

# Evolutionary Psychological Foundations of Civil Wars

**Satoshi Kanazawa** London School of Economics and Political Science

*I propose an evolutionary psychological perspective on wars and suggest that the ultimate cause of intergroup conflict may be the relative availability of reproductive women. Polygyny, which allows some men to monopolize all reproductive opportunities and exclude others, may increase the prevalence of civil wars, but not interstate wars, which did not exist in the ancestral environment. The analysis of the Correlates of War data support both hypotheses; polygyny increases civil wars but not interstate wars. Polygyny explains a greater proportion of the variance in civil war experience than democracy does in interstate war experience. If the democratic peace is the first law of international relations (interstate wars), then polygyny may be the first law of intergroup conflict (civil wars).*

Evolutionary psychology (EP) has influenced many social sciences in the last couple of decades. Its influence extends, not only to the core fields of psychology and anthropology, but also to the neighboring fields of economics (Cosmides and Tooby 1994; Rogers 1994), sociology (Horne 2004; Simpson 2003), criminology (Daly and Wilson 1988), demography (Bock 1999; MacDonald 1999), history (Betzig 2002), and public policy (Browne 2002; Crawford and Salmon 2004). With a few notable exceptions (Alford and Hibbing 2004; Gat 2006; Johnson 2004; Orbell et al. 2004; Rubin 2002; Wrangham 1999), however, political science tends to lag behind this trend. The keyword search with “evolutionary psychology” and “political science” on the electronic database International Bibliography of the Social Sciences returns only one hit (as of February 2008). In contrast, “evolutionary psychology” and “sociology” return 33 hits and “evolutionary psychology” and “economics” return 34 hits. The search on PsycInfo shows similar disparity (7 hits with political science, 42 hits with sociology, and 39 hits with economics).

In this article, I seek to make a contribution to political science from an evolutionary psychological

perspective, by suggesting how the operation of evolved psychological mechanisms in the human brain and their interaction with the environment may affect the course of history at the national and even international levels. In particular, I offer an evolutionary psychological perspective on civil war and intergroup conflict. I derive two empirical hypotheses from it and subject them to empirical tests, using the Correlates of War data (Small and Singer 1982). The data analysis supports both hypotheses.

## Evolutionary Psychological Perspective on Wars and Intergroup Conflict

Evolutionary psychology (EP) is the study of universal human nature, which consists of domain-specific evolved psychological mechanisms. An evolved psychological mechanism is an information-processing procedure or “decision rule” that evolution by natural and sexual selection has equipped humans to possess in order to solve a particular adaptive

problem (a problem of survival or reproduction).<sup>1</sup> Evolved psychological mechanisms mostly operate behind and beneath conscious thinking and produce preferences and values, which rational human actors can then pursue within their constraints. They also engender emotions.

There are two important principles of EP. First, from an evolutionary psychological perspective, humans are no exceptions to the laws of nature. Humans, just like all other species, are designed by natural and sexual selection to reproduce. The fact that many of us do not think that is the ultimate goal of our existence or that some of us choose not to reproduce is irrelevant. We are not privy to the evolutionary logic behind our design, and, no matter what we choose to do in our own lifetimes, we are all descended from those who chose to reproduce. None of us inherited our psychological mechanisms from our ancestors who remained childless. Everything else in life, even survival, is a means to reproductive success (Dawkins 1976; Kanazawa 2004a).

Second, evolved psychological mechanisms need only be adaptive in the environment in which they evolved, called the environment of evolutionary adaptedness or the ancestral environment. For the most part, the ancestral environment is the African savanna during the Pleistocene Epoch (roughly 1.6 million to 10,000 years ago). Our evolved psychological mechanisms, and the human nature they comprise, are designed for and adapted to the ancestral environment. When the environment changes too rapidly and unexpectedly for evolution to catch up (as human civilization has in the past 10,000 years), our evolved psychological mechanisms often produce maladaptive behavior, due to the disjuncture between

the ancestral environment, for which they are designed, and the current environment, in which they now express themselves. For example, humans crave sweet and fatty foods, because preferential consumption of such high-calorie foods was beneficial to our ancestors in the context of the ancestral environment where the food supply was both scarce and precarious. The same preference for sweet and fatty foods expressed in the current environment of abundance, however, often leads to obesity and poor health.

Pioneers of evolutionary psychology (Crawford 1993; Symons 1990; Tooby and Cosmides 1990) all recognized that evolved psychological mechanisms are adapted for the conditions of the ancestral environment. Kanazawa (2004b) systematizes these observations into what he calls the Savanna Principle: *The human brain has difficulty comprehending and dealing with entities and situations that did not exist in the ancestral environment.* Among other things, it may potentially explain why humans may make the theoretically irrational decision to contribute to large collective action, such as voting in Presidential elections, when their marginal contribution to the outcome is infinitesimal. This may be at least in part because any collective action in the ancestral environment involved only a handful of individuals and their contribution *did* make a difference. It may also explain why individuals who watch certain types of TV shows are more satisfied with their friendships, as if they had more friends or socialized with them more frequently (Kanazawa 2002). This may at least partially be because TV (or any other realistic images of other humans) did not exist in the ancestral environment and our human brain may thus have difficulty distinguishing our real friends and TV characters. This is despite the fact that virtually all evolutionarily novel entities and situations (like representative democracy and television) are created by humans.

