nation, including measures of state fragility, quality of governance, type of governance, freedom of religion and corruption, among others, you would derive greater explanatory power by looking at the subordination of women at the household level via the components of the Syndrome than any of the other variables examined in the model, including ethno-religious fractionalization, urbanization, colonial history, civilization, terrain, and geographic borders.

Furthermore, the horizon of possibility for democracy is significantly constrained by the presence of the Syndrome, and autocracy, corruption and lack of rule of law at the household level are strongly and significantly associated with the Syndrome at the level of the polity. That finding contradicts those of other researchers who fail to find a significant relationship between women's empowerment and democracy, perhaps because these scholars did not use any variables in our Syndrome index that measures that empowerment at the household level.[21] Our theoretical framework anticipated these relationships, and large N analysis has corroborated it.

2. Security and Conflict Dimension

Our hypothesis is that, *ceteris paribus*, we expect societies with a higher Syndrome score to experience higher rates of conflict and insecurity. We took a broad approach to this conflict and security dimension, looking at measures of terrorism, crime, grievance, military expenditures, internal and external conflicts, trafficking, and even a measure of women's mobility in public spaces.

List and Description of Variables in the Security and Conflict Dimension

The variables which are most commonly used in the International Relations field and which the authors deemed as the most valid measures of national security and conflict are listed in alphabetical order below. (Note: Some potential variables of interest had to be excluded due to low N size and/or correlation greater than or equal to .9 with the variables in this list.[22]) The list provides the variable name, the source from which the variable was obtained, whether the measure is nominal/ordinal/continuous and the range where applicable, which directionality the variable takes, the N size for the variable, and whether any transformations were used:

1) Access to Weapons (2017), Vision of Humanity's Global Peace Index, scale from 1-5, higher scores are worse, N=163
2) Deaths from External Conflicts (2017), Vision of Humanity's Global Peace Index, scale from 1-5, higher scores are worse, N=163
3) Deaths from Internal Conflict (2017), Vision of Humanity's Global Peace Index, scale from 1-5, higher scores are worse, N=163
4) Disappearances (2014), Human Freedom Index, scale from 0-10, lower scores are worse, N=157
5) External Conflicts Fought (2017), Vision of Humanity's Global Peace Index, scale from 1-5, higher scores are worse, N=163
6) Freedom of Domestic Movement (2014), Human Freedom Index, scale from 0-10, lower scores are worse, N=157
7) Global Terrorism Index (2017), Vision of Humanity's Global Terrorism Index, scale from 0-10, higher scores are worse, N=163
8) Group Grievance (2014), Fund for Peace's Fragile State Index (Accessed from The Quality of Government Institute), scale from 1-10, higher scores are worse, N=171
9) Homicide Rate (2016), Social Progress Index, rate of deaths per 100,000 population, higher scores are worse, N=160
10) Homicide (2014), Human Freedom Index, scale from 0-10, lower scores are worse, N=156

11) Homicide (2017), Vision of Humanity's Global Peace Index, rates per 100,000 population scaled 1-5, higher scores are worse, N=163

12) Incarceration Rate (2017), Vision of Humanity's Global Peace Index, rates per 100,000 population scaled 1-5, higher scores are worse, N=163

13) Incidents of Terrorism in a given year (2017), Vision of Humanity's Global Terrorism Index, number of terrorism incidents in a year, higher scores are worse, N=163

14) Intensity of Internal Conflicts (2017), Vision of Humanity's Global Peace Index, scale from 1-5, higher scores are worse, N=163

15) Intensity of Violent Conflict (2014), Human Freedom Index, scale from 0-10, lower scores are worse, N=157

16) Internal Conflicts Fought (2017), Vision of Humanity's Global Peace Index, scale from 1-5, higher scores are worse, N=163

17) Military Expenditures % of GDP (2016, or most recent without searching earlier than 2007), World Bank, percent, higher scores are worse, N=158

18) Military Expenditures (2017), Vision of Humanity's Global Peace Index, scale from 1-5, higher scores are worse, N=163

19) Monopoly on the use of force (2016), Bertelsmann Stiftung's Transformation Index (Accessed from The Quality of Government Institute), scale from 1-10, lower scores are worse, N=128 (this variable was excluded from the factor analysis because its sample size was too small (<140), but it was analyzed separately)

20) Neighboring Country Relations (2017), Vision of Humanity's Global Peace Index, scale from 1-5, higher scores are worse, N=163

21) Overall index of Disappearance, Conflict, and Terrorism Score (2014), Human Freedom Index, scale from 0-10, lower scores are worse, N=157

22) Perceptions of Criminality (2017), Vision of Humanity's Global Peace Index, rates per 100,000 population scaled 1-5, higher scores are worse, N=163

23) Political Stability and Absence of Violence/Terrorism (2016), The World Bank, scale from -2.5 to 2.5 (actual range is -2.91 to +1.53), lower scores are worse, N=176

24) Political Terror Scale (2016), The Political Terror Scale (this is terror inflicted by the state, such as torture, extra-judicial killings, etc.), scale from 1-5, higher scores are worse, N=175

25) Political Terror (2017), Vision of Humanity's Global Peace Index, scale from 1-5, higher scores are worse, N=163

26) Societal Violence Scale (2014, or 2013 if 2014 value was unavailable), The Political Terror Scale, scale from 1-5, higher scores are worse, N=174

27) States of Concern to the International Community Scale (2011), The SOCIC Scale, scale from 0-4, higher scores are worse, N=157

28) Terrorism Fatalities (2014), Human Freedom Index, scale from 0-10, lower scores are worse, N=157

29) Terrorism Impact (2017), Vision of Humanity's Global Peace Index, ordinal scale from 1-5, higher scores are worse, N=163 (this variable was excluded from the factor analysis because it was too highly correlated with the Global Terrorism Index variable (>0.9), but it was analyzed separately)

30) Terrorism Injuries (2014), Human Freedom Index, scale from 0-10, lower scores are worse, N=156

31) Trafficking (2015), The WomanStats Project, scale from 0-4, higher scores are worse, N=174

32) Violent Crime (2017), Vision of Humanity's Global Peace Index, scale from 1-5, higher scores are worse, N=163

33) Violent Demonstrations (2017), Vision of Humanity's Global Peace Index, scale from 1-5, higher scores are worse, N=163

34) Weapons Imports (2017), Vision of Humanity, scale from 1-5, rates, higher scores are worse, N=163

35) Women's Mobility (2017), The WomanStats Project, scale from 0-4, higher scores are worse, N=173

To reduce the number of variables, we ran a factor analysis to find variables loading highly on the same factors and thus could be analyzed together. In this manner, we identified six factors, and the z-scores of the variables in each factor were added to create the score for each cluster, after checking for consistency in direction (or multiplied by -1 to maintain consistency):

1) Violence and Instability factor (higher scores are considered worse, N=145):
This factor consists of these nine variables with loadings ranging from .607 to 1.018: (1) States of Concern, (2) Group Grievance, (3) Political Terror Scale, (4) Trafficking of Women, (5) Intensity of Internal Conflicts, (6) Violence Demonstrations, (7) Political Terror, (8) Women's Mobility, and (9) Relations with Neighboring Countries.

2) Absence of Violent Terrorism and Freedom of Domestic Movement factor (lower scores are considered worse, N=157): This factor consists of these two variables with loadings ranging from -.817 to -.529: (1) Political Stability and Absence of Violence/Terrorism and (2) Freedom of Domestic Movement.

3) Terrorism Injury and Violent Conflict factor (lower scores are considered worse, N=156): This factor consists of these four variables with loadings ranging from -.977 to -.607: (1) Terrorism Injuries, (2) Terrorism Fatalities, (3) Intensity of Violent Conflicts, and (4) Overall Index of Disappearance, Conflict, and Terrorism.

4) Homicide and Violent Crime factor (higher scores are considered worse, N=154): This factor consists of these three variables with loadings ranging from .615 to .943: (1) Homicide Rates (SPI), (2) Homicide (GPI), and (3) Violent Crime.

5) **Terrorism Incidents and Internal Conflict factor** (higher scores are considered worse, N=163): This factor consists of these three variables with loadings ranging from .517 to .831: (1) Incidents of Terrorism in a given year, (2) Internal Conflicts Fought, and (3) Global Terrorism Index.

6) **Military Expenditure and Weapons Importation factor** (higher scores are considered worse, N=152): This factor consists of these three variables with loadings ranging from .727 to .923: (1) Military Expenditure as % of GDP, (2) Military Expenditures (GPI), and (3) Weapons Imports.

Outline of analyses used in Conflict and Security Dimension

We begin our empirical analysis of this dimension by looking at our Violence and Stability Factor which has nine indicators. These indicators are: States of Concern to the International Community, which measures state compliance to international norms in terms of use of force, international political norms and international economic norms; Group Grievance, a sub-component of the Fragile States Index, which assesses the extent of cleavages between groups in society and focuses on divisions based on social or political characteristics especially those related to access to resources and services; Political Terror Scale which measures a country's levels of violence and terror for a specific year; Trafficking of Women scale which ranks states as to laws governing trafficking of women and the degree of state compliance to that law; Intensity of Internal Conflicts which ranks states from conflict to severe crisis evaluating the severity of conflict within the state; Violent Demonstrations which ranks the possibility of violent demonstrations within a state; Political Terror, a sub-component of the Global Peace Index, which measures a country's levels of political terror and violence for a given year; Women's Mobility scale which assesses the ability of a woman to be in and to move in public spaces; and Neighboring Country Relations, a sub-component of the Global Peace Index, which measures relations with neighboring countries on a scale from peaceful to very aggressive.

We identified six variables for ancillary analyses for the Violence and Instability factor. The first ancillary analysis used our Absence of Violent Terrorism and Freedom of Domestic Movement factor which has these two indicators: Political Stability and Absence of Violence/Terrorism from the World Bank, which estimates the likelihood of political instability and politically-motivated violence for a given state; Freedom of Domestic Movement which measures the ability to move freely in a country from severely restricted to unrestricted movement. The second ancillary analysis only used the World Bank's Political Stability and Absence of Violence/Terrorism. The third and fourth ancillary analyses used Trafficking of Women, and Political Terror Scale (all indicators of our Violence and Instability factor).

Second, we look at the Societal Violence Scale, which provides data on the extent of violence within a given country in terms of scope, severity, and numbers affected.

Third, we utilize the Military Expenditures and Weapons Importation factor, which has three indicators, in the main analysis. The first indicator is Military Expenditure as % of GDP (Stockholm International Peace Research Institute). This variable uses the NATO definition, which includes among others all expenditures labeled military including capital expenditures, peacekeeping, personnel, pensions, social services and maintenance figured as a % of a nation's GDP. The second indicator, Military Expenditures, a sub-component of the Global Peace Index, also figures military expenditures defined as the outlays of governments to meet costs of national armed forces, as a percentage of GDP. The third indicator in this factor, Weapons Imports, a sub-component of the Global Peace Index, measures major conventional weapons imported for a period of time figured per capita for a given country. We use Access to Weapons in an ancillary analysis. This sub-component of the Global Peace Index measures the ease of access for small arms and light weapons.

Fourth, we look at Monopoly on the Use of Force, which measures the central government's control over weapons of force and whether it extends to all regions of the country or is challenged by non-government groups.

Fifth, we use the Global Terrorism Index, a oft-used and inclusive source that scales the impact of terrorism including fatalities, incidents, injuries, and property damage in our main analysis. We use our Terrorism Incidents and Internal Conflict factor in our first ancillary analysis. This factor has three indicators: Incidents of Terrorism in a given year, a sub-component of the Global Terrorism Index, which gives the total actual number of terrorist attacks in a given year; Internal Conflicts Fought which measures the number and duration of a country's internal conflicts; and Global Terrorism Index. The second ancillary analysis uses Terrorism Impact, which combines terrorism injury, fatality, and property damage data. The third ancillary analysis uses the Terrorism Injury and Violent Conflict factor. This factor has four indicators: Terrorism Injuries which scales the number injured by terrorism in a year; Terrorism Fatalities which scales the number killed through terrorism in a given year by country; Intensity of Violent Conflicts which assesses the intensity of conflicts, which are then ranked from no conflict to severe crisis; and the Overall Index of Disappearance, Conflict and Terrorism which includes variables such as violent conflicts, internally organized conflicts, politically motivated disappearances, battle-related deaths, and impact of armed conflict in personal freedoms. The fourth ancillary analysis uses Deaths from Internal Conflict, which is a subcomponent of the Global Peace Index.

Sixth, we use the Perceptions of Criminality which utilizes assessments of levels of perceived criminality in a given country in the main analysis. We use three variables for ancillary analysis. The first is our Homicide and Violent Crime factor, which has three indicators: Homicide Rates, a sub-component of the Social Progress Index (using data from the UN Office on Drugs and Crime), which measures the number of homicides per 100,000; Homicide, a sub-component of the Global Peace Index, which measures the total number of deliberate inflictions of death (penal code offences) per 100,000; and Violent crime which assesses likelihood of violent crime that poses significant problems for government or business. The second ancillary variable is Homicide, a sub-component of the Human Freedom Index, rates acts of intentional homicide for 100,000 and then scales the data. The third ancillary variable is Incarceration Rate which measures the prison population per 100,000 population.

Lastly, we look at two external conflict indicators: Deaths from External Conflict, a sub-component of the Global Peace Index, which measures the number of deaths from conflicts external to the country analyzed, in a main analysis; and External Conflicts Fought which measures the number and duration of conflicts outside its own territory which a country is involved in, in an ancillary analysis.

Model specification

The model for each dependent variable or dependent variable cluster takes the same form in each case:

> Dependent variable or cluster_i = Syndrome + Civilization + Colonial status + Urbanization + Terrain + Number of land neighbors + Religious fractionalization + Ethnic fractionalization + ε_i

A general linear model (GLM) was used to investigate the statistical significance and explanatory power of these eight independent variables. We hypothesized that, after controlling for the influence of the other seven control variables, the Patrilineal-Fraternal Syndrome will still be a significant predictor of these dependent variables and dependent variable clusters for the nations in our study.

Model results

We run 20 general linear model analyses under Security and Conflict cluster, seven of these are used in the main analysis and the other 13 were used as ancillary variables. We find that the Syndrome was significant in 14 of those 20 models. The six models where Syndrome was not significant include the following dependent variables: (1) Homicide and

Violent Crime factor, (2) Homicide (HFI), (3) Deaths from Internal Conflicts, (4) Deaths from External Conflicts, (5) External Conflicts Fought, and (6) Incarceration Rates. It is interesting that most of these dimensions are related to crime and external conflict. Table 8.2.1 summarizes the GLM results of the analyses for the conflict and security cluster. We discuss the variables in descending order of their R-squared values, which are indicators of the usefulness and explanatory power of the models.

Table 8.2.1. Summary of GLM results for the Conflict and Security cluster in descending order of R-squared values. The ancillary analyses are italicized.

Dependent variable	**Adjusted R-squared (N)**	**Independent variables significant at .001 in descending order of effect size**
1) Violence and Instability factor • States of Concern to the International Community • Group Grievance • Political Terror Scale • Trafficking of Women • Intensity of Internal Conflicts • Violence Demonstrations • Political Terror • Women's Mobility • Relations with Neighboring Countries	.642 (145)	Syndrome No. of Land neighbors
Absence of Violent Terrorism and Freedom of Domestic Movement factor • *Political Stability and Absence of Violence/Terrorism* • *Freedom of Domestic Movement*	*.525 (157)*	*Syndrome* *No. of Land neighbors*
Political Stability and Absence of Violence/ Terrorism	*.547(176)*	*Syndrome* *No. of Land neighbors*
Trafficking of Women	*.454 (174)*	*Syndrome*
Political Terror Scale	*.425 (163)*	*Syndrome* *No. of Land neighbors*

2) Societal Violence Scale	.377 (174)	Syndrome No. of Land neighbors
3) Military Expenditures and Weapons Importation factor • Military Expenditure as % of GDP • Military Expenditures • Weapons Imports *Access to Weapons*	.318 (152) *.383 (163)*	Urbanization Syndrome *Syndrome*
4) Monopoly on the Use of Force	.234 (128)	Syndrome
5) Global Terrorism Index *Terrorism Incidents and Internal Conflict factor* • *Incidents of Terrorism in a given year* • *Internal Conflicts Fought* • *Global Terrorism Index* *Terrorism Impact* *Terrorism Injury and Violent Conflict factor* • *Terrorism Injuries* • *Terrorism Fatalities* • *Intensity of Violent Conflicts* • *Overall Index of Disappearance, Conflict and Terrorism* *Deaths from internal conflict*	.239 (163) *.220 (163)* *.213 (163)* *.137 (156)* *.135 (163)*	Syndrome No. of Land neighbors *Syndrome* *Syndrome* *No. of Land neighbors* *Syndrome* *None*
6) Perceptions of Criminality *Homicide and Violent Crime factor* • *Homicide Rates* • *Homicide from Global Peace Index* • *Violent Crime* *Homicide from Human Freedom Index* *Incarceration Rate*	.188 (163) .180 (154) *.110 (156)* *.047 (163)*	Syndrome *Syndrome* *None* *None*

7) External Conflicts Fought *Deaths from External Conflict*	.044 (163) *.011 (163)*	None *None*

We elaborate on the GLM results of the seven dependent variables used in the main analysis.

1) **Violence and Instability factor** (higher scores are considered worse, N=145):

   Recall that this factor combines several variables (States of Concern Scale, Group Grievance, Political Terrorism Scale, Trafficking, Internal Conflict, Violent Demonstrations, Political Terror, Women's Mobility, and Neighboring Country Relations), the results obtained are as follows:

Table 8.2.2: General Linear Model Results for Violence and Instability factor (Adjusted R-squared= .642)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	-10.720	2.428	.000	.134
Colonial Status=0 (Never Colonized)	-.656	1.130	.562	.003
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	2.528	1.019	.014	.047
CIV=2 (Muslim)	3.061	1.198	.012	.049
CIV=4 (Hindu/Sinic/Buddhist)	4.210	1.440	.004	.064
CIV=5 (Africa)	0			
Syndrome 2017	1.013	.127	.000*	.334
Urbanization 2015	-.031	.020	.132	.018
Number of Land Neighbors	.581	.152	.000*	.104
Terrain 2014	.039	.026	.147	.017

Religious Fractionalization 2003	-4.205	1.733	.017	.045
Ethnic Fractionalization 2003	2.461	1.913	.201	.013

The adjusted R-squared is a remarkably strong .642, indicating that the specified model explained at least 64.2% of the variability of the several different measures of violence, instability, and insecurity. Only two variables emerged as significant: the Syndrome and Number of Land Neighbors. Both variables are positively related to this cluster of measures; that is, the higher the Syndrome score or the greater the number of land neighbors, the higher the level of instability and insecurity. The effect for the Syndrome is the largest in the model, over three times that of Land Neighbors. The bivariate relationship between the Syndrome and this cluster is very strong at .773 ($p<.0001$), and the scatterplot in Figure 8.2.1 demonstrates this well. The Syndrome is strongly and significantly associated with greater violence and instability for the nation-state.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome and Land Neighbors are the only variables that are significant in predicting the logits or predicted probabilities of higher levels of violence and instability. We specifically find that for every one unit increase in the Syndrome, the odds increase by 47%, or alternatively there is a 1.47 times greater risk, that the country experiences higher levels of violence and instability, after holding all other control variables constant.

We used four ancillary variables as a check for the Violence and instability factor. The first is Absence of Violent Terrorism and Freedom of Movement factor. The adjusted R-squared for this model is a strong .525, indicating that the specified model explained at least 52.5% of the variability of this factor, and very much like the previous cluster of variables, only the Syndrome and Number of Land Neighbors were significant. This, time, however, both variables are negatively associated with the cluster, meaning the higher the Syndrome score and the greater the number of land neighbors, the lower the level of freedom of domestic movement and the more unstable, violent, and subject to terrorism is the nation-state. The effect size for the Syndrome is the strongest in the model.

The second ancillary variable we used was Political Stability and Absence of Violence/Terrorism. The results showed a strong adjusted R-squared value of .547, indicating that our specified model explained at least 54.7% of the variability in the Political Stability and Absence of Violence/Terrorism of the countries in our study. The same two variables were significant: Syndrome and Number of Land Neighbors, with directionality as predicted. High Syndrome scores are associated with a lack of political stability and the presence of violence and terrorism.

The third ancillary variable we used was Trafficking of Women. The results showed a strong adjusted R-squared value of .454, indicating that the specified model explained at least 45.4% of the variability of the Trafficking of Women scores, and only one variable emerges as significant: the Syndrome. The coefficient is positive, meaning the higher the Syndrome score, the higher the levels of trafficking of women.

The fourth ancillary variable we used was the Political Terror Scale which yielded a strong adjusted R-squared value of .425, indicating that the specified model explained at least 42.5% of the variability of the Political Terror Scale scores, and two variables are significant: the Syndrome and Number of land neighbors, with the effect size of the former larger than that of the latter. Both variables have positive coefficients, meaning the higher the Syndrome score or the greater the number of land neighbors, the higher the score on the Political Terror Scale.

2) **Societal Violence Scale** (higher scores are considered worse, N=174): The results are as follows:

Table 8.2.3: General Linear Model Results for Societal Violence Scale (Adjusted R-squared=.377)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	1.664	.443	.000	.087
Colonial Status=0 (Never Colonized)	.294	.216	.175	.012
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	.258	.190	.177	.012
CIV=2 (Muslim)	-.153	.223	.494	.003
CIV=4 (Hindu/Sinic/Buddhist)	.293	.275	.288	.008
CIV=5 (Africa)	0			
Syndrome 2017	.114	.023	.000*	.140
Urbanization 2015	-.005	.004	.172	.013
Number of Land Neighbors	.100	.028	.001*	.076
Terrain 2014	.012	.005	.018	.037
Religious Fractionalization 2003	-.344	.318	.281	.008

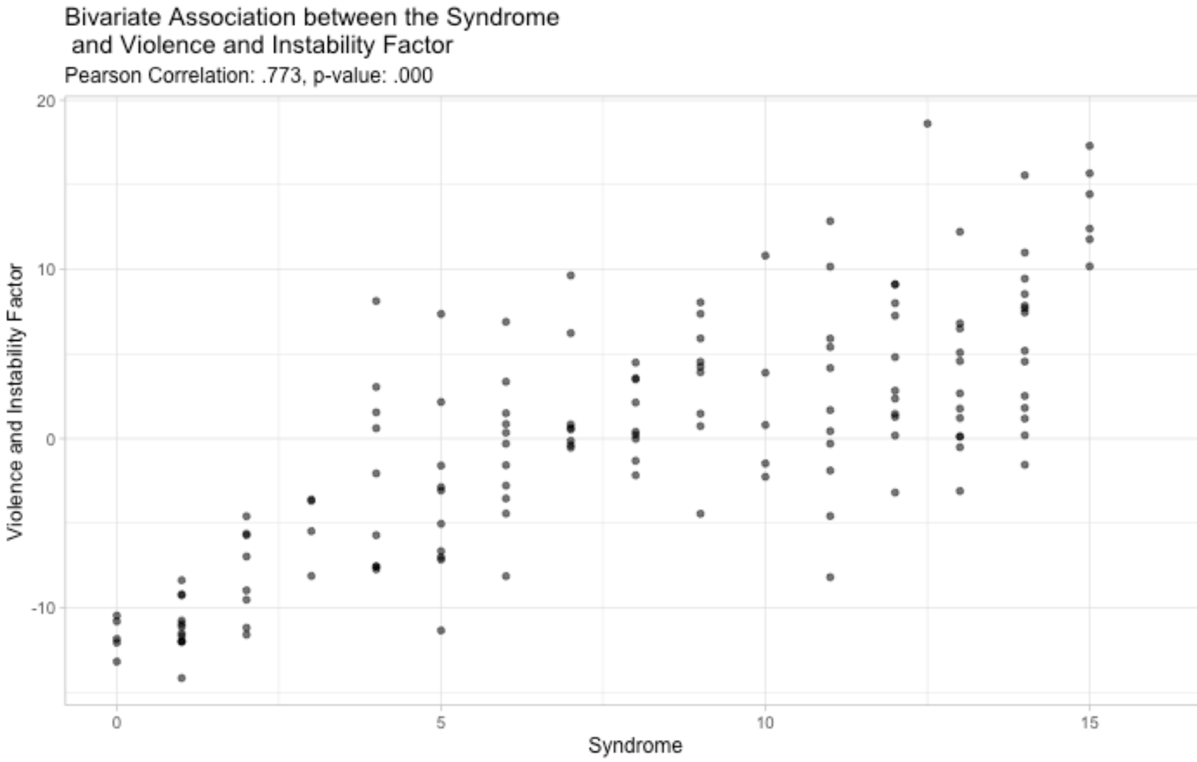
Ethnic Fractionalization 2003	.572	.332	.088	.020

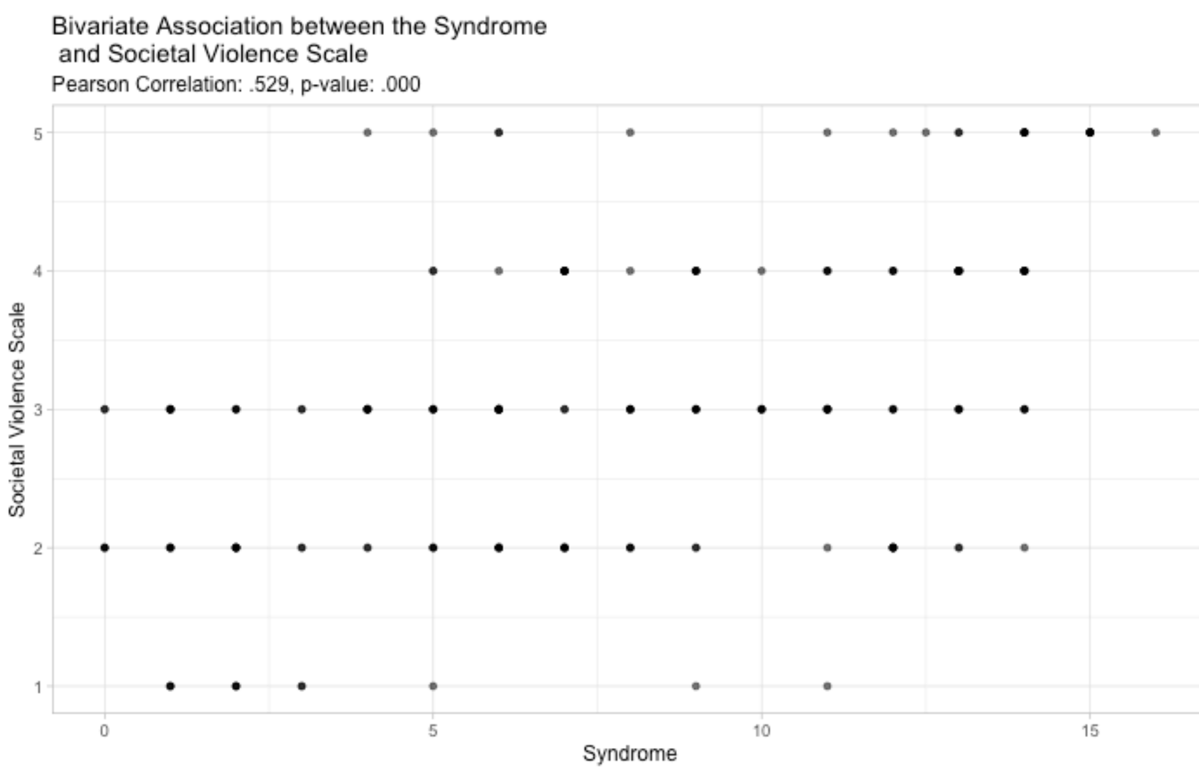
* significant at 0.001

The adjusted R-squared is a moderate .377, indicating that the specified model explained at least 37.7% of the variability of the Societal Violence Scales scores, and only two variables were significant: the Syndrome and Number of land neighbors, with the effect size of the former being almost twice that of the latter. The coefficients for these variables are both positive, meaning the higher the Syndrome score or the greater the number of land neighbors, the higher the level of societal violence. The bivariate correlation between the Syndrome and the Societal Violence Scale is moderately strong at .529, p<.0001, and the scatterplot in Figure 8.2.1 shows the distinctive trapezoidal shape we have come to recognize. The two outlier countries identified on the scatterplot with relatively high Syndrome scores but fairly low societal violence levels include Vanuatu and Brunei, two very small states.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome and Ethnic Fractionalization are the only variables that are significant in predicting the logits or predicted probabilities of a country scoring poorly on the Societal Violence Scale. We specifically find that for every one unit increase in the Syndrome, the odds increase by 26%, or alternatively there is a 1.26 times greater risk, that the country scores poorly on the Societal Violence Scale, after holding all other control variables constant.

Figure 8.2.1 Scatterplots of Syndrome with Violence/Instability factor and Societal Violence Scale





3) **Military Expenditure and Weapons Importation factor** (higher scores are considered worse, N=152): Recall that this factor combines three variables (Military Expenditure as % of GDP, Military Expenditure, and Weapons Importation), the results are as follows:

Table 8.2.4: General Linear Model Results for Military Expenditure and Weapons Importation Factor (Adjusted R-squared=.318)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	-4.277	1.147	.000	.097
Colonial Status=0 (Never Colonized)	.101	.517	.845	.000
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	.224	.474	.638	.002
CIV=2 (Muslim)	1.271	.563	.026	.038
CIV=4 (Hindu/Sinic/Buddhist)	.406	.697	.561	.003
CIV=5 (Africa)	0			
Syndrome 2017	.258	.057	.000*	.135
Urbanization 2015	.048	.009	.000*	.173
Number of Land Neighbors	.044	.071	.534	.003
Terrain 2014	-.030	.013	.021	.040
Religious Fractionalization 2003	.518	.801	.519	.003
Ethnic Fractionalization 2003	-2.088	.850	.015	.044

* significant at 0.001

The adjusted R-squared is a moderate .318, indicating that the specified model explained at least 31.8% of the variability of this factor, and only two variables emerge as significant; the Syndrome and Urbanization. Both have positive coefficients, meaning the higher the Syndrome score or the higher the rate of Urbanization, the higher military expenditures and weapons imports. The finding for urbanization is somewhat intuitive, but the finding for the Syndrome is thought-provoking, especially since the effect sizes are fairly similar. However, the bivariate correlation between the Syndrome and this cluster is weak at only .250, and not significant at the p=.001 level. The scatterplot in Figure 8.2.2 reveals a considerable spread on the dependent variable across the Syndrome scores. Some countries with high expenditures and imports and also high Syndrome scores include Oman and Saudi Arabia. Israel, at scale point 6 on Syndrome, has noticeably higher expenditures and imports than other nations at that same Syndrome level. (The US has such as large GDP that its out-sized military expenditures do not appear as a very high percentage of GDP.) Australia, scoring a 0 on Syndrome, has a middle-range score on this outcome measure.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable), but find that the model does not meet the validity requirements, so we do not report the results.

We also used Access to Weapons in an ancillary analysis for our Military Expenditures and Weapons Importation factor. The results show a moderately strong adjusted R-squared value of .383, indicating that the specified model explained at least 38.3% of the variability of access to weapons, and the only significant variable in the GLM analysis is the Syndrome. While Syndrome's effect size is quite small, the coefficient value is in the predicted direction. We find that countries with the Syndrome have higher levels of access to weapons.

4) **Monopoly on the use of force** (lower scores are considered worse meaning that other forces or even a "deep state" compromise the state's monopoly on the use of force, N=128): The results are as follows:

Table 8.2.5: General Linear Model Results for Monopoly on the Use of Force (Adjusted R-squared=.234)

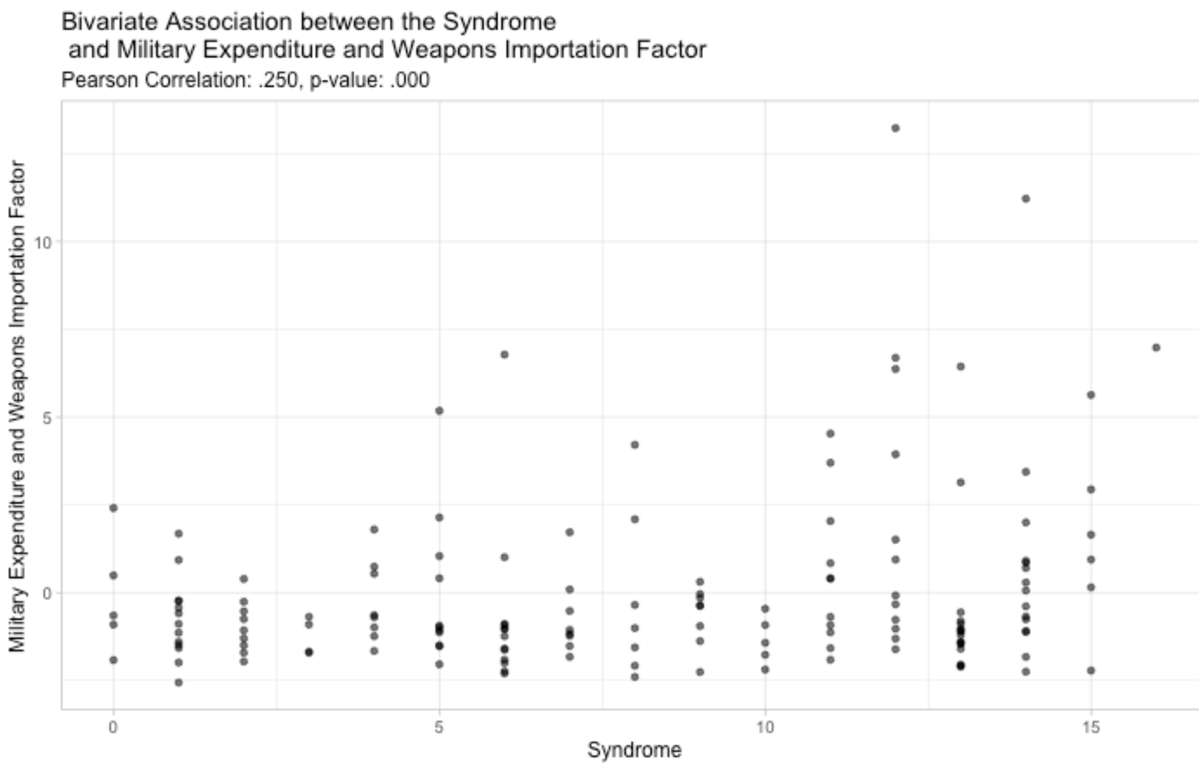
Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	9.558	1.266	.000	.348
Colonial Status=0 (Never Colonized)	.265	.751	.725	.001
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	-.584	.519	.263	.012
CIV=2 (Muslim)	.548	.563	.333	.009
CIV=4 (Hindu/Sinic/Buddhist)	-.357	.694	.608	.002
CIV=5 (Africa)	0			
Syndrome 2017	-.291	.064	.000*	.164
Urbanization 2015	.008	.010	.447	.005
Number of Land Neighbors	-.059	.078	.452	.005
Terrain 2014	-.002	.014	.863	.000
Religious Fractionalization 2003	2.154	.896	.018	.051
Ethnic Fractionalization 2003	-.859	.911	.348	.008

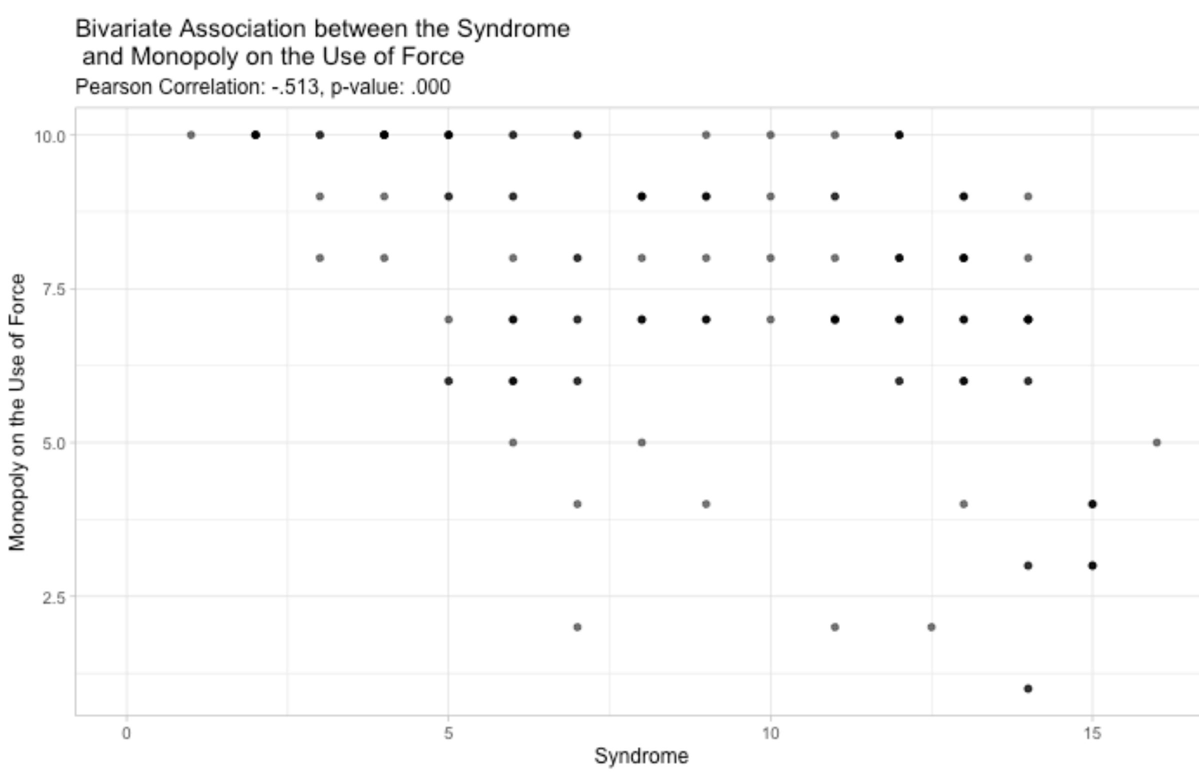
* significant at 0.001

The adjusted R-squared is a moderate .234, indicating that the specified model explained at least 23.4% of the variability of monopoly on the use of force, and only one variable emerges as significant, the Syndrome, with a moderate effect size and a negative coefficient (meaning that the higher the Syndrome score, the worse the situation on the government's use of force). The bivariate correlation is a moderately strong -.513, $p<.001$, with the scatterplot in Figure 8.2.2 showing a clearly empty lower left quadrant. At Syndrome scale point 7, Haiti has a very low monopoly on the use of force. Somalia, with Syndrome scale point 14, has the worst overall score on this variable.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable), but find that the model does not meet the validity requirements, so we do not report the results.

Figure 8.2.2 Scatterplots of Syndrome with Military Expenditures and Weapons Importation factor and Monopoly on the use of force





5) **Global Terrorism Index** (higher scores are considered worse, N=163): The results are as follows:

Table 8.2.13: General Linear Model Results for Global Terror Index (Adjusted R-squared =.239)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	-2.759	1.261	.030	.034
Colonial Status=0 (Never Colonized)	1.558	.576	.008	.050
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	.969	.530	.069	.024
CIV=2 (Muslim)	.826	.616	.182	.013
CIV=4 (Hindu/Sinic/Buddhist)	1.244	.748	.099	.020
CIV=5 (Africa)	0			
Syndrome 2017	.246	.063	.000*	.099
Urbanization 2015	.013	.010	.200	.012
Number of Land Neighbors	.290	.079	.000*	.089
Terrain 2014	.025	.014	.082	.022
Religious Fractionalization 2003	.189	.894	.833	.000
Ethnic Fractionalization 2003	.224	.934	.811	.000

* significant at 0.001

We obtained a moderate adjusted R-squared value of .239, indicating that the specified model explained at least 23.9% of the variability of the Global Terrorism Index scores, and two variables emerge as significant: the Syndrome and Number of land neighbors. Both coefficients are positive, meaning the higher the Syndrome score and the greater the number of land neighbors, the higher the Global Terrorism score. The effect size for Syndrome is somewhat larger than that for land neighbors. The bivariate correlation with Syndrome is a weak .321, $p<.001$, and the scatterplot in Figure 8.2.3 shows that the nations with the worst scores on the Global Terrorism Index are all high Syndrome countries, such as Iraq, Nigeria, Afghanistan, Pakistan, and Syria. At a low Syndrome score of 4, Ukraine has a high terror score, but we feel this is associated with an external conflict with Russia.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable), but find that the model does not meet the validity requirements, so we do not report the results.

We used four ancillary variables as checks for the Global Terrorism Index. The first is Terrorism Incidents and Internal Conflict factor which consists of Incidents of Terrorism in a given year, Internal Conflicts Fought, and the Global Terrorism Index. The adjusted R-squared for this factor is a moderate .22, indicating that the specified model explained at least 22% of the variability of this factor, a fairly low percentage. However, we note that Syndrome is the only significant variable, though the effect size is small. The coefficient is in the expected positive direction, meaning that the higher the Syndrome score, the higher the incidence of terrorism and number of internal conflicts fought.

The second ancillary variable used is Terrorism Impact. The adjusted R-squared for the GLM analysis for this dependent variable is a moderate .213, indicating that the specified model explained at least 21.3% of the variability of the terrorism impact ratings. The two variables that are significant are the Syndrome and the Number of land neighbors, each with modest effect sizes. Both coefficients are positive, meaning that the higher the Syndrome score or number of land neighbors, the greater the impact of terrorism on the nation-state.

The third ancillary variable we used was the Terrorism Injury and Violent Conflict factor which combines several variables: Terrorism Injuries, Terrorism Fatalities, Intensity of Violent Conflict, and Overall index of Disappearance, Conflict, and Terrorism Score. The adjusted R-squared for this analysis is a weak .137, indicating that the specified model explained only at least 13.7% of the variability of this factor; noteworthy is the fact that the only significant variable in the model is the Syndrome, with the predicted negative association (that is, the higher the Syndrome score, the more affected by terrorism and internal conflict the nation), though the effect size is modest.

The fourth ancillary variable we used is Deaths from Internal Conflict. The GLM results yielded a very low R-squared value of .135 and none of the independent variables in the model was significant.

