

Polygyny or Misogyny? Reexamining the “First Law of Intergroup Conflict”¹

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Abstract

Kanazawa (2009) proposes a “first law of intergroup conflict”, suggesting that polygyny and its impact on access to reproductive women provides “the ultimate cause” for civil war. This controversial claim is supported by an empirical analysis at odds with most existing studies of civil wars. We reconsider the influence of polygyny in a more conventional statistical model. We fail to find evidence that ethnic groups with polygyny engage more frequently in civil wars, although our results indicate that civil wars are more common in societies with legal polygamy. We detail how these findings seem at odds with Kanazawa’s theory, and argue that misogyny seems a more plausible source of insights into the context for civil war and peace. We then show that civil wars are less common when women’s rights are better established and that legal polygamy has no notable residual effect once women’s rights are considered.

1 Introduction

Kanazawa (2009, 25) has recently published an article in the *Journal of Politics* arguing that the risk of civil war is a function of “the relative availability of reproductive women”. According to Kanazawa, reproduction is the main motivation for individuals; Polygyny “reduces the availability of reproductive women in groups” (p. 27), and an increased risk of violence and warfare follows as a result of the reproductive motive and frustration. Kanazawa further argues that the so-called “Savanna Principle”, which is held to stipulate that “the human brain has difficulty comprehending and dealing with entities and situations that did not exist in the ancestral environment” (p. 27), implies that reproductive frustration should give rise to more civil conflict involving polygynous groups, but not interstate war, as these are carried out by bureaucratic structures. According to Kanazawa (2009:28),

... 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.

Kanazawa claims to present empirical evidence of polygyny “explaining” so much of the “variance in civil war experience” that it should be regarded as “the first law of ... civil wars” (p. 25).

Kanazawa’s reported results are generally inconsistent with previous research on civil war, and many details in the empirical analysis in the article are highly unclear. His theory

strikes us as odd and questionable. Kanazawa's stark contrast between interstate wars—where organized bureaucracies are held to play a major role—and civil wars seems to equate the latter with unorganized violence, presumably reminiscent of violence in our ancestral environment. However, civil wars also by definition involve the state as an actor (see the definition employed for Kanazawa's data in Small and Singer 1982; Sambanis 2004). Insurgents are not always the first movers in conflict, and resort to violence may be a deliberate and strategic response to state repression or grievances rather than wanton and apolitical violence (see Kalyvas 2001). Moreover, insurgencies too must overcome collective action problems, and often have highly developed hierarchical organizations (see Cunningham, Gleditsch and Salehyan 2009; Weinstein 2006). Still, the claims of a law-like link between polygyny and civil war merits closer scrutiny.

We first reexamine the evidence for a link between the practice of polygyny and civil war within the context of a more conventional statistical model of the risk of civil war. Our analyses considers whether specific ethnic groups practice polygyny and participate in conflict. Our results indicate that although there is some evidence that the risk of civil war may be higher in states that allow for polygamy, there is no evidence that polygynous groups are more likely to be involved in civil war once we take into account a state's marital laws. We then critique Kanazawa's proposed evolutionary explanation linking polygyny to civil war, and argue that existing work on the relative status of women and violence provide a much more plausible interpretation of the empirical findings. We also provide some empirical evidence suggesting that misogyny seems more important for the risk of civil war than polygyny.

2 Untangling Kanazawa's analysis

Kanazawa (2009, 31) presents empirical evidence suggesting that only polygyny and “national IQ” are statistically significant predictors of civil war experience.¹ The model specification in Kanazawa is highly unconventional, however, and the results for other features in the model are in stark contrast to previous results on civil war. For example, economic development, which has been emphasized as consistently robust in other studies of civil war (see, for example, Hegre and Sambanis 2006), is held to be completely irrelevant to explaining the onset the civil war.

Kanazawa's (2009) analysis is poorly documented, and appears to suffer from a number of problems. The estimated statistical model bears very little correspondence or resemblance to other statistical models considered in previous research on civil war. Kanazawa indicates that he creates a measure of a country's “conflict experience” based on Singer and Small's (1982) data on civil and interstate war for the period 1816–1980, where a number of different reported variables are combined with the help of a factor analysis. The reported number of cases for the analyses (N=133) suggests that the observations must refer to a cross section of countries, but there is no discussion of how data for

¹Indeed, Kanazawa's results suggest a positive relationship between national IQ scores and conflict, although he does not comment on these results. A positive impact of national IQ on conflict, if correct, could be seen as entailing dramatic security implications for the so-called Flynn effect, namely the tendency for average IQ test scores to increase over time (Flynn 2007). However, the frequency of civil war has actually decreased after the end of the cold war (see Gleditsch 2008), so this implication of the model does not seem to be borne out by the evidence.

conflicts over a period of 164 years are aggregated up to a single cross section. Moreover, there is no indication of what year(s) the information on the control variables considered such as democracy and economic development are taken from. We note that the democracy data developed by Bollen (1990) that are held to have been used are available only for a select number of years after 1960. As far as we can ascertain it appears as if Kanazawa must be trying to account for conflict over the period using right hand side values measured at the very end of the period, which entails obvious problems of temporal ordering. Likewise, Kanazawa's analysis of interstate war, which is intended to show that polygyny does not increase the risk of interstate war, considers individual states rather than dyadic relationships between pairs of states. Although Kanazawa (2009, 31) invokes the absence of conflict between democracies, which he labels "the first law of interstate conflict", his analysis could not by construction reflect such a relationship since the democratic peace is known to apply only to pairs of democracies and there is little evidence suggesting that individual democratic states are less likely to engage in interstate conflict (see Russett and Oneal 2001).