How would evolutionary psychology explain war and intergroup conflict? Recall that EP suggests that humans are designed to behave in ways that would have promoted reproductive success in the context of the ancestral environment. While modern nations may go to war on philosophical, moral, political, and economic principles, such as “the defense of democracy” or “the protection of national interest,” the primary motives for engaging in warfare in the ancestral environment was most likely reproductive. Ethnographic studies of contemporary hunter-gatherer societies, which are often used as approximate (albeit imperfect) analogs of human groups in the ancestral environment, underscore the reproductive motives behind warfare (Gat 2006, 3–145).

<sup>1</sup>Natural selection refers to the process of differential survival; sexual selection refers to the process of differential reproductive success. This is how Darwin originally defined natural and sexual selection, as two separate processes. That’s why he wrote two separate books—*On the Origin of Species by Means of Natural Selection* (1859) to explain natural selection, and *The Descent of Man, and Selection in Relation to Sex* (1871) to explain sexual selection. In the 1930s, however, biologists redefined natural selection to subsume sexual selection, and began to contend that differential reproductive success was the currency of natural selection. This is now the orthodox in all biology textbooks.

I concur with Miller (2000, pp. 8-12), Campbell (2002, pp. 34-35) and others in the current generation of evolutionary psychologists and believe that we should return to Darwin’s original definitions and treat natural and sexual selection as two distinct processes. I am fully aware that this view is still controversial and in the minority, but I firmly believe that the conceptual separation of natural and sexual selection will bring theoretical clarity in evolutionary biology and psychology.

In one such study, Chagnon recounts his conversation with a Yanomamö warrior.

The headman of the village, Säsawä, coveted my British commando knife and kept begging me to give it to him. He wanted me to tell him all about the knife, its origin, history, and how often it had been exchanged in trades. When I told him that it was used by people of my "group" when they went on raids against their enemies, his interest shifted to our military exploits.

'Who did you raid?' he asked.

'Germany-teri.'

'Did you go on the raid?'

'No, but my father did.'

'How many of the enemy did he kill?'

'None.'

'Did any of your kinsmen get killed by the enemy?'

'No.'

'You probably raided because of women theft, didn't you?'

'No.'

At this answer he was puzzled. He chatted for a moment with the others, seeming to doubt my answer. (1997, 191).

Chagnon notes that "the Yanomamö themselves regard fights over women as the primary causes of the killings that lead to their wars" (1997, 190). Buss summarizes: "Among the Yanomamö, there are two key motives that spur men to declare war on another tribe—a desire to capture the wives of other men or a desire to recapture wives that were lost in previous raids. . . . It seemed silly to them to risk one's life for anything other than capturing women" (1994, 219–20). This ultimate (albeit unconscious) reproductive motive behind wars could potentially explain why it is so common for invading soldiers to rape women of the conquered group (Shields and Shields 1983). From this perspective, rape (and other reproductive opportunities) may not be an unfortunate byproduct of war, but its original purpose. Keeley (1996, 199, Table 8.1) notes that 58.0% of the 162 Western North American Indian tribes engage in wars for "capture of women (for wives)."

In his study of the Huk rebellion in the Philippines from 1946 to 1954, Goodwin (1997) notes that participants in this Communist insurgency against the government were keenly aware of the importance of sexual and reproductive opportunities (and a lack thereof) for their exclusively male activists. Goodwin argues that the Huk movement ultimately failed because the participation in it did not provide any reproductive opportunities for the soldiers and such opportunities were available elsewhere. It is important to note, however, that the conscious awareness of the underlying reproductive motives in participation

in wars is not necessary. Individuals may not always be aware of the ultimate reasons for their behavior (Kanazawa 2001a).

If the ultimate (albeit unconscious to most peoples except for the Yanomamö or the Huk insurgents) reason for intergroup conflict is the desire to abduct women from another group, then a shortage of reproductive women in one's own group may heighten such a desire. Apart from exogenous shocks like imbalanced sex ratios, one social factor which artificially but consistently decreases the availability of reproductive women in a group is polygyny. By allowing some men to monopolize many or most reproductive women, polygyny reduces the number of women left available for the rest of the men, even when the sex ratio is roughly 50:50. Studies show that the degree of polygyny increases men's tendency toward violence (Daly and Wilson 1988; Kanazawa and Still 2000); the more polygynous the society, the greater the incidence of violent crimes. Similarly, the degree of polygyny may increase men's desire to raid another group in order to gain access to reproductive women.

White's (1988, Table 1) analysis of the Standard Cross-Cultural Sample, which includes 186 traditional societies throughout the world, shows that 60.87% of highly polygynous societies ( $n = 46$ ) practice marriage of captive women taken in war. White and Burton (1988, 879, Table 1) report that the correlation between a 5-point scale for cultural rules for polygyny (from 1 = monogamy is prescribed to 5 = polygyny is preferred by most men, and attained by most men of sufficient years or wealth) and the marriage of captive women (1 = absent, 2 = present) is .503. The marriage of captive women correlates .373 with the percentage of women in polygynous marriages, and .381 with the percentage of men in polygynous marriages. Thus the more polygynous the society, the more likely it is that men marry women who were captured in raids.