6) **Perceptions of Criminality** (higher scores are considered worse, N=163): The results are as follows:

Table 8.2.7: General Linear Model Results for Perceptions of Criminality (Adjusted R-squared=.188)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	2.200	.456	.000	.144
Colonial Status=0 (Never Colonized)	-.258	.208	.218	.011
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	.229	.192	.233	.010
CIV=2 (Muslim)	-.169	.223	.449	.004
CIV=4 (Hindu/Sinic/Buddhist)	.157	.271	.564	.002

CIV=5 (Africa)	0			
Syndrome 2017	.086	.023	.000*	.092
Urbanization 2015	-1.163E-6	.004	1.000	.000
Number of Land Neighbors	.068	.029	.018	.040
Terrain 2014	.004	.005	.417	.005
Religious Fractionalization 2003	-.146	.323	.653	.001
Ethnic Fractionalization 2003	.165	.338	.626	.002

* significant at 0.001

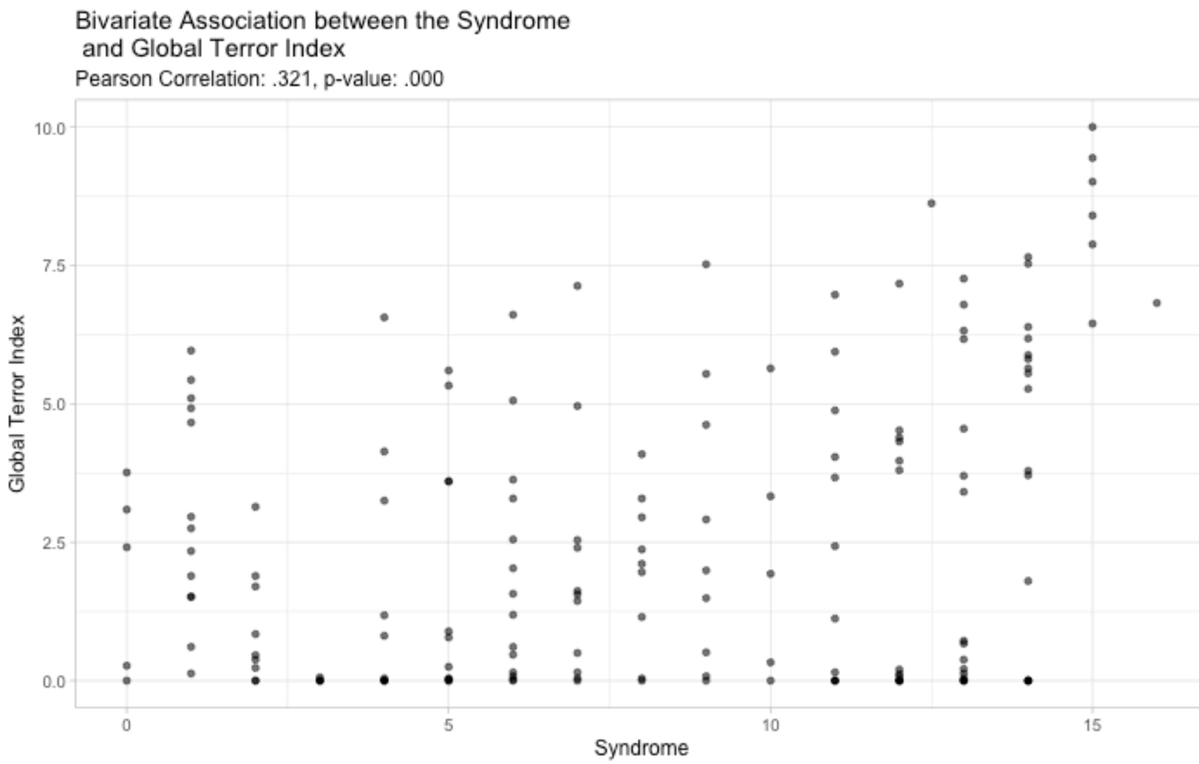
The adjusted R-squared is a weak .188, indicating that the specified model explained only at least 18.8% of the variability of perceptions of criminality, and the only significant variable is the Syndrome, with a modest effect size. The coefficient is positive, meaning the higher the Syndrome score, the great the perception of criminality within the society. The bivariate association with Syndrome is shown in Figure 8.2.3.

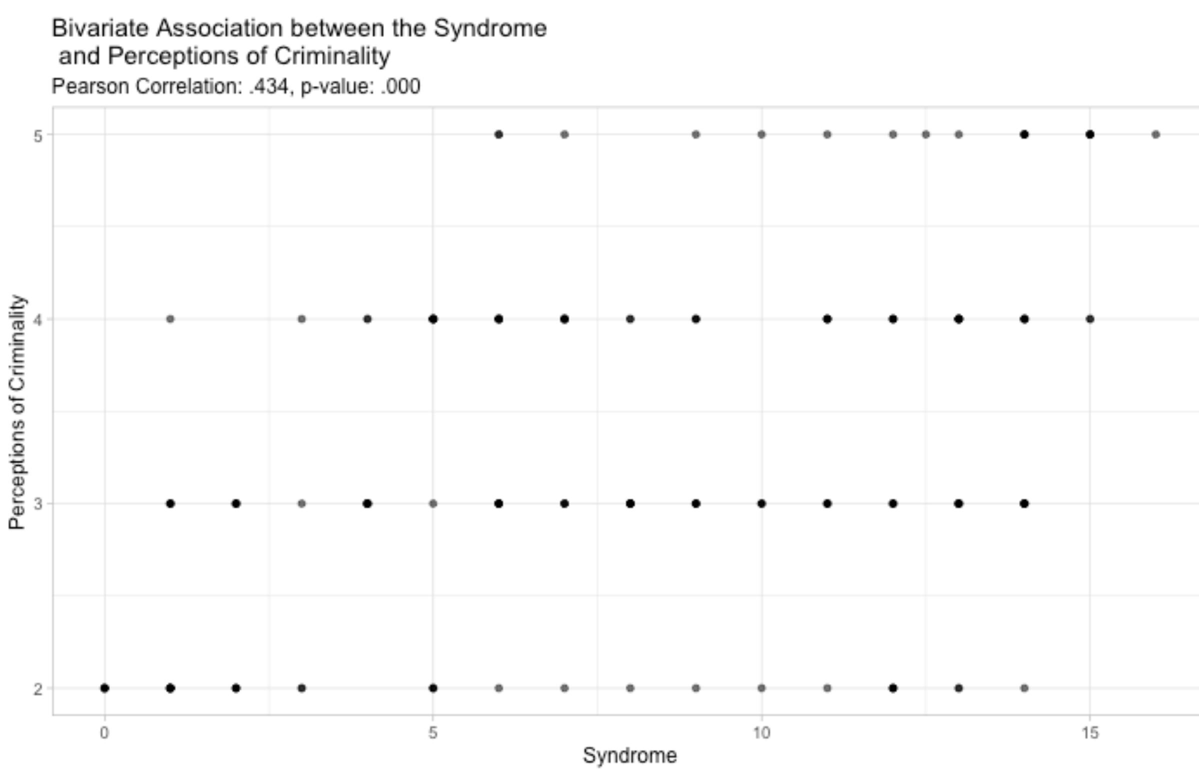
Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable), but find that the model does not meet the validity requirements, so we do not report the results.

We used our Homicide and Violent Crime factor, Homicide from the Human Freedom Index, and Incarceration rate as ancillary analyses for this analysis. The first had a weak adjusted R-squared value of .180, indicating that the specified model explained only at least 18.0% of the variability of the Homicide and Violent Crime factor. The Syndrome is not a significant predictor of this factor. The ancillary analyses for Homicide from the Human Freedom Index and Incarceration rate also had very low R-squared values (.110

and .047, respectively) with no significant independent variables in the models so we do not report the results.

Figure 8.2.3 Scatterplots of Syndrome with Global Terrorism Index and Perceptions of Criminality





7) External Conflicts

We used two indicators of external conflicts, but they were a poor fit for our data. The first indicator is the External Conflicts Fought scale obtained from the Global Peace Index. It had a very low R-squared value of .044 with no significant independent variable. The second indicator is Deaths from External Conflict which is also a component the Global Peace Index. The GLM results for this model yielded a low R-squared value of .011 with no significant independent variable.

Concluding Discussion for the Conflict and Security Dimension

We ran 20 analyses on numerous variables related to several aspects of the conflict and security dimension, such as internal conflict and violent instability, external conflict, criminal behavior, military expenditures/weapons imports/access to weapons, and terrorism. In five of these analyses, the Syndrome did not prove significant: more specifically, we found no relationship between the Syndrome and external conflict, and very little relationship between the Syndrome and criminal behavior (i.e., with the exception of the variable of Perception of Criminality).

However, in relation with the remaining 15 analyses, using variables indicating internal conflict and terrorism, the Syndrome emerged as a persistently significant explanatory variable. In seven of these 15, the Syndrome was the only significant variable in the model, and in seven others, it was the significant variable with the largest effect size.

While the adjusted R-squared values ranged across the spectrum from weak to strong, and ditto for the effect sizes for the Syndrome when significant, the consistency of the findings across the model runs is noteworthy. Countries with higher Syndrome scores experience greater levels of internal conflict, violent instability, and terrorism, and are much more interested in acquiring, accessing, and importing weapons. However, the presence of the Syndrome does not seem to predict well to external conflict, nor to generic measures of criminal behavior such as homicide and incarceration rates.

3. Economic Performance Dimension

We hypothesize that across a variety of measurements, nations high on the Syndrome scale should experience lower economic performance. We look at the character of the economic system in our Rentierism cluster, so such indicators are not examined here.

List and description of Variables in the Economic Performance Dimension

The variables which are most commonly used in social science research and which the authors deemed as the most valid measures of economic performance are listed in alphabetical order below. (Note: Some potential variables of interest had to be excluded due to low N size and/or correlation $\geq$.9 with the variables in this list.[23]) The list provides the variable name, provides the variable, the source from which the variable was obtained, whether the measure is nominal/ordinal/continuous and the range where applicable, which directionality the variable takes, the N size for the variable, and whether any transformations were used:

1) Agriculture, Forestry, and Fishing Value Added as % GDP (2016, or most recent without searching earlier than 2007), World Bank, percent, higher scores are worse, N=168
2) Availability of Affordable Housing (2016), Social Progress Index, percentage (0-1) of respondents answering satisfied to the question, “In your city or area where you live, are you satisfied or dissatisfied with the availability of good, affordable housing?”, lower scores are worse, N=153

3) Economic Freedom Index (2017), Economic Freedom Index, ordinal (0-100), lower scores are worse, N=169
4) GDP Annual Growth % (2016), The World Bank (Accessed from Knoema), percent (negative if GDP decreased), lower scores are worse, N=163
5) GDP per capita PPP (2017), International Monetary Fund's World Economic Outlook Database (Accessed from Knoema), GDP per capita based on purchasing-power-parity in current prices, lower scores are worse, N=170 (this variable was log transformed in the analysis)
6) GINI (2016, or most recent without searching earlier than 2007), The World Bank, indicates the degree of economic inequality in the society, ordinal (0-100), higher scores are worse (0 = perfect equality, 100 = perfect inequality), N=143
7) Global Competitiveness Index Rankings (2016), World Economic Forum's Global Competitiveness Report (Accessed from Knoema), ranking (1 = best), N=137, higher scores are worse, the N size was too low to include in the EFA but a separate analysis was done for this variable
8) Government Debt to GDP (2013-2018), Trading Economics, percent, higher scores are worse, N=168
9) Government Expenditures as percentage of GDP (2016 or most recent without searching earlier than 2007), World Bank, percent, lower scores are worse, N=168
10) Female Labor Force (2016, or most recent without searching earlier than 2007), The World Bank, percent of total labor force, lower scores are worse, N=174

11) Final Consumption (2016), National Accounts Main Aggregates Database (Accessed from Knoema), US dollars, lower scores are worse, N=174 (this variable was log transformed in the analysis)

12) Food Security (2016), The Global Food Security Index, scale (min=26.1, max=85.8), lower scores are worse, N=113, the N size was too low to include in the EFA but a separate analysis was done for this variable

13) HFI Economic Freedom (2016), Cato Institute, ordinal (0-10), lower scores are worse, N=157

14) High-Technology Exports (2016, or most recent without searching earlier than 2007), World Bank, percent of manufactured exports, lower scores are worse, N=155

15) Internet Users (2016), Social Progress Index, percent of population, lower scores are worse, N=160

16) Mobile Telephone Subscriptions (2016), Social Progress Index, number per 100 inhabitants, lower scores are worse, N=160

17) Poverty and Economic Decline (2016), Fragile States Index from the Failed States Index published by the Fund for Peace (Accessed from The Quality of Government Institute), scale (min=1.8, max=9.4), higher scores are worse, N=171

18) Property Rights (2017), Heritage Foundation's Index of Economic Freedom (Accessed from The Quality of Government Institute), ordinal (0-100), lower scores are worse, N=169

19) Prosperity Index (2016), Legatum Institute (Accessed from Knoema), rankings (1 = best), higher scores are worse, N=148

20) Quality of Electricity Supply (2016), Social Progress Index, ordinal (1-7) "Average response to the question: "In your country, how would you assess the reliability of the electricity supply (lack of interruptions and lack of voltage fluctuations)?", lower scores are worse (1 = not reliable at all, 7 = extremely reliable), N=144

21) Unemployment Rate (2016), World Bank, percent of the total labor force, higher scores are worse, N=174

22) Uneven Economic Development (2016), Fragile States Index from the Failed States Index published by the Fund for Peace (Accessed from the Quality of Government Institute), scale (min=1.3, max=9.5), higher scores are worse, N=171

We desired to reduce the number of variables examined through factor analysis in order to find those variables which loaded highly on the same factors and thus could be analyzed together. One of the variables in this dimension, GDP per capita PPP (log transformed), was both included in the EFA and analyzed separately because we desired to directly observe the effects of the Syndrome on countries' GDP per capita.

The factor analysis yielded three distinct loading patterns[24], and the z-scores of the variables in each factor were added to create the score for each factor, after checking for consistency in direction (or multiplied by -1 to maintain consistency):

1) Wealth Infrastructure and Economic Freedom factor (lower scores are considered worse, N=138): This factor consists of these eight variables with loadings ranging from .316 to 1.220: (1) Economic Freedom Index, (2) HFI Economic Freedom, (3) GDP per capita PPP (log-transformed), (4) Property Rights, (5) Quality of Electricity Supply, (6) Mobile Telephone Subscriptions, (7) Internet Users, and (8) Availability of Affordable Housing.

2) Reliance on Agriculture and Lack of Prosperity factor (higher scores are considered worse, N=146): This cluster consists of these two variables with loadings ranging from -.742 to -.681: (1) Agriculture Value Added as % GDP and (2) Prosperity Index.

3) Economic Inequality factor (higher scores are considered worse, N=139): This cluster consists of these two variables with loadings ranging from .635 to .967: (1) GINI and (2) Uneven Economic Development.

Outline of analyses used in the Economic Performance Dimension

We first looked at Food Security which measures access to sufficient and nutritious food that meets dietary standards. This index measures affordability, quality and availability of food.

We examine our Reliance on agriculture and lack of prosperity factor next. This factor has two indicators: Agriculture Value Added as % of GDP and the Prosperity Index. The first indicator measures the net output of the entire agriculture section, which includes forestry, hunting and fishing as well as cultivation of crops and livestock production. The Prosperity Index investigates the general conditions required for prosperity such as economic quality, business, environment, governance, security, natural environment and health. We used two variables for ancillary analyses: Prosperity Index and Agriculture, forestry, and fishing value added as % of GDP.

Third, we used GDP per capita PPP (log-transformed), a standard measure of income that uses a nation's gross domestic product for a year divided by the total population converted to international dollars and using purchasing power parity rates.

Fourth, we examined Poverty and Economic Decline. This index utilizes a number of variables such as per capita income, GNP, unemployment, inflation, debt and so on to discern patterns of economic decline.

Fifth, we used our Wealth infrastructure and economic freedom factor as our main analysis. This factor consists of these eight variables: 1) The HFI (Human Freedom Index, Cato Institute) Economic Freedom Index presents a sweeping measure of human freedom, which it defines as the absence of coercive constraints. It uses 79 indicators of personal and economic freedom. 2) The Index of Economic Freedom (Heritage Institute) measures economic freedom for a country based on quantitative and qualitative factors under the headings of judicial effectiveness, government size (including spending and tax burden), regulatory efficiency, and open markets. 3) GDP per capita PPP (analyzed separately above) is a nation's gross domestic product using purchasing power parity rates. 4) Property Rights measures to what extent laws protect private property rights and these laws are enforced. 5) Quality of Electrical Supply measures the electrical supply in terms of reliability and lack of voltage fluctuations. 6) Mobile Telephone Subscriptions gives the number of mobile cellular telephone subscriptions per 100 inhabitants of a given country. 7) Internet Users measures the number of individuals with access to the internet for a given country**.** 8) Availability of Affordable Housing presents survey answers to queries of satisfaction of good affordable available housing in respondent's area. We used GDP Annual Growth Percentage which measures the percent by which GDP grows or declines in a given year, in an ancillary analysis.

Sixth, we used the Global Competitiveness Index in a main analysis. This index addresses institutions and infrastructure that support competitiveness, human capital, markets, and capability for innovation. We used two variables in ancillary analyses: Final Consumption (log-transformed) adds the sums of expenditures by private consumption and general government consumption. High Technology Exports gives the percentage of manufactured exports in sectors with high research and development input and includes aerospace, pharmaceuticals, scientific instruments and computer and communications technology.

Seventh, we used our Economic inequality factor that consists of two variables: the GINI Index and the Uneven Economic Development Index. The Gini Index is the most commonly used measurement of inequality. The Uneven Economic Development Index separates inequality within the economy from the economy's actual performance. It notes structural inequality based on identity or class indicators. It also measures opportunities for mobility within a given society.

Eighth, we used Female Labor Force Participation, which measures the percent of women in the total labor force. Ninth, we used Government Expenditures as % of GDP which calculates general government spending as a share of GDP and indicates the size of government and the viability of a given state economy. It has a secondary use which is to indicate a country's approach to delivering public goods and services and providing social protection. We used Government Debt to GDP, which examines the ability of a country to make future payment on its debt given present economic data, in an ancillary analysis. Lastly, we examined Unemployment Rate which calculates the percent of the total labor force that is unemployed but actively seeking employment.

Model specification

The model for each dependent variable or dependent variable cluster takes the same form in each case:

Dependent variable or cluster = Syndrome + Civilization + Colonial status + Urbanization + Terrain + Number of land neighbors + Religious fractionalization + Ethnic fractionalization + ε_i

A general linear model (GLM) procedure was used to investigate the statistical significance and explanatory power of these eight independent variables. We hypothesized that, after controlling for the influence of the other seven control variables, the Patrilineal-Fraternal Syndrome will still be a significant predictor of these dependent variables and factors for the nations in our study.

Model results

We run 16 general linear model analyses under Economic Performance. We find that the Syndrome was significant in 10 of those models. The 6 models where Syndrome was not significant include: (1) High-Technology Exports, (2) Final Consumption (log-transformed), (3) Government Expenditure as % of GDP, (4) Unemployment rate, (5) GDP Annual Growth %, and (6) Government Debt to GDP Ratio. We elaborate on the remaining 9 models.

Table 8.3.1 summarizes the results of these analyses ordered by descending adjusted R-squared values. The italicized variables and factors are used in ancillary analyses.

Dependent variable	**Adjusted R-squared (N)**	**Independent variables significant at .001 by descending order of effect size**
1) Food security index	.809 (113)	Syndrome Urbanization
2) Reliance on agriculture and lack of prosperity factor • Agriculture value added as % of GDP	.740 (146)	Syndrome Urbanization

• Prosperity Index *Prosperity Index* *Agriculture, forestry, and fishing value added as % of GDP*	 *.746 (146)* *.535 (168)*	 *Syndrome* *Urbanization* *Syndrome* *Urbanization*
3) GDP PPP (log-transformed)	.695 (170)	Syndrome Urbanization Muslim civilization
4) Poverty and economic decline	.612 (171)	Urbanization Syndrome
5) Wealth infrastructure and economic freedom factor • HFI Economic freedom index 2016 • Economic freedom index 2017 • GDP PPP (log-transformed) • Property rights • Quality of electricity supply • Mobile telephone subscriptions • Internet users • Availability of affordable housing *GDP annual growth percentage*	.600 (138) .034 (163)	Syndrome Urbanization *None*
6) Global Competitiveness Index Rankings *Final consumption (log-transformed)* *High technology exports*	.564 (137) *.444 (174)* *.156 (155)*	Syndrome Urbanization *Urbanization* *Land neighbors* *None*
7) Economic inequality factor • GINI • Uneven economic development indicator	.482(139)	Syndrome
8) Female labor force participation	.471 (174)	Syndrome Urbanization Muslim civilization Religious fractionalization
9) Government expenditure as % of GDP *Government Debt to GDP*	.095 (168) *.056 (168)*	None *None*
10) Unemployment rate	.013 (174)	None

1) **Food Security Index** (lower scores are considered worse, N=113): The results are as follows:

Table 8.3.2: General Linear Model Results for Food Security (Adjusted R-squared=.809)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	44.999	5.315	.000	.425
Colonial Status=0 (Never Colonized)	6.341	2.167	.004	.081
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	-.914	2.125	.668	.002
CIV=2 (Muslim)	3.842	2.455	.121	.025
CIV=4 (Hindu/Sinic/Buddhist)	.778	3.097	.802	.001
CIV=5 (Africa)	0			
Syndrome 2017	-1.334	.286	.000*	.183
Urbanization 2015	.406	.044	.000*	.465
Number of Land Neighbors	.027	.294	.927	.000
Terrain 2014	-.072	.057	.209	.016
Religious Fractionalization 2003	4.933	3.486	.160	.020
Ethnic Fractionalization 2003	-8.437	4.132	.044	.041

* significant at 0.001

The adjusted R-squared is a remarkably strong .809, indicating that the specified model explained, impressively, at least 80.9% of the variability of food security, and the only two variables reaching significance are the Syndrome and Urbanization. While the effect size of Urbanization is much larger than that of the Syndrome, their effects are in the opposite direction. Higher rates of Urbanization are associated with higher levels of Food Security; higher scores on the Syndrome are associated with significantly lower levels of Food Security. The bivariate correlation (-.750, p<.000) is very strong, and again the scatterplot in Figure 8.3.1 shows the characteristic pattern of an empty lower left quadrant and considerable spread in the right half of the graph, though most scores anchor the negative association.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable), but find that the model does not meet the validity requirements, so we do not report the results.

1) Reliance on Agriculture and Lack of Prosperity factor (higher scores are considered worse, N=146): Recall that this factor combines several variables (Agriculture Value Added as % GDP and Prosperity Index), the results are as follows:

Table 8.3.3: General Linear Model Results for Reliance on Agriculture and Lack of Prosperity factor (Adjusted R-squared=.740)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	-.543	.554	.328	.008
Colonial Status=0 (Never Colonized)	-.049	.236	.837	.000
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	.195	.228	.392	.006
CIV=2 (Muslim)	-.297	.263	.261	.010
CIV=4 (Hindu/Sinic/Buddhist)	.235	.322	.466	.004
CIV=5 (Africa)	0			
Syndrome 2017	.215	.027	.000*	.325

Urbanization 2015	-.031	.004	.000*	.279
Number of Land Neighbors	.053	.034	.120	.019
Terrain 2014	.010	.006	.090	.022
Religious Fractionalization 2003	-.351	.373	.349	.007
Ethnic Fractionalization 2003	.924	.399	.022	.040

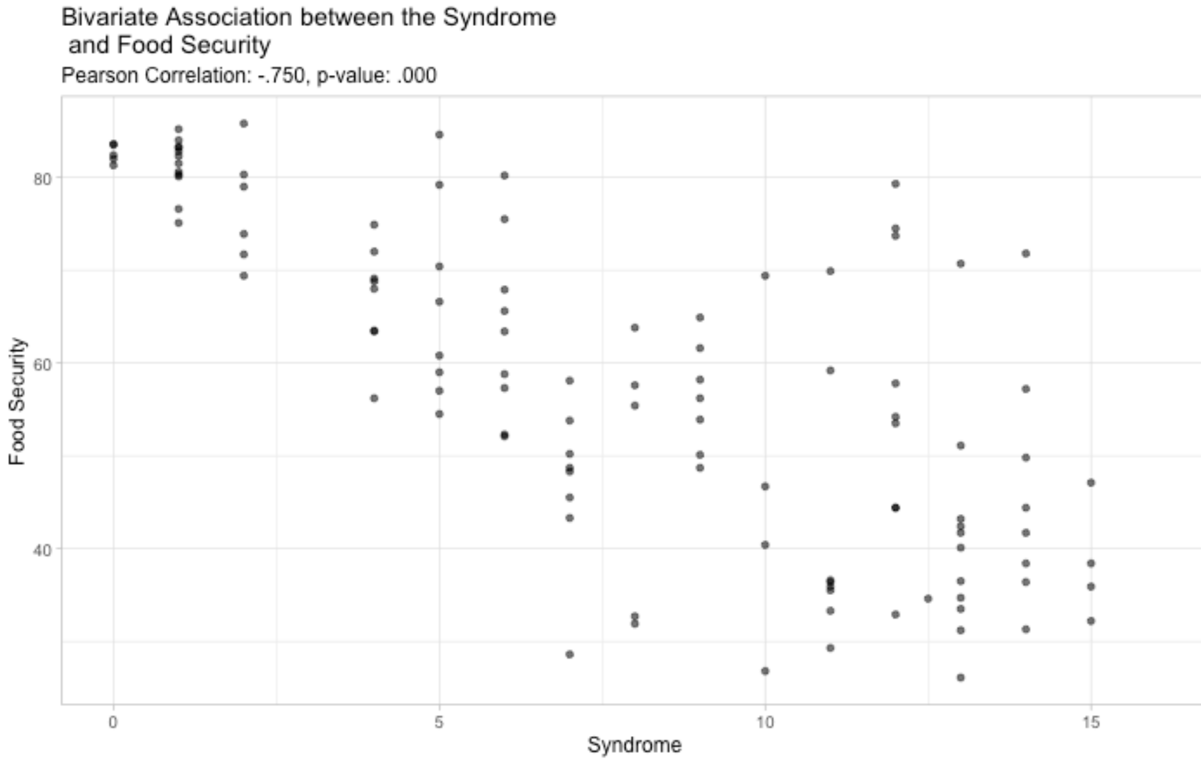
* significant at 0.001

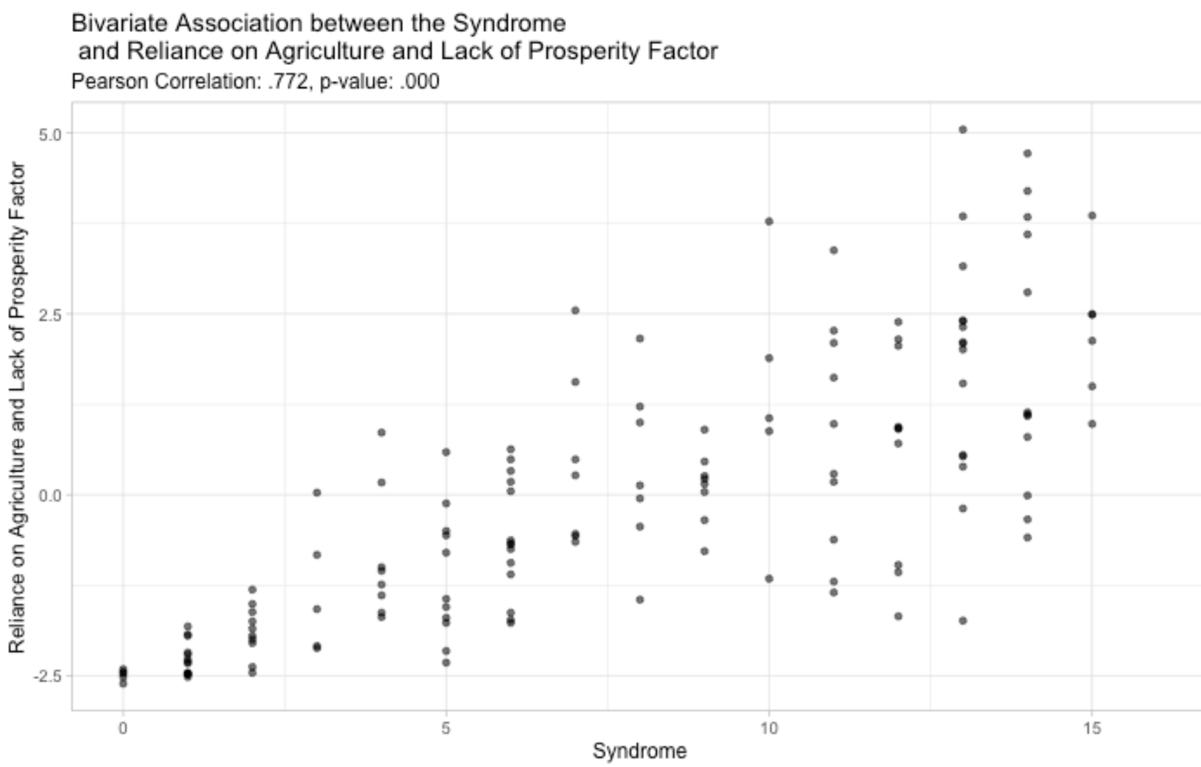
The adjusted R-squared is a remarkably strong .740, indicating that the specified model explained at least 74% of the variability of this cluster. For this cluster of variables combining indicators of agriculture value added and prosperity index, once again only two variables reach significance—the Syndrome and Urbanization. Once again the larger effect size of the two is for the Syndrome, being .325. The very strong bivariate correlation scatterplot in Figure 8.3.1 (correlation = .772, $p<.000$) shows a strong positive relationship between the Syndrome and reliance on agriculture and lack of prosperity.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome and Urbanization are the only variables that are significant in predicting the logits or predicted probabilities of higher levels of reliance on agriculture and lack of prosperity. We specifically find that for every one unit increase in the Syndrome, the odds increase by 49%, or alternatively there is a 1.49 times greater risk, that the country experiences higher levels of reliance on agriculture and lack of economic prosperity, after holding all other control variables constant.

We run two ancillary analyses, Prosperity Index and Agriculture, Forestry, and Fishing Value added as % of GDP. The former had a high adjusted R-squared of .746 and the latter had an adjusted R-squared of .535. Both had the same significant independent variables as the Reliance on Agriculture and lack of prosperity factor: the Syndrome and Urbanization. Higher values of the Syndrome were associated with significantly lower levels of prosperity and higher levels of agriculture/forestry/fishing as percent of GDP.

Figure 8.3.1 Scatterplots of Syndrome with Food Security Index and Reliance on Agriculture and Lack of Prosperity factor





2) **GDP per capita PPP 2017 (log transformed)** (lower scores are considered worse, N=170): The results are as follows:

Table 8.3.4: General Linear Model Results for GDP per capita PPP 2017 (log transformed) (Adjusted R-squared=.695)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	8.793	.343	.000	.820
Colonial Status=0 (Never Colonized)	.102	.166	.541	.003
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	.010	.146	.946	.000
CIV=2 (Muslim)	.608	.174	.001*	.078
CIV=4 (Hindu/Sinic/Buddhist)	-.055	.216	.799	.000
CIV=5 (Africa)	0			
Syndrome 2017	-.099	.018	.000*	.178
Urbanization 2015	.026	.003	.000*	.363
Number of Land Neighbors	.002	.022	.935	.000
Terrain 2014	-.011	.004	.007	.050
Religious Fractionalization 2003	.439	.245	.075	.022
Ethnic Fractionalization 2003	-.768	.261	.004	.056

* significant at 0.001

The adjusted R-squared is a remarkably strong .695, indicating that the specified model explained at least 69.5% of the variability of GDP per capita PPP. Three variables reach significance: Muslim majority countries, the Syndrome, and Urbanization. While

Muslim majority nations and urbanized nations have higher GDP per capita, countries with high Syndrome scores have significantly lower GDP per capita. (As several Muslim majority nations are also arguably rentier states, please look to the Rentierism Cluster for further analysis.) While the effect size for Urbanization is almost twice that of Syndrome, Syndrome's effect size is more than twice that of Muslim majority nations. We can see in the moderately strong bivariate correlation in the scatterplot in Figure 8.3.2 ($r = -.651$, $p<.000$) the same large and empty lower left quadrant, while the right half of the graph, though anchoring the negative correlation, sees greater spread.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome, Urbanization, and Muslim Civilization are the only variables that are significant in predicting the logits or predicted probabilities of higher GDP per capita PPP. We specifically find that for every one unit increase in the Syndrome, the odds increase by 31%, or alternatively there is a 1.31 times greater risk, that the country experiences a lower GDP PPP, after holding all other control variables constant.

Indeed, since GDP per capita PPP (log transformed) and urbanization are highly correlated (very strong bivariate correlation of .748, $p<.000$) and that makes sense because manufactured goods have favorable terms of trade compared to commodities, it might be interesting to see the results of the same multivariate model but excluding urbanization as one of the explanatory variables. When that model is analyzed, the R-squared is diminished to .528, but the effect size of the Syndrome more than doubles, becoming the most predictive variable in the model compared to the other three significant variables (Muslim majority nations and now also never colonized status and terrain (indicated by %

arable land))—the effect size for the Syndrome is more than triple that of the next largest effect size variable. We also ran the logistic regression model also excluding Urbanization (using a binary version of the response variable), and find that for every one unit increase in the Syndrome, the odds increase by 50%, or alternatively there is a 1.5 times greater risk, that the country experiences lower GDP per capita, after holding all other control variables (except Urbanization) constant.

4) Poverty and Economic Decline (higher scores are considered worse, N=171):

The results are as follows:

Table 8.3.5: General Linear Model Results for Poverty and Economic Decline (Adjusted R-squared=.612)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	6.718	.571	.000	.485
Colonial Status=0 (Never Colonized)	-.302	.282	.286	.008
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	.033	.245	.894	.000
CIV=2 (Muslim)	-.868	.286	.003	.059
CIV=4 (Hindu/Sinic/Buddhist)	.006	.352	.985	.000
CIV=5 (Africa)	0			
Syndrome 2017	.185	.030	.000*	.206
Urbanization 2015	-.036	.005	.000*	.274
Number of Land Neighbors	-.028	.037	.453	.004
Terrain 2014	.010	.007	.125	.016

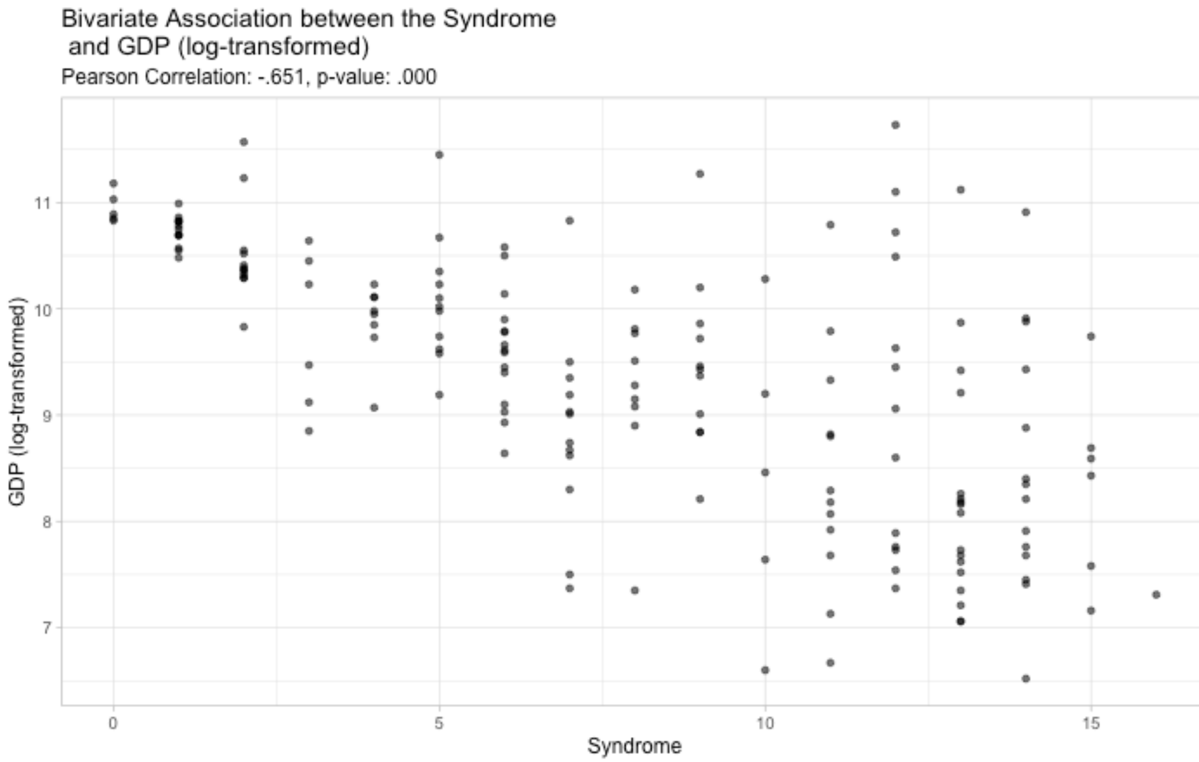
Religious Fractionalization 2003	-.646	.407	.114	.017
Ethnic Fractionalization 2003	.080	.437	.855	.000

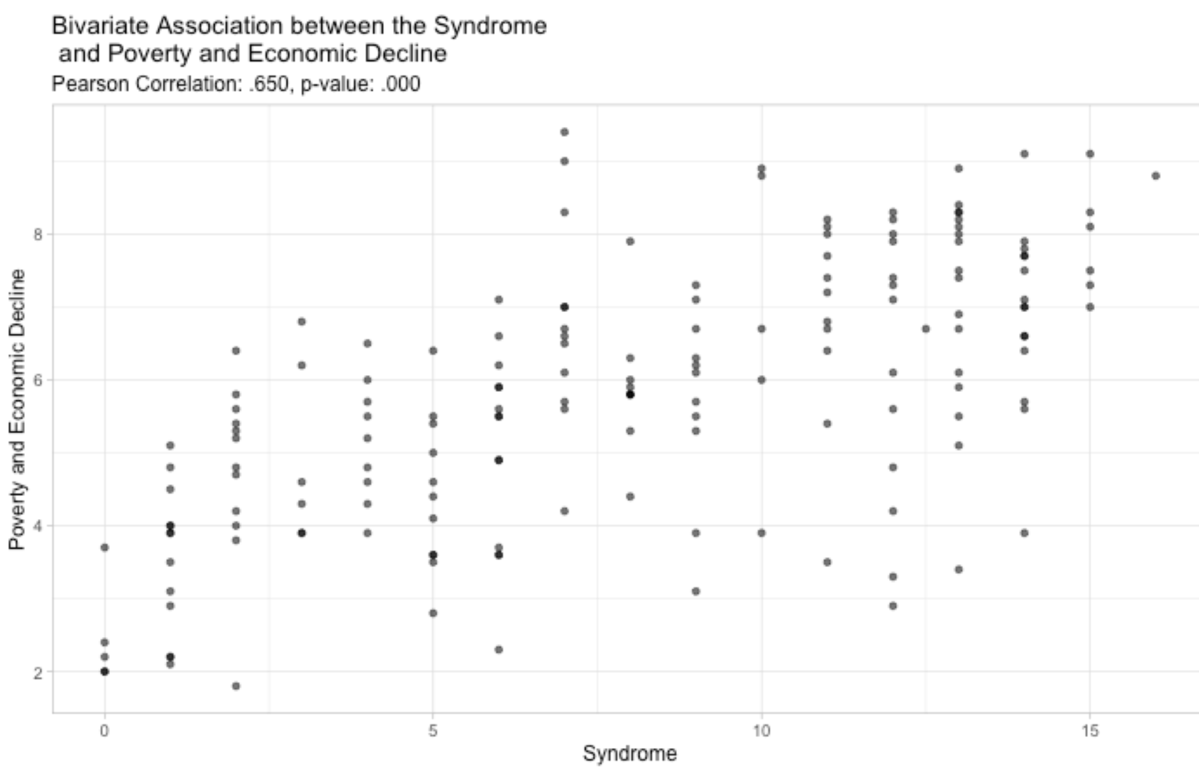
* significant at 0.001

The adjusted R-squared is a remarkably strong .612, indicating that the specified model explained at least 61.2% of the variability of poverty and economic decline, with only two out of the eight variables appearing significant, the Syndrome and Urbanization. While Urbanization's effect size is slightly larger than the Syndrome, they are fairly close. Additionally, we find that the coefficient for Syndrome is positive, indicating that countries with higher Syndrome scores have higher levels of poverty and economic decline on average. In the bivariate correlation between Syndrome and Poverty and Economic Decline, we find a clear positive, moderately strong relationship, with a correlation value of .650. The scatterplot in Figure 8.3.2 shows this relationship.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome, Urbanization, and Muslim Civilization are the only variables that are significant in predicting the logits or predicted probabilities of higher levels of poverty and economic decline. We specifically find that for every one unit increase in the Syndrome, the odds increase by 40%, or alternatively there is a 1.4 times greater risk, that the country experiences higher levels of poverty and economic decline, after holding all other control variables constant.

Figure 8.3.2 Scatterplots of Syndrome with GDP PPP and Poverty and economic decline





5) Wealth Infrastructure and Economic Freedom factor (lower scores are considered worse, N=138): Recall that this factor combines several variables (HFI Economic Freedom Index 2016, Economic Freedom Index 2017, GDP PPP (log transformed), Property Rights, Quality of Electricity Supply, Mobile Telephone Subscriptions, Internet Users, and Availability of Affordable Housing), the results are as follows:

Table 8.3.6: General Linear Model Results for Wealth Infrastructure and Economic Freedom factor (Adjusted R-squared= .600)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	.466	2.283	.838	.000
Colonial Status=0 (Never Colonized)	1.341	.981	.174	.015
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	-.810	.937	.389	.006
CIV=2 (Muslim)	2.157	1.107	.054	.030
CIV=4 (Hindu/Sinic/Buddhist)	-.688	1.273	.590	.002
CIV=5 (Africa)	0			
Syndrome 2017	-.636	.117	.000*	.197
Urbanization 2015	.095	.019	.000*	.173
Number of Land Neighbors	-.222	.139	.113	.021
Terrain 2014	-.029	.026	.268	.010
Religious Fractionalization 2003	3.651	1.569	.022	.043
Ethnic Fractionalization 2003	-2.504	1.656	.133	.019

* significant at 0.001

The adjusted R-squared is a remarkably strong .6, indicating that the specified model explained at least 60% of the variability of this cluster. The only two variables significantly associated with measures of economic freedom, property rights, and electricity/internet access were Urbanization and Syndrome. High Syndrome countries had significantly lower scores than low Syndrome countries, and the effect size for the Syndrome is actually somewhat greater than that for Urbanization. In the scatterplot in Figure 8.3.3 for the moderately strong bivariate correlation between this cluster and Syndrome (-.657, p<.000), we see a marked negative slope to the line, with virtually no countries in the lower left quadrant of the graph. Some of the countries that appear relatively high in their wealth infrastructure and economic freedom given their high Syndrome values include United Arab Emirates, Qatar, and Bahrain.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome, Urbanization, and Muslim Civilization are the only variables that are significant in predicting the logits or predicted probabilities of lower levels of wealth infrastructure and economic freedom. We specifically find that for every one unit increase in the Syndrome, the odds increase by 55%, or alternatively there is a 1.55 times greater risk, that the country experiences lower levels of wealth infrastructure and economic freedom, after holding all other control variables constant.

An ancillary analysis was run using GDP annual growth percentage. The adjusted R-squared value was a very low .034 with no significant independent variable.