In their multiple regression analysis, White and Burton (1988, 880, Table 3) show that the interaction term between the marriage of captive women and small population (which magnifies the effect of the addition of captive women on the operational sex ratio) has a significantly positive effect on the cultural rules for polygyny (standardized coefficient = .264,  $p < .001$ ,  $n = 142$ ). White and Burton conclude that "warfare for capture of women" is one of the strongest correlates of polygyny in tribal societies.

It therefore appears possible to suggest that polygyny may increase the incidence of war. Now does this mean that polygynous societies engage in a greater number of interstate wars than monogamous societies?

No. Modern interstate wars are initiated, declared, orchestrated, conducted, and fought by modern, bureaucratic states, not by men or even groups of men. And the Savanna Principle suggests that the human brain may have difficulty comprehending and dealing with modern, bureaucratic states, because they did not exist in the ancestral environment. Polygyny, even in modern society, creates a shortage of reproductive women, and this in turn may make young men more violent and desirous of abducting and capturing women. (It is almost always the young resourceless men of low status who are left without mates in polygynous societies.) For this reason, the degree of polygyny does increase the incidence of murder and rape in society (Daly and Wilson 1988; Kanazawa and Still 2000). However, men's evolved psychological mechanisms, adapted to and designed for the ancestral environment, would not incline them then to channel their heightened desire through legislatures, political parties, aristocracies, royal families, or dictatorships in order to mount a war on another society, especially since the political leaders who control these institutions already have multiple mates (Betzig 1986).<sup>2</sup> Men's tendency toward violence and aggression declines significantly when they have ample mating opportunities (Daly and Wilson 1988; Kanazawa 2003; Kanazawa and Still 2000).

So polygyny would not increase the incidence of modern interstate wars. However, it should increase any other instance of intergroup conflict, initiated and fought by groups of men, at a lower level of aggregation, in a form that existed in the ancestral environment. One such instance of intergroup conflict within a society is civil wars. Civil wars happen when self-organized groups of men rebel or fight. Unlike interstate wars, the initiation and declaration of civil wars do not require that men channel their desires and frustrations through the bureaucracy of the modern states. Any group of men, frustrated by

<sup>2</sup>An anonymous reviewer points out that leaders of civil wars, rebellions, and insurgencies are often highly successful and admired individuals in their own community, many of whom go on to become national leaders if their cause is successful. They therefore should have plenty of reproductive opportunities. So why would they launch a civil war?

There are two important points to note. First, because subnational units (like rebellions and insurgencies) are by definition smaller on average than nation states, the leaders of such subnational units must on average be less prestigious and resourceful than leaders of nation states. Second, and more importantly, it is possible for a group of men without a clear leader to initiate and wage a civil war whereas it is by definition impossible to initiate and wage interstate wars without national leaders. So the status and resources of subnational leaders must be less important for the prospect of civil wars than those of national leaders for the prospect of interstate wars.

the lack of reproductive opportunities, can violently express their dissatisfaction, rebel, and fight.

An evolutionary psychological perspective on wars developed here would therefore lead to two complementary hypotheses:

*H1: The degree of polygyny in society increases the incidence and extent of civil wars.*

*H2: The degree of polygyny in society does not increase the incidence and extent of interstate wars.*

In contrast, both the political accountability model (Bueno de Mesquita et al. 1999) and the political norms model (Dixon 1994) of the democratic peace proposition would predict that the degree of democracy in society would decrease the incidence and extent of both interstate and civil wars. If democratic leaders are more hesitant to engage in military conflict with foreign opponents because such conflict may be expensive both in economic and human terms, as the political accountability model suggests, then they should be equally hesitant to engage in such conflict with domestic opponents. If democratic leaders have at their disposal effective and appropriate means to diffuse conflict with foreign opponents, as the democratic norms model avers, then they should be able to use the same means to diffuse conflict with domestic opponents.

In their study of the surplus male population (called "bare branches" in Chinese) in China and India, Hudson and den Boer note:

Two observations would seem to follow from the analysis thus far. First, high-sex-ratio societies are governable only by authoritarian regimes capable of suppressing violence at home and exporting it abroad through colonization or war. Second, high-sex-ratio societies that are ethnically heterogeneous are likely to experience civil strife directed against minority ethnic groups, which the government (if it represents the majority ethnic group) may seek to encourage. In our view, the first observation holds for China, and the second, for India. (2004, 202)

I completely agree with their prediction for India; regardless of ethnic composition, high sex ratios, whether created by offspring sex selection or polygyny, should increase crime, violence, civil unrest, and ethnic conflict (though not necessarily because the government encourages it). However, I disagree with their prediction for China. Bare branches "belong predominantly to the lowest socioeconomic class," are "more likely to be underemployed or unemployed" and "typically transients with few ties to the communities,"

and “live and socialize with other bare branches” (188–92). They are simply not likely to compel the elite state leaders to wage wars on their behalf, so that they may acquire mates from abroad. I therefore predict that, while it may experience high rates of crime and violence and possibly civil wars, China will *not* wage interstate wars against another state in the near future.

However, Hudson and den Boer argue that it may be in the state leaders’ self-interest in maintaining internal social order to send and expend bare branches in imperial wars and foreign expeditions (207–27). In essence, their argument relies on the diversionary or scapegoating theory of war (Levy 1988, 666–72). Gelpi (1997) shows, however, that only democratic states engage in diversionary tactics but authoritarian states do not, while Pickering and Kisangani (2005) show that only mature democracies, consolidating autocracies, and transitional polities engage in diversionary tactics (Oakes 2006). Both of these conclusions seem to suggest that China would not wage interstate wars in order to divert attention from its domestic problem of bare branches.