6) **Global Competitiveness Index Rankings** (higher scores are considered worse, N=137): The results are as follows:

Table 8.3.7: General Linear Model Results for Global Competitiveness Index Rankings (Adjusted R-squared=.564)

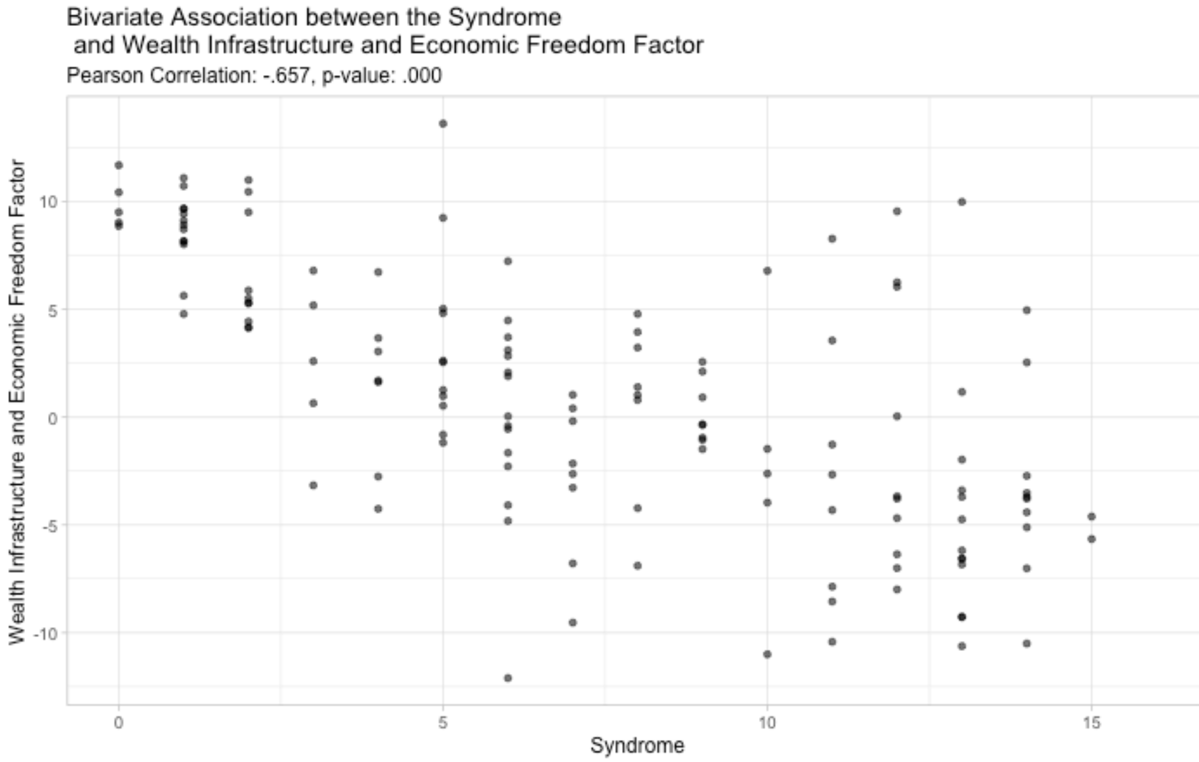
Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	88.301	15.827	.000	.209
Colonial Status=0 (Never Colonized)	-16.980	6.720	.013	.051
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	3.811	6.547	.562	.003
CIV=2 (Muslim)	-19.346	7.630	.013	.052
CIV=4 (Hindu/Sinic/Buddhist)	1.268	8.858	.886	.000
CIV=5 (Africa)	0			
Syndrome 2017	3.656	.787	.000*	.154
Urbanization 2015	-.623	.129	.000*	.164
Number of Land Neighbors	-.449	.931	.631	.002
Terrain 2014	.058	.172	.735	.001
Religious Fractionalization 2003	-24.777	10.609	.021	.044
Ethnic Fractionalization 2003	20.166	11.676	.087	.025

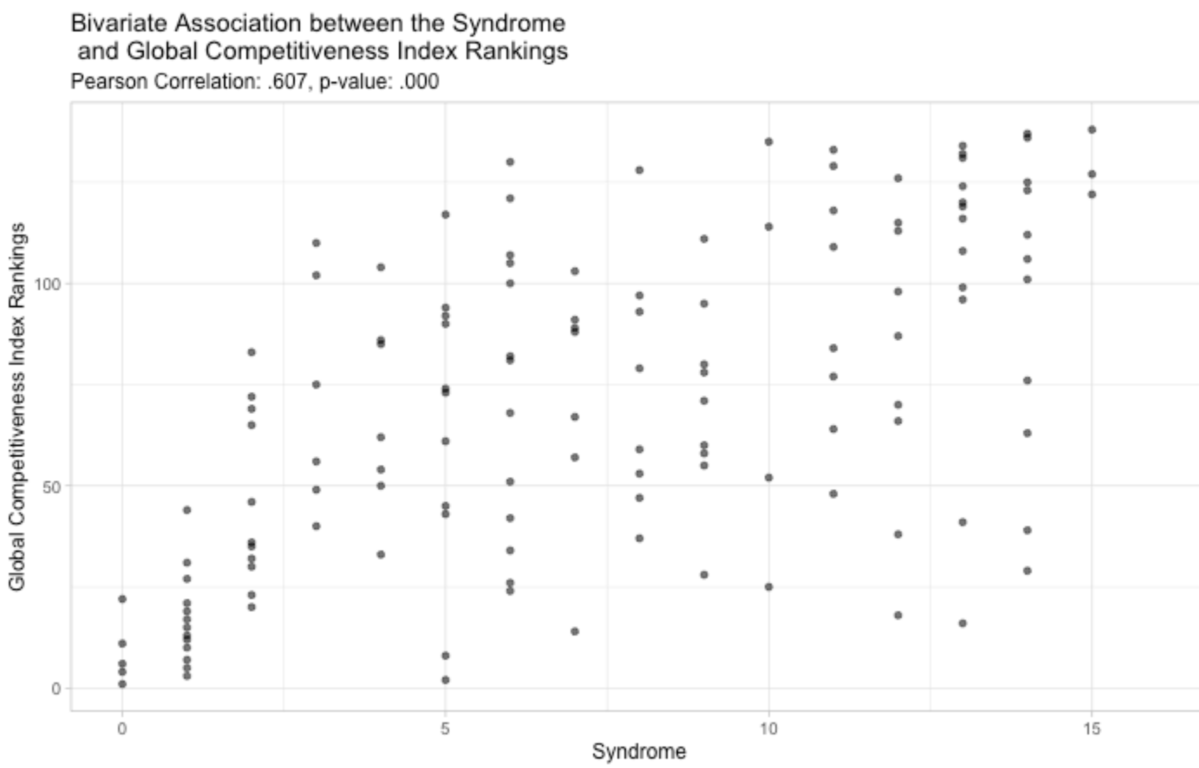
The adjusted R-squared is a strong .564, indicating that the specified model explained at least 56.4% of the variability of the Global Competitiveness Index rankings, the only two variables reaching significance in the model are once again the Syndrome and Urbanization. The effect sizes for each variable are similar, but the directions are once again opposite. Higher Urbanization is associated with higher economic competitiveness, and higher Syndrome scores are associated with lower economic competitiveness (since higher scores are worse in the ranking system for the index). The bivariate scatterplot in Figure 8.3.3 shows a fairly diffuse, moderately strong relationship ($r=.607$, $p<.000$), yet with a noticeable positive relationship.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome and Urbanization are the only variables that are significant in predicting the logits or predicted probabilities of worse Global Competitiveness Index rankings. We specifically find that for every one unit increase in the Syndrome, the odds increase by 26%, or alternatively there is a 1.26 times greater risk, that the country ranks worse on the Global Competitiveness Index, after holding all other control variables constant.

We used two ancillary variables in this main analysis of Global Competitiveness Index (GCI). Final consumption (log-transformed) had an adjusted R-squared of .444 with Urbanization and Land Neighbors as the only significant predictors of GCI. High technology exports had an R-squared value of .156 and no significant predictors. Because Syndrome is not significant in these findings, we do not report the GLM results.

Figure 8.3.3 Scatterplots of Syndrome with Wealth Infrastructure and Economic Freedom factor and Global Competitiveness Index





7) Economic Inequality factor (higher scores are considered worse, N=139):

Recall that this factor combines two variables (GINI and Uneven Economic Development), the results are as follows:

Table 8.3.8: General Linear Model Results for Economic Inequality factor (Adjusted R-squared=.482)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	.183	.836	.827	.000
Colonial Status=0 (Never Colonized)	-.561	.366	.128	.020
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	-.560	.320	.083	.026
CIV=2 (Muslim)	-1.019	.414	.015	.050
CIV=4 (Hindu/Sinic/Buddhist)	-.841	.488	.088	.025
CIV=5 (Africa)	0			
Syndrome 2017	.158	.042	.000*	.110
Urbanization 2015	-.014	.008	.068	.028
Number of Land Neighbors	.021	.048	.670	.002
Terrain 2014	-.024	.009	.006	.063
Religious Fractionalization 2003	.108	.579	.852	.000
Ethnic Fractionalization 2003	.811	.578	.163	.017

* significant at 0.001

The adjusted R-squared is a strong .482, indicating that the specified model explained at least 48.2% of the variability of this cluster. The only variable that is significant in this model is the Syndrome. We find a positive coefficient, indicating that on average as Syndrome increases, so does a country's economic inequality. This is consistent with our hypothesis. The scatterplot in Figure 8.3.4 shows the clear and moderately strong positive relationship between the Syndrome and economic inequality (r = .616, p-value = .000).

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable), but find that the model does not meet the validity requirements, so we do not report the results.

8) Female Labor Force Participation (lower scores are considered worse, N=174):

The results are as follows:

Table 8.3.9: General Linear Model Results for Female Labor Force Participation (Adjusted R-squared=.471)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	54.977	3.445	.000	.631
Colonial Status=0 (Never Colonized)	.867	1.677	.606	.002
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	-2.726	1.476	.067	.022
CIV=2 (Muslim)	-6.977	1.736	.000*	.098
CIV=4 (Hindu/Sinic/Buddhist)	-.378	2.139	.860	.000
CIV=5 (Africa)	0			
Syndrome 2017	-1.219	.179	.000*	.237
Urbanization 2015	-.142	.029	.000*	.140
Number of Land Neighbors	.239	.221	.281	.008

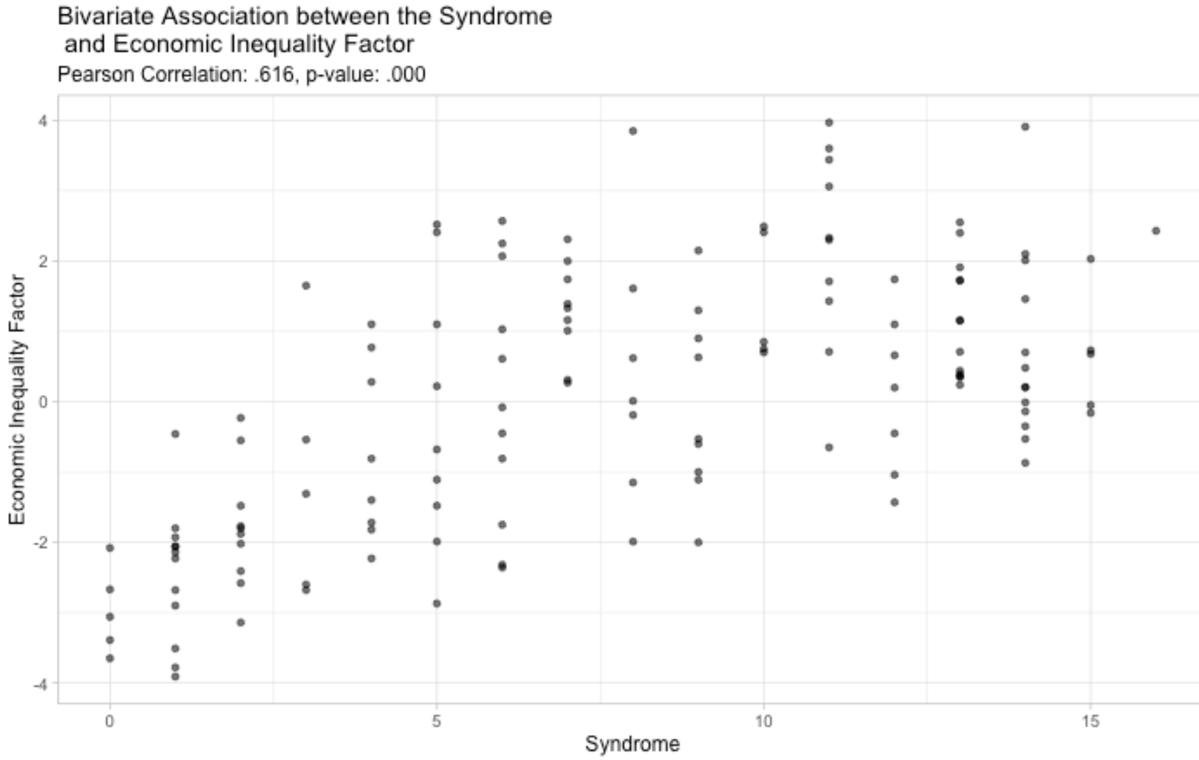
Terrain 2014	.039	.040	.336	.006
Religious Fractionalization 2003	7.939	2.452	.001*	.066
Ethnic Fractionalization 2003	4.477	2.581	.085	.020

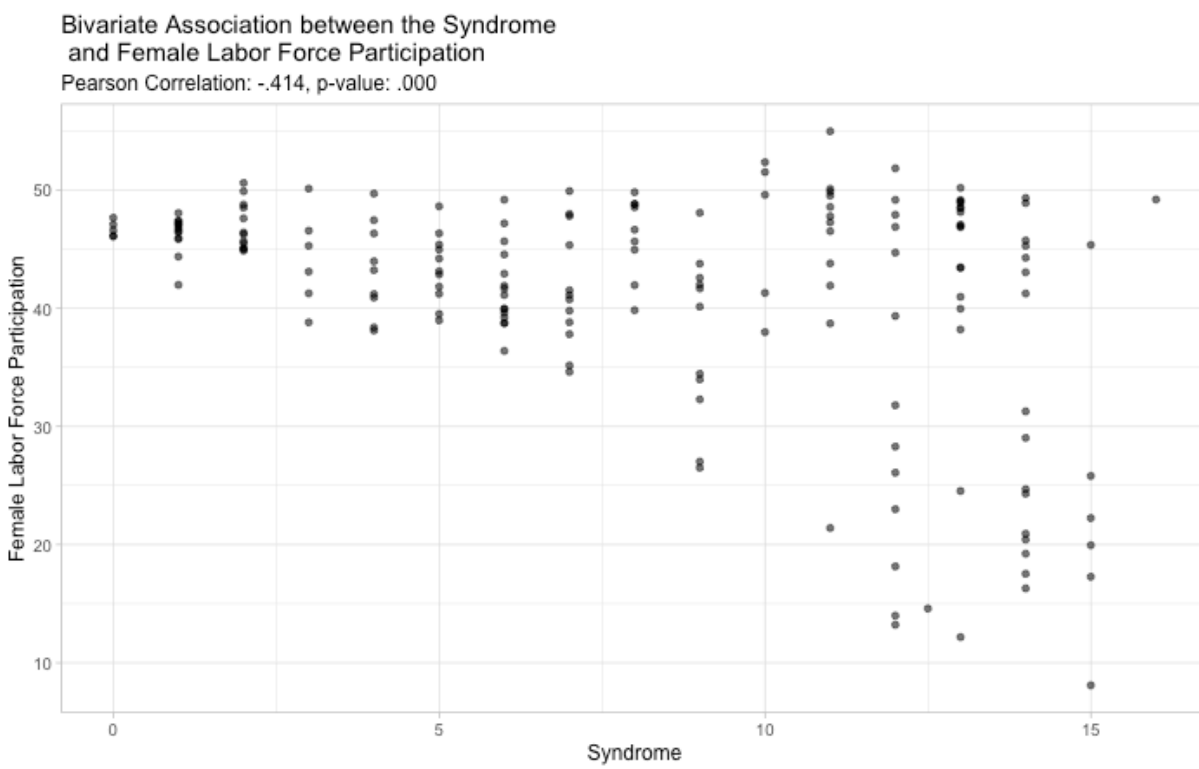
* significant at 0.001

The adjusted R-squared is a strong .471, indicating that the specified model explained at least 47.1% of the variability of female labor force participation, and the variables that reached significance include Muslim majority, the Syndrome, Urbanization, and Religious Fractionalization. Muslim majority nations and nations with high Syndrome scores have significantly lower female labor force participation; highly urbanized countries have lower female labor force participation; countries with higher levels of religious fractionalization experience lower female labor force participation. However, the effect size for the Syndrome dwarfs that of the other three variables. This is explored in the bivariate scatterplot in Figure 8.3.4, where we can see a large empty lower left quadrant (moderately strong correlation of -.414, $p<.000$). On the right hand side of the graph, however, we see no empty quadrant at all, suggesting that high Syndrome countries range from very high to very low female labor force participation.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable), but find that the model does not meet the validity requirements, so we do not report the results.

Figure 8.3.4 Scatterplots of Syndrome with Economic Inequality factor and Female labor force participation





8) **Government expenditure as % of GDP and Unemployment Rate:** The GLM results for the last two main analyses in the economic cluster had very low adjusted R-squared values (.095 and .013, respectively) and Syndrome was not significant in either analysis so we do not report the details of the analyses.

Concluding Discussion for the Economic Performance Dimension

Overall we see that in 10 of the 16 analyses conducted on indicators of economic prosperity and performance, the Syndrome demonstrated significance—in one of the models, Economic Inequality, it was the only significant variable, and in another 8 it held the largest effect size in the model. We find the Syndrome highly useful in explaining a cluster of variables representing Wealth Infrastructure and Economic Freedom, a cluster of variables representing Reliance on Agriculture and Lack of Prosperity, a cluster of variables representing Poverty and Economic Decline. It was the only significant variable in the model explaining Income Inequality, and it was also a significant variable in models of Female Labor Force Participation, Final Consumption, Food Security, Global Competitiveness, and GDP (PPP). Countries with high Syndrome scores are simply less wealthy, more economically unequal, less competitive, less food secure, and less economically secure than nations with low Syndrome scores.

4. Economic Rentierism Dimension

We hypothesize that countries with higher Syndrome scores will be associated with rent-based economies. We also hypothesize that the ability of the state to concentrate assets in the hands of the government through an economy that foregrounds extraction rather than production may reflect characteristics associated with the Syndrome. In addition, the "resource curse" has been identified as being associated with higher levels of gender inequality.[25] These variables that exist to tap this concept are imperfect measures; we identify fuel, ore, tourism, and aid rents as possible sources of state control of rents.

List and description of variables in the Economic Rentierism Dimension

The variables which are most commonly used in social science research and which the authors deemed as the most valid measures of rentierism are listed in alphabetical order below. (Note: Some potential variables of interest had to be excluded due to low N size and/or correlation ≥.9 with the variables in this list; see this endnote.[26]) The list provides the variable, the source from which the variable was obtained, whether the measure is nominal/ordinal/continuous and the range where applicable, which directionality the variable takes, the N size for the variable, and whether any transformations were used:

1) Aid Per Capita GDP, (2016, or most recent without searching earlier than 2007), World Bank, US dollars, higher scores are worse, N=130
2) Fuel Exports (2016, or most recent without searching earlier than 2007), World Bank, percent of merchandise exports, higher scores are worse, N=158
3) Natural Resource Depletion (2014), UNDP Human Development Reports, percent of GNI, higher scores are worse, N=164
4) Ores and Metals Exports (2016, or most recent without searching earlier than 2007), World Bank, percent of merchandise exports, higher scores are worse, N=159
5) Total Natural Resources Rents as % of GDP (2016, or most recent without searching earlier than 2007), World Bank, percent, higher scores are worse, N=173

6) Tourism as a Percentage of GDP (2017), World Travel and Tourism Council (Accessed from Knoema), percent, higher scores are worse, N=160

Outline of analyses used in the Rentierism Dimension

We examine these six different variables separately, so a factor analysis is not performed for these variables. The main variable used in is Total Natural Resources Rents as % of GDP: Rentier states derive a large part of national revenues from extraction and sale of resources rather than by production of goods and services in country. Rentier economies are generally not highly diversified, although some states, like Russia, while well diversified, receive a large share of the state budget from the oil and gas sector. These states may have policies of very low or no taxation of citizens and pay for state services from rent profits. This has the potential of concentrating power in the hands of state elites. We then analyze the other five variables beginning with Ores and Metals Exports and Fuel Experts. These two variables comprise a large percentage of some states' economies and small sectors of others. They measure the extent of rents for these resources as the foundation of a state's economy. Natural Resource Depletion measures the loss of a given resource, such as minerals, fishing, and fossil fuels. The variables Aid Per Capita GDP and Tourism as a Percentage of GDP present alternative sectors of a state's economy where rentierism may be present. Whether by currency transfers for tourism or by grants of funds from bilateral and multilateral organizations, state income comes from outside sources, not local production. These two variables may have a moderate impact on a given economy, but generally they help ameliorate economic challenges rather than supply a large share of the state budget.

Model specification

The model for each dependent variable or dependent variable cluster takes the same form in each case:

> Dependent variable or $cluster_i$ = Syndrome + Civilization + Colonial status + Urbanization + Terrain + Number of land neighbors + Religious fractionalization + Ethnic fractionalization + ε_i

A general linear model (GLM) procedure was used to investigate the statistical significance and explanatory power of these six independent variables. We hypothesized that, after controlling for the influence of the other seven control variables, the Patrilineal-Fraternal Syndrome will still be a significant predictor of these dependent variables and dependent variable clusters for the nations in our study.

Model results

We run six GLM under Economic Rentierism. We find that the Syndrome was significant in only one of those models. The five models where Syndrome was not significant include: (1) Ores and Metals Exports, (2) Fuel Exports, (3) Natural Resource Depletion, (4) Aid per Capita GDP, and (5) Tourism as % of GDP. Table 8.4.0 summarizes the results of these GLM analyses.

Table 8.4.1 Summary of GLM results for the Rentierism Dimension in descending order of R-squared values. Ancillary analysis in italics.

Dependent variable	**Adjusted R-squared (N)**	**Independent variables significant at .001 by descending order of effect size**
Natural Resources as % of GDP	.303 (173)	Syndrome
Ores and Metals Exports	.061 (159)	None
Fuel Exports	.250 (158)	Urbanization
Natural Resource Depletion	.243 (164)	Terrain
Aid Per Capita GDP	.024 (130)	None
Tourism as a Percentage of GDP	.158 (160)	No. of Land neighbors

We elaborate on the model where Syndrome was significant.

Natural Resources as % of GDP (higher scores are considered worse, N=173): The results were as follows:

Table 8.4.2: General Linear Model Results for Natural Resources as % of GDP (Adjusted R-squared=.303)

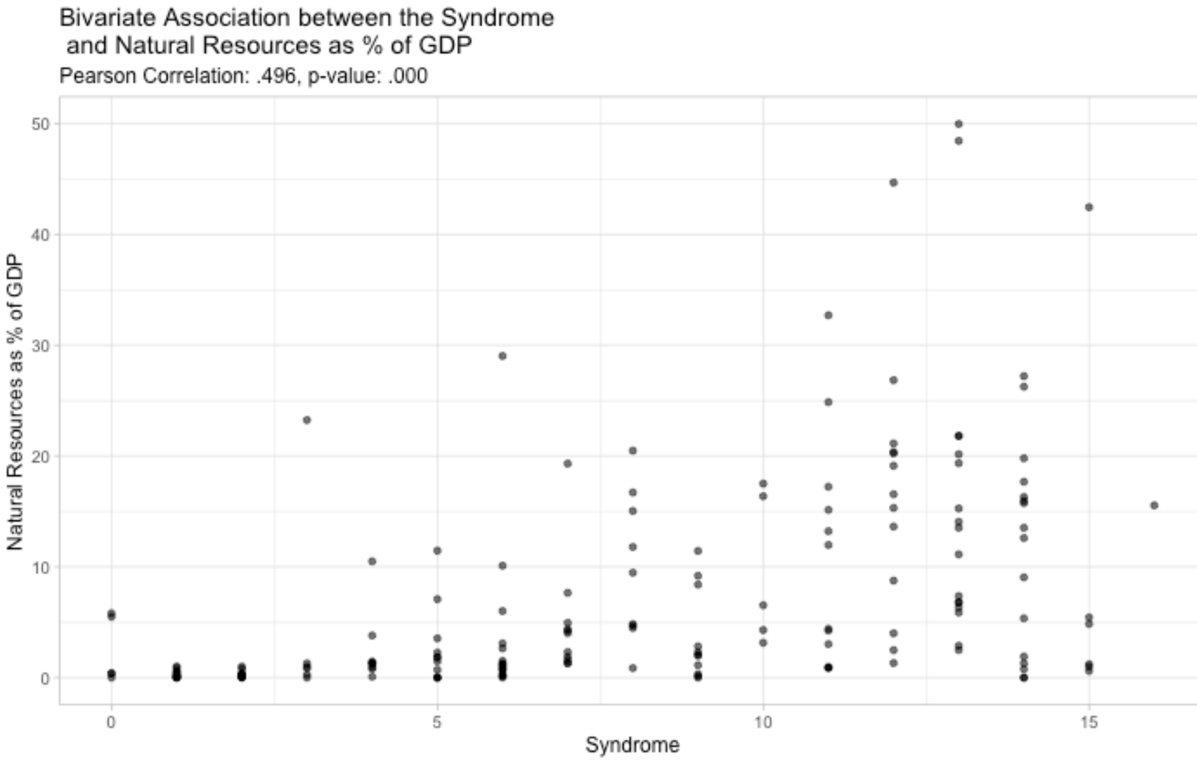
Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	-7.327	4.194	.083	.020
Colonial Status=0 (Never Colonized)	.959	2.042	.639	.001
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	1.575	1.792	.381	.005
CIV=2 (Muslim)	2.916	2.125	.172	.013
CIV=4 (Hindu/Sinic/Buddhist)	.950	2.661	.721	.001
CIV=5 (Africa)	0			
Syndrome 2017	.887	.218	.000*	.101
Urbanization 2015	.042	.035	.235	.010
Number of Land Neighbors	.253	.269	.349	.006
Terrain 2014	-.120	.049	.015	.039
Religious Fractionalization 2003	2.835	2.984	.344	.006
Ethnic Fractionalization 2003	7.373	3.171	.021	.035

* significant at 0.001

The adjusted R-squared is a moderate .303, indicating that the specified model explained at least 30.3% of the variability of natural resources as a percentage of GDP, demonstrating moderate explanatory power for the model. Only one variable was significant in the model: the Syndrome, though the effect size is modest. The bivariate correlation was a moderately strong .496, significant at the $p<.001$ level. The scatterplot in Figure 8.4.1 shows that those with highest levels of natural resources as a % of GDP all do tend to have high Syndrome scores. The upper left quadrant of the scatterplot is empty.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome, Terrain, and Ethnic Fractionalization are the only variables that are significant in predicting the logits or predicted probabilities of higher levels of natural resources rents as a % of GDP. We specifically find that for every one unit increase in the Syndrome, the odds increase by 18%, or alternatively there is a 1.18 times greater risk, that the country experiences higher levels of natural resources rents as a % of GDP, after holding all other control variables constant.

Figure 8.4.1 Scatterplot of Syndrome with Natural Resources as % of GDP



Concluding Discussion for the Rentierism Dimension

We were interested in exploring measures of rentierism because the structures of state economic productivity may be related to its social structures. Our empirical analysis demonstrates that existing measures of the state's ability to extract resource-based rents are not well explained by any of the variables in the overall model tested. Only the variable of Natural Resources as a percentage of GDP showed any significant correlation to the Syndrome, with the bivariate scatterplot showing that a higher percentage of these rents are significantly associated with higher Syndrome scores. In multivariate modeling, the effect size was modest, however. We believe this putative relationship deserves greater study, perhaps using better, more comprehensive indicators of rentierism when these are developed, for the existing variables only examine subsets of sources of rents.

5. Health and Wellbeing Dimension

We hypothesize that nations with higher Syndrome scores will have lower levels of health and life expectancy for women, men, and children including vulnerability to various illnesses; lower levels of spending on health, less prenatal care, higher birth rates, higher rates of habits detrimental to health, less access to clean water and sanitary facilities, undernourishment, greater hunger and less adequate diet, and more prevalence of female genital mutilation.

List and description of variables in the Health and Wellbeing Dimension

The variables which are most commonly used in social science research and which the authors deemed as the most valid measures of health and well-being of a nation are listed in alphabetical order below. (Note: Some variables were excluded due to N size reasons, their data was not recent enough, or because their bivariate correlation with another variable in this cluster exceeded 0.90.[27]) The list provides the variable name, the variable, the source from which the variable was obtained, whether the measure is nominal/ordinal/continuous and the range where applicable, which directionality the variable takes, the N size for the variable, and whether any transformations were used:

1) Access to Improved Sanitary Facilities (2016), Social Progress Index, percent, lower scores are worse, N=172
2) Access to Improved Water Sources (2016), Social Progress Index, percent of the rural population, lower scores are worse, N=171

3) Average Dietary Energy Supply Adequacy (2014-2016), Food and Agriculture Organization of the UN, percent (3-year average), lower scores are worse, N=162
4) Births per 1000 Women Ages 15-19 (2016), The World Bank, rate per 1000, higher scores are worse, N=174
5) Cigarette Consumption, number of cigarettes smoked per person per year ages ≥ 15, (2016), The Tobacco Atlas, higher scores are worse, N=171
6) Deaths due to Diarrhea of Children Under 5 (2010), Global Health Observatory (Accessed from Knoema), percent, higher scores are worse, N=171
7) Difference Between Female and Male Life Expectancy (2015), The WomanStats Project, ordinal (0-2), higher scores are worse, N=173
8) Female Genital Cutting/Mutilation (2015), The WomanStats Project, ordinal (0-4), higher scores are worse, N=176
9) Global Hunger Index (2016), Global Hunger Index, scale (min=4, max=46.1), higher scores are worse, N=118 (Note: This variable was excluded from the EFA because its sample size was too low, but was analyzed separately.)
10) Health Expenditure as % of GDP (2015), World Health Organization, percent, lower scores are worse, N=169
11) Health Expenditure Per Capita (2015), World Health Organization (Accessed from Wikipedia), US dollars, lower scores are worse, N=168
12) Incidence of Tuberculosis per 100,000 People (2016), The World Bank, rate per 100,000, higher scores are worse, N=174
13) Infant Mortality Rate (2016), The World Bank, rate per 1000 live births, higher scores are worse, N=174

14) Life Expectancy at Birth for Females (2015), World Health Organization, years, lower scores are worse, N=173

15) Life Expectancy (2015), World Health Organization, years, lower scores are worse, N=173

16) Lifetime Risk of Maternal Death (2015), The World Bank, percent, higher scores are worse, N=174

17) Maternal Mortality Rate (2015), The WomanStats Project, ordinal (0-4), higher scores are worse, N=173

18) Percentage of Adults Ages 15-49 with HIV/AIDS (2016), CIA World Factbook, percent, higher scores are worse, N= 130

19) Prevalence of HIV Among Women Ages 15+ (2016), The World Bank, percent ("Women's share of population aged 15+ living with HIV (%)", meaning that it is the percentage, out of the total HIV population, of women), higher scores are worse, N=131 (Note: This variable was excluded from the EFA because its sample size was too low, but was analyzed separately.)

20) Prevalence of Wasting - % Under 5 (2015, or most recent without searching earlier than 2007), The World Bank, percent, higher scores are worse, N=116 (Note: This variable was excluded from the EFA because its sample size was too low, but was analyzed separately.)

21) Sustainable Society Index Human Wellbeing (2016), Sustainable Society Index, continuous scale (min=3.1; max=9.0), higher scores are worse, N=154

22) Total Alcohol Consumption Per Capita (2015), The World Bank, liters of pure alcohol per capita, higher scores are worse, N=171

23) Percent Births Attended by Skilled Staff (2017, or most recent without searching earlier than 2007), The World Bank, percent, lower scores are worse, N=162

24) Percent Children Ages 12-23 Months Immunized Against Measles (2016), The World Bank, percent, lower scores are worse, N=173

25) Percent of Population Between 15-49 with HIV (2016), The World Bank, percent, higher scores are worse, N=131 (Note: This variable was excluded from the EFA because its sample size was too low, but was analyzed separately.)

26) Percent of Population that is Undernourished (2015), The World Bank, percent, higher scores are worse, N=159

27) Percent Population Using Open Defecation in Urban Areas (2015), WHO/UNICEF, percent, higher scores are worse, N=171 (Note: if value was missing and % Total Population Using Open Defecation variable's value was 0, we used a 0)

28) Percent of Pregnant Women Receiving Prenatal Care (2017, or most recent without searching earlier than 2007), The World Bank, percent, lower scores are worse, N=144

29) Percent Total Population Using Open Defecation (2015), WHO/UNICEF, percent, higher scores are worse, N=174

30) Percent Under 5 Who are Stunted (2015, or most recent without searching earlier than 2007), The World Bank, percent, higher scores are worse, N=117 (Note: This variable was excluded from the EFA because its sample size was too low, but was analyzed separately.)

31) Percent Under 5 who are Underweight (2015, or most recent without searching earlier than 2007), The World Bank, percent, higher scores are worse N=116 (Note: This variable was excluded from the EFA because its sample size was too low, but was analyzed separately.)

We desired to reduce the number of variables examined through factor analysis in order to find variables which clustered highly on the same factors and thus could be analyzed together. In this manner and through theoretical considerations, we identified four factors, with 20 variables requiring individual modeling, for a total of 24 outcome variables. The z-scores of the variables in each factor were added to create the score for each factor, after checking for consistency in direction (or multiplied by -1 to maintain consistency):

1) Preventable Death factor (higher scores are considered worse, N=172): This cluster consists of these four variables with loadings ranging from .737 to 1.063: (1) Lifetime Risk of Maternal Death, (2) Infant Mortality Rate, (3) Births per 1000 Women Ages 15-19, and (4) Difference Between Female and Male Life Expectancy.

2) Open Defecation factor (higher scores are considered worse, N=171): This cluster consists of these two variables with loadings ranging from .845 to .920: (1) % Total Population Using Open Defecation and (2) % Population Using Open Defecation in Urban Areas.

3) Health Care Access factor (lower scores are considered worse, N=159): This cluster consists of these three variables with loadings ranging from -.826 to -.648: (1) Access to Improved Sanitary Facilities, (2) % Birth Attended by Skilled Staff, and (3) Life Expectancy.

4) Malnutrition and Illness factor (higher scores are considered worse, N=159):

This cluster consists of these two variables with loadings ranging from -.923 to -.533: (1) % of Population that is Undernourished and (2) Incidence of Tuberculosis per 100,000 People.

Outline of analyses used in the Health and Wellbeing Dimension

We present ten separate analyses for the Health and Well Being dimension. The first analysis includes five variables. It first examines the Health Care Access Factor, which includes three variables. Access to improved sanitary facilities measures the percent of the population with improved methods of sanitation. Percent of Births Attended by Skilled Staff measures the percentage of deliveries which trained personnel supervise during pregnancy, labor, and the postpartum period. This includes the training to conduct deliveries on their own and care for newborns. The third variable in this factor, Life Expectancy, measures the average number of years that a newborn, male or female, could live given death rates that apply both to their year of birth and their given locale. We also include two variables for ancillary analysis. The Sustainable Society Index combines a number of variables related to human wellbeing including nutrition, improved water, sanitation, education, life expectancy, gender equality, income distribution, rates of population growth and good governance. The final variable, Percent of Pregnant Women Receiving Prenatal Care, measures the percentage of women attended at least once by trained health workers because of her pregnancy.

The second analysis looks at national health expenditures. The main analysis variable is Health Expenditure Per Capita which is a state's total health expenditure per capita figured in PPP. The ancillary variable, Health Expenditure as percent of GDP, comprises the sum of public and private health expenditures (e.g., insurance, government funds, external borrowings and grants) calculated against a state's GDP. It includes a large range of health services, preventive and curative, family planning activities, nutrition activities, and emergency aid.

The third analysis utilizes the Preventable death factor as its primary analysis and seven variables as ancillary analyses. The Factor is composed of four variables. Lifetime Risk of Maternal Death which assesses the risk of a reproductive age woman dying from a cause related to child bearing. Infant Mortality Rate gives the number of children dying before reaching one year of age, per 1,000 live births in a given year and locale. Births per 1000 Women Ages 15-19 is also called the adolescent fertility rate; it calculates the births (per 1000) by women aged 15-19. The final variable in the factor is Difference Between Female and Male Life Expectancy which measures the difference between male and female life expectancy rates for a given locale. The first ancillary variable is Life Expectancy at Birth for Females which gives the number of years a female newborn could live given both the age-specific death rates for the year of her birth and her locale. Maternal Mortality Rate measures a woman's risk of death while pregnant or giving birth from any cause related to her pregnancy or childbearing figured for 100,000 live births. Deaths due to Diarrhea of Children Under 5 measures the percent of children under five years whose deaths are due to diarrhea. The Percent of Children Under 5 who are Stunted measures the percentage of children under five whose height is significantly under international standards. The Percent of Children Under 5 who are Underweight measures the percentage of children under age 5 whose weight is significantly under international standards. Prevalence of Wasting – Percent of Children Under 5 gives the percentage of children whose weight for their height is significantly under international standards. The seventh ancillary variable for Analysis 3 is Percent of Children Ages 12-23 Months Immunized Against Measles. This measures the percentage of children aged 12-23 months who received at least one dose of the measles vaccination.

The fourth analysis has one variable, Total Alcohol Consumption Per Capita which measures the total amount of alcohol by liter consumed over a calendar year figured per capita for population over 15. The fifth analysis measures three variables concerned with HIV/AIDS. The main variable analyzed is Prevalence of HIV Among Women Ages 15+ which is women's share of population aged 15 and over infected with HIV, meaning that it is the percentage of women out of the total HIV population. The first ancillary variable, of Population Between 15-49 with HIV, measures the percentage of people aged 15-49 infected with HIV. The second ancillary variable, Percentage of Adults Ages 15-49 with HIV/AIDS, measures the percentage of adults (15-49) living with HIVAIDS.

The sixth analysis looks at variables associated with hunger, malnutrition and illness. We use the Global Hunger Index, which measures hunger, undernourishment, child wasting and stunting and child mortality, in our main analysis. We use two variables in ancillary analyses. The first ancillary variable used is our Malnutrition and Illness factor which has two indicators: Percent of Population that is Undernourished which measures the percent who consume below the minimum level of dietary energy consumption continually. Incidence of Tuberculosis per 100,000 People measures the estimated number of new and relapse cases of tuberculosis for 100,000 population in a given year. The second ancillary variable used is Average Dietary Energy Supply Adequacy which assesses the adequacy of calorie intake by calculating the percentage of the Average Dietary Energy Requirement needed for dietary adequacy.

The seventh analysis has one variable, Female Genital Cutting/Mutilation, which is defined by scratching, cutting, circumcising, and/or stitching the external genitalia of a girl or woman. This ranges from mild forms to severe forms such as infibulation.

The eighth analysis also has one variable, Access to Improved Water Sources, which measures the percentage of the rural population with piped water to a house or yard, or access to a public tap, well, protected spring or other protected water source.

The ninth analysis has one variable, Cigarette Consumption, which measures the number of cigarettes, whether machine rolled or consumer rolled, smoked per year for population over 15 figured per capita.

The tenth analysis uses the Open defecation factor, which has two variables. Percent of Total Population Using Open Defecation measures the percentage of population whose sanitary practices are open defecation. Percent of Population Using Open Defecation in Urban Areas measures the percentage of population in urban areas whose sanitary practices are open defecation.

Model specification

The model for each dependent variable or dependent variable cluster takes the same form in each case:

> Dependent variable or cluster_i = Syndrome + Civilization + Colonial status + Urbanization + Terrain + Number of land neighbors + Religious fractionalization + Ethnic fractionalization + ε_i

A general linear model (GLM) procedure was used to investigate the statistical significance and explanatory power of these eight independent variables. We hypothesized that, after controlling for the influence of the other seven control variables, the Patrilineal-

Fraternal Syndrome will still be a significant predictor of these dependent variables and factors for the nations in our study.

Model results

We run 24 general linear model analyses under Health and Wellbeing. We find that the Syndrome was significant in 17 of those 24 models. The seven models where Syndrome was not significant include: (1) Open Defecation factor, (2) Percent of Children Ages 12-23 Months Immunized Against Measles, (3) Access to Improved Water, (4) Average Dietary Energy Supply Adequacy, (5) Cigarette Consumption, (6) Percent of Population Between 15-49 with HIV, and (7) Percentage of Adults Ages 15-49 with HIV/AIDS. Table 8.5.1 below summarizes the results of the GLM analyses.

Table 8.5.1 Summary of GLM results for the Health and Wellbeing cluster in descending order of R-squared values. Ancillary analysis in italics.

Dependent variables	**Adjusted R-squared (N)**	**Independent variables significant at .001 by descending order of effect size**
1) Health care access factor • Access to improved sanitary facilities • % Birth attended by skilled staff • Life expectancy	.702 (159)	Syndrome Urbanization Muslim civilization Ethnic fractionalization
Sustainable Society Index Human Wellbeing	*.715 (154)*	*Syndrome* *Ethnic fractionalization* *Muslim civilization*
% of Pregnant women receiving prenatal care	*.332 (144)*	*Syndrome* *Urbanization*
2) Health expenditure per capita	.616 (168)	Syndrome Urbanization Colonial status
Health expenditure as % of GDP	.254 (169)	*Colonial status* *Syndrome*
3) Preventable death factor	.594 (172)	Syndrome

• Risk of maternal death • Infant mortality rate • Births per 1000 women ages 15-19 • Difference in life expectancy between men and women		Urbanization Ethnic fractionalization
Life expectancy at birth for females	*.746 (173)*	*Syndrome* *Urbanization* *Muslim civilization* *Ethnic fractionalization*
Maternal mortality rate	*.699 (175)*	*Urbanization* *Syndrome* *Muslim civilization* *Ethnic fractionalization*
Deaths due to diarrhea of children under 5	*.628 (171)*	*Urbanization* *Syndrome* *Ethnic fractionalization*
% under 5 who are stunted	*.550 (117)*	*Urbanization* *Syndrome*
% under 5 who are underweight	*.516 (116)*	*Urbanization* *Syndrome*
Prevalence of wasting: % under 5	*.359 (116)*	*Urbanization* *Syndrome*
% Children ages 12-23 months immunized against measles	*.209 (173)*	*None*
4) Total alcohol consumption per capita	.535 (171)	Syndrome Religious fractionalization Terrain
5) Prevalence of HIV among women ages 15+	.525 (131)	Muslim civilization Syndrome
% of Population between 15-49 with HIV	*.243 (131)*	*Religious fractionalization* *Western civilization*
Percentage of adults ages 15-49 with HIV/AIDS	*.243 (130)*	*Religious fractionalization* *Western civilization*
6) Global Hunger Index	.577 (118)	Urbanization Syndrome

Malnutrition and Illness factor • *% of Population undernourished* • *Incidence of tuberculosis per 100,000 people* *Average dietary energy supply adequacy*	*.432 (159)* *.309 (162)*	*Urbanization* *Syndrome* *Muslim and Western civilizations* *Urbanization*
7) Female Genital Mutilation (FGM)	.297 (176)	Syndrome Colonial status Ethnic fractionalization
8) Access to improved water	.436 (171)	Urbanization Ethnic fractionalization
9) Cigarette consumption	.255 (171)	None
10) Open defecation factor • % Total population using open defecation • % Population using open defecation in urban areas	.295 (171)	None

We elaborate on the ten main GLM analyses.

1) **Health Care Access factor** (lower scores are considered worse, N=159): Recall that this factor combines three variables (Access to Improved Sanitary Facilities, % Birth Attended by Skilled Staff, and Life Expectancy), the results are as follows:

Table 8.5.2 General Linear Model Results for Health Care Access factor (Adjusted R-squared=.702)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	.589	.774	.448	.004
Colonial Status=0 (Never Colonized)	-.444	.425	.299	.008
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	.636	.329	.055	.027
CIV=2 (Muslim)	1.891	.392	.000*	.147

CIV=4 (Hindu/Sinic/Buddhist)	1.465	.477	.003	.065
CIV=5 (Africa)	0			
Syndrome 2017	-.297	.042	.000*	.267
Urbanization 2015	.040	.007	.000*	.212
Number of Land Neighbors	.024	.050	.628	.002
Terrain 2014	-.015	.009	.107	.019
Religious Fractionalization 2003	-.201	.573	.726	.001
Ethnic Fractionalization 2003	-2.273	.608	.000*	.094

* significant at 0.001

The adjusted R-squared is a remarkably strong .702, indicating that the specified model explained at least 70.2% of the variability of this factor. Four variables proved significant: the Syndrome, Urbanization, Muslim Civilization, and Ethnic Fractionalization. The coefficients for the Syndrome and Ethnic Fractionalization are negative showing that the higher these two variables, the poorer the government's ability to provide basic services to their citizens. Urbanization and Muslim Civilization were both positive meaning that the higher their score, the better health services provided and accessed on a national basis. The Syndrome showed the largest effect size (.267) followed by Urbanization at .212, and Muslim Civilization at .147. Ethnic Fractionalization showed the smallest effect size out of the significant variables (.094). The bivariate correlation between Syndrome and Health Care Cluster is negative and very strong (r=-.707, p-value= .000) as the scatterplot in Figure 8.5.1 illustrates in a negative curve. The outliers in the lower portion of the upper left quadrant is Mongolia which ranks as a 3 in Syndrome and -.02 in Health Care Access, Haiti which ranks as a 7 for Syndrome and -4.14 in Health Care Access, and Madagascar which ranks as an 8 for Syndrome and -4.63 in Health Care Access.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome and Urbanization are the only variables that are significant in predicting the logits or predicted probabilities of lower health care access for its citizens. We specifically find that for every one unit increase in the Syndrome, the odds increase by 48%, or alternatively there is a 1.48 times greater risk, that the country experiences lower health care access for its citizens, after accounting for the other control variables.

We used the Human Wellbeing component of the Sustainable Society Index in an ancillary analysis and found a high adjusted R-squared value of .715 with Syndrome, Ethnic Fractionalization and Muslim civilization as the three most significant predictors of this outcome variable. Another ancillary variable used was Percentage of Pregnant women receiving prenatal care. The adjusted R-squared value was a much lower .332 but Syndrome and Urbanization were still significant predictors.

2) **Health Expenditure Per Capita** (lower scores are considered worse, N=168): The results are as follows:

Table 8.5.3 General Linear Model Results for Health Expenditure Per Capita (Adjusted R-squared=.616)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	898.993	550.601	.105	.018
Colonial Status=0 (Never Colonized)	1233.852	265.153	.000*	.131
Colonial Status=1 (Ever Colonized)	0			

CIV=1 (West/Orthodox/Latin)	-131.194	233.721	.575	.002
CIV=2 (Muslim)	354.210	277.603	.204	.011
CIV=4 (Hindu/Sinic/Buddhist)	-408.168	345.440	.239	.010
CIV=5 (Africa)	0			
Syndrome 2017	-171.859	28.565	.000*	.201
Urbanization 2015	26.679	4.585	.000*	.190
Number of Land Neighbors	-45.079	34.966	.199	.011
Terrain 2014	-4.178	6.349	.512	.003
Religious Fractionalization 2003	1114.804	395.845	.006	.052
Ethnic Fractionalization 2003	-298.892	416.299	.474	.004

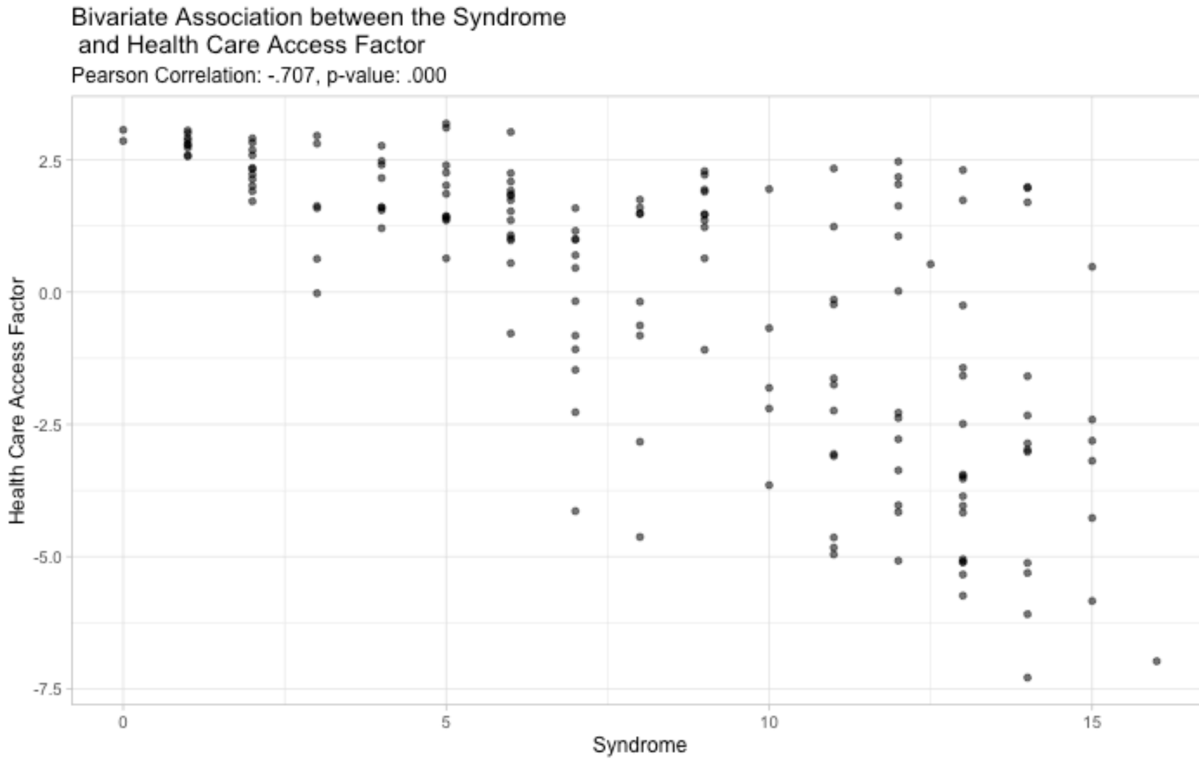
* significant at 0.001

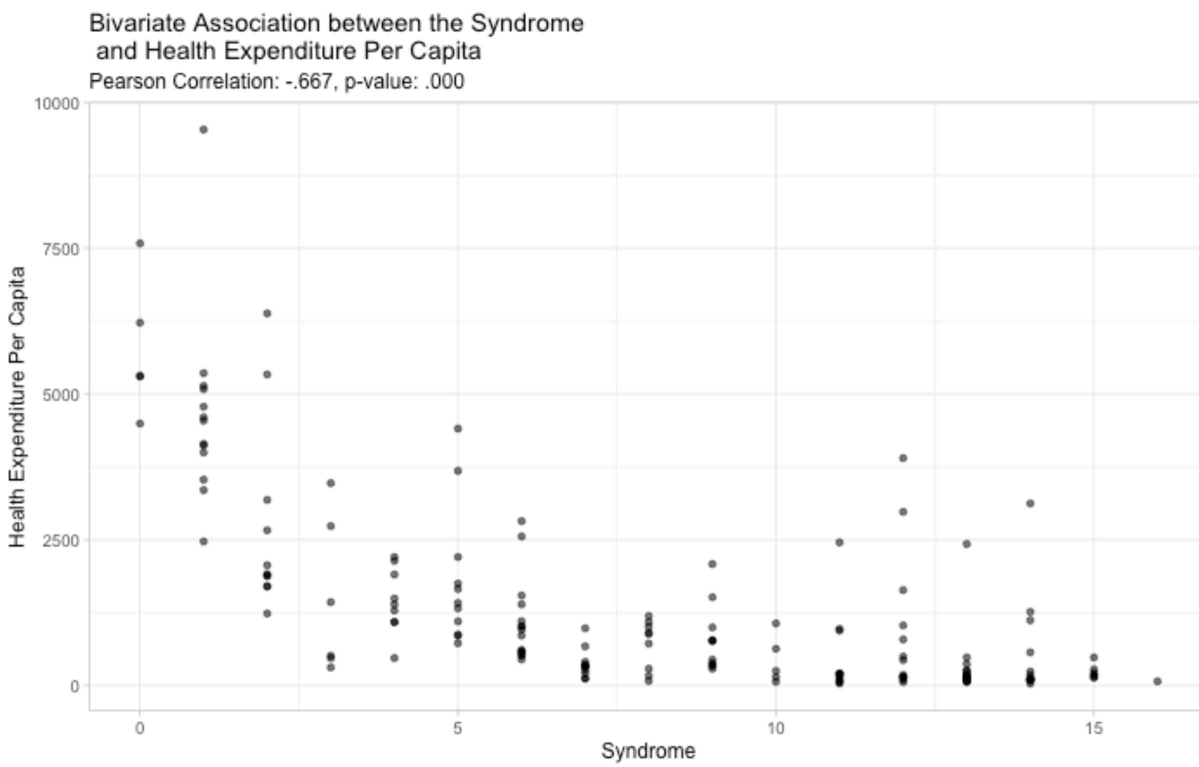
The adjusted R-squared is a remarkably strong .616, indicating that the specified model explained at least 61.6% of the variability of health expenditure per capita. Three variables are significant: Colonial Status/Never Colonized, the Syndrome, and Urbanization. The effect sizes respectively are .131, .201, and .190 with Syndrome slightly higher than Urbanization. Colonial status/Never Colonized and Urbanization have positive coefficients that show that countries that were not colonized as well as Urbanized countries have higher health expenditures per capita. The Syndrome's negative coefficient shows that the higher the Syndrome score, the less countries spend on health per capita. The bivariate correlation between Health Expenditure Per Capita and the Syndrome is likewise significant and moderately strong, a negative (r = -.667, p-value .000). The scatterplot in Figure 8.5.1 demonstrates a strong negative correlation with countries high on the syndrome spending less on health. Outliers in the upper left quadrant include the United States which ranks 1 on Syndrome and a high $9536 on health expenditures per capita. In the middle of the plot outliers are Japan and Singapore, which both rank as 5 on Syndrome and score $4405 and $3681 respectively on Health Expenditure. We also find a few outliers in the lower left quadrant: Qatar and Kuwait both with Syndrome scores of 12, United Arab Emirates with a Syndrome score of 13, and Saudi Arabia with a Syndrome score of 14.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome, Urbanization, and Religious Fractionalization are the only variables that are significant in predicting the logits or predicted probabilities of lower health expenditure per capita. We specifically find that for every one unit increase in the Syndrome, the odds increase by 70%, or alternatively there is a 1.7 times greater risk, that the country experiences lower health expenditure per capita, after accounting for the other control variables.

We used Health Expenditure as % of GDP as ancillary variable but obtained a much lower adjusted R-squared value of .254. However, Syndrome was still significant, as was Colonial Status.

Figure 8.5.1 Scatterplots of Syndrome with Health Care Access factor and Health expenditure per capita





3) **Preventable Death factor** (higher scores are considered worse, N=172): Recall that this factor combines four variables (Risk of Maternal Death, Infant Mortality Rate, Births per 1000 Women Ages 15-19, Difference in Life Expectancy between Men and Women), the results are as follows:

Table 8.5.4: General Linear Model for Preventable Death factor (Adjusted R-squared= .594)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	-1.076	1.146	.349	.006
Colonial Status=0 (Never Colonized)	.463	.556	.406	.005
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	-.598	.491	.225	.010
CIV=2 (Muslim)	-1.752	.575	.003	.059
CIV=4 (Hindu/Sinic/Buddhist)	-1.118	.709	.117	.017
CIV=5 (Africa)	0			
Syndrome 2017	.366	.060	.000*	.200
Urbanization 2015	-.040	.010	.000*	.104
Number of Land Neighbors	-.091	.074	.218	.010
Terrain 2014	.002	.013	.893	.000
Religious Fractionalization 2003	-.120	.818	.884	.000
Ethnic Fractionalization 2003	3.394	.879	.000*	.092

* significant at 0.001

The adjusted R-squared is a strong .594, indicating that the specified model explained at least 59.4% of the variability of this cluster. Three variables are significant in this model: The Syndrome, Urbanization, and Ethnic Fractionalization. The coefficient for the Syndrome is positive which means that higher Syndrome countries score worse on this cluster. Ethnic Fractionalization coefficient is also positive, which means that countries that score higher in ethnic fractionalization score worse on this cluster. The coefficient for the Urbanization variable is negative which means that countries that are more urbanized score better on the Preventable Death Cluster. The effect size for Urbanization (.104) and Ethnic Fractionalization (.092) are similar, but both are outstripped by the Syndrome (.200). The bivariate correlation between Syndrome and the Preventable Death Cluster bears out this moderately (almost very) strong correlation ($r = .696$ p-value: .000) as does the scatterplot in Figure 8.5.2. High Syndrome scores are associated with the variables combined in this Preventable Death Cluster: a higher risk of maternal death spread over the woman's lifetime, higher mortality rates for children under 5, higher number of births for women ages 15-19, and higher discrepancies in life expectancy between men and women. These correlations show that health for women and children are severely compromised in Syndrome countries.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome and Urbanization are the only variables that are significant in predicting the logits or predicted probabilities of high instances of preventable death. We specifically find that for every one unit increase in the Syndrome, the odds increase by 84%, or alternatively there is a 1.84 times greater risk, that the country experiences high instances of preventable death, after accounting for the other control variables.

We use seven ancillary variables (see Table 8.5.1) in a GLM analysis and the adjusted R-squared values ranged from .209 to .746. The Syndrome is significant in six of these ancillary analyses. The only outcome variable that is not significant is % of Children ages 12-23 months immunizes against measles; this variable has also the lowest adjusted R-squared.

4) **Total Alcohol Consumption Per Capita** (higher scores are considered worse, N=171): The results are as follows:

Table 8.5.6 General Linear Model Results for Total Alcohol Consumption Per Capita (Adjusted R-squared=.535)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	6.957	1.438	.000	.137
Colonial Status=0 (Never Colonized)	-.499	.695	.474	.003
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	-.503	.621	.420	.004
CIV=2 (Muslim)	-1.314	.721	.071	.022
CIV=4 (Hindu/Sinic/Buddhist)	-.360	.891	.687	.001
CIV=5 (Africa)	0			
Syndrome 2017	-.587	.075	.000*	.292
Urbanization 2015	.007	.012	.573	.002
Number of Land Neighbors	.282	.092	.002	.060
Terrain 2014	.060	.017	.000*	.082
Religious Fractionalization 2003	3.796	1.015	.000*	.086

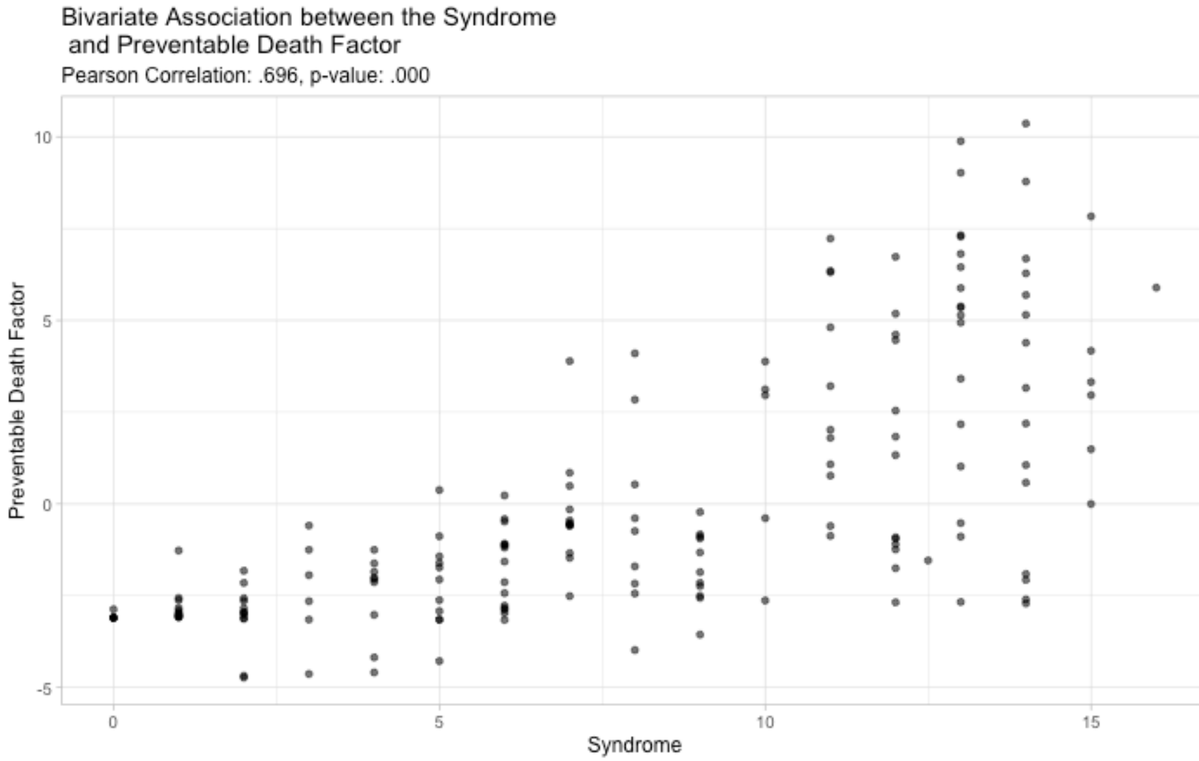
Ethnic Fractionalization 2003	.923	1.071	.390	.005

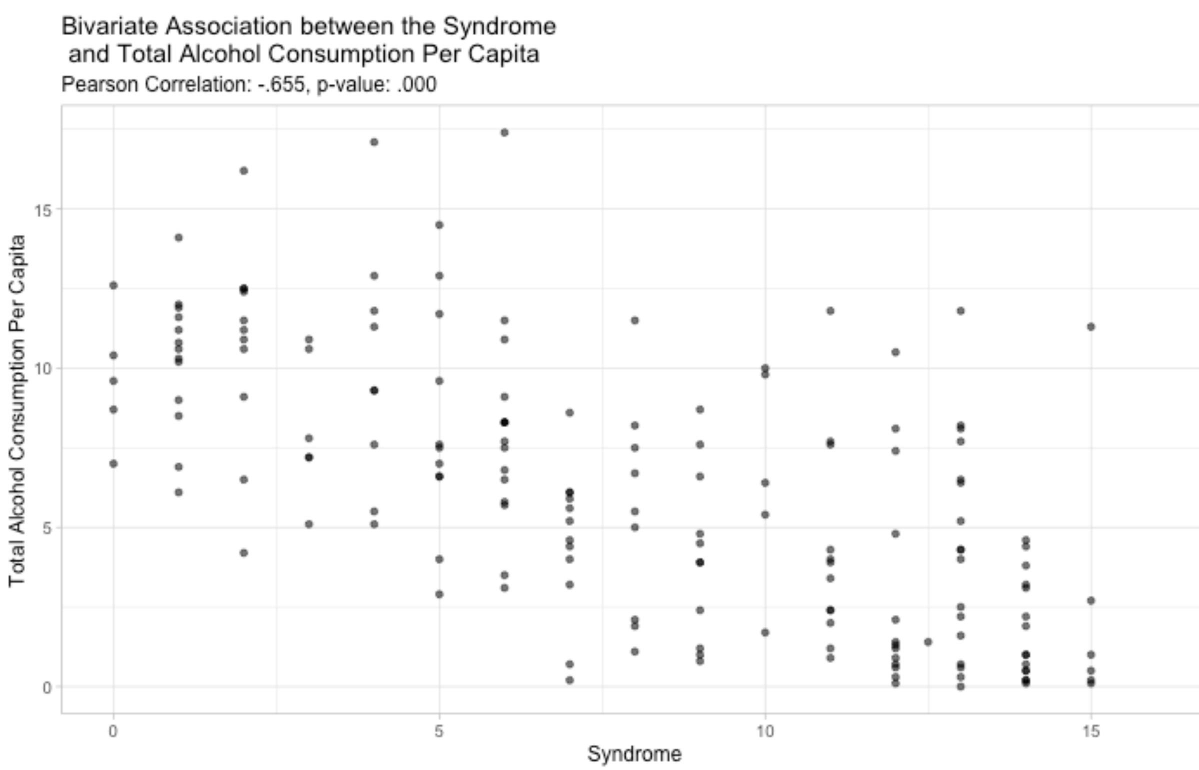
* significant at 0.001

The adjusted R-squared is a strong .535, indicating that the specified model explained at least 53.5% of the variability of total alcohol consumption per capita. Three variables are significant: the Syndrome (effect size .292), Percent of Arable Terrain (.082), and Religious Fractionalization (.086). The coefficient for the Syndrome is negative which means that countries that rank higher on the Syndrome consume less alcohol per capita. The other two variables are positive which means that countries that rank high on percent of Arable Terrain and Religious Fractionalization have higher rates of alcohol consumption per capita. The bivariate correlation between Syndrome and Alcohol consumption is moderately strong and negative -.655 p-value: .000. The scatterplot in Figure 8.5.2 also illustrates this relationship in its downward slope. Our original hypothesis was that societies with strong male kin networks may correlate with higher alcohol consumption. Research on health issues link higher alcohol consumption with increased incidence of (male) suicide and illness. The data does not support our hypothesis, and countries that score higher on the Syndrome have lower rates of alcohol consumption per capita. We note that many high Syndrome countries are Muslim-majority nations and have lower availability for alcohol consumption for religious reasons. The country in the far right ranking 15 on Syndrome and in the middle rank on alcohol consumption is Nigeria. The country with the highest alcohol consumption is Moldova, the second highest country is Belarus. Both are low in Syndrome but high in alcohol consumption.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome is the only variable that is significant in predicting the logits or predicted probabilities of higher levels of total alcohol consumption. We specifically find that for every one unit increase in the Syndrome, the odds decrease by 37% that the country experiences high levels of total alcohol consumption per capita, after accounting for the other control variables.

Figure 8.5.2 Scatterplots of Syndrome with Preventable Death factor and Total alcohol consumption per capita





5) **Prevalence of HIV Among Women Ages 15+** (higher scores are considered worse, N=131): The results are as follows:

Table 8.5.7 General Linear Model Results for Prevalence of HIV Among Women Ages 15+ (Adjusted R-squared=.525)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	29.178	6.185	.000	.168
Colonial Status=0 (Never Colonized)	-.257	3.450	.941	.000
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	-5.899	2.617	.026	.044
CIV=2 (Muslim)	-14.630	3.015	.000*	.176
CIV=4 (Hindu/Sinic/Buddhist)	-7.974	4.070	.053	.034
CIV=5 (Africa)	0			
Syndrome 2017	1.599	.345	.000*	.163
Urbanization 2015	-.109	.052	.040	.038
Number of Land Neighbors	.269	.485	.580	.003
Terrain 2014	.053	.073	.472	.005
Religious Fractionalization 2003	7.906	4.526	.083	.027
Ethnic Fractionalization 2003	9.711	5.031	.056	.033

* significant at 0.001

The adjusted R-squared is a strong .525, indicating that the specified model explained at least 52.5% of the variability of prevalence of HIV among women. Two variables reach significance: CIV=2 (Muslim Civilization) with an effect size of .176 and

Syndrome with an only slightly smaller effect size of .163. The coefficient for Muslim Civilization is negative which means that the prevalence of HIV among women over 15 is lower in Muslim-majority countries. The coefficient for Syndrome is positive which means that there is a higher prevalence of HIV among Women aged 15 and over in higher Syndrome scoring countries. The bivariate correlation between Syndrome and Prevalence of HIV among women aged 15 and over is a moderately strong .553 (p-value: .000). This is demonstrated in the upward slant of the scatterplot in Figure 8.5.3.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome is the only variable that is significant in predicting the logits or predicted probabilities of higher prevalence of HIV among women ages 15 and over. We specifically find that for every one unit increase in the Syndrome, the odds increase by 58%, or alternatively there is a 1.58 times greater risk, that the country experiences higher prevalence of HIV among women ages 15 and over, after holding all other control variables constant.

We use % of population between 15-49 with HIV and Percentage of adults ages 15-49 with HIV/AIDS as ancillary variables. The adjusted values for these two ancillary analyses are .243 and .245, respectively, and Syndrome was not significant in both analyses so we do not report the results.

6) **Global Hunger Index** (higher scores are considered worse, N=118): The results are as follows:

Table 8.5.8 General Linear Model Results for Global Hunger Index (Adjusted R-squared=.577)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	18.402	4.530	.000	.142
Colonial Status=0 (Never Colonized)	-1.983	2.811	.482	.005
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	-1.426	1.829	.437	.006
CIV=2 (Muslim)	-3.649	2.098	.085	.029
CIV=4 (Hindu/Sinic/Buddhist)	-1.072	2.815	.704	.001
CIV=5 (Africa)	0			
Syndrome 2017	1.227	.236	.000*	.213
Urbanization 2015	-.244	.038	.000*	.294
Number of Land Neighbors	-.056	.292	.847	.000
Terrain 2014	-.028	.051	.582	.003
Religious Fractionalization 2003	-1.295	3.348	.700	.001
Ethnic Fractionalization 2003	6.297	3.400	.067	.033

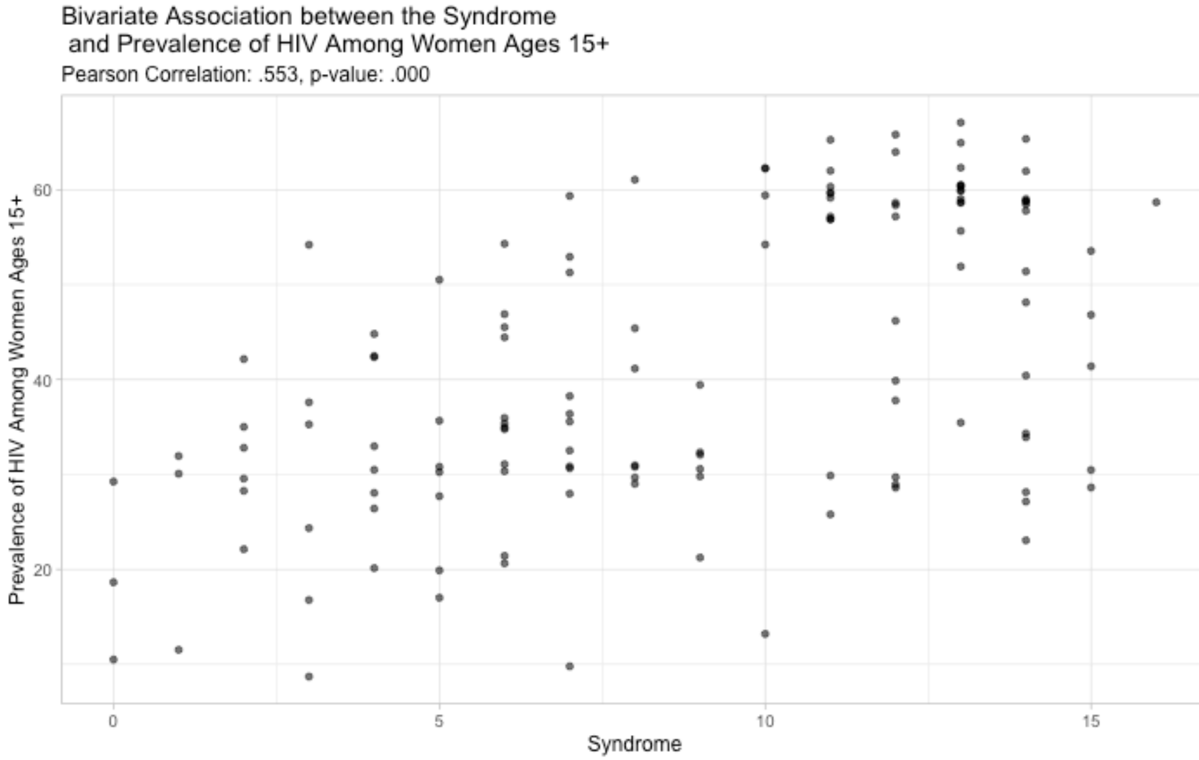
* significant at 0.001

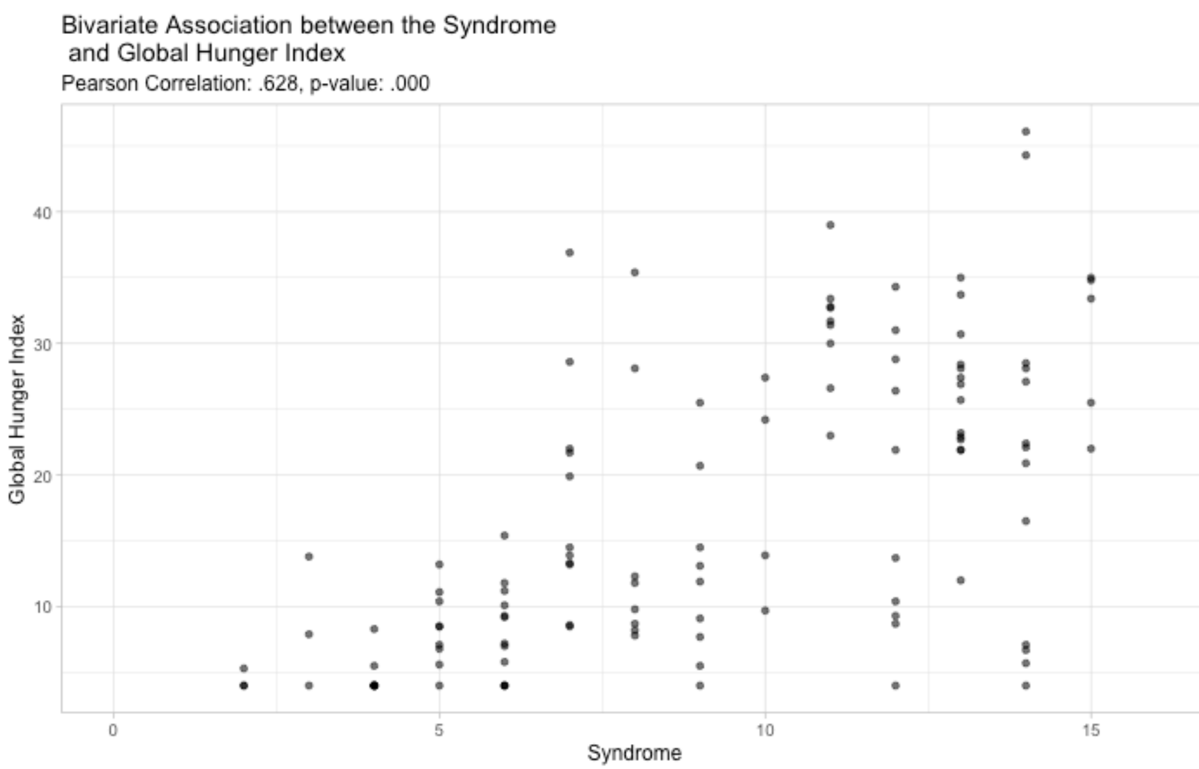
The adjusted R-squared is a strong .577, indicating that the specified model explained at least 57.7% of the variability of Global Hunger Index scores. The two variables which prove significant are the Syndrome (effect size .213) and Urbanization (effect size .294). The coefficient for Syndrome is positive and for Urbanization negative. This means that levels of hunger are higher on average in Syndrome countries and lower in urbanized countries. The bivariate correlation between Syndrome and the Global Hunger Index is a moderately strong .682 (p-value: .000). The scatterplot in Figure 8.5.3 demonstrates this relationship in an upward curve. We identify some of the outliers in the upper middle portion of the scatterplot: Haiti (Syndrome=7) and Madagascar (Syndrome=8). We also find that the Central African Republic and Chad, both with high Syndrome scores of 14, achieve the two highest (worst) values for the Global Hunger Index.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome and Urbanization are the only variables that are significant in predicting the logits or predicted probabilities of worse scores on the Global Hunger Index. We specifically find that for every one unit increase in the Syndrome, the odds increase by 80%, or alternatively there is a 1.8 times greater risk, that the country experiences worse scores on the Global Hunger Index, after holding all other control variables constant.

We use our Malnutrition and Illness factor and Average dietary energy supply adequacy as ancillary variables and their adjusted R-squared values are .432 and .309 respectively. Syndrome is a significant predictor of the former, but not of the latter.

Figure 8.5.3 Scatterplots of Syndrome with Prevalence of HIV among women ages 15+ and Global Hunger Index





7) **Female Genital Cutting/Mutilation or FGM** (higher scores are considered worse, N=176): The results are as follows:

Table 8.5.9 General Linear Model Results for Female Genital Cutting/Mutilation (Adjusted R-squared=.297)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	-.877	.518	.092	.019
Colonial Status=0 (Never Colonized)	.953	.252	.000*	.088
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	.179	.222	.422	.004
CIV=2 (Muslim)	-.166	.261	.526	.003
CIV=4 (Hindu/Sinic/Buddhist)	-.459	.321	.155	.014
CIV=5 (Africa)	0			
Syndrome 2017	.118	.027	.000*	.113
Urbanization 2015	.006	.004	.153	.014
Number of Land Neighbors	-.039	.033	.239	.009
Terrain 2014	.000	.006	.978	.000
Religious Fractionalization 2003	-.390	.369	.291	.007
Ethnic Fractionalization 2003	1.418	.388	.000*	.082

* significant at 0.001

The adjusted R-squared is a moderate .297, indicating that the specified model explained at least 29.7% of the variability of female genital cutting/mutilation. Three variables are significant in this model: Colonial Status (never colonized), the Syndrome, and

Ethnic Fractionalization. The syndrome has a higher effect size (.113) than does Colonial Status/Never Colonized (.088) or Ethnic Fractionalization (.082). The bivariate correlation between Syndrome and FGM is moderately strong (.439 p value: .000). The coefficients for all three variables are positive which shows that the higher scores on each correlate with higher use of FGM.

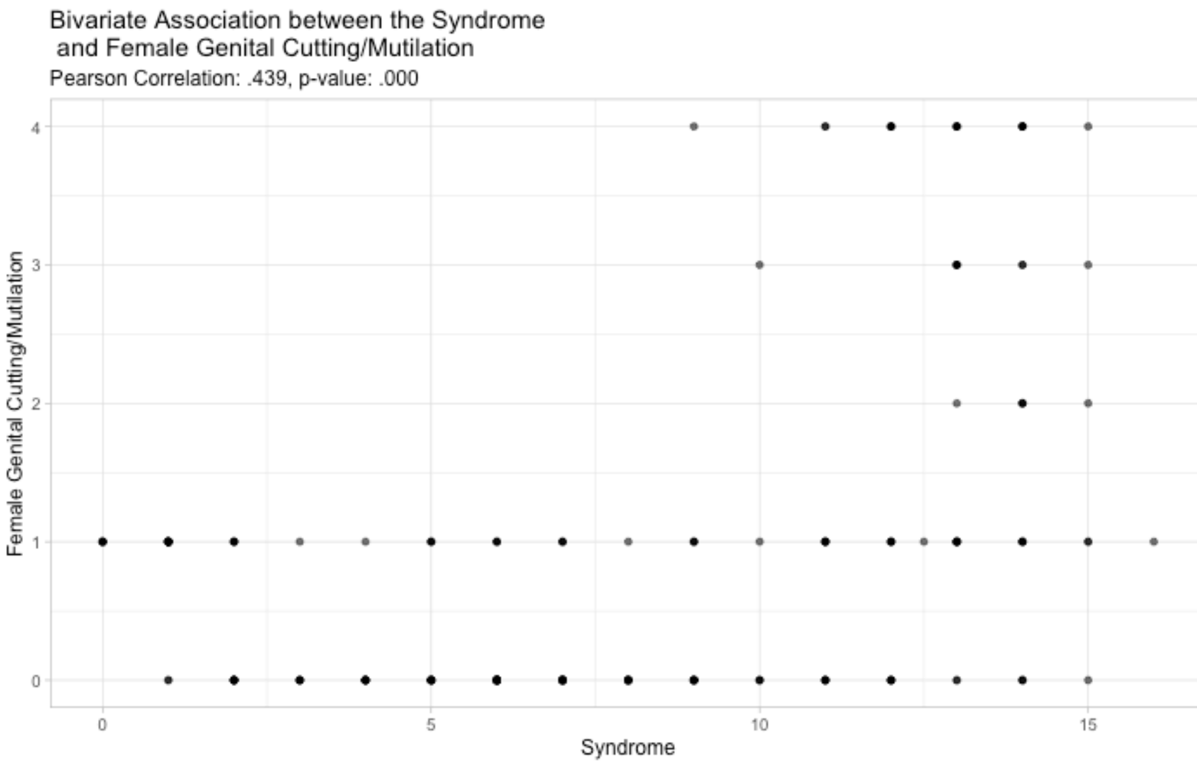
The positive Colonial Status (never colonized) coefficient proves significant largely because of its small N size (23). of never colonized countries. FGM is not randomly distributed over countries as it is a civilization-specific practice. There are only 23 countries that were never colonized, the majority (16 of the 23) are rated 1 (practice is rare or found in small enclaves of minority populations that practice FGM). Of the countries ranked 1, FGM is confined to enclaves. When an ANOVA was run to test this relationship, the relationship between Colonial Status (never colonized) with FGM was not significant.

The scatterplot in Figure 8.5.4 tells the story that only high Syndrome countries rank higher (i.e., 2, 3 and 4) on the FGM scale. Low Syndrome countries have no or rare prevalence of FGM. The blank upper left quadrant on the scatterplot shows that the prevalence of FGM for countries that rank low on the Syndrome is essentially non-existent or very rare (<11%) of FGM while countries with higher Syndrome scores show significant prevalence of Female Genital Mutilation.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome and Ethnic Fractionalization are the only variables that are significant in predicting the logits or predicted probabilities of FGM occurring (more than rarely). We specifically find that for every one unit increase in the Syndrome, the odds increase by

76%, or alternatively there is a 1.76 times greater risk, that FGM occurs in a country, after holding all other control variables constant.

Figure 8.5.4 Scatterplot of Syndrome with Female Genital Mutilation



8) Access to improved water

We run a GLM analyses for access to improved water and find a moderate adjusted R-squared value of .436 but Syndrome is not a significant predictor so we do not report the results.

9) Cigarette consumption

The GLM analysis for cigarette consumption show a low adjusted R-squared value of .255 and Syndrome is not a significant predictor so we do not show the results.

10) Open defecation factor

This factor has an even lower adjusted R-squared (.295) than cigarette consumption and Syndrome was not significant either so we do not report the results.

Concluding Discussion for the Health and Wellbeing Dimension

For our Health and Wellbeing dimension's empirical analysis, we run 24 GLM analyses of health and well-being using 20 single dependent variables and four extracted factors. Syndrome was significant in three of the four factors, and for 14 of the 20 single variables, or 17 of the 24 models run. The Syndrome had the largest effect size in eight of the models, showing strong predictive power not only for variables directly related to women's health, such as female life expectancy, maternal mortality, FGM, and prevalence of HIV among women, but also child-related health indices such as percent under age 5 who are stunted, wasted, or underweight, as well as population-wide indicators of hunger, illness, mortality and levels of government investment in healthcare expenditures. To understand issues of national health, we need to look at Syndrome-encoding practices within the country. The subordination of women at the household level clearly undermines national health outcomes. Our theoretical framework anticipated this relationship and our large N analysis corroborated it.

6. Demographic Security Dimension

We hypothesize that nations manifesting a strong patrilineal/fraternal culture as measured by the Syndrome Index tend to have higher levels of demographic insecurity, to wit, higher fertility rates, lower contraceptive prevalence, higher unmet need for contraception, a larger youth bulge, and greater demographic pressures.

List and description of variables in the Demographic Security Dimension

The variables which are most commonly used in social science research and which the authors deemed as the most valid measures of demographic security are listed in alphabetical order below. (Note: Some potential variables of interest had to be excluded due to low N size and/or correlation $\geq .9$ with the variables in this list; see this endnote.[28]) The list provides the variable name, the source from which the variable was obtained, whether the measure is nominal/ordinal/continuous and the range where applicable, which directionality the variable takes, the N size for the variable, and whether any transformations were used:

1) Contraceptive Prevalence (2016, or most recent without searching earlier than 2007), The World Bank, percentage of women ages 15-49, lower scores are worse, N=135
2) Demographic Pressures (2017), The Fund for Peace Fragile States Index, ordinal scale (min=1.1, max=10.0), higher scores are worse, N=172
3) Fertility Rates ages 15-19 (2010-2015), UNDP World Population Prospects, births per 1,000 women, higher scores are worse, N=174
4) Mother's Mean Age at First Birth (2006-2016), Central Intelligence Agency World Factbook, continuous (age), lower scores are worse, N=123
5) Total Fertility (2015), The World Bank, births per woman "the number of children that would be born to a woman if she were to live to the end of her childbearing years and bear children in accordance with age-specific fertility rates of the specified year," higher scores are worse, N=175

6) Unmet need for Contraception (2016, or most recent without searching earlier than 2007), The World Bank, percentage of married women ages 15-49, higher scores are worse, N=116

7) Youth Risk Factor (2013)[29], ratio of the number of 17-26 year olds to the size of a country's total labor force, higher scores are worse, N=166

Model specification

The following model was used for each dependent variable:

Dependent variable$_i$ = Syndrome + Civilization + Colonial status + Urbanization + Terrain + Number of land neighbors + Religious fractionalization + Ethnic fractionalization + ε_i

A GLM analysis was used to investigate the statistical significance and explanatory power of each of these eight independent variables. We hypothesized that, after controlling for the influence of the other control variables, the Patrilineal/Fraternal Syndrome will still be a significant predictor of these demographic dependent variables for the nations in our study.

Outline of analyses used in the Demographic Security Dimension

We perform five main analyses for the Demographic Security Cluster. First, we look at Mother's Mean Age at First Birth which provides data on early pregnancies, before the age of 18, which adversely impact women's health and future opportunities. For ancillary analysis we utilize Fertility Rates Ages 15-19. High numbers of births among this age cohort often correlate with women who before the age of 18 marry early or become pregnant.

The second analysis consists of one variable, Demographic Pressure, which measures the impact of population size upon the state. On one hand population may produce pressures related to food supply, access to safe water, ability to provide needed infrastructure. On the other hand, insufficient population growth in various sectors of the population may lead to insufficient economic growth to support social security and pensions for aged citizens.

The third analysis consists of one variable, Total Fertility. The Total Fertility Rate gives the number of children that a woman would give birth to if she were to live to the end of her child bearing years and her child bearing falls in line with the fertility rates of a specified year. Generally, it is the total number of births for a woman in her lifetime.[30]

The fourth analysis consisted of two variables measuring contraceptive use. Contraceptive Prevalence, our main variable, measures use of any contraceptive for women aged 15-49. The ancillary analysis looked at the variable, Unmet Need for Contraception, which measures the percentage of women of reproductive age, married or in a union, who want to stop or delay childbearing, but are not currently using any method of contraception.

The fifth analysis looks at the Youth Risk Factor. This variable looks at the size of 17 to 26 year olds in ratio to the size of a country's total labor force. High values of this cluster signify a large youth bulge, which has been associated with higher levels of internal instability and violence.

Model results

We run seven general linear model analyses under Demographic Security. We find that the Syndrome was significant in five of those seven models. The two models where Syndrome was not significant include: (1) Fertility rates for females ages 15-19 and (2) Unmet Need for Contraception. Table 8.6.1 summarizes the results of the GLM analyses.

Table 8.6.1 Summary of GLM results for the Demographic Security Dimension in descending order of R-squared values. Ancillary analyses in italics.

Dependent variables	**Adjusted R-squared (N)**	**Independent variables significant at .001 by descending order of effect size**
1) Mother's mean age at first birth *Fertility rates ages 15-19*	.712 (123) *.486 (174)*	Syndrome *Urbanization* *Ethnic fractionalization*
2) Demographic pressure	.707 (172)	Syndrome Urbanization
3) Total fertility rate	.602 (175)	Syndrome Urbanization Ethnic fractionalization
4) Contraceptive prevalence *Unmet need for contraception*	.491 (135) *.304 (116)*	Syndrome Ethnic fractionalization *None*
5) Youth Risk Factor	.479 (166)	Syndrome

We elaborate on the five main analyses.

1) **Mother's Mean Age at First Birth** (lower scores are considered worse, N=123):

The results are as follows:

Table 8.6.2 General Linear Model Results for Mother's Mean Age at First Birth (Adjusted R-squared=.712)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	24.794	1.335	.000	.772
Colonial Status=0 (Never Colonized)	.919	.565	.107	.025
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	.324	.523	.537	.004
CIV=2 (Muslim)	.487	.657	.460	.005

CIV=4 (Hindu/Sinic/Buddhist)	.780	.765	.310	.010
CIV=5 (Africa)	0			
Syndrome 2017	-.436	.074	.000*	.254
Urbanization 2015	.040	.013	.002	.090
Number of Land Neighbors	.002	.092	.986	.000
Terrain 2014	.016	.014	.266	.012
Religious Fractionalization 2003	.944	.952	.324	.010
Ethnic Fractionalization 2003	-2.471	1.038	.019	.053

* significant at 0.001

The adjusted R-squared is a remarkably strong .712, indicating that the specified model explained at least 71.2% of the variability of mother's mean age at first birth. Syndrome was the only significant predictor of this dependent variable, with Syndrome having an effect size that was much larger than any other variable. There is a significant negative correlation between Syndrome and mother's mean age at first birth (beta = -.436): the higher the Syndrome score for a country, the lower the mother's age at first birth. This is confirmed by the scatterplot in Figure 8.6.1 where we find a very strong linear relationship between mean age of first birth and the Syndrome (r=-.818, p<.001). We find a few countries which buck this trend, including Jamaica and Mongolia with Syndrome values of 3 which both have surprisingly low mean age at first birth, and Jordan (Syndrome=14) which has surprisingly high mean age at first birth.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome is the only variable that is significant in predicting the logits or predicted probabilities of lower average age of first birth for the mother (less than 23.95). We specifically find that for every one unit increase in the Syndrome, the odds increase by 62%, or alternatively there is a 1.62 times greater risk, that the country experiences a lower average age of first birth for the mother, after holding all other control variables constant.