Small and Singer (1982, 203–20) identify three types of military conflict which is entirely internal to a nation: (1) *civil war* involves central (national) government; (2) *regional internal war* involves regional (subnational) government; and (3) *communal violence* does not involve government at any level. My prediction about the effect of polygyny extends to all three types of internal wars; however, my empirical analysis below is limited only to the first type because Small and Singer (1982) exclude regional internal war and communal violence from their data set. It is important to point out that, unlike international wars fought between two or more nation states, at least one of the parties in all three types of internal wars is not government. A group of men can initiate and fight all three types of internal war (civil war, regional internal war, and communal violence) but *not* international war. I therefore expect polygyny to increase regional internal war and communal violence as well as civil war.

## Empirical Analyses

### Data

I use Small and Singer’s (1982) Correlates of War (COW) data, which are among the most comprehensive and highest-quality data on interstate and civil wars during the period 1816–1980. My unit of

analysis throughout is the nation state, which are members of what Small and Singer (1982, 38–43) define as the interstate system. A war is a military conflict with at least 1,000 battle deaths in total (or per year in the case of extrasystemic wars; see below) among all the participant system members. A system member qualifies as a participant in a war if it sustains at least 100 battle deaths or deploys at least 1,000 combat troops (Small and Singer 1982, 54–57).

Small and Singer (1982) define three different types of wars: *Intrasystemic* wars, fought between two or more members of the interstate system ( $n = 67$ ); *Extrasystemic* (imperial or colonial) wars, fought between a member of the interstate system and its colony or other nonmember ( $n = 51$ ); *Civil* wars, fought within a member of the interstate system, between subnational groups and the central government ( $n = 160$ ). In my analysis of interstate wars, I include both intra- and extrasystemic wars ( $n = 118$ ). In my analysis of civil wars, I include Small and Singer’s civil wars.

### Dependent Variables: War Experiences

Small and Singer (1982) use 10 quantitative indicators of wars (total battle deaths in 1000s; battle deaths per 10,000 population; battle death per war month; battle death per war; battle deaths per system year; war months per war; total number of wars; total war months; number of wars per system year; and total war months per system year). A bivariate correlation matrix shows that all but one (total battle deaths per month) of the 10 quantitative indicators of civil wars are strongly and significantly correlated with each other. An exploratory factor analysis also shows that these nine quantitative indicators of civil war load very heavily on one latent factor, while the tenth does not. I therefore perform a principal component analysis to extract a latent factor “civil war experience” out of the nine quantitative indicators of civil war.<sup>3</sup>

A bivariate correlation matrix shows that all 10 quantitative indicators of interstate wars are strongly and significantly correlated with each other. An exploratory factor analysis also shows that all 10 quantitative indicators of interstate war load very heavily

<sup>3</sup>Prior to performing the principal component analysis, I used all 10 indicators of civil wars and all 10 indicators of interstate wars separately in 10 separate regression models for civil wars and 10 for interstate wars. My substantive conclusions were exactly the same as those drawn from the main analyses: Polygyny increases incidence, frequency and severity of civil wars, while it has no effect on indicators of interstate wars.

and consistently on one latent factor. I therefore perform a principal component analysis to extract a latent factor “interstate war experience” out of the 10 quantitative indicators. In the following regression analyses, I use the latent factors “civil war experience” and “interstate war experience” as the dependent variables.

### Independent Variable: Polygyny

I use Kanazawa and Still’s (1999) polygyny scores, compiled from the *Encyclopedia of World Cultures* (Levinson 1991–95). In order to measure the level of polygyny for each country, Kanazawa and Still (1999) first determine the level of polygyny for each ethnic and cultural group within the country. *Encyclopedia of World Cultures* contains detailed descriptions of social and cultural practices of all known cultural groups in the world. Their marriage systems are coded on the following 4-point scale.

- 0 - Monogamy is the rule and is widespread
- 1 - Monogamy is the rule but some polygyny occurs
- 2 - Polygyny is the rule or cultural ideal but is limited in practice
- 3 - Polygyny is the rule and is widespread

This scale is very similar to the 5-point scale that White (1988) proposes and is commonly used in cultural anthropology (White and Burton 1988). Unlike Betzig’s (1982) 4-point scale, which measures the extent of polygyny among *political leaders*, this scale (like White’s) measures the practice of polygyny among *the general population*.

Kanazawa and Still then multiply the score for each cultural group by its relative size within the population of the country. The weighted sum of such scores, which varies from .0000 to 3.000, is the polygyny score for the country. For example, in Turkey, there are two ethnic groups: the Turks and the Kurds. According to the *Encyclopedia of World Cultures* (Levinson 1991–95), the Turks are strictly monogamous (polygyny score = 0; Volume 9, 375) while among the Kurds polygyny is the rule even though its practice is limited (polygyny score = 2; Volume 9, 176). The Turks represent 80% of the population in Turkey, and the Kurds the remaining 20% (CIA 2008). Thus the computed polygyny score for the country of Turkey is:  $0 \times .80 + 2 \times .20 = .4000$ .

This weighting procedure inadvertently transforms the original 4-point ordinal scale into an interval scale. However, given that most variables of

interest in political science, such as the frequency and intensity of wars under consideration here, are available only for countries, not for ethnic or cultural groups, polygyny scores should also be available for each country. The weighting procedure therefore represents the best compromise, since using the unweighted scores for the ethnic and cultural groups is not an option in most empirical analyses in political science.

It is important to point out that the polygyny scores that I use here are not devised for the current purposes, but were instead originally compiled a decade ago for a comparative study of marriage institutions (Kanazawa and Still 1999) and have subsequently been used for analyses of crime (Kanazawa and Still 2000) and menarche (Kanazawa 2001b).

### Control Variables

In addition to polygyny, I control for the following variables, because they are known to affect the incidence of civil war and/or to correlate with polygyny.

**World-system status.** Because a nation can only engage in interstate wars or experience civil wars within its borders if it is a member of Small and Singer’s (1982) interstate system, I control for the number of years that a nation is a member of the system. It serves as a measure of “risk exposure.” In addition, because a nation’s position in the world system may affect its likelihood of waging interstate wars or experiencing civil wars, I also control for the number of years that a nation is defined as a central system nation and a major power by Small and Singer (1982).

**Economic development.** I control for the nation’s level of economic development by GDP per capita. Data on GDP per capita are available from the United Nations (<http://unstats.un.org/unsd/demographic/products/socind/inc-.eco.htm>).

**Democracy.** I use Bollen’s (1993) liberal democracy index as a measure of the nation’s level of democracy. Bollen uses confirmatory factor analysis to construct a latent dimension of liberal democracy from eight empirical indicators, such as freedom of the media and citizens’ political rights. His liberal democracy index varies from 0 (complete authoritarianism) to 100 (complete democracy). I prefer Bollen’s (1993) liberal democracy index to Gurr’s Polity IV (Marshall and Jagers 2005), because the former is a proper interval scale while the latter is an ordinal scale. Despite the fact that Bollen’s and Gurr’s measures of democracy are not very highly correlated ( $r = .5724$ ), all of my substantive conclusions remain identical if I use

Polity IV as a measure of democracy (results available upon request).

**Income inequality.** I control for income inequality (measured by the Gini coefficient) because it is known to be significantly correlated with the degree of polygyny in society (Kanazawa and Still 1999). Data on the Gini coefficient are available from the CIA World Factbook (CIA 2008).

**Islam.** Islam is the only major world religion that sanctions polygyny and is thus significantly correlated with polygyny. Islamic nations are also much more likely to experience civil wars than Christian or Hindu nations (Toft 2007). I therefore control for whether a majority of the population in the nation is Muslim (1 = yes). Data on the religious composition of the nation's population are also available from the CIA World Factbook.

**National IQ.** Finally, national IQ (the average intelligence of a nation's population) is known to be significantly correlated with polygyny, democracy, income inequality (Kanazawa 2008), and economic development (Lynn and Vanhanen 2002). I therefore control for national IQ as a potential confound in the regression equations. Data on national IQ are available from Lynn and Vanhanen (2006).

## Results

Table 1 presents the results of the regression analysis. The left column shows that, net of the nation's world system status, economic development, democracy, income inequality, religion, and national IQ, polygyny has a significantly positive effect on the nation's civil war experience ( $b = .2565$ ,  $p < .05$ , standardized coefficient = .2668). The more polygynous a nation is, the more frequently and extensively it experiences civil wars within its borders. National IQ also significantly increases the nation's experience of civil war ( $b = .0241$ ,  $p < .05$ , standardized coefficient = .3216). No other variables included in the regression equation has a significant effect on civil war. Contrary to what one might expect from both the political accountability and political norms models of the democratic peace proposition, democracy does not prevent civil wars; in fact, its nonsignificant coefficient is positive ( $b = .0001$ , *ns*, standardized coefficient = .0050).

Table 1, right column, shows that, net of the same variables, polygyny does *not* significantly increase the nation's interstate war experience; in fact, its nonsignificant coefficient is *negative* ( $b = -.0213$ , *ns*,

TABLE 1 The Effect of Polygyny on Civil and Interstate Wars

	Civil war	Interstate war
Polygyny	.2565* (.1227)	-.0213 (.1013)
	.2668	-.0206
Central	-.0008 (.0042)	.0035 (.0035)
	-.0289	.1116
Major	-.0005 (.0035)	.0190****
	-.0160	.5493
System	.0031 (.0025)	-.0024 (.0021)
	.1780	-.1260
Economic development	-.0000 (.0000)	-.0000*
	-.3011	-.2753
Democracy	.0001 (.0032)	-.0063*
	.0050	-.2365
Income inequality	.0016 (.0129)	.0110 (.0107)
	.0174	.1112
Islam	-.1959 (.2587)	-.2375 (.2136)
	-.0801	-.0904
National IQ	.0241* (.0115)	.0372***
	.3216	.4622
Constant	-2.2445 (1.2448)	-3.0059 (1.0278)
Number of cases	113	113
R <sup>2</sup>	.1243	.4822

Note: Main entries are unstandardized regression coefficients.

Numbers in parentheses are standard errors.

Numbers in italics are standardized regression coefficients (betas).