We use Fertility rates for ages 15-19 as an ancillary variable and the GLM analysis show a moderately strong adjusted R-squared value of .486, but the Syndrome is not a significant predictor so we do not report the results.

2) **Demographic Pressure** (higher scores are considered worse, N=172): The results are as follows:

Table 8.6.3: General Linear Model Results for Demographic Pressure (Adjusted R-squared=.707)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	5.241	.691	.000	.280
Colonial Status=0 (Never Colonized)	.195	.336	.562	.002
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	-.392	.297	.189	.012
CIV=2 (Muslim)	-1.042	.347	.003	.057
CIV=4 (Hindu/Sinic/Buddhist)	-.091	.428	.833	.000
CIV=5 (Africa)	0			
Syndrome 2017	.331	.036	.000*	.360
Urbanization 2015	-.034	.006	.000*	.190
Number of Land Neighbors	.005	.045	.914	.000

Terrain 2014	-.003	.008	.693	.001
Religious Fractionalization 2003	-.195	.494	.694	.001
Ethnic Fractionalization 2003	.918	.531	.086	.020

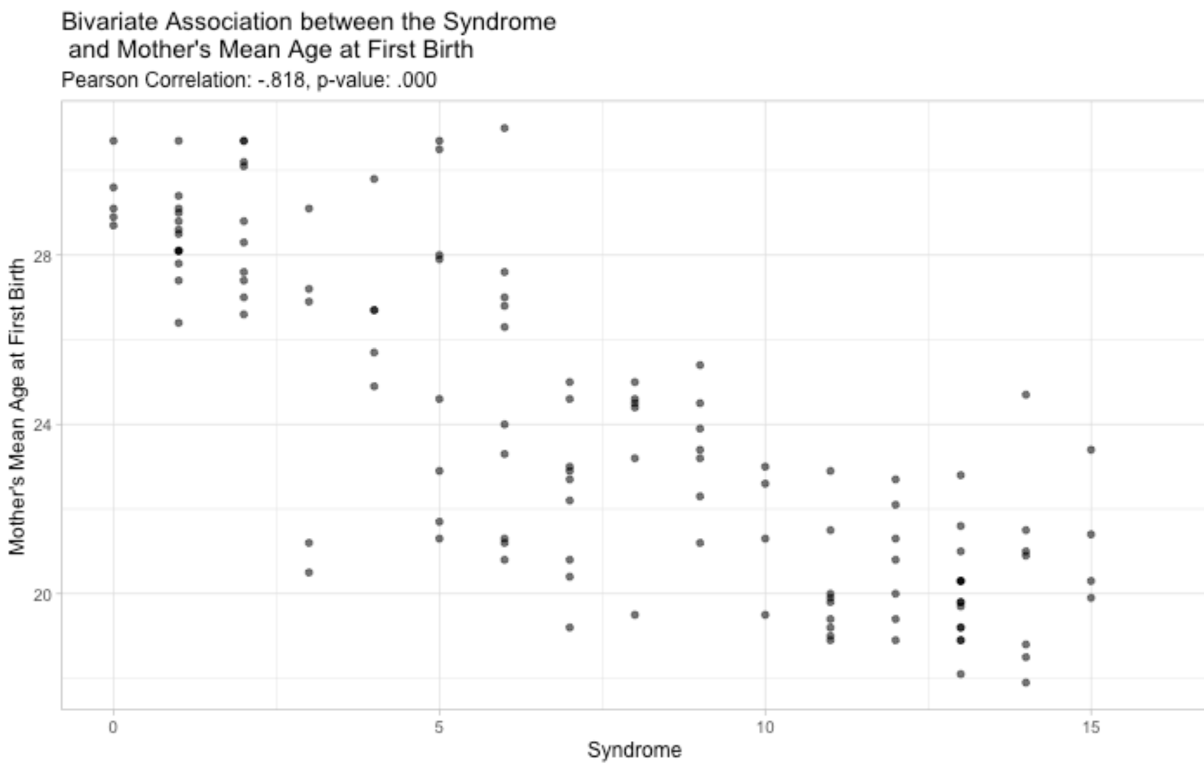
* significant at 0.001

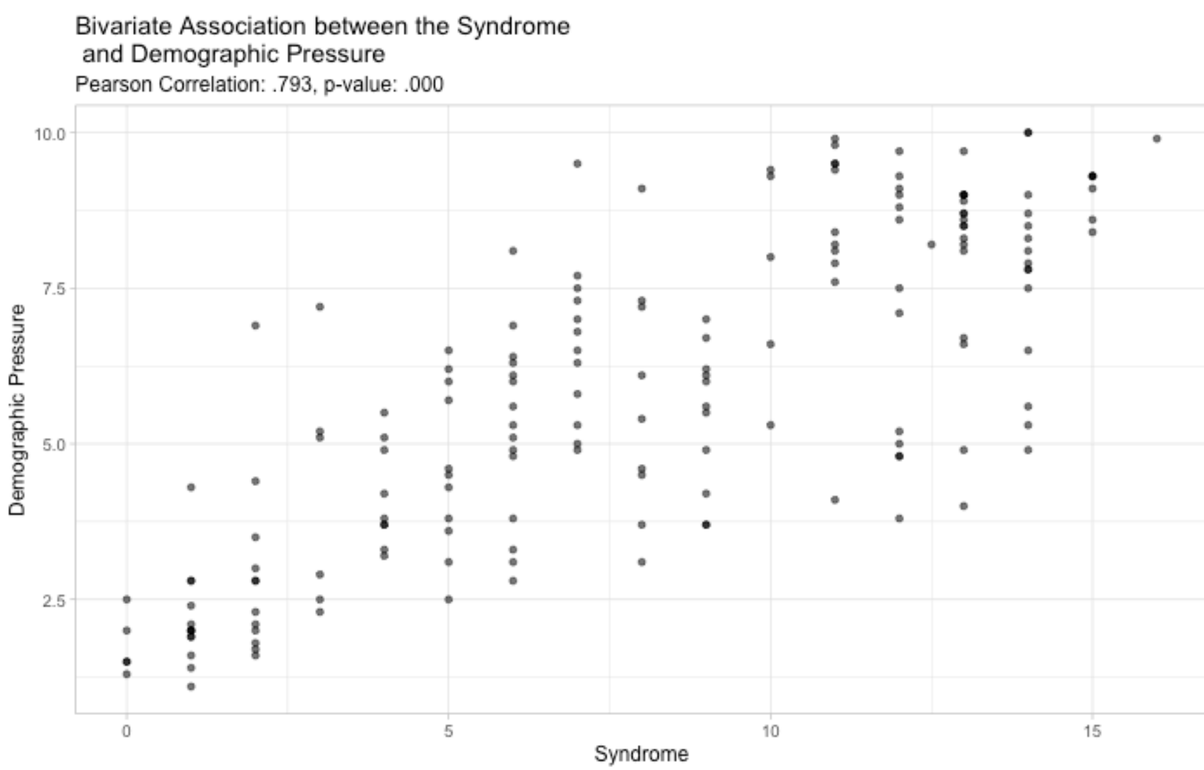
The Fund for Peace's Demographic Pressure variable is defined as pressures on the population such as disease and natural disasters which make it difficult for the government to protect its citizens or if the government demonstrates a lack of capacity or will to do so. It combines measures related to natural disasters, disease, environment, pollution, food scarcity, malnutrition, water scarcity, population growth, youth bulge, and mortality. Higher scores mean higher demographic pressure.

We regressed demographic pressure on our eight independent variables and found that the adjusted R-squared is a remarkably strong .707, indicating that at least 70% of the variability in demographic pressure can be explained by our model. The only two significant predictors in the model are the Syndrome and percent Urbanization, with Syndrome having an effect size almost twice as large as percent Urbanization. These findings support our claim that nations which manifest a strong patrilineal culture as measured by the Syndrome Index tend to experience higher demographic pressures. The scatterplot in Figure 8.6.1 further amplifies this finding: there is a very strong linear correlation between the Syndrome and Demographic pressure ($r = .793$). We find that Bahamas and Cape Verde have surprisingly high demographic pressure given their low Syndrome scores (2 and 3 respectively). Some of the countries with the highest Syndrome score and the highest demographic pressure include Somalia, South Sudan, and Malawi. On the other end of that, some with both the lowest Syndrome and demographic pressure include Australia and Finland.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome and Urbanization are the only variables that are significant in predicting the logits or predicted probabilities of higher levels of demographic pressure. We specifically find that for every one unit increase in the Syndrome, the odds increase by 39%, or alternatively there is a 1.39 times greater risk, that the country experiences higher levels of demographic pressure, after holding all other control variables constant.

Figure 8.6.1 Scatterplots of Syndrome with Mother's mean age at first birth and Demographic Pressure





3) **Total Fertility Rate** (higher scores are considered worse, N=175): The results are as follows:

Table 8.6.4 General Linear Model Results for Total Fertility Rate (Adjusted R-squared=.602)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	2.408	.449	.000	.162
Colonial Status=0 (Never Colonized)	.111	.219	.613	.002
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	-.247	.192	.202	.011
CIV=2 (Muslim)	-.720	.226	.002	.064
CIV=4 (Hindu/Sinic/Buddhist)	-.571	.279	.042	.027
CIV=5 (Africa)	0			
Syndrome 2017	.144	.023	.000*	.203
Urbanization 2015	-.016	.004	.000*	.105
Number of Land Neighbors	.009	.029	.759	.001
Terrain 2014	-.002	.005	.751	.001
Religious Fractionalization 2003	-.275	.320	.391	.005
Ethnic Fractionalization 2003	1.280	.336	.000*	.089

* significant at 0.001

The adjusted R-squared is a remarkably strong .60, indicating that the specified model explained at least 60% of the variability in total fertility rates. Three of the eight independent variables had significant explanatory power: the Syndrome, percent urbanization, and degree of ethnic fractionalization, in descending order of effect size. The effect size of the Syndrome is twice that of either of the other two variables. The subordination of women at the household level, as represented by the Syndrome score, is critical in predicting total fertility rates, more so than urbanization and ethnic fractionalization. These findings support our hypothesis that nations with strong patrilineal cultures as measured by the Syndrome Index tend to have higher fertility rates, after controlling for the effects of our control variables. The scatterplot in Figure 8.6.2 confirms this finding when Syndrome is regressed alone against fertility rate: the correlation coefficient is very strong (r = .714, p<.001).

We find the significance of ethnic fractionalization understandable; as Cincotta notes, "the more a state politically, economically, and socially marginalizes an ethnic group, the more likely that group is to grow demographically."[31]

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome, Urbanization, and Ethnic Fractionalization are the only variables that are significant in predicting the logits or predicted probabilities of higher total fertility rates. We specifically find that for every one unit increase in the Syndrome, the odds increase by 92%, or alternatively there is a 1.92 times greater risk, that the country experiences higher total fertility rates, after holding all other control variables constant.

4) **Contraceptive Prevalence** (lower scores are considered worse, N=135): The results are as follows:

Table 8.6.5 General Linear Model Results for Contraceptive Prevalence (Adjusted R-squared=.491)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	69.109	9.193	.000	.337
Colonial Status=0 (Never Colonized)	-5.154	4.484	.253	.012

Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	2.164	3.792	.569	.003
CIV=2 (Muslim)	6.450	4.436	.149	.019
CIV=4 (Hindu/Sinic/Buddhist)	12.692	5.635	.026	.044
CIV=5 (Africa)	0			
Syndrome 2017	-2.542	.489	.000*	.195
Urbanization 2015	.155	.079	.051	.034
Number of Land Neighbors	1.297	.563	.023	.046
Terrain 2014	.061	.104	.562	.003
Religious Fractionalization 2003	-3.576	6.405	.578	.003
Ethnic Fractionalization 2003	-22.455	6.314	.001*	.102

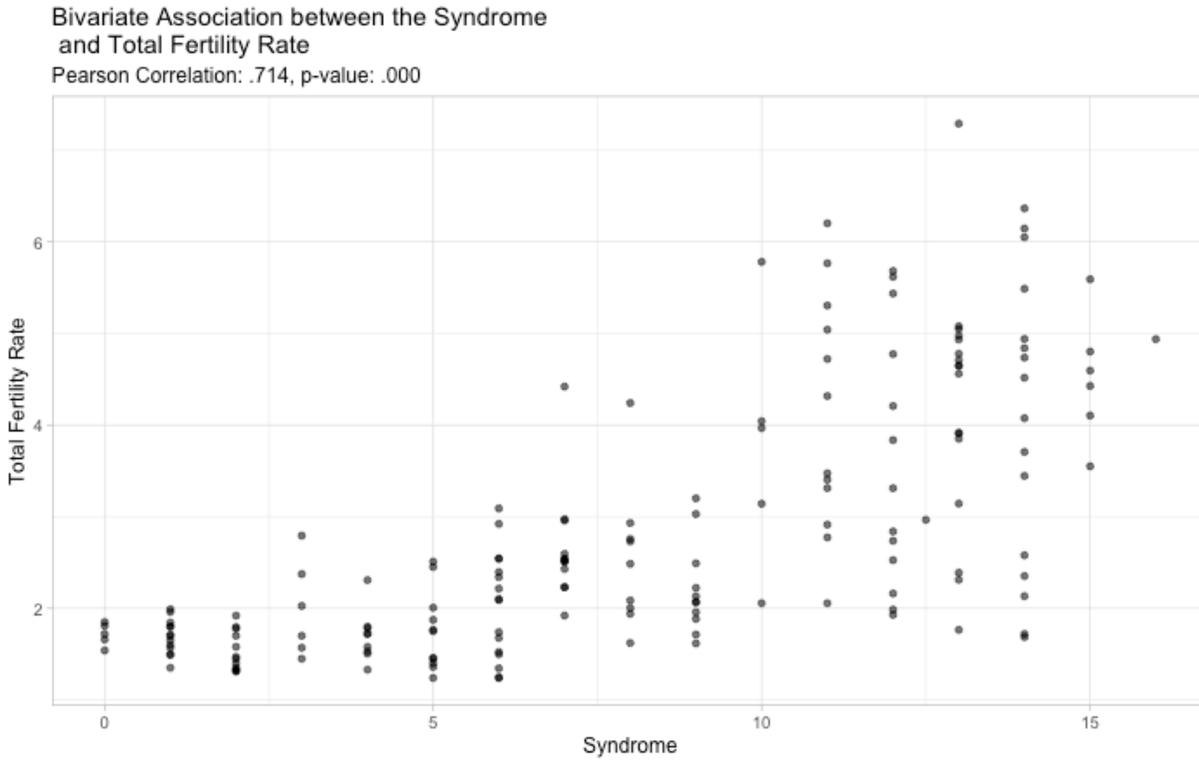
* significant at 0.001

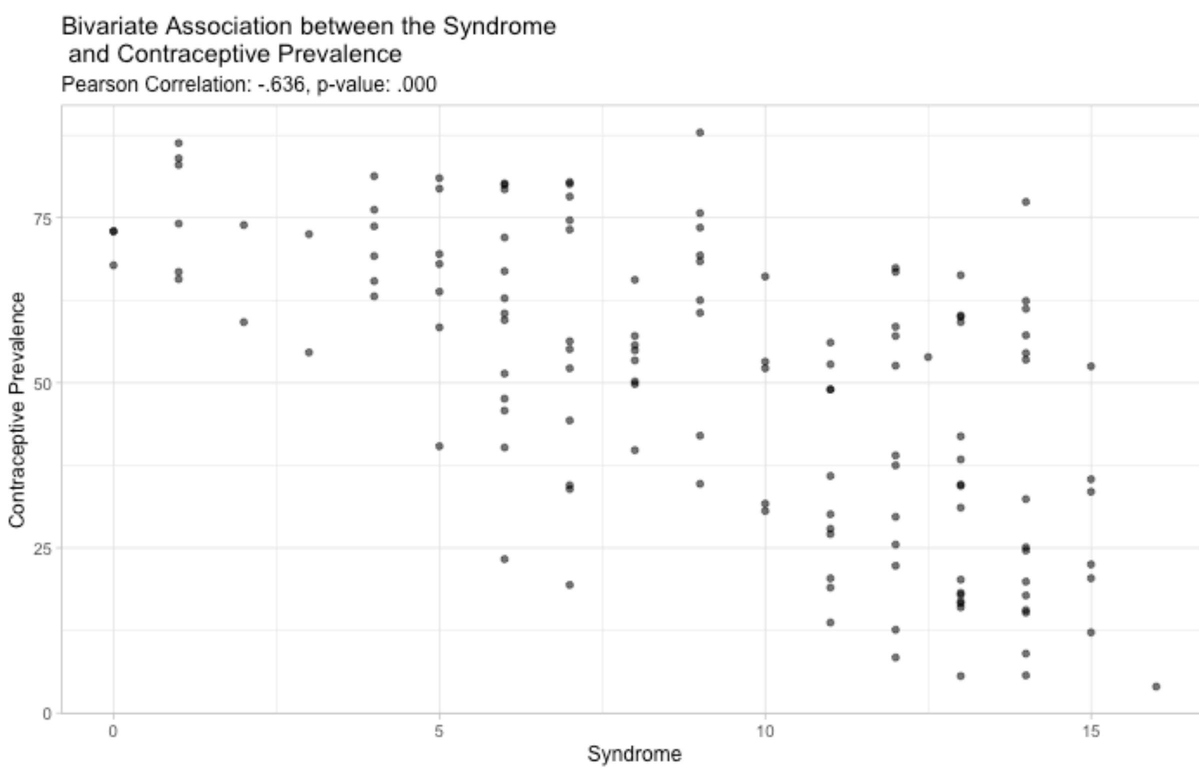
The adjusted R-squared is a strong .49, indicating that at least 49% of the variability in prevalence of contraceptive use can be explained by the specified model and only two of the independent variables had significant explanatory powers: the Syndrome and Ethnic Fractionalization. The former had a slightly higher effect size, .195 versus .102. This finding shows that women in nations with higher Syndrome scores have a harder time accessing contraceptive methods (beta estimate = -2.542, p-value = .000) after controlling for the effects of the other covariates. Similarly, women in highly ethnically fractionalized societies face similar problems in accessing contraception. The results for the Syndrome are supported by the scatterplot in Figure 8.6.2 which shows a moderately strong negative linear correlation (r = -.636, p-value = .000) between Syndrome and Contraceptive Prevalence.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome is the only variable that is significant in predicting the logits or predicted probabilities of lower percentages of women ages 15-49 who are practicing, or whose sexual partners are practicing, any form of contraception (less than 49.42%). We specifically find that for every one unit increase in the Syndrome, the odds increase by 32%, or alternatively there is a 1.32 times greater risk, that the country experiences lower contraceptive prevalence, after holding all other control variables constant.

We used Unmet need for contraception as an ancillary variable and the GLM analysis yielded an adjusted R-squared value of .304, but Syndrome was not a significant predictor so we do not report the results.

Figure 8.6.2 Scatterplots of Syndrome with Total Fertility rate and Contraceptive prevalence





5) Youth Risk Factor (higher scores are considered worse, N = 166): The results are as follows:

Table 8.6.6 General Linear Model Results for Youth Risk Factor (Adjusted R-squared= .479)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	.355	.052	.000	.241
Colonial Status=0 (Never Colonized)	-.031	.025	.219	.010
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	-.010	.022	.670	.001
CIV=2 (Muslim)	-.044	.026	.095	.019
CIV=4 (Hindu/Sinic/Buddhis t)	-.025	.033	.443	.004
CIV=5 (Africa)	0			
Syndrome 2017	.020	.003	.000*	.270
Urbanization 2015	-.001	.000	.203	.011
Number of Land Neighbors	.001	.003	.789	.000
Terrain 2014	.000	.001	.579	.002
Religious Fractionalization 2003	-.093	.037	.014	.041
Ethnic Fractionalization 2003	-.009	.040	.829	.000

* significant at 0.001

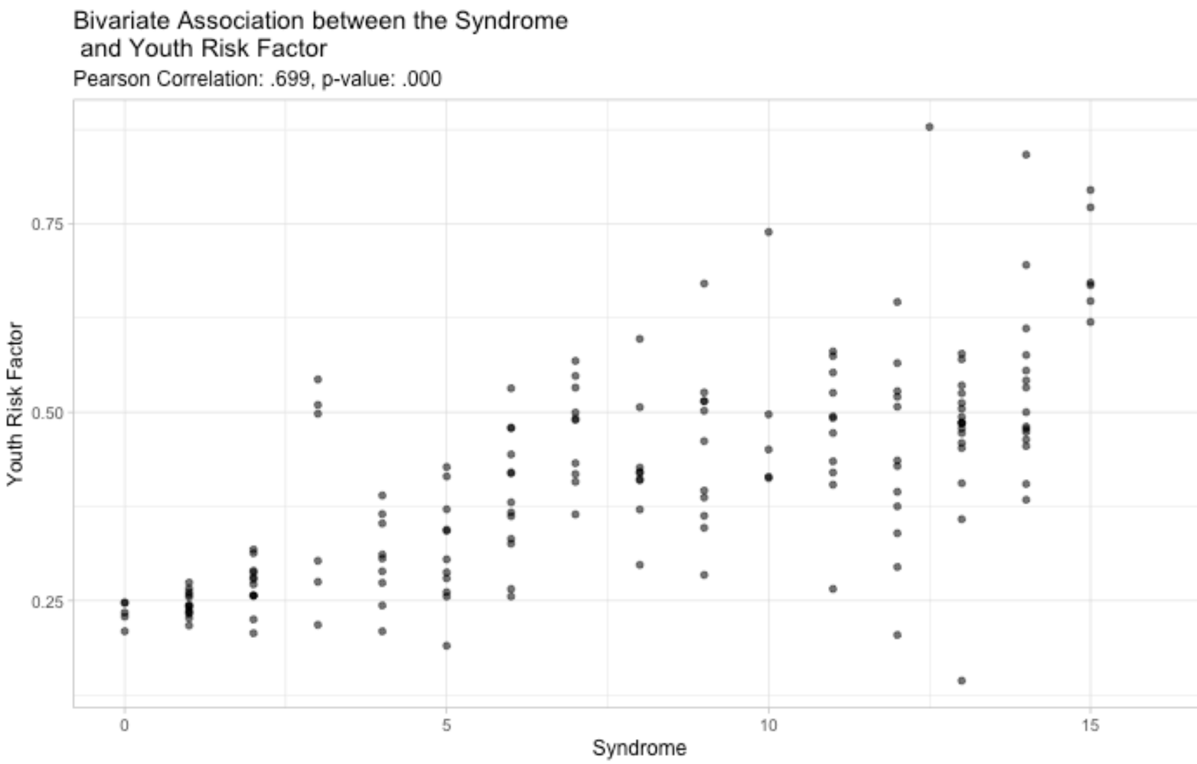
The Youth Risk Factor includes variables that measure the stress that large youth cohorts exert within a given country, defined as the percentage of 17 to 26 year olds in the labor market. High values of this cluster signify a large youth bulge, which has been associated with higher levels of internal instability and violence.[32]

The adjusted R-squared is a strong .479, indicating that the specified model explained at least 47.9% of the variability of the Youth Risk Factor or youth bulge. Of the eight independent variables, only one had significant explanatory power: the Syndrome. The Syndrome's effect size was much larger than any of the other variables. This finding shows that Syndrome is a good predictor of youth bulge after controlling for the effects of the other covariates. The coefficient for the Syndrome is positive, meaning the higher the Syndrome score, the greater the score on the youth risk factor or bigger youth bulge.

The scatterplot in Figure 8.6.3 supports this finding when only Syndrome is compared against Youth Risk Factor which measures the size of the youth bulge. We can see that there is a moderately, almost very, strong positive and significant linear correlation ($r=.699$, $p<.001$) between these two variables: higher Syndrome scores are associated with higher youth bulge, on average. The countries with a Syndrome score of 3 that appear to be outliers in the scatterplot are Jamaica, Cape Verde, and Mongolia, with surprisingly high youth risk factor for their low Syndrome score. Some of the countries with both the highest Syndrome and the highest youth risk factor include Syria, Jordan, Iraq, and Yemen.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome and Religious Fractionalization are the only variables that are significant in predicting the logits or predicted probabilities of higher ratio of the number of 17-26 year olds to the size of the country's total labor force. We specifically find that for every one unit increase in the Syndrome, the odds increase by 68%, or alternatively there is a 1.68 times greater risk, that the country experiences higher youth risk factor, after holding all other control variables constant.

Figure 8.6.3 Scatterplot of Syndrome with Youth Risk Factor



Concluding Discussion for the Demographic Security Dimension

The Patrilineal/Fraternal Syndrome was a highly significant predictor of five of the seven demographic variables we analyzed, after controlling for the effect of our covariates of interest. It had also the highest overall explanatory power as measured by effect size in these five runs. These findings support our hypothesis that nations manifesting a strong patrilineal culture as measured by the Syndrome Index tend to have higher fertility rates, lower contraceptive prevalence, higher unmet need for contraception, and possess a larger youth bulge and greater demographic pressures. Demographic insecurity is clearly related to the Patrilineal/Fraternal Syndrome as a security provision mechanism, with its low levels of women's empowerment at the household level.

7. Education of the Population Dimension

We hypothesize that countries with higher Syndrome scores will experience lower levels of literacy and education, both as a whole and specifically among women and girls. We also predict that high Syndrome countries will have larger discrepancies in the education and literacy between men and women.

List and description of variables in the Education Dimension

The list below provides the variable, the source from which the variable was obtained, whether the measure is nominal/ordinal/continuous and the range where applicable, which directionality the variable takes, the N size for the variable, and whether any transformations were used. (Note: Five variables were excluded because their bivariate correlation with another variable in this cluster exceeded 0.90 and one variable was further excluded because its measure was too close conceptually to other variables.[33]):

1) Access to Basic Knowledge (2016), Social Progress Index, ordinal (0-100), lower scores are worse, N=158
2) Access to Information and communications (2016), Social Progress Index, ordinal (0-100), lower scores are worse, N=168
3) Average years of schooling (2015), UNDP Human Development Reports, years, lower scores are worse, N=172
4) Discrepancy in Educational Attainment Between Males and Females (2015), The WomanStats Project, ordinal (0-4), higher scores are worse, N=175
5) Female Literacy Rate Age 15-24 (2016, or most recent without searching earlier than 2007), The World Bank, percentage of women ages 15-24 “who can both read

and write with understanding a short simple statement about their everyday life", lower scores are worse, N=126

6) Gender Parity Index for primary school (2017, or most recent without searching earlier than 2007), The World Bank, Ratio of girls to boys enrolled at primary level in public and private schools, lower scores are worse, N=169
7) Gender Parity Index for secondary school (2017, or most recent without searching earlier than 2007), The World Bank, Ratio of girls to boys enrolled at secondary level in public and private schools, lower scores are worse, N=163
8) Government Expenditures per student secondary as % of GDP per capita (2017, or most recent without searching earlier than 2007), The World Bank, percent, lower scores are worse, N=129[34]
9) Male Female Difference in Literacy Rates (2016, or most recent without searching earlier than 2007), The World Bank (this value was calculated from the World Bank's Female Literacy and Male Literacy Rates), difference in percent between males and females, higher scores are worse, N=124
10) Overall Literacy Rate between Males and Females (2009-2016), CIA World Factbook, percentage of total population age 15 and over that can read and write, lower scores are worse, N=148
11) Survival Rate to the last year of primary school for females (2016, or most recent without searching earlier than 2007), The World Bank, percent of cohort, lower scores are worse, N=150

We desired to reduce the number of variables examined through factor analysis in order to find variables which clustered highly on the same factors and thus could be analyzed together. However, the factor analysis extracted only one factor, so all variables in this cluster were analyzed separately, except for two variables which we combined because they are conceptually similar: Discrepancy in Educational Attainment Between Males and Females and Male Female Difference in Literacy Rates. After checking for consistency in direction, the z-score for these variables were added to create the score to form the Male-Female Literacy and Education Difference Cluster (N=124) (lower scores are considered better).

Outline of analyses used in the Education Dimension

The first analysis uses the variable, Average Years of Schooling, which presents the average numbers of years of education received by people aged 25 and older as our main analysis. We also analyze two ancillary variables: Gender Parity Index for Secondary School, which calculates the ratio of girls to boys enrolled at secondary level in public and private schools, and Gender Parity Index for Primary School, which does the same for primary school.

The second analysis uses one variable, Access to Basic Knowledge, a Social Progress Index sub-component, which measures adult literacy rate, primary school enrollment, secondary school enrollment, gender parity in secondary enrollment, and access to quality education.

The third analysis has one variable, Access to Information and Communications, which measures mobile phone subscriptions, internet users, access to online governance, and access to independent media for a given country.

The fourth analysis utilizes Overall Literacy Rate between Males and Females, defined as the percent of total population aged 15 and above that can read and write a simple statement (generally numeracy is required as well) as the main analytical variable. We add one ancillary analysis, which is a factor Male-female Literacy and Education Difference Factor with two variables: Discrepancy in Educational Attainment between Females and Males measures and scales the difference between male and female education level reached, and Male Female Difference in Literacy Rates measures the difference in percent of male and female literacy rates (ages 25 and older).

The fifth, sixth, and seventh analyses all use one variable apiece. The fifth analysis looks at the Female Literacy Rate Age 15-24, which is the percentage of women aged 15-24 who can read and write simple statements and do simple arithmetic. The sixth analysis examines Survival Rate to Last Year of Primary School for Females, which measures children enrolled in first grade who eventually reach the last grade by percent. The seventh analysis proves Government Expenditures per Student Secondary as % of GDP per capita, which gives the average general government expenditures per student in a given level of education, here secondary, as a percent of GDP per capita.

Model specification

The model for each dependent variable or dependent variable cluster takes the same form in each case:

> Dependent variable or cluster_i = Syndrome + Civilization + Colonial status + Urbanization + Terrain + Number of land neighbors + Religious fractionalization + Ethnic fractionalization + ε_i

A general linear model (GLM) procedure was used to investigate the statistical significance and explanatory power of these eight independent variables. We hypothesized that, after controlling for the influence of the other seven control variables, the Patrilineal-

Fraternal Syndrome will still be a significant predictor of these dependent variables for the nations in our study.

Model results

We run 10 general linear model analyses under Education of the Population. We find that the Syndrome was significant in 6 of those 10 models. The 4 models where Syndrome was not significant include: (1) the Male:Female Literacy ratio and Discrepancy in Educational Attainment factor, (2) the Gender Parity Index for Primary School, (3) the Gender Parity Index for Secondary School, and (4) Government Expenditures per Student Secondary as % of GDP Per Capita. Table 8.7.1 summarizes the results of these analyses.

Table 8.7.1 Summary of GLM results for the Health and Wellbeing Dimension in descending order of R-squared values. Ancillary analyses in italics.

Dependent variables	**Adjusted R-squared (N)**	**Independent variables significant at .001 by descending order of effect size**
1) Average years of schooling	.676 (172)	Syndrome Urbanization Religious fractionalization Muslim civilization
Gender parity index for secondary school	*.238 (163)*	*None*
Gender parity index for primary school	*.110 (169)*	*None*
2) Access to basic knowledge	.608 (158)	Syndrome Muslim civilization Urbanization
3) Access to information and communications	.569 (168)	Urbanization Syndrome
4) Overall literacy rate	.555 (148)	Syndrome Urbanization Ethnic fractionalization
Male-female literacy and education difference factor • *Discrepancy in educational attainment between females and males*	*.064 (124)*	*None*

• *Male female difference in literacy rates*		
5) Female literacy rate Age 15-24	.495 (126)	Syndrome Urbanization Ethnic fractionalization
6) Survival rate to last year of primary school for females	.485 (150)	Muslim civilization Urbanization Syndrome
7) Government expenditures per student secondary as % of GDP per capita	.042(129)	None

We elaborate on the seven main analyses.

1) **Average Years of Schooling** (lower scores are considered worse, N=172): The results are as follows:

Table 8.7.2 General Linear Model Results for Average Years of Schooling (Adjusted R-squared=.676)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	7.755	.923	.000	.325
Colonial Status=0 (Never Colonized)	-.219	.449	.627	.002
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	.568	.394	.152	.014
CIV=2 (Muslim)	1.855	.466	.000*	.097
CIV=4 (Hindu/Sinic/Buddhist)	.839	.585	.154	.014
CIV=5 (Africa)	0			
Syndrome 2017	-.414	.048	.000*	.336
Urbanization 2015	.041	.008	.000*	.162
Number of Land Neighbors	.061	.059	.303	.007
Terrain 2014	-.008	.011	.453	.004

Religious Fractionalization 2003	2.977	.663	.000*	.121
Ethnic Fractionalization 2003	-1.482	.701	.036	.029

* significant at 0.001

The adjusted R-squared is a remarkably strong .676, indicating that the specified model explained at least 67.6% of the variability of average years of schooling. We find that Civilization (Muslim), Patrilineal/Fraternal Syndrome, Urbanization, and Religious Fractionalization are all significant variables in this model. We further note that Syndrome has by far the largest effect size – more than twice as large as any of the other significant variables. The sign of the Syndrome coefficient is in the predicted direction (negative, meaning the lower (better) the Syndrome score the higher the average years of schooling for men and women ages 25 and older). It appears that the strongest determinant of this variable is the Patrilineal-Fraternal Syndrome, which appears to corroborate our hypothesis.

We further note that the direction of the coefficient for Urbanization is positive, which indicates that as the level of urbanization increases, a country's average years of schooling improves. We find that the direction of the coefficient for Religious Fractionalization is positive, which indicates that as the fractionalization increases, a country's average years of schooling also increases. We also find that the coefficient for Muslim civilizations is positive, which indicates that predominantly Muslim countries experience higher average years of schooling than African civilization countries.

In further analysis, we note the bivariate correlation between the Syndrome and the average years of schooling is a very strong -.754 (p-value .000), with the scatterplot in

Figure 8.7.1 showing the relationship. All of the lowest scores for this variable are found in the countries with the highest Syndrome scores, and the vast majority of medium-lower scores (with the exception of Cape Verde, which can be found in the lower left quadrant, with a Syndrome Score of 3 and only 4.8 average years of schooling). Countries with the lowest (best) Syndrome scores attain the highest levels of average years of schooling.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome, Urbanization, and Religious Fractionalization are the only variables that are significant in predicting the logits or predicted probabilities of average years of schooling being less than or only to the completion of primary education. We specifically find that for every one unit increase in the Syndrome, the odds increase by 57%, or alternatively there is a 1.57 times greater risk, that the country experiences average years of schooling less than or only to the completion of primary education, after holding all other control variables constant.

We use two variables in ancillary analyses: Gender parity index for secondary school and Gender parity index for primary school. The former had a low adjusted R-squared value of .238 while the latter had an even lower R-squared value of .110. The Syndrome was not significant in both analyses so we do not report the details of the analyses.

2) **Access to Basic Knowledge** (lower scores are considered worse, N=158): The results are as follows:

Table 8.7.3: General Linear Model Results for Access to Basic Knowledge (Adjusted R-squared=.608)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	88.623	5.020	.000	.696
Colonial Status=0 (Never Colonized)	-3.055	2.344	.195	.012
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	3.208	2.129	.134	.016
CIV=2 (Muslim)	9.935	2.549	.000*	.100
CIV=4 (Hindu/Sinic/Buddhist)	7.178	2.991	.018	.041
CIV=5 (Africa)	0			
Syndrome 2017	-1.638	.261	.000*	.225
Urbanization 2015	.167	.044	.000*	.097
Number of Land Neighbors	.311	.322	.335	.007
Terrain 2014	.004	.058	.945	.000
Religious Fractionalization 2003	1.230	3.540	.729	.001
Ethnic Fractionalization 2003	-11.860	3.774	.002	.068

* significant at 0.001

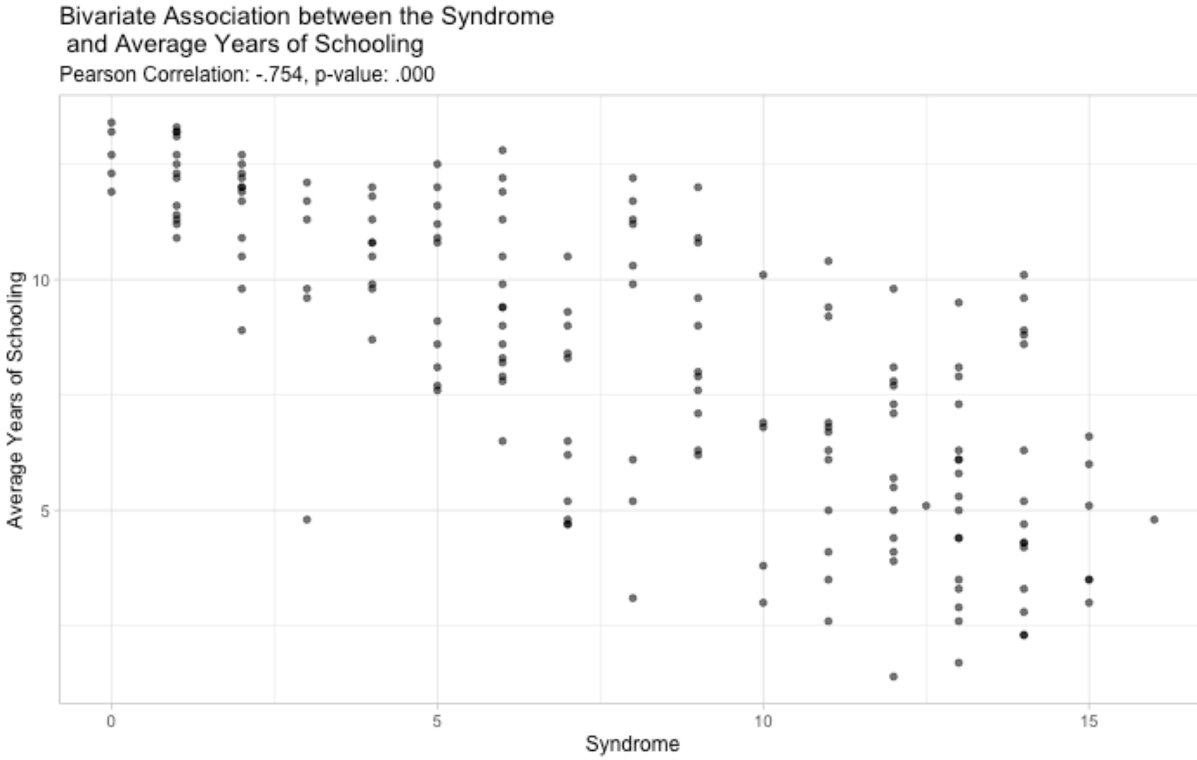
The adjusted R-squared is a remarkably strong .608, indicating that the specified model explained at least 60.8% of the variability of access to basic knowledge. We find that Civilization (Muslim), Patrilineal/Fraternal Syndrome, and Urbanization are all significant variables in this model. We further note that Syndrome has the largest effect size – more than twice as large as Muslim Civilizations or Urbanization. The sign of the Syndrome coefficient is in the predicted direction (negative, meaning the lower (better) the Syndrome score the higher the access to basic knowledge). This variable is an index that considers adult literacy rates, primary school enrollment, lower secondary school enrollment, upper secondary school enrollment and gender parity in secondary enrollment. When a country has a worse Syndrome score, a country's score for the combination of these variables worsens. It appears that the strongest determinant of this variable is the Patrilineal-Fraternal Syndrome, which appears to corroborate our hypothesis.

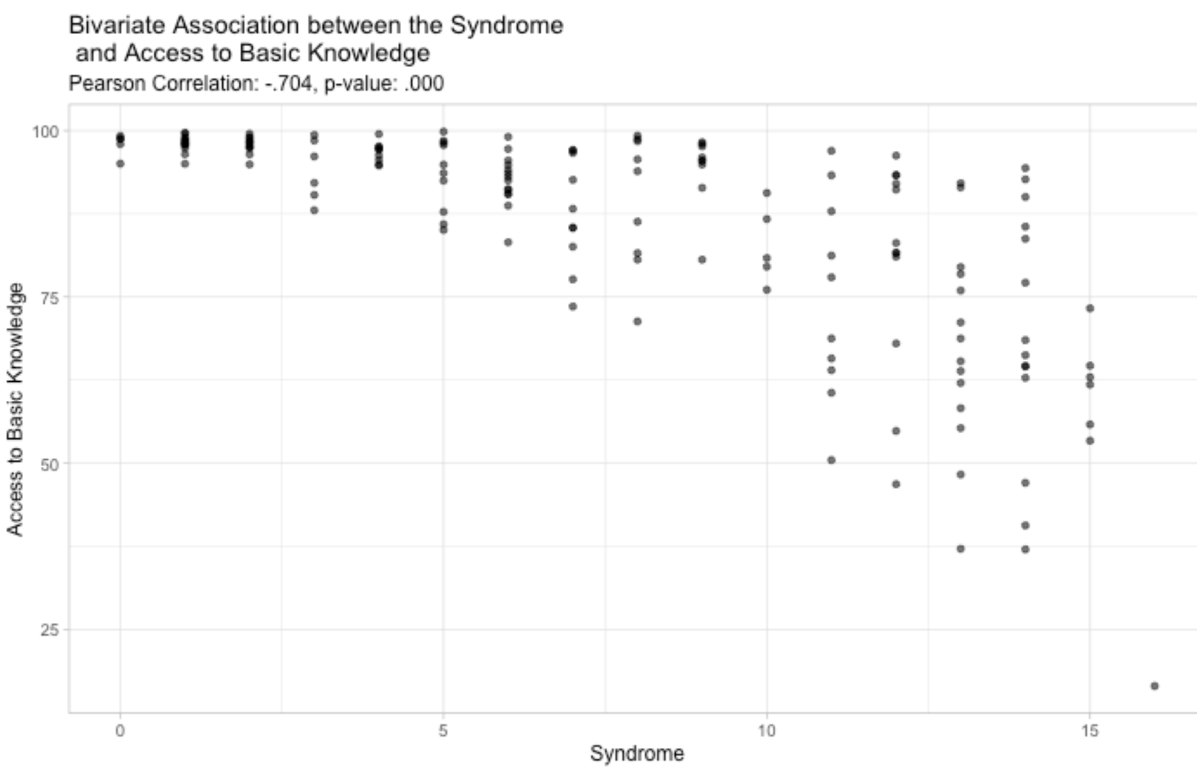
We further note that the direction of the coefficient for Urbanization is positive, which indicates that as the level of urbanization increases, a country's access to basic knowledge score improves. We also find that the coefficient for Muslim civilizations is positive, which indicates that predominantly Muslim countries experience increased access to basic knowledge than the comparison group of African civilization countries.

In further analysis, we note the bivariate correlation between the Syndrome and the Access to Basic Knowledge variable is a very strong -.704 (p-value .000), with the scatterplot in Figure 8.7.1 showing the relationship. While higher scores can be found at every different level of Syndrome, all of the lowest scores for this variable are found in the countries with the highest Syndrome scores. This indicates that, although higher scores for access to basic knowledge can occur at any level, lower scores are essentially eliminated when countries have lower levels of Syndrome practices. We additionally note that the country that experiences the lowest level of access to basic knowledge is also the country that experiences the lowest Syndrome score (16), South Sudan.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome, Urbanization, and Muslim Civilization are the only variables that are significant in predicting the logits or predicted probabilities of lower access to basic knowledge. We specifically find that for every one unit increase in the Syndrome, the odds increase by 66%, or alternatively there is a 1.66 times greater risk, that the country experiences lower access to basic knowledge, after holding all other control variables constant.