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ ; \*\*\*\* $p < .0001$ .

standardized coefficient =  $-.0206$ ). Consistent with the democratic peace proposition, democracy significantly decreases interstate wars ( $b = -.0063$ ,  $p < .05$ , standardized coefficient =  $-.2365$ ). In addition, the nation's major power status ( $b = .0190$ ,  $p < .0001$ , standardized coefficient = .5493) and national IQ ( $b = .0372$ ,  $p < .001$ , standardized coefficient = .4622) both increase the nation's interstate war experience; GDP per capita ( $b = -.0000$ ,  $p < .05$ , standardized coefficient =  $-.2753$ ) significantly decreases it. The model accounts for nearly half the variance in national experience with interstate wars ( $R^2 = .4822$ ). The results presented in Table 1 provide direct support for Hypotheses 1 and 2, and indirect support for the Savanna Principle, which

states that the human brain has difficulty comprehending and dealing with entities and situations that did not exist in the ancestral environment, such as the modern bureaucratic state.

## Discussion

An evolutionary psychological perspective on civil wars proposed in this paper suggests that a relative lack of reproductive opportunities may contribute to intergroup conflict, and that polygyny, which produces a large number of mateless young men, may potentially increase such conflict. However, the application of the Savanna Principle would lead to the prediction that polygyny may not necessarily increase the incidence and extent of interstate wars, while it may increase the number and scope of civil wars.

The analysis of the Correlates of War (COW) data support both hypotheses derived from an evolutionary psychological perspective on wars. Polygyny increases civil wars, while it has no effect on interstate wars. The comparison of the standardized coefficients suggests that polygyny explains a greater proportion of the variance in civil war experience than democracy does in interstate war experience. If the democratic peace is the first law of international relations (interstate wars) (Levy 1988), then *polygyny may be the first law of intergroup conflict (civil wars)*.

One alternative explanation for the empirical results reported above is that, rather than polygyny increasing wars, the direction of causation is reverse: Warlike societies suffer from a shortage of men and thus allow polygyny so that all women can be married. Given that my data are cross-sectional, not longitudinal, I cannot rule out this alternative explanation empirically. However, this view cannot explain why polygyny is *not* significantly correlated with interstate wars when they can also result in a large number of casualties, except for the fact that civil wars often kill more men than interstate wars (Fearon and Laitin 2003, 75).

The results presented above suggest that Toft's (2007) conclusion that Muslim nations are more likely to experience civil wars than Christian or Hindu nations may need to be reevaluated. The results suggest that it is not because they are Muslim but because they are polygynous that these nations are more likely to experience civil wars. The results of the multiple regression analysis show that Islam does not increase a nation's civil war experience once polygyny is controlled; in fact, Islam has a nonsignificant *negative* effect on both civil and interstate war experiences.

In a recent study, Caprioli (2005) shows that the degree of gender inequality in a state (measured by fertility and female labor force participation) increases the likelihood that it experiences internal conflict (what I call "civil wars" here). Caprioli's findings, however, are consistent with my explanation of civil wars. Societies characterized by greater degrees of gender inequality tend to have higher degrees of resource inequality among men (Kanazawa and Still 2001), and societies with greater degrees of resource inequality among men are more likely to be polygynous (Kanazawa and Still 1999). I would therefore expect that societies characterized by greater degrees of gender inequality (as a correlate of polygyny) would be more likely to experience civil wars, exactly as Caprioli (2005) finds. However, Caprioli and Boyer (2001) demonstrate that the degree of gender inequality also predicts the severity of international crisis (what I call "interstate wars" in this paper). More theoretical and empirical work is necessary to examine the independent effects of polygyny and gender inequality on civil and interstate wars.

Hudson and den Boer (2004, 207–27) argue that it may be in the state leaders' self-interest in maintaining internal social order to send and expend bare branches in imperial wars and foreign expeditions. Rubin (2002, 118–23) also suggests that polygynous societies tend to have authoritarian governments in order to suppress civil wars. However, my analysis of the COW data above shows that polygynous societies are much more likely to experience civil wars, but not interstate wars. Does this mean that the governments of polygynous societies are not sufficiently authoritarian to suppress civil wars, and, if they were, there would be no more civil wars in polygynous societies than in monogamous societies?<sup>4</sup>

The most that any government (authoritarian or otherwise) can do to control the behavior of its citizens is to threaten them with death. From an evolutionary psychological perspective, as Rubin himself (2002, 120–21) recognizes, the threat of death does not carry much weight for young men in highly polygynous societies faced with the distinct possibility of total reproductive failure because of a lack of reproductive opportunities. From the perspective of the genes, total reproductive failure—not leaving any offspring—is death. Thus, for the same reasons that polygyny (and a consequent lack of reproductive opportunities) inclines men to murder, rape and assault, despite the distinct possibility of state criminal penalty, the same desperate situation can lead

<sup>4</sup>I thank one anonymous reviewer for raising this question.



them to wage civil wars for potential reproductive opportunities (Kanazawa 2007). There is very little the state can do to control the behavior of young men in polygynous societies even with the threat of death.

The present analysis is only among the first attempts to introduce an evolutionary psychological perspective in the study of war and intergroup conflict (along with Hudson and den Boer 2004, Thayer 2004, and Gat 2006), and it is far from the only evolutionary psychological explanation of this phenomenon. The data, which aggregate each nation's experience with civil wars over a long period of time (1816–1980) and reduce it to one case, is admittedly very crude. Further empirical studies are necessary, both to establish the importance of reproductive factors in the study of wars and intergroup conflict and to adjudicate between my theory and its competitors. Such future empirical studies can benefit from more sophisticated and disaggregated data than those used in the analysis above.

## Acknowledgments

I thank John Orbell, Valerie M. Hudson, participants of the 2005 international conference on “Alien Rule and Its Discontents,” organized by Michael Hechter at the University of Washington, and anonymous reviewers for their comments on earlier drafts.

*Manuscript submitted 19 September 2006*

*Manuscript accepted for publication 12 April 2008*

## References

- Alford, John R., and John R. Hibbing. 2004. “The Origin of Politics: An Evolutionary Theory of Political Behavior.” *Perspectives on Politics* 2 (4): 707–23.
- Betzig, Laura. 1982. “Despotism and Differential Reproduction: A Cross-Cultural Correlation of Conflict Asymmetry, Hierarchy, and Degree of Polygyny.” *Ethology and Sociobiology* 3 (4): 209–21.
- Betzig, Laura L. 1986. *Despotism and Differential Reproduction: A Darwinian View of History*. New York: Aldine.
- Betzig, Laura. 2002. “British Polygyny.” In *Human Biology and History*, ed. Malcolm Smith. London: Taylor and Francis, 30–97.
- Bock, John. 1999. “Evolutionary Approaches to Population: Implications for Research and Policy.” *Population and Environment* 21 (2): 193–222.
- Bollen, Kenneth. 1993. “Liberal Democracy: Validity and Method Factors in Cross-National Measures.” *American Journal of Political Science* 37 (4): 1207–30.
- Browne, Kingsley R. 2002. *Biology at Work: Rethinking Sexual Equality*. New Brunswick, NJ: Rutgers University Press.
- Bueno de Mesquita, Bruce, Jeremy Morrow, Randolph Siverson, and Alastair Smith. 1999. “An Institutional Explanation of the Democratic Peace.” *American Political Science Review* 93 (4): 791–808.
- Buss, David M. 1994. *The Evolution of Desire: Strategies of Human Mating*. New York: Basic Books.
- Campbell, Anne. 2002. *A Mind of Her Own: The Evolutionary Psychology of Women*. Oxford: Oxford University Press.
- Caprioli, M. 2005. “Primed for Violence: The Role of Gender Inequality in Predicting Internal Conflict.” *International Studies Quarterly* 49 (2): 161–78.
- Caprioli, Mary, and Mark A. Boyer. 2001. “Gender, Violence, and International Crisis.” *Journal of Conflict Resolution* 45 (4): 503–18.
- Chagnon, Napoleon A. 1997. *Yanomamö*. 5th ed. Fort Worth: Harcourt Brace.
- CIA. 2008. *The World Factbook 2008*. Washington DC: Central Intelligence Agency.
- Cosmides, Leda, and John Tooby. 1994. “Better Than Rational: Evolutionary Psychology and the Invisible Hand.” *American Economic Review* 84 (2): 327–32.
- Crawford, Charles B. 1993. “The Future of Sociobiology: Counting Babies or Proximate Mechanisms?” *Trends in Ecology and Evolution* 8 (5): 183–86.
- Crawford, Charles, and Catherine Salmon. 2004. *Evolutionary Psychology, Public Policy, and Personal Decisions*. Mahwah, NJ: Lawrence Erlbaum.
- Daly, Martin, and Margo Wilson. 1988. *Homicide*. New York: De Gruyter.
- Darwin, Charles. 1859. *On the Origin of Species by Means of Natural Selection*. London: John Murray.
- Darwin, Charles. 1871. *The Descent of Man, and Selection in Relation to Sex*. London: John Murray.
- Dawkins, Richard. 1976. *The Selfish Gene*. Oxford: Oxford University Press.
- Dixon, William J. 1994. “Democracy and the Peaceful Settlement of International Conflict.” *American Political Science Review* 88 (1): 14–32.
- Fearon, James D., and David D. Laitin. 2003. “Ethnicity, Insurgency, and Civil War.” *American Political Science Review* 97 (1): 75–90.
- Gat, Azar. 2006. *War in Human Civilization*. Oxford: Oxford University Press.
- Gelpi, Christopher. 1997. “Democratic Diversions: Governmental Structure and the Externalization of Domestic Conflict.” *Journal of Conflict Resolution* 41 (2): 255–82.
- Goodwin, Jeff. 1997. “The Libidinal Constitution of a High-Risk Social Movement: Affectual Ties and Solidarity in the Huk Rebellion, 1946 to 1954.” *American Sociological Review* 62 (1): 53–69.
- Horne, Christine. 2004. “Values and Evolutionary Psychology.” *Sociological Theory* 22 (3): 477–503.
- Hudson, Valerie M., and Andrea M. den Boer. 2004. *Bare Branches: Security Implications of Asia's Surplus Male Populations*. Cambridge, MA: MIT Press.
- Johnson, Dominic D. P. 2004. *Overconfidence and War: The Havoc and Glory of Positive Illusions*. Cambridge, MA: Harvard University Press.
- Kanazawa, Satoshi. 2001a. “De Gustibus Est Disputandum.” *Social Forces* 79 (3): 1131–63.