Figure 8.7.1 Scatterplots of Syndrome with Average years of schooling and Access to basic knowledge





3) Access to Information and Communications (lower scores are considered worse, N=168): The results are as follows:

Table 8.7.4: General Linear Model Results for Access to Information and Communications (Adjusted R-squared=.569)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	66.288	5.768	.000	.477
Colonial Status=0 (Never Colonized)	1.960	2.799	.485	.003
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	-2.292	2.471	.355	.006
CIV=2 (Muslim)	.421	2.914	.885	.000
CIV=4 (Hindu/Sinic/Buddhist)	-5.482	3.645	.135	.015
CIV=5 (Africa)	0			
Syndrome 2017	-1.774	.302	.000*	.192
Urbanization 2015	.294	.049	.000*	.202
Number of Land Neighbors	-.337	.373	.367	.006
Terrain 2014	-.024	.068	.728	.001
Religious Fractionalization 2003	7.631	4.149	.068	.023
Ethnic Fractionalization 2003	-4.658	4.421	.294	.008

* significant at 0.001

The adjusted R-squared is a strong .569, indicating that the specified model explained at least 56.9% of the variability of access to information and communication. We find that Patrilineal/Fraternal Syndrome and Urbanization are the only significant variables in this model. We note that Syndrome does not have the largest effect size for this variable, but that the effect size of Urbanization is only slightly larger than Syndrome. The coefficient for Urbanization indicates that as the level of urbanization increases, the access to information and communication also increases on average. The sign of the Syndrome coefficient is in the predicted direction (negative, meaning the lower the Syndrome score the higher the access to information and communication). This variable is an index that considers mobile telephone subscriptions, internet users, and the Press Freedom Index. When a country has lower Syndrome, a country's score for the combination of these variables improves.

In further analysis, we note the bivariate correlation between the Syndrome and the Access to Information and Communication variable is a moderately strong -.674 (p-value .000), with the scatterplot in Figure 8.7.2 showing the relationship. With the exception of one outlier in the lower left quadrant (Cuba with a Syndrome score of 4), lower scores of access are not found for countries with lower (better) Syndrome levels. Additionally, the highest access scores attained are found for countries with better Syndrome scores.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome and Urbanization are the only variables that are significant in predicting the logits or predicted probabilities of lower access to information and communications. We specifically find that for every one unit increase in the Syndrome, the odds increase by 28%, or alternatively there is a 1.28 times greater risk, that the country experiences lower access to information and communications, after holding all other control variables constant.

4) **Overall Literacy rate for 15+ of population (CIA World Factbook)** (lower scores are considered worse, N=148): The results are as follows:

Table 8.7.5 General Linear Model Results for Overall Literacy Males and Females (Adjusted R-squared=.555)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	91.149	6.948	.000	.583
Colonial Status=0 (Never Colonized)	-4.994	4.046	.219	.012
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	3.304	3.095	.288	.009
CIV=2 (Muslim)	11.146	3.460	.002	.078
CIV=4 (Hindu/Sinic/Buddhist)	7.261	4.409	.102	.022
CIV=5 (Africa)	0			
Syndrome 2017	-2.230	.383	.000*	.216
Urbanization 2015	.256	.059	.000*	.133
Number of Land Neighbors	-.030	.468	.949	.000
Terrain 2014	-.118	.083	.156	.016
Religious Fractionalization 2003	11.173	5.504	.045	.032
Ethnic Fractionalization 2003	-19.402	5.495	.001*	.092

* significant at 0.001

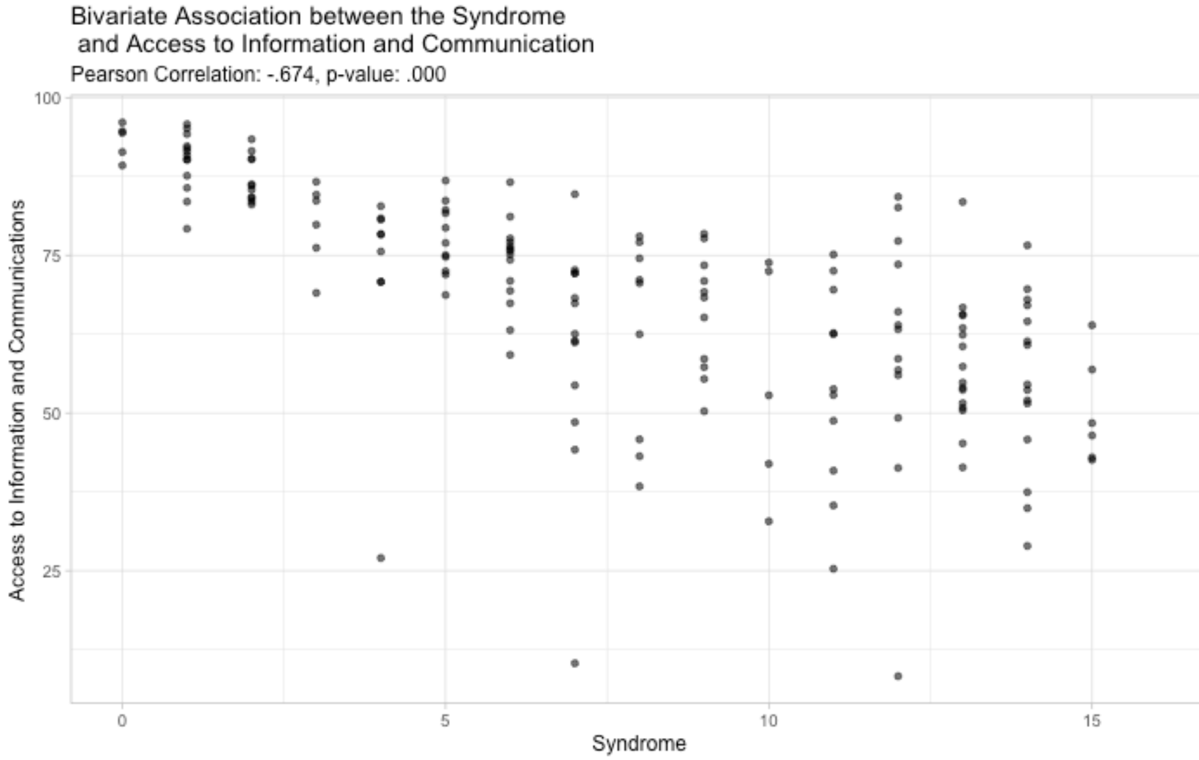
The adjusted R-squared is a strong .555, indicating that the specified model explained at least 55.5% of the variability of overall literacy rates. We find that Patrilineal/Fraternal Syndrome, Urbanization, and Ethnic Fractionalization are all significant variables in this model. We note that Syndrome, has the largest effect size in this model, more than twice as large as ethnic fractionalization and almost twice as large as urbanization. The sign of the Syndrome coefficient is in the predicted direction (negative, meaning the worst the Syndrome score the lower the overall literacy of men and women in a country). It appears that the strongest determinant of this variable is the Patrilineal/Fraternal Syndrome, which appears to corroborate our hypothesis.

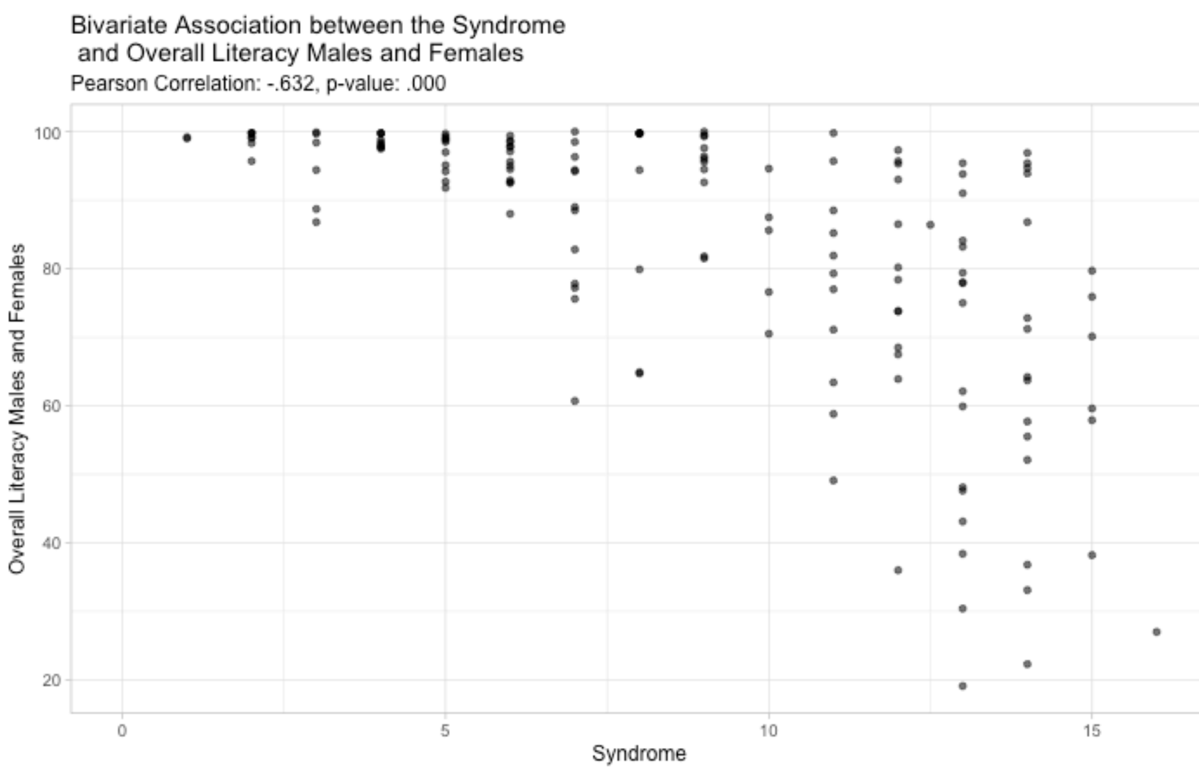
We additionally note that coefficients indicate that countries with higher levels of urbanization experience higher overall literacy rates on average, and countries with higher levels of ethnic fractionalization experience lower levels of literacy rates on average. In further analysis, we note the bivariate correlation between the Syndrome and the overall literacy of men and women variable is a moderately strong -.632 (p-value .000), with the scatterplot in Figure 8.7.2 showing the relationship. We find an empty lower left quadrant in the scatterplot, indicating that lower overall literacy rates are only found in countries with higher Syndrome scores.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome is the only variable that is significant in predicting the logits or predicted probabilities of an overall literacy rate below (or equal to) 95%. We specifically find that for every one unit increase in the Syndrome, the odds increase by 45%, or alternatively there is a 1.45 times greater risk, that the country's overall literacy rate is below 95%, after accounting for the other control variables.

We examined Discrepancy in educational attainment between males/females and Male/female difference in literacy rates, and the GLM analyses yielded a very low adjusted R-squared value of .064. Syndrome was not significant so we do not report the results.

Figure 8.7.2 Scatterplots of Syndrome with Access to Information and Communications and Overall literacy rate, total 15+ population





5) **Female Literacy Rate Age 15-24** (lower scores are considered worse, N=126): The results are as follows:

Table 8.7.6 General Linear Model Results for Female Literacy Rate Age 15-24 (Adjusted R-squared=.495)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	97.287	8.952	.000	.532
Colonial Status=0 (Never Colonized)	-4.936	5.003	.326	.009
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	-1.182	3.887	.762	.001
CIV=2 (Muslim)	6.994	4.330	.109	.024
CIV=4 (Hindu/Sinic/Buddhist)	5.527	5.316	.301	.010
CIV=5 (Africa)	0			
Syndrome 2017	-2.228	.496	.000*	.162
Urbanization 2015	.278	.078	.001*	.108
Number of Land Neighbors	-.197	.592	.740	.001
Terrain 2014	-.009	.108	.936	.000
Religious Fractionalization 2003	10.204	6.911	.143	.021
Ethnic Fractionalization 2003	-23.518	6.967	.001*	.099

* significant at 0.001

The adjusted R-squared is a strong .495, indicating that the specified model explained at least 49.5% of the variability of female literacy rates. We find that Patrilineal/Fraternal Syndrome, Urbanization, and Ethnic Fractionalization are all significant variables in this model. We note that while the effect size of Syndrome is fairly small (.162), it has the largest effect size in this model. The sign of the Syndrome coefficient is in the predicted direction (negative, meaning the worst the Syndrome score the lower the literacy rates for females ages 15 to 24). It appears that the strongest determinant of this variable is the Patrilineal-Fraternal Syndrome, which appears to corroborate our hypothesis.

We further note that the direction of the coefficient for Urbanization is positive, which indicates that as the level of urbanization increases, a country's the literacy rates for girls ages 15 to 24 also increases. We find that the direction of the coefficient for Ethnic Fractionalization is negative, which indicates that as the religious fractionalization in a country increases, the country's literacy rates for girls of this age decreases.

In further analysis, we note the bivariate correlation between the Syndrome and the female literacy rate variable is a moderately strong -.617 (p-value .000), with the scatterplot in Figure 8.7.3 showing the relationship. While higher scores can be found at every different level of Syndrome, all of the worst scores for this variable are found in the countries with the highest (worst) Syndrome scores.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome and Urbanization are the only variables that are significant in predicting the logits or predicted probabilities of literacy rates for females below (or equal to) 95%. We specifically find that for every one unit increase in the Syndrome, the odds increase by 126%, or alternatively there is a 2.26 times greater risk, that the country's literacy rates for females aged 15-24 is below 95%, after holding all other control variables constant.

6) **Survival Rate to the last year of primary school for females** (lower scores are considered worse, N=150): The results are as follows:

Table 8.7.7 General Linear Model Results for Survival Rate to the Last Year of Primary School for Females (Adjusted R-squared=.485)

Parameter	B	Std. Error	Sig.	Partial Eta Squared
Intercept	82.516	6.997	.000	.523
Colonial Status=0 (Never Colonized)	-3.931	3.637	.282	.009
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	7.100	3.078	.023	.040
CIV=2 (Muslim)	13.412	3.451	.000*	.106
CIV=4 (Hindu/Sinic/Buddhist)	5.932	4.257	.166	.015
CIV=5 (Africa)	0			
Syndrome 2017	-1.408	.383	.000*	.096
Urbanization 2015	.229	.059	.000*	.105
Number of Land Neighbors	.085	.507	.867	.000
Terrain 2014	-.086	.079	.275	.009
Religious Fractionalization 2003	1.400	5.176	.787	.001
Ethnic Fractionalization 2003	-12.915	5.468	.020	.042

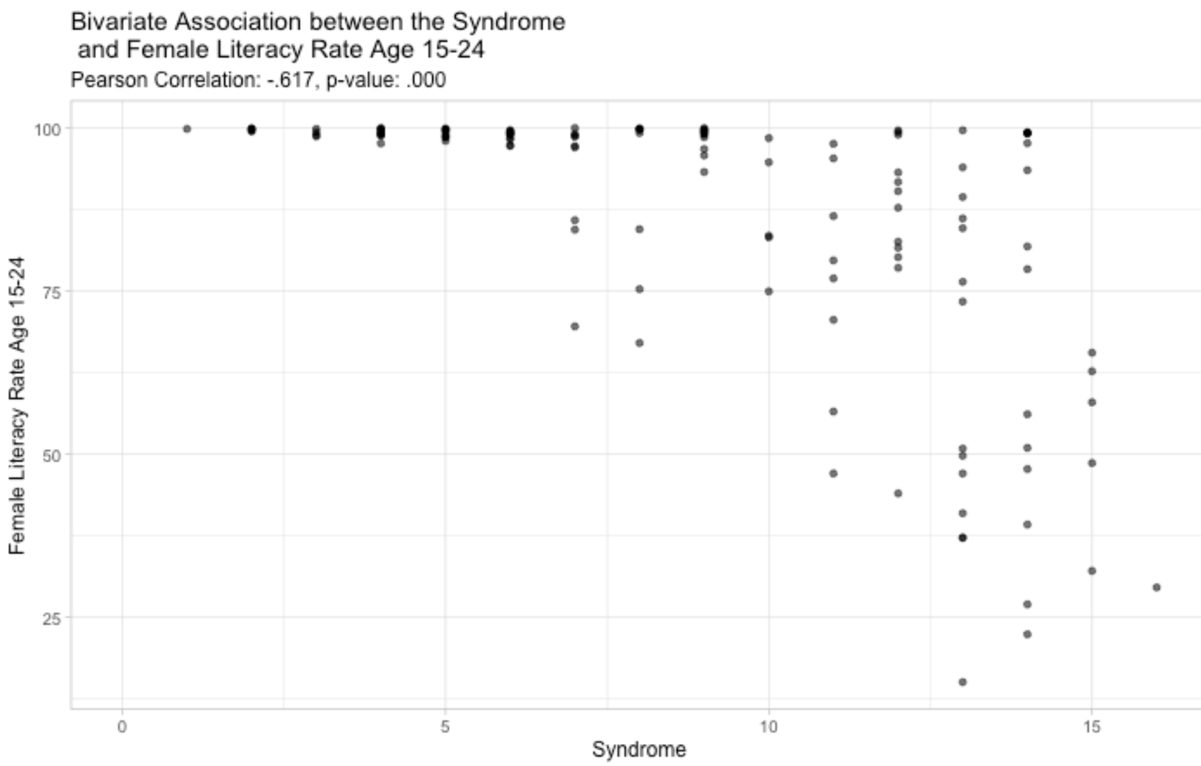
* significant at 0.001

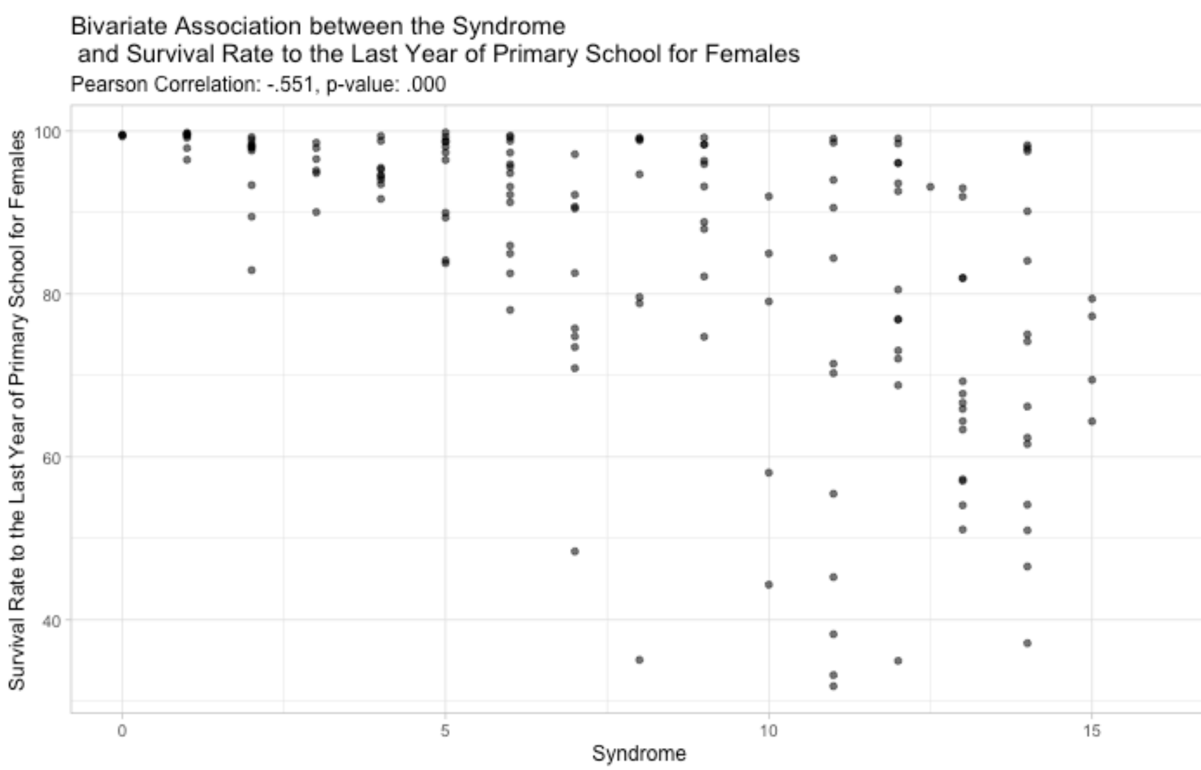
The adjusted R-squared is a strong .485, indicating that the specified model explained at least 48.5% of the variability of girls' survival rate to final year of primary school. The only significant variables in this model are Muslim Civilization, Syndrome, and

Urbanization. While Muslim Civilization appears the strongest determinant of this variable, its effect size is only slightly larger than both the Syndrome and Urbanization. We find that the coefficient for Muslim civilizations is positive, which indicates that predominantly Muslim countries experience higher survival rates of girls to the last year of primary school than the comparison group of African civilization countries. The sign of the coefficient for Urbanization is positive, meaning the higher the percentage of people living in urban areas in a country, the higher survival rates of girls to the last year of primary school. The Syndrome's negative coefficient indicates that countries with higher Syndrome scores will have lower survival rates to the last year of primary school for females, consistent with our hypothesis. The bivariate correlation between the Syndrome and Survival Rates is a moderately strong -.551, and the scatterplot in Figure 8.7.3 shows a generally negative trend. We note that the countries with higher Syndrome scores in the scatterplot experience much higher variation in survival rates. We find the lower left quadrant completely empty, indicating that countries that have lower Syndrome scores have the highest survival rates for females to the end of primary school. We do note that Nicaragua and Madagascar, with moderate Syndrome scores (7 and 8 respectively), experience lower survival rates than would be expected given their scores.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome and Urbanization are the only variables that are significant in predicting the logits or predicted probabilities of lower percentage of girls who survive to the last year of primary school (less than 90%). We specifically find that for every one unit increase in the Syndrome, the odds increase by 31%, or alternatively there is a 1.31 times greater risk, that the country experiences lower percentages of girls who survive to the last year of primary school, after holding all other control variables constant.

Figure 8.7.3 Scatterplots of Syndrome with Female literacy rate age 15-24 and Survival rate to last year of primary school for females





7) Government expenditures per student in secondary school as % of GDP per capita

The GLM analysis yielded a very low adjusted R-squared value of .042 and Syndrome was not significant so we do not report the results.

Concluding Discussion for the Education Dimension

While the Patrilineal/Fraternal Syndrome is not significantly related to all of the variables in this Education dimension, it is a significantly related variable in 6 out of the 10 analyses performed. In 4 of those 6, it is the most significant determinant of the dependent variable in terms of effect size. The outcome variables for which the Syndrome had the largest effect size were :

- Average Years of Schooling (for men and women ages 25 and over)
- Access to Basic Knowledge and Communication
- Female Literacy Rate Age 15-24
- Overall Literacy of Males and Females

These are noteworthy results, we believe. A wide variety of education and literacy indicators appear to be significantly determined by the degree to which the Patrilineal-Fraternal Syndrome is encoded within the behavior of the society. The results for Female Literacy Rates indicate that Syndrome is a significant determinant of girls' access to literacy. The results for both Average Years of Schooling and Access to Basic Knowledge, measures of the education access and experience of both men and women, indicate that Syndrome significantly impacts overall education in a society. We also find that Syndrome is a significant determinant of the discrepancy between men and women's literacy levels. While countries with worse Syndrome scores do not always have poor levels of education and literacy, we find that the absence of the Syndrome essentially eliminates poor education and literacy levels.

9. Social Progress Dimension

We hypothesize that Syndrome countries will suffer in comparison with non-Syndrome countries in a number of areas that can be roughly summed up as pertaining to a variety of aspects of social progress.

In this dimension we include access to electricity, which is critical for household functions and children's school homework and thus links to education as well as women's work. We include indicators that touch on human happiness and unhappiness including the happiness index and suicide rates. We look at state respect for diversity in tolerance for immigrants and religious tolerance. The provision of social safety nets and pensions indicates a state's protection of disabled and aged citizens.

The Social Progress Cluster also analyzes the relationship of the Syndrome countries to respected international gender indicators and includes five gender equality indexes, as well as a state's formal commitment to the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW). We contend that these respected international measures of women's status are not primary measures of a woman's wellbeing, but strongly relate to women's wellbeing as defined by the Syndrome. Thus we hypothesize, that countries that rank high on the Syndrome will also rank low on these scales for women's status. Finally, we examine the relation of Syndrome countries and the best international model of human wellbeing, the UN Human Development Index, and hypothesize that Syndrome countries will rank lower.

List and description of variables in the Social Progress Dimension

The variables which are most commonly used in social science research and which the authors deemed as the most valid measures of social progress are listed in alphabetical order below. (Note: Some variables were excluded due to N size reasons, for theoretical reasons, or because their bivariate correlation with another variable in this cluster exceeded 0.90. [35]) The list provides the variable name, the source from which the variable was obtained, whether the measure is nominal/ordinal/continuous and the range where applicable, which directionality the variable takes, the N size for the variable, and whether any transformations were used:

1) Access to Electricity % of population (2016), The World Bank, percent, lower scores are worse, N=175
2) Discrimination and violence against minorities (2016), Social Progress Index, ordinal (0-10), higher scores are worse, N=160
3) Female Suicide Rates (2015), World Health Organization, rates per 100,000 female population, higher scores are worse, N=173
4) Formal Commitment to CEDAW (2015), The WomanStats Project, ordinal (0-3), higher scores are worse, N=176
5) Gender Gap Index (2016), World Economic Forum, ordinal (0-1), lower scores are worse (0 = inequality, 1 = equality), N=144
6) Gender Inequality Index (2015), United Nations Development Programme, scale (min=.040, max=.767), higher scores are worse, N=155
7) Government Framework for Gender Equality (2015), The WomanStats Project, ordinal (0-7), higher scores are worse, N=176

8) Happiness Index (2015), World Happiness Report (Accessed from the Quality of Government Institute), ordinal (0-10), lower scores are worse, N=157
9) Hofstede Individualism Score Hofstede Individualism Score (2018), Geert-Hofstede, ordinal (0-100), higher scores are for countries that are more individualistic, N=101
10) Human Development Index (2015), UNDP Human Development Reports, scale (min=.352, max=.949), lower scores are worse, N=172
11) Legal Declaration of Gender Equality (2015), The WomanStats Project, ordinal (0-2), higher scores are worse, N=176
12) Percentage of pensionable age persons receiving SS/pensions (2005-2016), percent, lower scores are worse, N=159
13) Presence of National Gender Equality Action Plan (2015), The WomanStats Project, ordinal (0-2), higher scores are worse, N=176
14) Religious Tolerance (2016), Social Progress Index, ordinal (1-4), lower scores are worse, N=160
15) Social Safety Nets (2016), Bertelsmann Stiftung's Transformation Index (Accessed from the Quality of Government Institute), scale (1-10), lower scores are worse (1 = Social Safety Nets do not exist, 10 = Social Safety Nets are comprehensive), N=128
16) Tolerance for Immigrants (2016), Social Progress Index, percent (0-1) of respondents answering yes to the question, "Is the city or area where you live a good place or not a good place to live for immigrants from other countries?", lower scores are worse, N=152

We desired to reduce the number of variables examined through factor analysis in order to find variables which clustered highly on the same factors and thus could be analyzed together. However, the factor analysis would not load because the matrix was positive definite. We therefore chose to analyze all of the 16 variables separately.

Outline of analyses in the Social Progress Dimension

We perform nine main analyses on the Social Progress dimension and seven ancillary analysis. In our first analysis, we examine a key variable for our study, the Human Development Index. This widely used and respected index measures human development through three variables, life expectancy, education and per capita income.

The second uses one variable, the Gender Inequality Index which measures gender inequalities in human development (reproductive health, maternal mortality and early marriage), empowerment (legislative seats held and education levels), and economic status (labor force participation).

The third analysis has two variables. Our main analysis is the Happiness Index which ranks countries on a package of factors that respondents to Gallup World Poll surveys consider necessary for a best possible life. Respondents name income, healthy life expectancy, social support, freedom, trust and generosity among others. For an ancillary analysis, we use Female Suicide Rates, the number of suicides among women in a given country per 100,000 population.

The main variable for the fourth analysis is the Percentage of Pensionable Age Persons Receiving SS/pensions defined as the percent of beneficiaries covered by old-age pensions. Social Safety nets, our ancillary variable, measures the services provided by state or other institutions such as welfare, unemployment benefits, universal healthcare, free education, workers compensation and so forth which cushion individuals from falling into poverty.

The fifth analysis has one variable, Access to Electricity Percent of Population which measures the percent of population with access to electricity.

The sixth analysis uses the Hofstede Individualism Score as a main variable. Legal frameworks in liberal democracies benefit the rights of individuals (contract societies) as opposed to loyalty and dependence on groups (status societies). This variable contrasts individualism and collectivism as a characteristic of national culture. As noted in Part One, the Syndrome is the most dominant expression of collectivism across time and history. We include it in the Social Progress cluster because the quest for human development is impaired to the extent that the individual is not recognized as the primary unit of society.

The seventh analysis examines the well-known Gender Gap Index which measures gender disparities in terms of health, education, economy, and politics. The eighth analysis uses Discrimination and Violence among Minorities for its major analysis. This sub-component of the Social Progress Index, measures discrimination and violence against ethnic, sectarian, religious, and communal groups by state. We use two variables in ancillary analyses: Religious Tolerance, a sub-component of the Social Progress Index which compiles measures of 13 types of religious hostility by private individuals, organizations or groups in society including religion-related armed conflict or terrorism, mob or sectarian violence, harassment over attire for religious reasons or other religion-related intimidation or abuse; and Tolerance for Immigrants, also a sub-component of the Social Progress Index which presents the percentage of respondents answering yes to the question on a Gallup World Poll, ”is the city of area where you live a good place or not a good place to live for immigrants from other countries?”

The ninth analysis uses Legal Declaration of Gender Equality in the main analysis which measures the extent of a country's codification of gender equality in law, whether in the constitution or through legislation. We use three variables for ancillary analysis: Formal Commitment to CEDAW which ranks the degree to which a country has committed itself to The Convention on the Elimination of All forms of Discrimination against Women (CEDAW); Government Framework for Gender Equality which measures and scales the degree to which a country enacts feminist goals into policy on three dimensions (legal declaration of gender equality, Presence of Gender Equality Action Plan, and commitment to international goals as expressed in CEDAW); and Presence of National Gender Equality Action Plan which indicates whether country has a comprehensive and current national gender equality action plan.

Model specification

The model for each dependent variable or dependent variable cluster takes the same form in each case:

Dependent variable or cluster$_i$ = Syndrome + Civilization + Colonial status + Urbanization + Terrain + Number of land neighbors + Religious fractionalization + Ethnic fractionalization + ε_i

A general linear model (GLM) procedure was used to investigate the statistical significance and explanatory power of these eight independent variables. We hypothesized that, after controlling for the influence of the other seven control variables, the Patrilineal-Fraternal Syndrome will still be a significant predictor of these dependent variables for the nations in our study.

Model results

We run 16 general linear model analyses under Social Progress. We find that the Syndrome was significant in 12 of those models. The 4 models where Syndrome was not significant include: (1) Female Suicide Rates, (2) Tolerance for Immigrants, (3) Formal Commitment to CEDAW, and (4) Presence of National Gender Equality Action Plan. The last two findings are interesting for they suggest that formal government commitment to gender equality may not translate into greater levels of women's empowerment at the household level.   Table 8.8.1 summarizes the results of the GLM analysis.

Table 8.8.1 Summary of GLM results for the Social Progress Dimension in descending order of R-squared values. Ancillary analyses in italics.

Dependent variable	**Adjusted R-squared (N)**	**Independent variables significant at .001 by descending order of effect size**
1) Human Development Index	.788 (172)	Urbanization Syndrome Muslim civilization Ethnic fractionalization
2) Gender Inequality Index	.718 (155)	Syndrome Urbanization Ethnic fractionalization
3) Happiness Index *Female suicide rates (WHO)*	.643 (157) *.097 (173)*	Syndrome Urbanization Muslim civilization *None*
4) Percentage of pensionable age persons receiving SS/pensions *Social Safety nets*	.533 (159) *.509 (128)*	Syndrome *Urbanization* *Syndrome*
5) Access to electricity % of population	.495 (175)	Urbanization Syndrome Muslim civilization
6) Hofstede Individualism Score	.471 (101)	Syndrome
7) Gender Gap Index	.445 (144)	Syndrome

8) Discrimination and violence among minorities	.399 (160)	Number of land neighbors Syndrome
Religious tolerance	*.324 (160)*	*Number of land neighbors* *Syndrome* *Colonial status*
Tolerance for immigrants	*.089 (152)*	*None*
9) Legal declaration of gender equality	.384 (176)	Syndrome
Government framework for gender equality	*.251 (176)*	*Syndrome*
Formal commitment to CEDAW	.125(176)	*Muslim civilization*
Presence of national gender equality action plan	*.044 (176)*	*None*

We elaborate on the nine main analyses.

1) **Human Development Index** (lower scores are considered worse, N=172): The results are as follows:

Table 8.8.2 General Linear Model Results for Human Development Index (Adjusted R-squared=.788)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	.658	.037	.000	.680
Colonial Status=0 (Never Colonized)	.016	.018	.390	.005
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	.019	.016	.228	.010
CIV=2 (Muslim)	.081	.019	.000*	.111

CIV=4 (Hindu/Sinic/Buddhist)	.037	.024	.122	.016
CIV=5 (Africa)	0			
Syndrome 2017	-.017	.002	.000*	.347
Urbanization 2015	.003	.000	.000*	.385
Number of Land Neighbors	.001	.002	.697	.001
Terrain 2014	-.001	.000	.064	.023
Religious Fractionalization 2003	.063	.027	.020	.036
Ethnic Fractionalization 2003	-.108	.028	.000*	.090

* significant at 0.001

The adjusted R-squared is a remarkably strong .788, indicating that the specified model explained at least 78.8% of the variability of the Human Development Index scores. Four variables proved significant: Muslim Civilization (effect size .111), Syndrome (effect size .347), Urbanization (.385), and Ethnic Fractionalization (.090). The effect sizes of the Syndrome and Urbanization are over three times larger than that of Ethnic Fractionalization or Muslim Civilization. The Syndrome effect size is slightly less than Urbanization. The coefficients of Urbanization and Muslim Civilization are positive which means that countries with higher urbanization and those with predominantly Muslim civilizations will score higher on the Human Development Index. The coefficients for the Syndrome and Ethnic Fractionalization are negative which means that countries that rank high on those two indexes will rank low on the Human Development Index. The bivariate correlation between the Syndrome and the Human Development Index is significant and very strong (-.764 p-value: .000). The scatterplot in Figure 8.8.1 helps us visualize this relationship as it forms a steep negative curve. Some of the countries with high Human Development Index scores in addition to the high ranked Western European countries, found in the upper right quadrant, include wealthy Gulf state such as United Arab Emirates, Qatar, and Saudi Arabia. The Human Development Index is highly respected as a model of social wellbeing and for measuring a country's level of development as its component indexes go behind economic growth or income alone. The components of the index are life expectancy, knowledge, which includes education, and Gross National Income. That the Syndrome has such a strong negative correlation validates our overall hypothesis that the Syndrome represents a set of practices that compromise the wellbeing of men, women and children, not just women.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome and Urbanization are the only variables that are significant in predicting the logits or predicted probabilities of worse scores on the Human Development Index. We specifically find that for every one unit increase in the Syndrome, the odds increase by 66%, or alternatively there is a 1.66 times greater risk, that the country experiences lower scores on the Human Development Index, after holding all other control variables constant.

2) **Gender Inequality Index** (higher scores are considered worse, N=155): The results are as follows:

Table 8.8.3 General Linear Model Results for Gender Inequality Index (Adjusted R-squared=.718)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	.256	.057	.000	.131

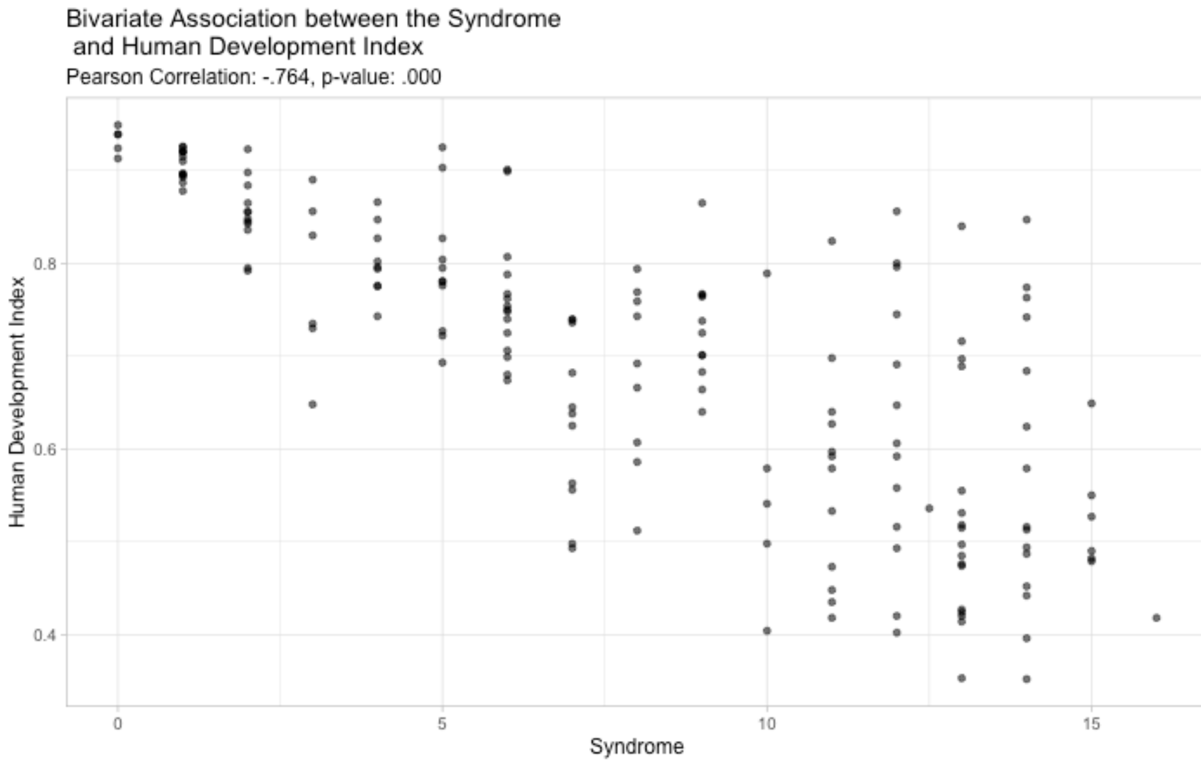
Colonial Status=0 (Never Colonized)	-.033	.025	.191	.013
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	.016	.024	.501	.003
CIV=2 (Muslim)	-.047	.028	.089	.021
CIV=4 (Hindu/Sinic/Buddhist)	-.014	.034	.686	.001
CIV=5 (Africa)	0			
Syndrome 2017	.026	.003	.000*	.392
Urbanization 2015	-.002	.000	.000*	.123
Number of Land Neighbors	-.005	.003	.167	.014
Terrain 2014	3.160E-5	.001	.959	.000
Religious Fractionalization 2003	-.048	.039	.223	.011
Ethnic Fractionalization 2003	.140	.041	.001*	.078

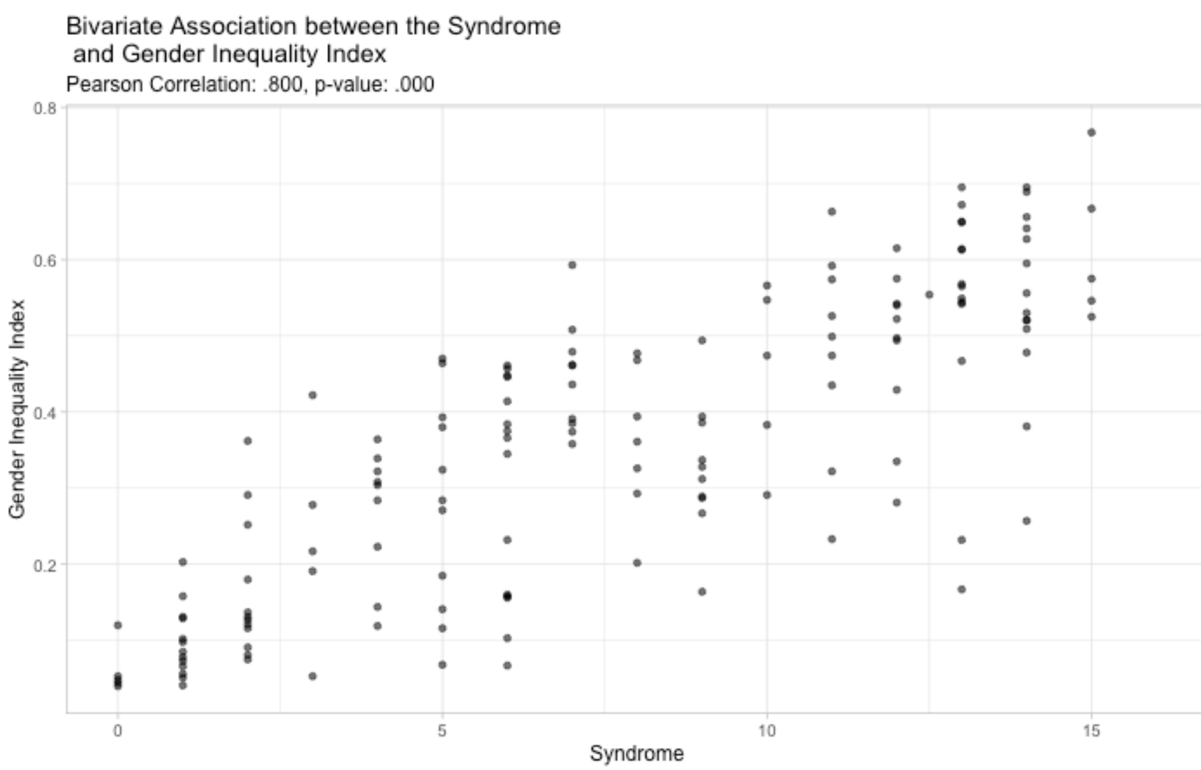
* significant at 0.001

The adjusted R-squared is a remarkably strong .718, indicating that the specified model explained at least 71.8% of the variability of the Gender Inequality Index scores. Three variables reach significance: Syndrome with an effect size of .392, Urbanization with an effect size of .123, and Ethnic Fractionalization with an effect size of .078. We note that the effect size of the Syndrome is three and a half times larger than that of Urbanization. The coefficient of Syndrome is positive which means that Syndrome countries are more likely to rank high on the Gender Inequality Index. The Urbanization coefficient is negative which means that more urbanized countries are less likely to rank high on the Gender Inequality Index. The very strong bivariate correlation is .800 p-value: .000. The scatterplot in Figure 8.8.1 shows a strong upward curve that substantiates the correlation between the two factors. The Gender Inequality Index was developed by the United Nations Development Program (UNDP) in conjunction with the Human Development Report. The strong relationship between Syndrome and this index mirrors the strong correlation between Syndrome and the Human Development Index (see #1 above).

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome and Muslim Civilization are the only variables that are significant in predicting the logits or predicted probabilities of worse scores on the Gender Inequality Index. We specifically find that for every one unit increase in the Syndrome, the odds increase by 81%, or alternatively there is a 1.81 times greater risk, odds that the country scores worse on the Gender Inequality Index, after holding all other control variables constant.

Figure 8.8.1 Scatterplots of Syndrome with Human Development Index and Gender Inequality Index





3) **Happiness Index** (lower scores are considered worse, N=157): The results are as follows:

Table 8.8.4 General Linear Model Results for Happiness Index (Adjusted R-squared=.643)

Independent/ Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	5.102	.400	.000	.545
Colonial Status=0 (Never Colonized)	.267	.183	.147	.015
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	.220	.171	.201	.012
CIV=2 (Muslim)	.667	.194	.001*	.080
CIV=4 (Hindu/Sinic/ Buddhist)	.471	.241	.052	.027
CIV=5 (Africa)	0			
Syndrome 2017	-.137	.021	.000*	.242
Urbanization 2015	.021	.003	.000*	.222
Number of Land Neighbors	-.028	.026	.287	.008
Terrain 2014	-.013	.005	.008	.050
Religious Fractionalization 2003	.003	.282	.993	.000

Ethnic Fractionalization 2003	.196	.305	.523	.003

* significant at 0.001

The adjusted R-squared is a strong .643, indicating that the specified model explained at least 64.3% of the variability of the Happiness Index scores. Three variables prove significant: Muslim Civilization (effect size.080), the Syndrome (.242), and Urbanization (.222). The effect size of Syndrome is a little larger than Urbanization, and both are around three times the size of Muslim civilization. The coefficients for Muslim Civilization and Urbanization are positive, meaning that these countries rank higher on the Happiness Index. The Syndrome's coefficient is negative which means that countries high on Syndrome rank lower on the Happiness Index. The bivariate correlation is significant and moderately strong at -.662 p-value: .000. The scatterplot in Figure 8.8.2 bears out this relationship with a strong negative curve showing that countries higher on Syndrome are ranked less happy by their citizens. We note that in the lower right quadrant, we find both Muslim and non-Muslim countries: Syria and Afghanistan are Muslim, but Togo, Burundi, and Benin are not majority Muslim.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome and Urbanization are the only variables that are significant in predicting the logits or predicted probabilities of worse scores on the happiness index. We specifically find that for every one unit increase in the Syndrome, the odds increase by 45%, or alternatively there is a 1.45 times greater risk, that the country scores worse on the happiness index, after holding all other control variables constant. That is noteworthy: *all* are significantly less happy when the first sexual political order is based on subordination, coercion, and exploitation of women.

We use WHO's Female Suicide Rates as an ancillary variable and the GLM analysis yields a very low adjusted R-squared value of .097 with no significant independent variables.

4) **Percentage of pensionable age persons receiving SS/pensions** (lower scores are considered worse, N=159): The results are as follows:

Table 8.8.5 General Linear Model Results for Percentage of Pensionable Age Persons Receiving SS/Pensions (Adjusted R-squared=.533)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	94.528	14.779	.000	.231
Colonial Status=0 (Never Colonized)	2.893	6.998	.680	.001
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	-.458	6.062	.940	.000
CIV=2 (Muslim)	7.830	7.273	.284	.008
CIV=4 (Hindu/Sinic/Buddhist)	-4.739	9.030	.601	.002
CIV=5 (Africa)	0			
Syndrome 2017	-6.028	.737	.000*	.330
Urbanization 2015	.058	.120	.627	.002
Number of Land Neighbors	2.232	.902	.015	.043
Terrain 2014	-.132	.163	.422	.005
Religious Fractionalization 2003	6.060	10.228	.554	.003

Ethnic Fractionalization 2003	-15.671	10.861	.151	.015

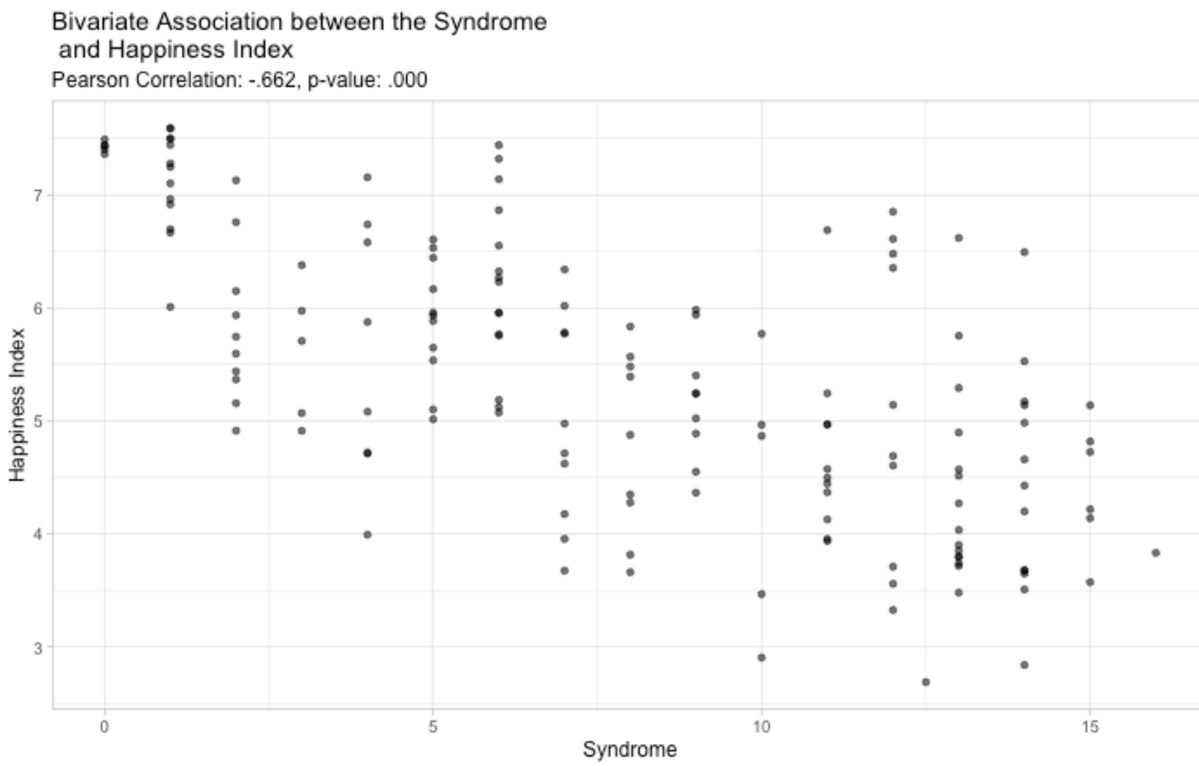
* significant at 0.001

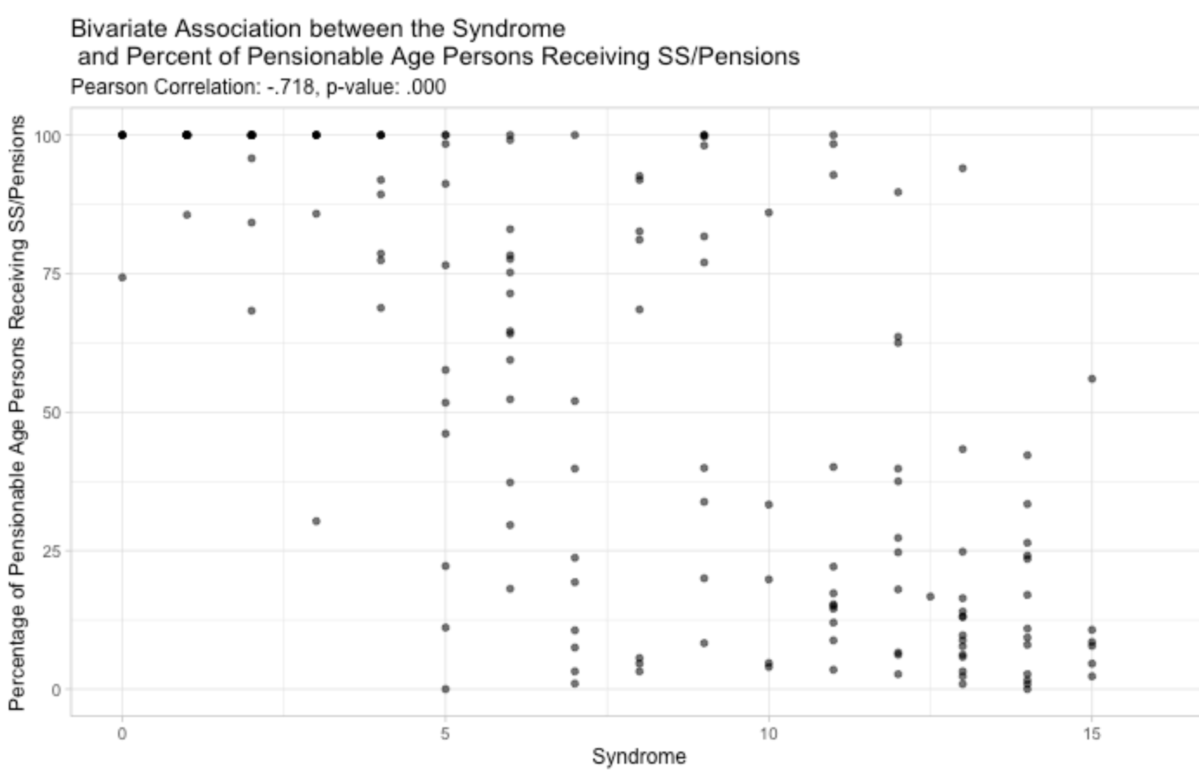
The adjusted R-squared is a strong .533, indicating that the specified model explained at least 53.3% of the variability of the percentage of pensionable aged persons receiving SS/pensions. One variable, Syndrome, achieves significance with an effect size of .330. Its coefficient is negative which means that Syndrome countries are far less likely to provide retirement aged individuals with social security or pensions, which corroborates our hypotheses. The bivariate correlation is a very strong -.718 p-value: .000. The scatterplot in Figure 8.8.2 shows a downward slope. The distribution is complicated by a number of outliers for mid and high Syndrome. A number of Syndrome countries (e.g. Central Asia) were part of the former USSR. These countries have a history of strong government involvement in care for elderly. Most other high Syndrome countries expect kinship units to care for their elderly. Sons in particular are traditionally assigned the duty of caring for their parents in need or old age. The expectation that sons care for their parents is also a factor in son preference or in higher birth rates as women desire sons to guarantee their security in their old age. In the upper left quadrant we have Norway, Iceland, New Zealand and Australia which are low on Syndrome and high on those of retirement age receiving SS/pensions. In the upper right quadrant we have Lesotho which is high on Syndrome and high on those of retirement age receiving SS/pensions. In the lower right quadrant, we find Afghanistan, Yemen, Lebanon, and Chad which are high on Syndrome and low on those of retirement age receiving SS/pensions.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome is the only variable that is significant in predicting the logits or predicted probabilities of lower percentages of pensionable age people receiving SS/pensions. We specifically find that for every one unit increase in the Syndrome, the odds increase by 86%, or alternatively there is a 1.86 times greater risk, that the country experiences lower percentages of pensionable aged persons receiving SS/pensions, after holding all other control variables constant.

We use Social Safety Nets as an ancillary variable and the GLM analysis results in a high adjusted R-squared value of .509 where Syndrome is a significant predictor for this outcome variable, together with Urbanization, both in the expected direction.

Figure 8.8.2 Scatterplots of Syndrome with Happiness Index and Percentage of pensionable persons receiving SS/pensions





5) **Access to electricity % of population** (lower scores are considered worse, N=175): The results are as follows:

Table 8.8.6 General Linear Model Results for Access to Electricity % of Population (Adjusted R-squared=.495)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	73.579	10.328	.000	.254
Colonial Status=0 (Never Colonized)	-4.114	5.028	.415	.004
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	8.390	4.425	.060	.024
CIV=2 (Muslim)	19.746	5.205	.000*	.088
CIV=4 (Hindu/Sinic/Buddhist)	10.635	6.413	.099	.018
CIV=5 (Africa)	0			
Syndrome 2017	-2.177	.538	.000*	.099
Urbanization 2015	.445	.086	.000*	.152
Number of Land Neighbors	.375	.663	.572	.002
Terrain 2014	-.050	.120	.675	.001
Religious Fractionalization 2003	-8.234	7.353	.265	.008
Ethnic Fractionalization 2003	-14.498	7.738	.063	.023

* significant at 0.001

The adjusted R-squared is a strong .495, indicating that the specified model explained at least 49.5% of the variability of access to electricity. Three indicators are significant: Muslim Civilization (effect size .088), Syndrome (.099), and Urbanization (.152).

The coefficients for Muslim Civilization and Urbanization are positive which means that majority Muslim countries and countries that are more urbanized have greater access to electricity on a per capita basis. The populations of Syndrome countries have less access to electricity on a per capita basis. The bivariate correlation is a moderately strong -.569 p-value: .000. As the scatterplot in Figure 8.8.3 shows, the correlation between electricity per capita and the Syndrome is uneven. While some Syndrome countries have excellent access to electricity, a number of countries have less access. Some countries rank medium on Syndrome, but have little electricity access. For example, countries in the upper left quadrant which are low on Syndrome, high on access to electricity are Switzerland, United States, and Spain. On the upper right quadrant countries which are high on Syndrome and also high on access to electricity are Iraq, Pakistan, Saudi Arabia, and Iran. Countries in the lower right quadrant which are high on Syndrome and low on access to electricity are South Sudan, Chad, Central African Republic, and Liberia.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome, Urbanization, and Muslim Civilization are the only variable that is significant in predicting the logits or predicted probabilities of lower percentages of the population with access to electricity (less than 93.3%). We specifically find that for every one unit increase in the Syndrome, the odds increase by 35%, or alternatively there is a 1.35 times greater risk, that the country experiences lower access to electricity, after holding all other control variables constant.

6) **Hofstede Individualism Score** (High scores are associated with more individualistic cultures, N=101): The results are as follows:

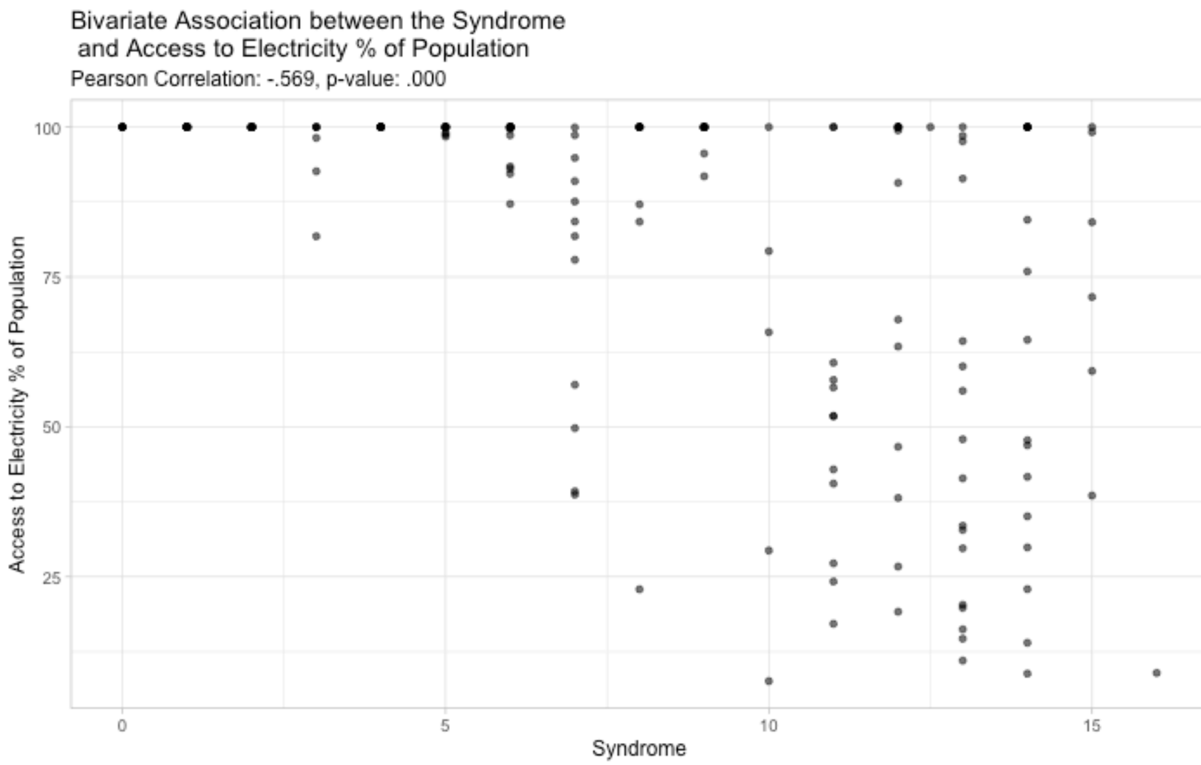
Table 8.8.7 General Linear Model Results for Hofstede Individualism (Adjusted R-squared=.471)

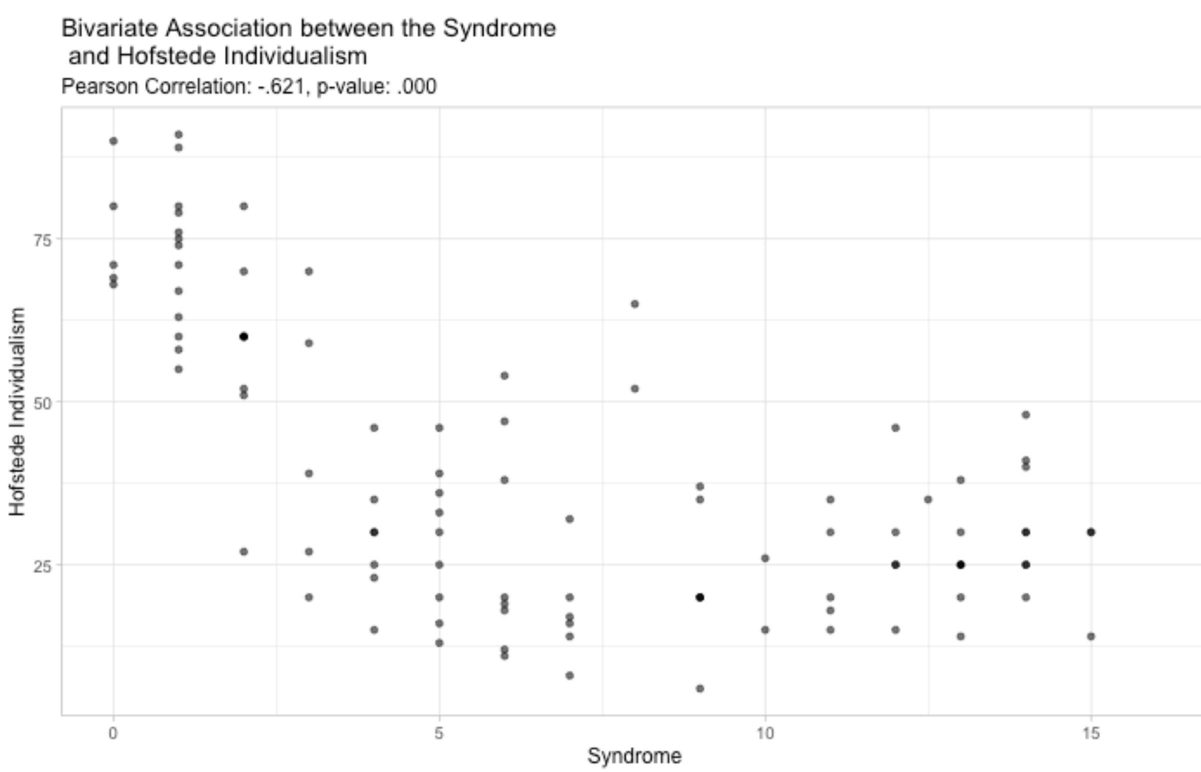
Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	25.475	12.371	.043	.048
Colonial Status=0 (Never Colonized)	9.902	4.472	.030	.055
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	-3.087	4.870	.528	.005
CIV=2 (Muslim)	-4.199	5.662	.460	.006
CIV=4 (Hindu/Sinic/Buddhist)	-10.578	6.572	.111	.030
CIV=5 (Africa)	0			
Syndrome 2017	-2.131	.530	.000*	.160
Urbanization 2015	.261	.098	.009	.077
Number of Land Neighbors	-.293	.646	.652	.002
Terrain 2014	.283	.132	.036	.051
Religious Fractionalization 2003	17.710	7.442	.020	.062
Ethnic Fractionalization 2003	2.960	8.877	.740	.001

* significant at 0.001

The adjusted R-squared is a strong .471, indicating that the specified model explained at least 47.1% of the variability of the Hofstede individualism scores, and the only variable reaching significance was the Syndrome, with a negative coefficient, meaning the higher the Syndrome score, the less individualistic the culture. This certainly makes sense in that the Syndrome imposes, shall we say, a lack of individualism particularly on all women, and the clan network also embeds men less as individuals and more as lineage representatives. The bivariate correlation with Syndrome is a moderately strong -.621 ($p<.0001$), and the scatterplot in Figure 8.8.3 shows the bivariate relationship between the Syndrome and individualism. Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome is the only variable that is significant in predicting the logits or predicted probabilities of a country experiencing worse Hofstede individualism scores. We specifically find that for every one unit increase in the Syndrome, the odds increase by 35%, or alternatively there is a 1.35 times greater risk, that the country scores lower on the Hofstede Individualism measure, after holding all other control variables constant.

Figure 8.8.3 Scatterplots of Syndrome with Access to electricity % of population and Hofstede Individualism Score





7) **Gender Gap Index** (lower scores are considered worse, N=144): The results are as follows:

Table 8.8.8 General Linear Model Results for Gender Gap Index (Adjusted R-squared=.445)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	.799	.025	.000	.894
Colonial Status=0 (Never Colonized)	-.004	.011	.683	.001
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	-.013	.010	.214	.012
CIV=2 (Muslim)	-.015	.012	.220	.012
CIV=4 (Hindu/Sinic/Buddhist)	.000	.014	.991	.000
CIV=5 (Africa)	0			
Syndrome 2017	-.010	.001	.000*	.318
Urbanization 2015	.000	.000	.038	.034
Number of Land Neighbors	-.001	.002	.709	.001
Terrain 2014	.000	.000	.985	.000
Religious Fractionalization 2003	.004	.017	.802	.001
Ethnic Fractionalization 2003	.010	.018	.600	.002

* significant at 0.001

The adjusted R-squared is a strong .445, indicating that the specified model explained at least 44.5% of the variability of Gender Gap Index scores. The only variable that establishes significance for this model is Syndrome with an effect size of .318. The variable's coefficient is negative which means that Syndrome countries rank worse on the

Gender Gap Index meaning that that Syndrome countries have larger gaps between men and women's achievement as measured on subindices of Health and Survival, Educational Attainment, Economic Participation and Opportunity, and Political Empowerment. The bivariate correlation is a moderately strong -.670 (p-value: .000). The scatterplot in Figure 8.8.4 demonstrates that high Syndrome countries are slightly more likely to have more significant gender gaps. We identify some of the outliers in the plot. The country with the lowest (worst) score on the Gender Gap Index is Yemen, with a Syndrome score of 15. Additionally, the three countries with the highest (best) scores on the Index include Iceland, Finland, and Norway.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome is the only variable that is significant in predicting the logits or predicted probabilities of worse scores on the Gender Gap Index. We specifically find that for every one unit increase in the Syndrome, the odds increase by 55%, or alternatively there is a 1.55 times greater risk, that the country will score worse on the Gender Gap Index, after holding all other control variables constant.

8) **Discrimination and Violence against Minorities** (higher scores are considered worse, N=160): The results are as follows:

Table 8.8.9 General Linear Model Results for Discrimination and Violence Against Minorities (Adjusted R-squared=.399)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	4.767	.806	.000	.200
Colonial Status=0 (Never Colonized)	.222	.384	.565	.002

Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	.265	.341	.437	.004
CIV=2 (Muslim)	.365	.408	.372	.006
CIV=4 (Hindu/Sinic/Buddhist)	.762	.500	.130	.016
CIV=5 (Africa)	0			
Syndrome 2017	.162	.042	.000*	.097
Urbanization 2015	-.018	.007	.010	.047
Number of Land Neighbors	.249	.052	.000*	.141
Terrain 2014	.007	.009	.460	.004
Religious Fractionalization 2003	-.862	.577	.138	.016
Ethnic Fractionalization 2003	.488	.620	.432	.004

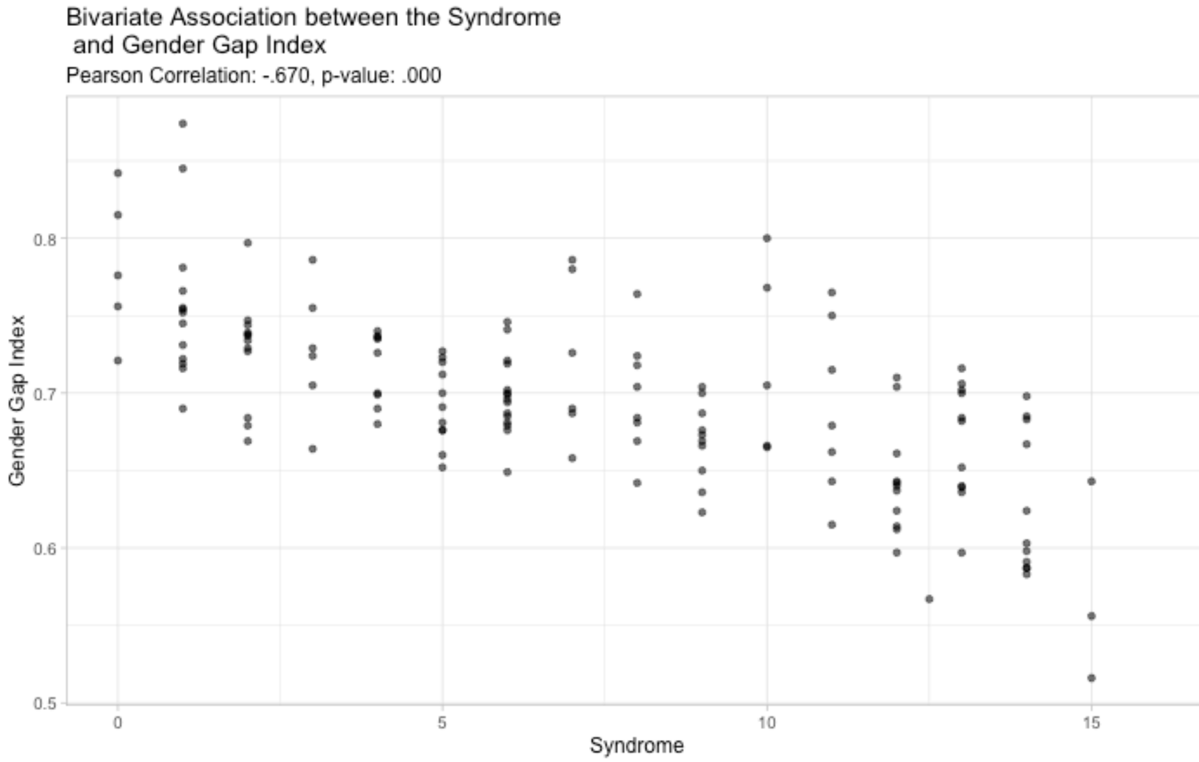
* significant at 0.001

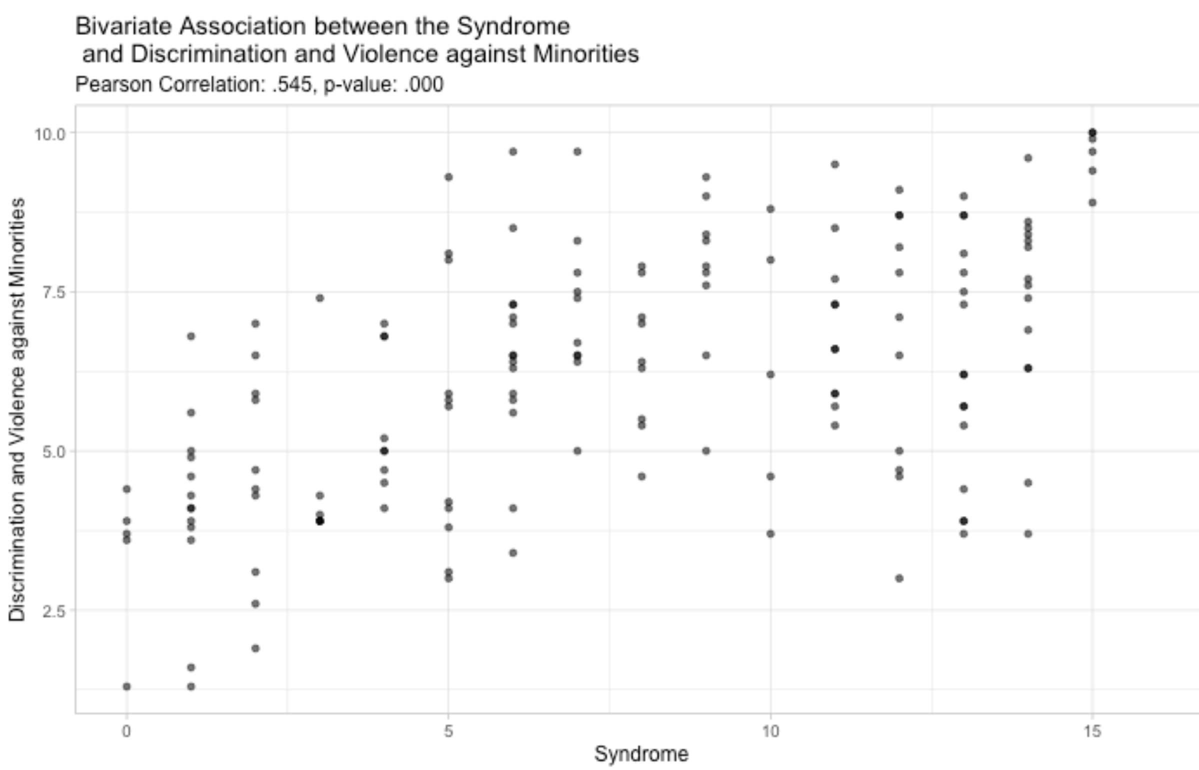
The adjusted R-squared is a moderate .399, indicating that the specified model explained at least 39.9% of the variability of discrimination and violence against minorities. Two variables prove significant: Syndrome and Number of Land Neighbors. The effect sizes are .097 and .141 respectively. The coefficient for both are positive which means that discrimination and violence against minorities increases the higher on the Syndrome a country ranks and the more land neighbors a country has. Thus, given more potentially competitive or even hostile neighbors on a state's border, a state tends to discriminate, often violently, against outsiders in country. The bivariate correlation is a moderately strong .545 p-value: .000. The scatterplot in Figure 8.8.4 bears out the relationship between the Syndrome and discrimination and violence against minorities in a positive curve. The three low Syndrome/low Discrimination and Violence against Minorities countries in the lower left quadrant are Sweden, Finland and Iceland. This data supports our claim that high Syndrome countries are associated with harsher attitudes and policies to citizens outside the majority national groups.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable), but find that, although the model does meet the validity requirements, the Syndrome is not significant in this model (p-value = 0.03), so we do not report the results.

We use two ancillary variables to supplement the Discrimination and Violence Among Minorities analysis. We find a comparable adjusted R-squared value of .324 for Religious Tolerance with Number of land neighbors, Syndrome and Colonial Status as significant independent variables with the expected directionality. The second ancillary variable used, Tolerance for Immigrants, had a low adjusted R-squared value of .089 and the GLM analyses showed no significant predictors.

Figure 8.8.4 Scatterplots of Syndrome with Gender Gap Index and Discrimination and violence among minorities





9) **Legal Declaration of Gender Equality** (higher scores are considered worse, N=176): The results are as follows:

Table 8.8.10 General Linear Model Results for Legal Declaration of Gender Equality (Adjusted R-squared=.384)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	-.480	.348	.169	.013
Colonial Status=0 (Never Colonized)	.147	.169	.388	.005
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	-.185	.149	.216	.010
CIV=2 (Muslim)	-.154	.175	.381	.005
CIV=4 (Hindu/Sinic/Buddhist)	-.286	.216	.187	.012
CIV=5 (Africa)	0			
Syndrome 2017	.134	.018	.000*	.270
Urbanization 2015	.006	.003	.052	.025
Number of Land Neighbors	-.001	.022	.964	.000
Terrain 2014	.000	.004	.922	.000
Religious Fractionalization 2003	.635	.247	.011	.042
Ethnic Fractionalization 2003	-.206	.260	.431	.004

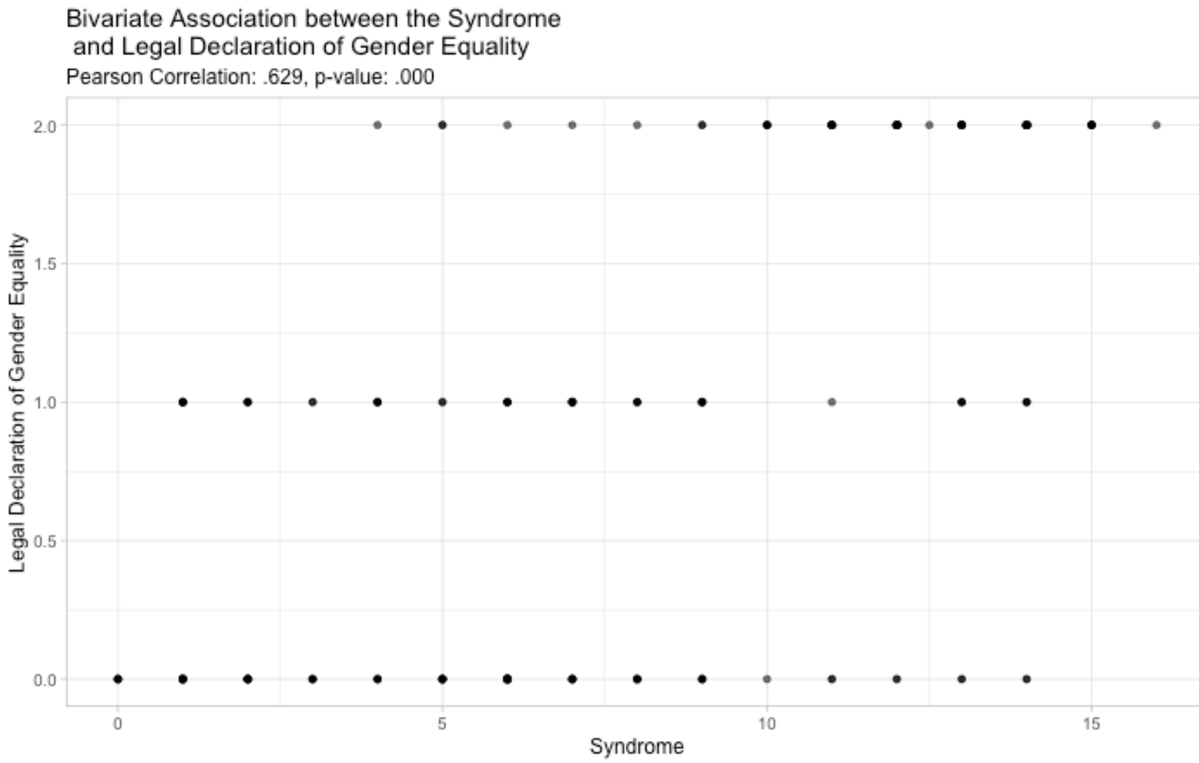
* significant at 0.001

The adjusted R-squared is a moderate .384, indicating that the specified model explained at least 38.4% of the variability of this scale on Legal Declaration of Gender Equality. One variable, Syndrome, achieves significance with an effect size of .270. The coefficient is positive which means that Syndrome countries are more likely to sign on to the U.N. Legal Declaration of Gender Equality. This variable looks at to what extent states codify gender equality in law, whether in its constitution or through legislation. This declaration is scaled in three levels with higher scores showing less legal commitment to gender equality. Level 2 reflects no meaningful legal declaration for the country. Level 1 countries have non-discrimination legislation only or customary law prioritized. Level 0 countries have enacted constitutional or comprehensive legal frameworks for gender equality. The scatterplot in Figure 8.8.5 shows how countries are distributed along these three levels, and the relationship is significant (F=67.41, p-value=.000). Generally speaking, high Syndrome countries have no or little constitutional language or legislation committed to gender equality. Level 2 also denotes the countries where customary or personal are valid sources of law even if they violate legal provisions of nondiscrimination or equality. It is important to note that high Syndrome countries scoring at level 0 or 1 are not likely to fully implement their legal and constitutional commitments to gender equality, even if they have made such commitments. For example, countries in the lower left quadrant which are low on Syndrome and have legal guarantees for gender equality are Switzerland and the United Kingdom. In the lower right quadrant, the countries are Somalia and the Solomon Islands which are high on Syndrome and also have legal guarantees for gender equality. We are more suspicious that Somalia and the Solomon may not be implementing these guarantees than we are of Switzerland and the UK.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome is the only variable that is significant in predicting the logits or predicted probabilities of no gender equality or non-discrimination clause in the constitution or legislation. We specifically find that for every one unit increase in the Syndrome, the odds increase by 69%, or alternatively there is a 1.69 times greater risk, that the country does not have a gender equality or non-discrimination clause in either its constitution or any legislation, after holding all other control variables constant.

We use three variables in ancillary analyses. The GLM analysis for Government Framework for Gender Equality has an adjusted R-squared value of .254 with Syndrome as the only significant independent variable, and with the expected directionality. This finding is consistent with the results of the main analysis. The Formal Commitment to CEDAW variable has an adjusted R-squared value of .125 and Syndrome is not a significant independent variable in the GLM analysis. Similar results are obtained for Presence of National Gender Equality Action Plan which has a much lower adjusted R-squared value of .044.

Figure 8.8.5 Scatterplot of Syndrome with Legal declaration of gender equality



Concluding Discussion for the Social Progress Dimension

Of the 16 dependent variables measuring Social Progress examined here, the Syndrome proved significant for 12. For five of the twelve dependent variables or variable clusters for which Syndrome was significant in multivariate modeling, it was the only variable showing significance, and in another two models it was the variable with the largest effect size.

Each of these outcomes provides valuable information for our argument. Two areas prove particularly important. Development experts constructed the Human Development Index (HDI) to provide a more comprehensive measure of state development. By measuring life expectancy, educational attainment, and gross national income, development becomes more multi-dimensional, and a more accurate depiction of the condition of a state than is possible by measuring on Gross Domestic Product (GDP). The bivariate correlation between the Syndrome and HDI is extremely strong, and thus Syndrome becomes an excellent predictor of a negative path regarding human development. We note that our empirical analysis includes data on the Syndrome's relation to each of the three major areas measured by HDI and refer readers to our other clusters for data on the Syndrome's relation to health and life expectancy, educational attainment, and economic performance.

The second area that deserves attention is the poor correlation between variables that concern gender: Formal Commitment to CEDAW that showed no correlation to Syndrome, Presence of National Gender Equality Action Plan that showed no correlation to Syndrome, Legal Declaration of Gender Equality that showed a significant but low correlation to Syndrome, Government Framework for Gender Equality which showed a moderately low correlation to Syndrome, Gender Gap Index that showed a moderately low correlation to Syndrome, and Gender Inequality Index that showed a moderately high correlation to Syndrome.

One would expect that Syndrome as a negative measure of women's wellbeing would correlate significantly with these six variables. The results, however, are diverse. The lack of correlation between Syndrome and Formal Commitment to CEDAW and Presence of National Gender Equality Action Plan suggests that states may sign on to international accords like CEDAW, or adopt international standards such as the National Gender Equality Plan without following through with reforms that would improve women's wellbeing at the household level. In the case of CEDAW, states may either ignore the international standards, not have resources to commit to policy changes, or may only join for face value. The relatively low correlation between Legal Declaration of Gender Equality and Government Frameworks for Gender Equality may reflect more rhetoric than real state effort and achievement.

The Gender Gap Index and the Gender Inequality Index show respectable correlations with our multivariate model, and in the case of the latter, a strong correlation. We suggest that those two indexes capture *effects* of the Syndrome in their index compositions. Many of the commonly used variables to indicate women's wellbeing are, in our judgment, secondary factors which are visible and easily measured such as education rates, health and life expectancy, labor force participation, and women's participation in government. Our theoretical framework holds that the Syndrome focuses on the practices embedded in informal social organizations that subsequently give rise to these more visible indicators of women's status.

9. Environmental Protection Dimension

We hypothesize that countries with worse Syndrome scores will experience lower air quality, lower levels of environmental protection, and higher risks from environmental factors. We predict that societies that subordinate and exploit women also subordinate and exploit Mother Earth.

List and description of variables in the Environmental Protection Dimension

The variables which are most commonly used in social science research and which the authors deemed as the most valid measures of environmental protection are listed in alphabetical order below. (Note: One variable was excluded because its bivariate correlation with another variable in this cluster exceeded 0.90.[36]) The list provides the variable name, the source from which the variable was obtained, whether the measure is nominal/ordinal/continuous and the range where applicable, which directionality the variable takes, the N size for the variable, and whether any transformations were used:

1) Air Quality (2014), Environmental Performance Index (Accessed from the Quality of Government Institute), scale (min=13.83, max=100), lower scores are worse, N=172
2) Biodiversity and Habitat (2016), Social Progress Index, ordinal (0-100), lower scores are worse (0 = no protection, 100 = high protection), N=160
3) Environmental Performance Index (2014), Environmental Performance Index (Accessed from the Quality of Government Institute), scale (min=15.47, max=87.67), lower scores are worse, N=171
4) Foundations of Wellbeing (2016), Social Progress Index; this variable combines indicators of the country's access to basic knowledge, access to information and communications, health and wellness, and environmental quality, ordinal (0-100), lower scores are worse, N=152
5) Global Climate Risk Index (2014), German Watch, continuous scale (min=8.17, max=117.67), higher scores are worse, N=172
6) Greenhouse Gases (2016), Social Progress Index, "emissions of carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6) expressed in CO2 equivalents", higher scores are worse, N=157
7) Household Indoor Air Pollution Attributable Deaths (2016), Social Progress Index, rate of deaths resulting from household air pollution per 100,000 people, higher scores are worse, N=160

8) Outdoor Air Pollution Attributable Deaths (2016), Social Progress Index, rate of deaths “resulting from emissions from industrial activity, households, and cars and trucks” per 100,000 people, higher scores are worse, N=160
9) Pesticide Regulation (2016), Environmental Performance Index (Accessed from the Quality of Government Institute), scale (min=0, max=96), lower scores are worse, N=173
10) Wastewater Treatment (2016), Social Progress Index, percentage of wastewater that is treated, lower scores are worse, N=156
11) Water and Sanitation (2014), Environmental Performance Index (Accessed from the Quality of Government Institute), scale (min=1.29, max=100), lower scores are worse, N=173

We desired to reduce the number of variables examined through factor analysis in order to find variables which clustered highly on the same factors and thus could be analyzed together. In this manner, we identified three factors and three variables requiring individual modeling, for a total of six outcome variables. The three variables to be examined separately because they did not load sufficiently highly on the other factors are:

- Outdoor Air Pollution Attributable Deaths
- Global Climate Risk Index
- Air Quality

The EFA results utilizing Principal Axis Factoring yielded three distinct loading patterns, and the z-scores of the variables in each cluster were added to create the score for each cluster, after checking for consistency in direction (or multiplied by -1 to maintain consistency):

1) **Water and Environmental Wellbeing factor** (higher scores are considered better, N=149): This factor consists of these four variables with loadings ranging from .737 to 1.099: (1) Water and Sanitation, (2) Environmental Performance Index, (3) Wastewater Treatment, and (4) Foundations of Wellbeing.

2) **Air Pollution factor** (lower scores are considered better, N=157): This factor consists of these two variables with loadings ranging from -.799 to -.284: (1) Household Indoor Air Pollution Attributable Deaths and (2) Greenhouse Gases Emissions.

3) **Biodiversity and Pest Regulation factor** (higher scores are considered better, N=160): This cluster consists of these two variables with loadings ranging from .449 to .624: (1) Biodiversity and (2) Pest Regulation.

Outline of analyses in the Environmental Protection Dimension

We perform four main analyses in the Environmental Protection dimension. The first looks at the Water and Environmental Wellbeing factor which consists of four indicator variables. These variables include Water and Sanitation, a sub-component of the Environment Performance Index, which evaluates quality of sanitation and drinking water; The Environmental Performance Index, which is a respected measure, gives an overall sense of a country's performance on environmental issue which include heath impacts, air quality, water and sanitation, water resources, agriculture, biodiversity and climate and energy among others; Wastewater Treatment gauges the percentage of produced wastewater treated by centralized treatment facilities; and Foundations of Wellbeing combines indicators of the country's access to basic knowledge, access to information and communications, health and wellness, and environmental quality. We then analyze two ancillary variables for this factor: Environmental Performance Index and Air Quality, which measures air quality through assessing household fuel use and minute atmospheric particulate matter (PM2.5).