- Kanazawa, Satoshi. 2001b. "Why Father Absence Might Precipitate Early Menarche: The Role of Polygyny." *Evolution and Human Behavior* 22 (5): 329–34.
- Kanazawa, Satoshi. 2002. "Bowling with Our Imaginary Friends." *Evolution and Human Behavior* 23 (3): 167–71.
- Kanazawa, Satoshi. 2003. "Why Productivity Fades with Age: The Crime-Genius Connection." *Journal of Research in Personality* 37: 257–72.
- Kanazawa, Satoshi. 2004a. "Social Sciences Are Branches of Biology." *Socio-Economic Review* 2 (3): 371–90.
- Kanazawa, Satoshi. 2004b. "The Savanna Principle." *Managerial and Decision Economics* 25 (1): 41–54.
- Kanazawa, Satoshi. 2007. "The Evolutionary Psychological Imagination: Why You Can't Get a Date on a Saturday Night and Why Most Suicide Bombers Are Muslim." *Journal of Social, Evolutionary, and Cultural Psychology* 1 (2): 7–17.
- Kanazawa, Satoshi. 2008. "De Gustibus Est Disputandum II: Why Liberals and Atheists Are More Intelligent." Interdisciplinary Institute of Management. London School of Economics and Political Science.
- Kanazawa, Satoshi, and Mary C. Still. 1999. "Why Monogamy?" *Social Forces* 78 (1): 25–50.
- Kanazawa, Satoshi, and Mary C. Still. 2000. "Why Men Commit Crimes (and Why They Desist)." *Sociological Theory* 18 (3): 434–47.
- Kanazawa, Satoshi, and Mary C. Still. 2001. "The Emergence of Marriage Norms: An Evolutionary Psychological Perspective." In *Social Norms*, ed. Michael Hechter and Karl-Dieter Opp. New York: Russell Sage Foundation, 274–304.
- Keeley, Lawrence H. 1996. *War before Civilization*. New York: Oxford University Press.
- Levinson, David. (Editor in Chief.) 1991–1995. *Encyclopedia of World Cultures*. (10 Volumes.) Boston: G.K. Hall.
- Levy, Jack S. 1988. "Domestic Politics and War." *Journal of Interdisciplinary History* 18 (4): 653–73.
- Lynn, Richard, and Tatu Vanhanen. 2002. *IQ and the Wealth of Nations*. Westport, CT: Praeger.
- Lynn, Richard, and Tatu Vanhanen. 2006. *IQ and Global Inequality*. Augusta, GA: Washington Summit Books.
- MacDonald, Kevin B. 1999. "An Evolutionary Perspective on Human Fertility." *Population and Environment* 21 (2): 223–46.
- Marshall, Monty G., and Keith Jagers. 2005. *Polity Project: Dataset Users' Manual*. Arlington, VA: Polity IV Project.
- Miller, Geoffrey F. 2000. *The Mating Mind: How Sexual Choice Shaped the Evolution of the Human Mind*. New York: Doubleday.
- Oakes, Amy. 2006. "Diversionary War and Argentina's Invasion of the Falkland Islands." *Security Studies* 15 (3): 431–63.
- Orbell, John, Tomonori Morikawa, Jason Hartwig, James Hanley, and Nicholas Allen. 2004. "'Machiavellian' Intelligence as a Basis for the Evolution of Cooperative Dispositions." *American Political Science Review* 98 (1): 1–16.
- Pickering, Jeffrey, and Emizet F. Kisangani. 2005. "Democracy and Diversionary Military Intervention: Reassessing Regime Type and the Diversionary Hypothesis." *International Studies Quarterly* 49 (1): 23–43.
- Rogers, Alan R. 1994. "Evolution of Time Preference by Natural Selection." *American Economic Review* 84 (3): 460–81.
- Rubin, Paul H. 2002. *Darwinian Politics: The Evolutionary Origin of Freedom*. New Brunswick: Rutgers University Press.
- Schildes, William M., and Lea M. Shields. 1983. "Forcible Rape: An Evolutionary Analysis." *Ethology and Sociobiology* 4 (3): 115–36.
- Simpson, Brent T. 2003. "Sex, Fear and Greed: A Social Dilemma Analysis of Gender and Cooperation." *Social Forces* 82: 35–52.
- Small, Melvin, and J. David Singer. 1982. *Resort to Arms: International and Civil Wars, 1816–1980*. Beverly Hills, CA: Sage.
- Symons, Donald. 1990. "Adaptiveness and Adaptation." *Ethology and Sociobiology* 11 (4–5): 427–44.
- Thayer, Bradley A. 2004. *Darwin and International Relations: On the Evolutionary Origins of War and Ethnic Conflict*. Lexington: University of Kentucky Press.
- Toft, Monica Duffy. 2007. "Getting Religion? The Puzzling Case of Islam and Civil War." *International Security* 31 (4): 97–131.
- Tooby, John, and Leda Cosmides. 1990. "The Past Explains the Present: Emotional Adaptations and the Structure of Ancestral Environments." *Ethology and Sociobiology* 11 (4–5): 375–424.
- White, Douglas R. 1988. "Rethinking Polygyny: Co-Wives, Codes and Cultural Systems." *Current Anthropology* 29 (4): 529–58.

Satoshi Kanazawa is a reader in management, London School of Economics and Political Science, London WC2A 2AE, UK.