The second analysis uses the Air Pollution Factor as the main analysis. This factor has two indicator variables: Household Indoor Air Pollution Attributable Deaths which measures deaths that can be attributed to illnesses linked to household air pollution and Greenhouse Gases which measures emissions of carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. The ancillary variable, Outdoor Air Pollution Attributable Deaths, measures the rate of deaths resulting from emissions from households, industry, and vehicles per 100,000 people,

The third analysis is the Biodiversity and Pest regulation factor which consists of two indicator variables: Biodiversity and Habitat which measures the percentage of naturally occurring community of flora and fauna in protected areas against the communities naturally occurring nationally, and Pesticide Regulation, a subcomponent of the Environmental Performance Index, which measures whether countries allow, restrict or ban twelve toxic chemical pollutants used in agriculture, industry, and household products.

The fourth analysis has one variable, the Global Climate Risk Index, which assess the impact of weather-related events (e.g. floods, hurricanes, heat waves) on states.

Model specification

The model for each dependent variable or dependent variable cluster takes the same form in each case:

Dependent variable or cluster$_i$ = Syndrome + Civilization + Colonial status + Urbanization + Terrain + Number of land neighbors + Religious fractionalization + Ethnic fractionalization + ε_i

A general linear model (GLM) procedure was used to investigate the statistical significance and explanatory power of these eight independent variables. We hypothesized that, after controlling for the influence of the other seven control variables, the Patrilineal-Fraternal Syndrome will still be a significant predictor of these dependent variables and factors for the nations in our study.

Model results

We run seven general linear model analyses under Environmental Protection. We find that the Syndrome was significant in six of those models. The model where Syndrome is not significant is the one that involves the Global Climate Risk Index. Table 8.9.1 summarizes the results of the GLM analyses

Table 8.9.1 Summary of GLM results for the Environmental Protection Dimension in descending order of R-squared values. Ancillary analyses in italics.

Dependent variables	**Adjusted R-squared (N)**	**Independent variables significant at .001 by descending order of effect size**
1) Water and Environmental Wellbeing factor • Water and sanitation • Environmental Performance Index • Wastewater treatment • Foundations of Wellbeing	.808 (149)	Urbanization Syndrome Ethnic fractionalization Colonial status
Environmental Performance Index	*.639 (171)*	*Syndrome* *Urbanization*
Air Quality	*.411 (172)*	*Syndrome* *Terrain* *Urbanization*
2) Air pollution factor • Household indoor air pollution attributable deaths • Greenhouse gases emissions	.587 (156)	Urbanization Syndrome
Outdoor air pollution attributable deaths	*.383 (160)*	*Syndrome* *Number of land neighbors*

3) Biodiversity and Pest regulation factor • Biodiversity • Pest Regulations	.207 (160)	Syndrome
4) Global Climate Risk Index	.022 (172)	None

We elaborate on the four main analyses.

1) **Water and Environmental Wellbeing factor** (lower scores are considered worse, N=149): Recall that this factor combines several variables (Water and Sanitation, Environmental Performance Index, Wastewater Treatment, and Foundations of Wellbeing), the results are as follows:

Table 8.9.2 General Linear Model Results for Water and Environmental Wellbeing factor (Adjusted R-squared= .808)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	-1.171	.951	.220	.012
Colonial Status=0 (Never Colonized)	1.407	.414	.001*	.081
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	-.073	.390	.851	.000
CIV=2 (Muslim)	.857	.461	.066	.026
CIV=4 (Hindu/Sinic/Buddhist)	.248	.567	.662	.001
CIV=5 (Africa)	0			
Syndrome 2017	-.360	.047	.000*	.312
Urbanization 2015	.075	.008	.000*	.406
Number of Land Neighbors	-.043	.058	.460	.004
Terrain 2014	-.002	.010	.879	.000
Religious Fractionalization 2003	1.576	.656	.018	.043

Ethnic Fractionalization 2003	-2.579	.687	.000*	.098

* significant at 0.001

The adjusted R-squared is a remarkably strong .808, indicating that the specified model impressively explained at least 80.8% of the variability of this cluster. We find that Colonial Status, Patrilineal-Fraternal Syndrome, Urbanization, and Ethnic Fractionalization are all significant variables in this model. We note that Syndrome does not have the largest effect size for this model, but that the effect size of Urbanization is only slightly larger than Syndrome, and that Syndrome's effect size is more than three times as large as the other two significant variables. We would expect that a country's level of urbanization would be the best predictor of water and environmental wellbeing, but we are surprised to find that Syndrome is significant when controlling for Urbanization and that its effect size is only slightly smaller than urbanization. This is a noteworthy result to find that, while we only expect urbanization to impact water and environmental wellbeing, Syndrome has a significant and almost as large of an impact on a country's water and environmental wellbeing. The sign of the Syndrome coefficient is in the predicted direction (negative, meaning the better the Syndrome score the better the water and environmental wellbeing).

We additionally find that countries that have never been colonized have better water and environmental wellbeing scores. We also find that countries with higher levels of ethnic fractionalization have lower levels of water and environmental wellbeing. This indicates that the more a country is fractionalized, the less they will focus on treating and sanitizing their water and in their environmental wellbeing on average.

In further analysis, we note the bivariate correlation between the Syndrome and the Water and Environmental Wellbeing is a very strong -.783 (p-value .000), with the scatterplot in Figure 8.9.1 showing the relationship. The lowest scores for Water and Environmental Wellbeing are only found for countries with worse Syndrome scores. Additionally, although there are some outliers with higher scores in the upper right quadrant, we find that only countries with the best Syndrome scores achieve the highest levels of Water and Environmental Wellbeing. The six outliers in the upper right quadrant include United Arab Emirates, Qatar, Bahrain, Kuwait, Lebanon, and Saudi Arabia. The outlier in the lower left quadrant is Mongolia, with a Syndrome score of 3 and a Water and Environmental Wellbeing score of -2.2.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome and Urbanization are the only variables that are significant in predicting the logits or predicted probabilities of worse water and environmental wellbeing. We specifically find that for every one unit increase in the Syndrome, the odds increase by 55%, or alternatively there is a 1.55 times greater risk, that the country experiences worse water and environmental wellbeing, after holding all other control variables constant.

We use two ancillary variables, Environmental Performance Index and Air Quality. The GLM analyses yield high adjusted R-squared values of .639 and .411, respectively, and Syndrome is a significant predictor of both outcome variables.

2) **Air Pollution factor (without outlier)** (higher scores are considered worse, N=156): Recall that this factor combines two variables (Household Indoor Air Pollution Attributable Deaths and Greenhouse Gases). We determined that the

insignificant results for the entire Air Pollution Cluster were largely due to an extreme outlier in the model, Central African Republic (13.07). In order to evaluate this, we removed this outlier from the model and reran the analysis. The results are found below.

Table 8.9.3 General Linear Model Results for Air Pollution factor (without Outlier) (Adjusted R-squared=.587)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	.699	.418	.097	.020
Colonial Status=0 (Never Colonized)	.148	.196	.451	.004
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	.042	.177	.814	.000
CIV=2 (Muslim)	-.374	.209	.076	.023
CIV=4 (Hindu/Sinic/Buddhist)	-.305	.257	.237	.010
CIV=5 (Africa)	0			
Syndrome 2017	.080	.021	.000*	.092
Urbanization 2015	-.027	.003	.000*	.303
Number of Land Neighbors	-.028	.027	.287	.008
Terrain 2014	3.426E-5	.005	.994	.000
Religious Fractionalization 2003	-.242	.298	.418	.005
Ethnic Fractionalization 2003	.983	.316	.002	.066

* significant at 0.001

The adjusted R-squared is a strong .587, indicating that the specified model explained at least 58.7% of the variability of this cluster without the outlier, much better than the original model. We find that Patrilineal-Fraternal Syndrome and Urbanization are both significant in this model. We note that Syndrome has the lowest effect size compared to Urbanization in this model. However, we are again impressed that Syndrome is significant when controlling for a country's level of urbanization. We find that the sign of the Syndrome coefficient is in the predicted direction (positive, meaning the worse the Syndrome score, the worse the air pollution).

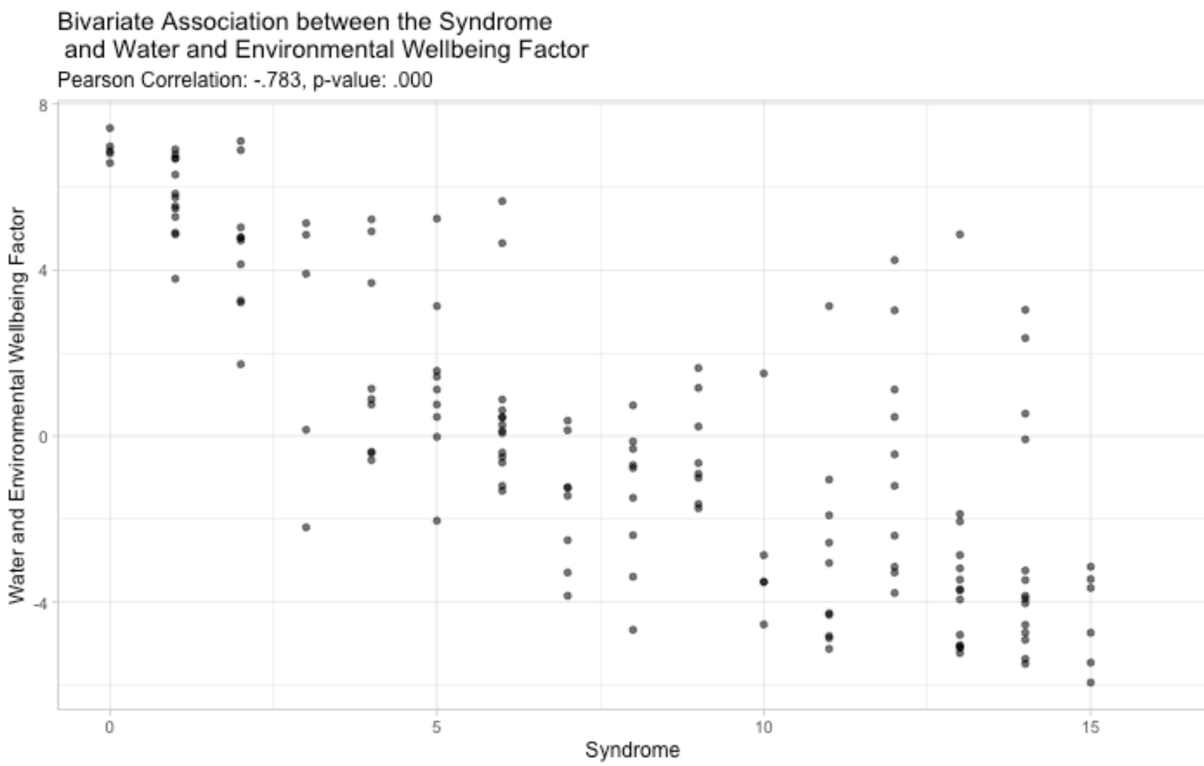
We further note that the direction of the coefficient for Urbanization is negative, which indicates that as the level of urbanization increases, a country's air pollution decreases on average. This finding is counter-intuitive, but may indicate greater use of wood-burning stoves in less urbanized environments.

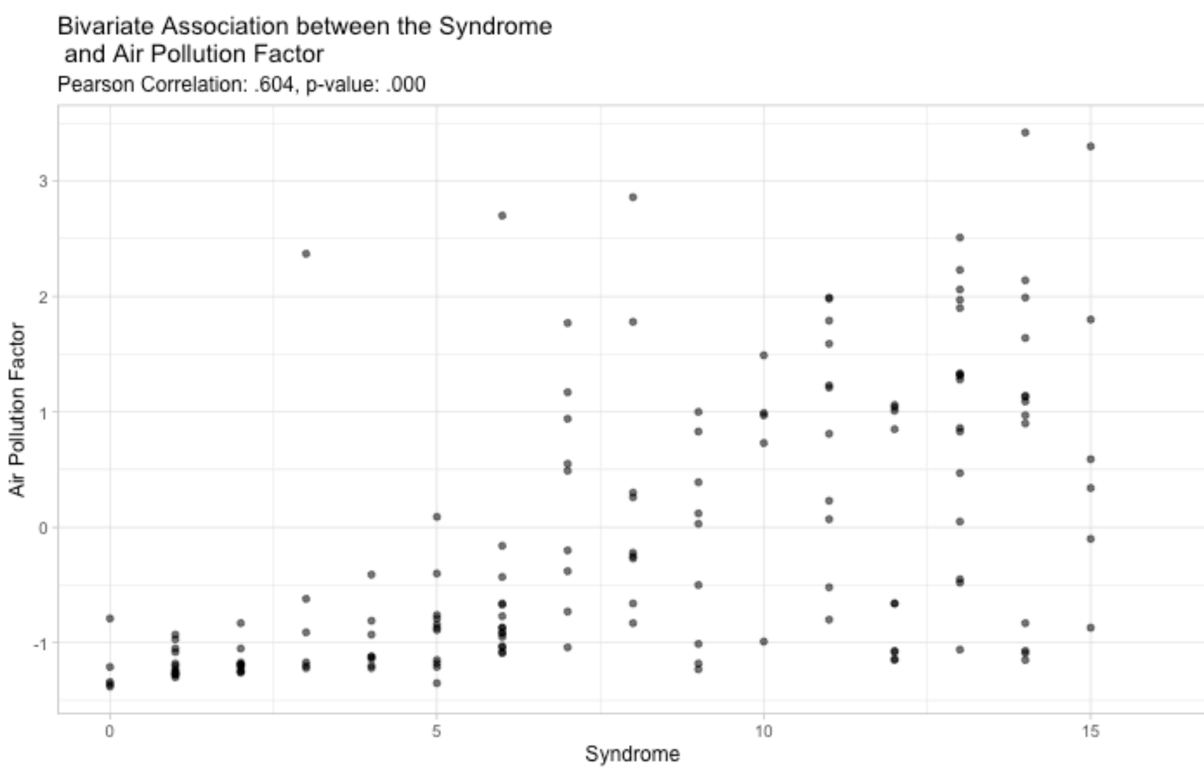
In further analysis, we note the bivariate correlation between the Syndrome and the Air Pollution factor (when the outlier is removed) is a moderately strong .604 (p-value .000), with the scatterplot in Figure 8.9.1 showing the relationship. The slope in the scatterplot is not very steep, but we do find that only countries with the worst Syndrome scores have the highest, or worst, values for the Air Pollution cluster.

Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable). The Syndrome and Urbanization are the only variables that are significant in predicting the logits or predicted probabilities of higher levels of air pollution. We specifically find that for every one unit increase in the Syndrome, the odds increase by 39%, or alternatively there is a 1.39 times greater risk, that the country experiences higher levels of air pollution, after holding all other control variables constant.

We use Outdoor Air Pollution Attributable Deaths as an ancillary variable and the analysis yields an adjusted R-squared value of .383. Syndrome is also a significant predictor for this outcome variable.

Figure 8.9.1 Scatterplots of Syndrome with Water and Environmental Wellbeing factor and Air Pollution factor





3) **Biodiversity and Pest Regulation factor** (lower scores are considered worse, N=160): Recall that this factor combines two variables (Biodiversity and Pesticide Regulation), the results are as follows:

Table 8.9.4 General Linear Model Results for Biodiversity and Pest Regulation Cluster (Adjusted R-squared=.207)

Independent/Control Variable	Parameter estimate	Standard error	p-value	Effect size
Intercept	.290	.759	.703	.001
Colonial Status=0 (Never Colonized)	-.002	.362	.995	.000
Colonial Status=1 (Ever Colonized)	0			
CIV=1 (West/Orthodox/Latin)	-.129	.321	.689	.001
CIV=2 (Muslim)	.113	.384	.770	.001
CIV=4 (Hindu/Sinic/Buddhist)	.363	.472	.443	.004
CIV=5 (Africa)	0			
Syndrome 2017	-.205	.039	.000*	.163
Urbanization 2015	.005	.006	.391	.005
Number of Land Neighbors	.054	.049	.268	.009
Terrain 2014	.006	.009	.469	.004
Religious Fractionalization 2003	.268	.544	.623	.002
Ethnic Fractionalization 2003	1.401	.584	.018	.040

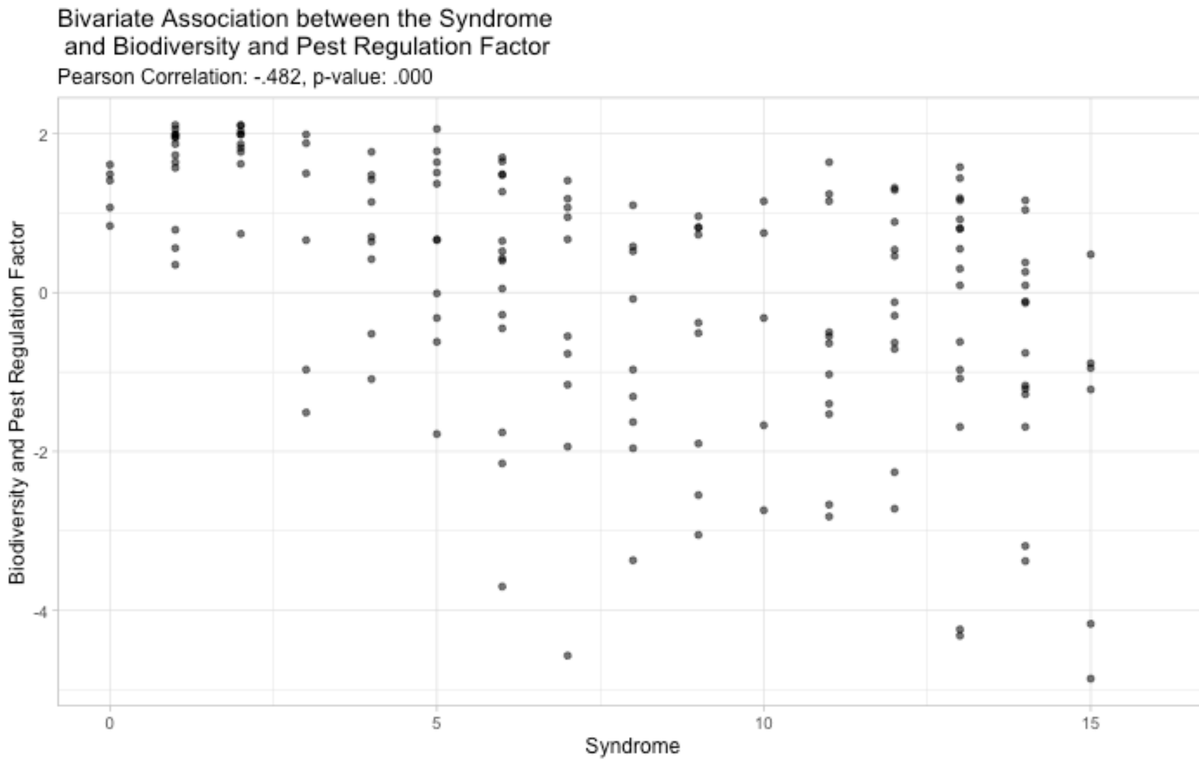
* significant at 0.001

The adjusted R-squared is a moderate .207, indicating that the specified model explained at least 20.7% of the variability of this cluster. We find that Patrilineal/Fraternal

Syndrome is the only significant variable in this model. We note that Syndrome has the largest effect size in this model. The sign of the Syndrome coefficient is in the predicted direction (negative, meaning the worst the Syndrome score the lower the pest regulation and biodiversity in a country). It appears that the strongest, and only significant, determinant of this variable is the Patrilineal-Fraternal Syndrome, which appears to corroborate our hypothesis.

In further analysis, we note the moderately strong bivariate correlation between the Syndrome and the Biodiversity and Pest Regulation factor is -.482 (p-value .000), with the scatterplot in Figure 8.9.2 showing the relationship. We find that the worst scores for the cluster are only found in countries with worse (higher) Syndrome scores. Additionally, we find that only countries with the best Syndrome scores achieve the highest levels of biodiversity and pest regulation. Because the Syndrome is significant in the general linear regression model, we also ran a logistic regression model (using a binary version of the response variable), but find that the model does not meet the validity requirements, so we do not report the results.

Figure 8.9.2 Scatterplot of Syndrome with Biodiversity and Pest Regulation factor



4) Global Climate Risk Index

The GLM results for this variable yielded a very low adjusted R-squared value of .022 with no significant terms so we do not report the results.

Concluding Discussion for the Environmental Protection Dimension

The Patrilineal/Fraternal Syndrome is significantly related to 6 out of the 7 analyses performed (this tally includes the sub analysis of the Air Pollution Cluster without the one extreme outlier). In four of those six, the Syndrome is either the only significant determinant of the dependent variable or it has the largest effect size. In the other two, we find that Urbanization has the strongest effect size, which is expected for environmental indicators. However, we find that even in these two analyses, the Syndrome's effect size is only slightly smaller than Urbanization. The outcome variables for which the Syndrome was the only determinant or had the largest effect size included:

- Biodiversity and Pest Regulation factor
- Outdoor Air Pollution Attributable Deaths
- Air Quality

The outcome variables for which Syndrome was significant, and its effect size was only slightly smaller than Urbanization included:

- Water and Environmental Wellbeing factor
- Air pollution factor (without the outlier)

These are noteworthy results, we believe. A wide variety of environmental indicators appear to be significantly determined by the degree to which the Patrilineal/Fraternal Syndrome is encoded within the behavior of the society. These results are especially interesting because Syndrome is still significant when Urbanization, which we would expect to explain environmental factors the most, is controlled for. These results are consistent with our hypothesis, that countries that care more for their women take better care of their environment. The concern for those who Manne calls "the givers"—women—appears to extend to another female-coded "giver," Mother Earth.[37]

10. Overall Conclusion

There are several interesting points to make about these results overall. First and foremost, the Syndrome matters—it emerges as a consistent and useful predictor of national outcome measures. The Syndrome was significant in 87 out of the 122 GLM analyses run (71.3%). More specifically Syndrome is significant for 15 out of 16 (93.8%)

Political Stability and Governance analyses, 15 out of 20 (75%) Security and Conflict analyses, 10 out of 16 (62.5%) Economic Performance analyses, 1 out of 6 (16.7%) Economic Rentierism analyses, 17 out of 24 (70.8%) Health and Wellbeing analyses, 5 out of 7 (71.4%) Demographic Security analyses, 6 out of 10 (60%) Education analyses, 12 out of 16 (75%) Social Progress analyses, and 6 out of 7 (85.7%) Environmental Protection analyses. Typically in these models, the Syndrome also displayed the largest or second-largest effect size, as well.

Furthermore, the odds ratios calculated from these analyses are well worth considering, and we present a summary table (Table 8.10) of those analyses where the Syndrome was significant in multivariate modeling **and** where the model conditions for logistic regression were met:

Table 8.10.1 Syndrome Odds Ratio and Percentage for Performing Poorly from the Logistic Regression results for each Variable where Syndrome was Significant in the GLM analysis
NOTE: Some outcome variables display "MANM" because the model assumptions were not met; this means that there is significant relationship in multivariate modeling, but because the model assumptions of logistic regression were not met, no odds or risk could be computed.

Category	**Variable**	**Syndrome Odds Ratio (_ times higher <u>risk of performing poorly</u> for each unit increase in Syndrome, holding all other control variables constant)**	**Percentage Increase (_% increase in the <u>odds of performing poorly</u> for each unit increase in Syndrome, holding all other control variables constant)**
Political Stability	Government System and Effectiveness Cluster	3.53** the <u>risk of performing poorly</u> on this measure for each 1 point	253% the <u>odds of performing poorly</u> on this measure for each 1 point

		increase in Syndrome score	increase in Syndrome score
	Security, Stability, and Legitimacy Cluster	1.43**	43%
	Lack of Freedom Cluster	1.49**	49%
	Civil Liberties	1.56**	56%
	Regime Types (risk for autocracy)	1.41**	41%
	Freedom to Establish Religion	1.26*	26%
	Private Property Rights	1.46**	46%
	Hofstede Individualism	1.35*	35%
	Fragile States Index	2.13**	113%
	World Bank Corruption	1.23*	23%
	World Bank Rule of Law	1.22*	22%
	Percent of Seats in Parliament Held by Women	Syndrome is significantly related, but model assumptions for logistic regression not met, so odds cannot be calculated. (MANM)	Syndrome is significantly related, but model assumptions for logistic regression not met, so % increase in odds cannot be calculated. (MANM)
	Government Participation of Women	MANM	MANM
Security and Conflict	Violence and Instability Cluster	1.46**	46%
	Political Stability and Absence of Violence/Terrorism and Freedom of	1.57**	57%

	Domestic Movement Cluster		
	Terrorism Injury and Violent Conflict Cluster	1.38**	38%
	Terrorism Incidents and Internal Conflict Cluster	1.28*	28%
	Societal Violence Scale	1.26*	26%
	Disappearances	1.35**	35%
	Political Terror Scale	1.42**	42%
	Trafficking of Women	1.41**	41%
	Military Expenditures and Weapons Importation Cluster	MANM	MANM
	Access to Weapons	MANM	MANM
	Perceptions of Criminality	MANM	MANM
	Monopoly on the Use of Force	MANM	MANM
	Terrorism Impact	MANM	MANM
	Global Terror Index	MANM	MANM
Economic Performance	Wealth Infrastructure and Economic Freedom Cluster	1.55**	55%
	Reliance on Agriculture and Lack of Prosperity Cluster	1.49**	49%
	Poverty and Economic Decline	1.40**	40%
	Global Competitiveness Index Rankings	1.26*	26%
	GDP (log transformed)	1.31*	31%
	GDP (log transformed) (without Urbanization)	1.50**	50%
	Economic Inequality Cluster	MANM	MANM

	Female Labor Force Participation	MANM	MANM
	Food Security	MANM	MANM
Economic Rentierism	Natural Resources as percentage of GDP	1.18*	18%
Environmental Protection	Water and Environmental Wellbeing Cluster	1.55*	55%
	Air Pollution Cluster (without Outlier)	1.39*	39%
	Outdoor Air Pollution Attributable Deaths	1.42**	42%
	Air Quality	1.39**	39%
	Biodiversity and Pest Regulation Cluster	MANM	MANM
Demographic Security	Youth Risk Factor	1.68**	68%
	Total Fertility Rate	1.92**	92%
	Demographic Pressure	1.39**	39%
	Mother's Mean Age at First Birth	1.62**	62%
	Contraceptive Prevalence	1.32**	32%
Education of the Population	Survival Rate to the Last Year of Primary School	1.31**	31%
	Average Years of Schooling	1.57**	57%
	Access to Basic Knowledge	1.66**	66%
	Access to Information and Communications	1.28*	28%
	Female Literacy Rate Age 15-24	2.26**	126%
	Overall Literacy Males and Females	1.45**	45%
Health and Wellbeing	Preventable Death Cluster	1.83**	83%
	Health Care Access Cluster	1.48**	48%

	Illness and Mortality Cluster	1.29**	29%
	Deaths due to Diarrhea of Children Under 5	1.49**	49%
	Maternal Mortality Rate	1.48**	48%
	Health Expenditure Per Capita	1.70**	70%
	Health Expenditure as % of GDP	1.22*	22%
	% of Pregnant Women Receiving Prenatal Care	1.35*	35%
	Total Alcohol Consumption Per Capita	0.63**	37% (less likely to have high alcohol consumption)
	Sustainable Society Index Human Wellbeing	1.81**	81%
	% Under 5 Who are Stunted	1.49**	49%
	Prevalence of Wasting (% Under 5)	1.35*	35%
	% Under 5 Who are Underweight	1.66**	66%
	Prevalence of HIV Among Women Ages 15+	1.58**	58%
	Global Hunger Index	1.80**	80%
	Life Expectancy at Birth for Females	1.48**	48%
	Female Genital Cutting/Mutilation	1.76**	76%
Social Progress	Human Development Index	1.66**	66%
	Social Safety Nets	1.40**	40%
	Percentage of Pensionable Age	1.86**	86%

	Persons Receiving SS/Pensions		
	Discrimination and Violence against Minorities	1.16	16%
	Religious Tolerance	1.16	16%
	Happiness Index	1.45**	45%
	Access to Electricity % of Population	1.35**	35%
	Legal Declaration of Gender Equality	1.69**	69%
	Gender Gap Index	1.55**	55%
	Gender Inequality Index	1.81**	81%
	Government Framework for Gender Equality	MANM	MANM
	Discrimination and Violence Against Minorities	Significant in multivariate modeling, but not logistic regression	Significant in multivariate modeling, but not logistic regression
	Religious Tolerance	Significant in multivariate modeling, but not logistic regression	Significant in multivariate modeling, but not logistic regression

** Syndrome is significant at 0.001
* Syndrome is significant at 0.01

These numbers are illuminating. If a collective chooses a first, sexual political order based on the subordination of women in order to build up male-bonded kin networks as its preferred security provision mechanism, it will face a wide range of increasing probabilities of poor outcomes for itself. For example, if women are subordinated through the Syndrome's components, the collective will face 80% higher odds for hunger for every step up the Syndrome scale it goes, 66% increased odds for underweight children for every step, 41% increased odds for autocracy for every step, 50% increased odds for lower GDP for every step, 113% increased odds for state fragility for every step, 57% increased odds of political violence and terrorism for every step, 55% increased odds for poorer environmental quality for every step, 92% increased risk for high fertility, 45% increased risk of national unhappiness for every step, 253% increased odds of poor government effectiveness, and so forth. It is almost as if in choosing male-bonded kin networks as a security provision mechanism with its accompanying subordination of women, a collective chooses to literally curse itself.

The findings are so strong, echoing McDermott's epigraph at the beginning of this chapter, that we wonder why these multidimensional linkages between poor national outcomes and women's subordination at the household level are not square one in both policy and scholarly conversations about national and international security. The Syndrome is the natural starting point for understanding outstanding differences in national stability, resilience, security, health, wealth, and wellbeing.

Second, it is important to consider which control variables were also significantly related to the outcome measures, in addition to the Syndrome. Of the models where Syndrome was significant, Urbanization was the next most significant predictor followed by Ethnic Fractionalization, Number of Land Neighbors, and Muslim Civilization. The only variable that was never significant in these models was Hindu/Sinic/Buddhist Civilization, and Western Civilization was only significant in one model. As we noted in Part One, civilizational identity is not the engine of these poor results; it is the subordination of women at the household level that should draw our attention, instead. These findings also tell us that Urbanization is clearly one important path to the amelioration of at least some components of the Syndrome, such as patrilocal marriage, while Ethnic Fractionalization and Number of Land Neighbors may represent societal stressors that synergize with Syndrome practices that subordinate women to their male-bonded kin/identity networks.

Third, it is also significant that the variability in outcome measures for higher Syndrome scale countries is much larger than for lower Syndrome scoring countries. Christine Bose has found a very similar phenomenon, noting large variation for outcomes such as maternal mortality, adolescent fertility rates, female labor force participation, secondary education, and literacy ratios among societies that rank lower on measures of women's empowerment.[38] The megaphone pattern of some of our scatterplots indicates that low Syndrome countries have consistent "good" outcomes as measured by the security of the state and well-being of its citizens and environment. On the other hand, high Syndrome countries have a comparatively wide range of results, with most of these countries tending towards "bad" outcomes for the state, the people, and the environment.

Why this variation? While a low Syndrome score appears to be "protective" of national outcomes, high Syndrome countries operate without such protection. Even so, the potential for worse outcomes among high Syndrome-encoding nations might be mitigated by a country's wealth and natural resources. For example, a number of oil-rich countries in the Middle East have high Syndrome scores, but also have some excellent outcomes in areas such as literacy and maternal mortality, which excellent outcomes have been made possible by their remarkably high level of wealth. However, should those extraordinary factors fade, we would expect a regress towards move typical (i.e., worse) high Syndrome score national outcomes. We undertook to identify the countries in our sample that had better-than-expected national outcomes given their relatively high Syndrome scores (see

Appendix IV). These included Bahrain, Jordan, Kuwait, Malaysia, Oman, Qatar, Saudi Arabia, the United Arab Emirates, but also, interestingly, Botswana. In future work, we would like to explore how a country like Botswana achieved such unusual national outcomes given its relatively high Syndrome score of 11. Khandis Blake (personal communication 2018) suggests, for example, that Botswana has an unusually high rate of male labor migration and, as a result, there is less opportunity for patrilocality and many households are, perforce, female-headed households. This deserves more in-depth investigation.

Overall, our results show that when patrilineal clans are powerful—as indicated by the degree of emphasis placed on the subordination of women at the household level via the Syndrome's components—such power is strongly associated with instability and insecurity, environmental degradation, low levels of well-being and prosperity for its citizens, poor governance and autocracy, and many other negative outcomes at the state level in aggregate statistical testing. This suggests that disruption of the Syndrome's mechanisms might provide a path to greater stability and security for nations and the international system. Is such change possible? Has it ever successfully happened before, and what have been the results? Have such attempts ever failed before, and if so, why did they fail? And what lessons for today might we derive? In the next part of this volume, we turn to those important questions.

[1]Kristen R. Monroe (ed.) T*he Evils of Polygyny: Rose McDermott*, (Ithaca: Cornell University, 2018), 23.
[2] These nations are Central African Republic, Libya, Syria, and Vanuatu. Please note Syria's imputation was actually 12.5, which was rounded up to 13 for input into the database to allow mapping to be possible.
[3] World Risk Report (n.d.), Bundnis Entwicklung Hilft, http://weltrisikobericht.de/english/
[4] Variables that we were considering but had to be dropped due to this stipulation included number of unique land borders, and two of the component parts of the aggregated fractionalization score (i.e., racial and linguistic fractionalization).
[5] Syndrome/Urbanization 2015 (-.496, significance .000), Syndrome/Land Neighbors (.163, significance .031), Syndrome/Terrain 2014 (-.167, significance .028), Syndrome/Religious Fractionalization 2003 (-.016, significance .839), Syndrome/Ethnic Fractionalization 2003 (.520, significance .000). The Syndrome is positively and significantly associated with Ethnic Fractionalization, and negatively and significantly associated with Urbanization, both of which findings are in harmony with our theoretical framework.
[6] World Bank (2015). "World Development Indicators," http://databank.worldbank.org/data
[7]Samuel Huntington, *The Clash of Civilizations and the Remaking of World Order*, (New York: Simon and Schuster, 1996).
[8]Donna Lee Bowen and Valerie M. Hudson (2017), Colonial Status Recoding, spreadsheet, reproduced in Appendix II of this volume.
[9]Ikechi Mbeoji, "The Civilised Self and the Barbaric Other: Imperial Delusions of Order and the Challenges of Human Security," *Third World Quarterly*, 27 no. 5 (2007): 855-869.
[10] World Bank (2014). "World Development Indicators," http://databank.worldbank.org/data
[11] Thomas Homer-Dixon, "On the Threshold: Environmental Changes as Causes of Acute Conflict," *International Security*, 16, no. 1 (Fall 1991): 76-116; Steve Pickering, "Determinism in the Mountains: The Ongoing Belief in the Bellicosity of 'Mountain People,'" *The Economics of Peace and Security*, 6 no. 2 (2011); Stephen A. Emerson, "Desert Insurgency: Lessons from the Third Tuareg Rebellion," *Small Wars and Insurgencies*, 22 no. 4 (2011), 669-687; Francis Fukuyama, *Political Order and Political Decay*, (New York: Farrar, Straus, and Giroux, 2014).
[12] Wikipedia (2018). "List of countries and territories by land borders." https://en.wikipedia.org/wiki/List_of_countries_and_territories_by_land_borders; Harvey Starr and G. Dale Thomas, "The Nature of Borders and International Conflict: Revisiting Hypotheses on Territory," *International Studies Quarterly*, 49 no. 1 (March 2005): 123-139.
[13]Harvey Starr and Benjamin Most, "Contagion and Border Effects on Contemporary African Conflict," *Comparative Political Studies*, 16 no. 1(1983) 92-117.
[14]Alberto Alesina et. al, "Fractionalization," *Journal of Economic Growth*, Vol. 8, Issue 2, June 2013: 155-194.
[15]James Fearon and David Laitin, "Ethnicity, Insurgency, and Civil War," *The American Political Science Review*, 97 no. 1 (2003): 75-90; Randall Blimes, "The Indirect Effect of Ethnic Heterogeneity on the Likelihood of Civil War Onset," *Journal of Conflict Resolution*, 50 no. 4 (2006), 536-547.
[16] Alesina, "Fractionalization," 155-194.
[17]Jonathan Fox, "The Ride of Religious Nationalism and Conflict: Ethnic Conflict and Revolutionary Wars, 1945-2001," *Journal of Peace Research*, 41 no. 6, (2004): 715-731; Mark Juergensmeyer, 4th ed. *Terror in the Mind of God: The Global Rise of Religious Violence*, (Oakland: University of California Press, 2017).
[18]Christopher Achen, "Toward a New Political Methodology: Microfoundations and Art," Annual Review of Political Science, 5, June 2002, 423-450.
[19]Phil Schrodt, "Seven Deadly Sins of Contemporary Quantitative Political Analysis," August 23, 2010: 3 unpublished manuscript, https://lcsr.hse.ru/data/2011/12/19/1261789486/Schrodt7SinsAPSA10.pdf
[20] The five variables excluded for N size reasons from the Political Stability cluster analysis were "Rule of Law 2016" from the World Justice Project, "Procedural Justice" from the Human Freedom Index, "Civil Justice" from the Human Freedom Index, "Criminal Justice" from the Human Freedom Index, and "Freedom of Associations" from the Human Freedom Index. Additionally, the variables "Index of Democracy" from the Economist Intelligence Unit (EIU), "Electoral Process and Pluralism" from EIU's Index of Democracy, and "Electoral Democracy Index"

from the V-Dem 2017 Annual Report, were excluded because they were too highly correlated with the variable "Freedom House Index Political Rights 2016".
[21]Daniela Donno and Bruce Russett "Islam, Authoritarianism, and Female Empowerment: What Are the Linkages?" *World Politics*, 56 (July 2004), 582-607
[22] The five variables excluded for N size reasons from Conflict and Security were "Riots and Protests after Election" from the National Elections across Democracy and Autocracy from The Quality of Government Institute, "Military Expenditure % of central government expenditure" from the World Bank, "Crime is effectively controlled" from World Justice Project, "Civil Conflict is effectively limited" from World Justice Project, and "People do not resort to violence to redress grievances" from World Justice Project. The "International Organized Conflict" variable from Human Freedom Index was excluded because it correlated too highly (>0.9) with the "Intensity of Internal Conflicts" variable from Vision of Humanity.
[23] The nine variables excluded for N size reasons from Economic Performance were "Poverty Ratio at $1.90 per day" from the World Bank, "Economic Output Strength" from Bertelsmann Stiftung's Transformation Index, "Unemployment Rate 2016-2017" from Global Economy, "Research and Development Expenditure" from the World Bank, "Prevalence of Undernourishment" from Food and Agriculture Organization of the UN, "Depth of Food Deficit" from Food and Agriculture Organization of the UN, "Human Capital Index Economy" from World Economic Forum, "Population Living in Slums" from the World Bank, and "Global Innovation Index" from the Global Innovation Index. "Real Interest Rate" from the World Bank was excluded because of operationalization issues. "Economic Performance" from Bertelsmann was excluded because it was highly correlated with the "Economic Output Strength" variable from the Global Peace Index and also had the same N-size as that variable. The "Unemployment Rate Male 2016" variable from the World Bank was excluded because it correlated too highly (>0.9) with the "Unemployment Rate" variable from the World Bank.
[24] Five factors were formed, but two of the factors combined variables that did not make sense to combine and so these were analyzed separately. These included a factor with (1) Final Consumption (log-transformed) and (2) High Technology Exports, and also a factor with (1) Government Expenditure as % of GDP and (2) Unemployment.
[25]Yu-Ming Liou and Paul Musgrave, "Oil, Autocratic Survival, and the Gendered Resource Curse: When Inefficient Policy is Politically Expedient," *International Studies Quarterly*, Vol. 60 Issue 3, (2016) 440-456, doi: 10.1093/isq/sqw021
[26] No variables were excluded for N size reasons from Economic Rentierism.
[27] The variable excluded for N size reasons from Health and Wellbeing was "Use of Modern Contraception by Married Women" from the Population Reference Bureau. "Mortality Rate for Communicable Disease" from the UN World Health Statistics was excluded because it is from 2008. "Percentage of Adults Ages 15-49 with HIV/AIDS" from the CIA World Factbook was excluded because it was highly correlated with the "% of Population Between 15-49 with HIV" variable from The World Bank. "Life Expectancy at Birth for Males" from World Health Organization was excluded because it was highly correlated with the "Life Expectancy" variable from the CIA World Factbook. "Mortality Under 5 per 1000 Live Births" from the World Bank was excluded because it was too highly correlated with the "Life Expectancy" variable from the CIA World Factbook and the "Infant Mortality Rate" variable from The World Bank. The "% of Women Ages 15-19 who have had children or are currently pregnant" variable from the World Bank was excluded because there are already variables which cover this data.
[28] "Total Dependency Ratio" from UNDP, "Birth Rate Scale" from The WomanStats Project, and "Fertility Rates ages 20-24" from UNDP were all excluded because they were each too highly correlated with "Total fertility rate" from the World Bank. In addition, the correlation between "Mother's mean Age at First Birth" from the CIA World Factbook and "Median Age of population" from the United Nations was also very high. Because Mother's mean Age at First Birth is more in line with our theoretical framework, we decided to exclude Median Age. We also excluded Mean Age of childbearing in favor of Mother's mean age at first birth because we are more interested in the prevalence of child brides.
[29]Noah Bricker and Mark Foley, "The Effect of Youth Demographics on Violence: The Importance of the Labor Market," *International Journal of Conflict and Violence*, Vol 7 no. 1 (2013) 179-194.
[30] We analyzed the variable, Total Dependency Ratio as well. This ratio gives the ratio of population aged 0-10 and those over 65 (per 100 population aged 20-64 years). We excluded this variable from further analysis because it was too closely correlated with Total Fertility Rate.
[31]Richard Cincotta, "Africa's Reluctant Fertility Transition," *Current History,* May 2011, 188.
[32] Bricker,"The Effect of Youth Demographics on Violence: The Importance of the Labor Market," 179-194.
[33] No variables were excluded for N size reasons from Education of the Population. The "Male Literacy Rate" and the "Female Literacy Rate" from the CIA World Factbook were excluded because they were too highly correlated with the World Bank Literacy variables. The "Male Literacy Rate Age 15-24" from the World Bank was excluded

because it is too highly correlated with the "Female Literacy Rate Age 15-24" variable from the World Bank. The "Gender Parity Index for primary and secondary schools" variable from the World Bank was excluded because it is too highly correlated with the "Gender Parity Index for secondary school" variable from the World Bank. The "Access to Advanced Education" variable from the Social Progress Index was excluded because it is too highly correlated with the "Average years of schooling" variable from the UNDP Human Development Reports. The "Overall Literacy Rate Difference between Males and Females" variable, calculated as the difference between the CIA values for Male and Female literacy rates was excluded because it is too close conceptually with the "Male/Female Difference in Literacy Rates" variable from the World Bank and the "Discrepancy in Educational Attainment Between Males and Females" variable from The WomanStats Project.

[34] We chose secondary rather than primary because the N size for secondary was larger.

[35] The one variable excluded for N size reasons from Social Progress was "Population living in slums" from Bertelsmann Stiftung's Transformation Index. "Social Progress Index 2016" from the Social Progress Index (SPI) was excluded because it was correlated highly with "Human Development Index" and because we had subcomponents of SPI in the analysis; "Tolerance for Homosexuals" was excluded because it overlapped too much theoretically with Discrimination against Minorities.

[36] No variables were excluded for N size reasons from Environmental Protection. "Environmental Health" from the Environmental Performance Index was excluded because it correlated too highly with the "Water and Sanitation" variable from the Environmental Performance Index.

[37]Kate Manne, *Down Girl: The Logic of Misogyny*, (Oxford: Oxford University Press, 2018).

[38]Christine E. Bose, "Patterns of Global Gender Inequalities and Regional Gender Regimes," *Gender and Society*, 29 no. 6, December 2015: 767-791.