The ambiguities of the analysis as presented in the published paper make us reluctant to accept the empirical evidence at face value.² However, claims to have discovered a new "law" of civil war should be taken seriously, and it is important to investigate these claims

²Despite characterizing himself as a "scientific fundamentalist" on his blog, Kanazawa is not willing to make the data used in the article available and seems to display little concern for replication. Kanazawa replied to an email from Gleditsch asking for a copy of the data on 11 October 2009 as follows: "I am afraid that, due to a large number of attempts at theft, fraud, and other deceptive activities in the past, I can no longer share my data with anyone that I do not personally know. I'm sorry." Moreover, he has not

using more conventional methods and reproducible data.

Kanazawa argues that polygyny leads specific groups to engage in conflict, but does not consider the conflict behavior of specific groups. He acknowledges that his study is highly aggregated and explicitly calls for more disaggregated analysis:

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 [sic] 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.

In the spirit of Kanazawa's call for further analysis, we re-examine the link between polygyny and conflict using a new data set that considers politically relevant ethnic groups and their specific involvement in conflict, called Ethnic Power Relations (EPR) (see Cederman, Wimmer and Min 2010; Wimmer, Cederman and Min 2009).³ We replicate a previous analysis of the risk of conflict by ethnic groups, from Cederman, Wimmer and Min (2010), who consider characteristics such as whether ethnic groups are politically excluded and other features likely to influence conflict. In our view, their proposed model seems better theoretically motivated than Kanazawa's model, and this also allows us to compare the estimated effects of polygyny on conflict directly to other features that have been high-responded to any questions on the analysis presented in his paper. A full record of the correspondence with Kanazawa and unanswered emails is available on request.

³The EPR data are available at <http://dvn.iq.harvard.edu/dvn/dv/epr>.

lighted in existing research on civil war. Before elaborating on these data and the model, we first turn to the issue of how to identify Kanazawa's main explanatory feature, namely polygyny.

3 Polygyny and Ethnic Groups

Kanazawa claims to use an overall polygyny score for countries in his analyses, based on a four level index of the extent of polygyny within specific ethnic groups, multiplied by their relative population shares. Without access to Kanazawa's actual data, we turn to his cited source for the information on polygyny, namely the *Encyclopedia of World Cultures* (Levinson 1991-1995), which in turn is based on information from the Human Relations Area File project at Yale University. The *Encyclopedia of World Cultures* provides summaries of different cultures including marital institutions and practices. However, it does not actually provide information on the frequency of polygyny in different ethnic groups in any standardized form, or as a scale in the way suggested by Kanazawa. The examples cited by Kanazawa of the Turks (held to be monogamous) and Kurds (held to be polygynous) are highly ambiguous; The *Encyclopedia of World Cultures* entry for the Kurds simply states that "according to the Quran, a man may have up to four wives . . . however, few men can afford even two wives" (Levinson 1991-1995, 176). The entry for Turks does not mention polygyny, but other reports suggest that even if polygamy may be illegal in Turkey, it is still possible to find examples of polygamy among ethnic Turks, and many Turks appear to be positive to polygamy.⁴ We conclude that it would be difficult

⁴See, for example, <http://www.timesonline.co.uk/tol/news/world/article489773.ece>.

to recreate Kanazawa's polygyny scores without additional information on the specific criteria used and how the material was interpreted. Rather than to try to create a graded scale of polygyny, we opt for the simpler alternative of a dummy variable for all groups in the EPR data listed in the index of the *Encyclopedia of World Cultures* under polygyny.

The *Encyclopedia of World Cultures* seems to be primarily focused on minority groups and provides less information on dominant groups and cultures. It is possible that the groups explicitly flagged as polygynous may understate the extent to which polygyny is permitted.⁵ We thus introduce an alternative variable indicating whether a state allows for polygamy as part of common law.⁶ This furthermore provides an opportunity ascertaining whether the effect is restricted only to states that allow for polygamy or apply to groups that practice polygyny in other legal contexts.

4 Polygyny, Legal Polygamy, and Civil War

The unit of analysis in the EPR data is the individual ethnic group. The EPR data contain time varying information on ethnic groups, their characteristics, and their relationship to state power. Unlike other data on ethnic groups that simply enumerate groups and list their size, the EPR data explicitly code their political status in terms access to executive power, based on an expert survey. Groups could be *included*, either if they hold absolute power or are included in some form of power sharing regime, or *excluded*, in the sense that there

⁵Any such biases, however, would also apply for Kanazawa's (2009) analyses, since these are based on the same source.

⁶Source:<http://en.wikipedia.org/wiki/Polygyny> (accessed October 2009).

is no access to political power for elites that claim to represent ethnic groups. Cederman, Wimmer and Min (2010) create a dyadic data set of annual observations, with ethnic groups paired with the government. The civil war coding is based on the PRIO/Uppsala Conflict Data Program (Gleditsch, Wallensteen, Erikson, Sollenberg and Strand 2002), and considers whether specific ethnic groups are involved in a civil conflict with more than 25 battle deaths either in terms of the specific motive or claims of insurgent groups or patterns of recruitment.

We follow Cederman, Wimmer and Min (2010) in their choice of model specification, and include the following variables:

- Excluded: a dummy variable which indicates whether a group is excluded from political power. Within excluded groups we further distinguish between the following subcategories: a) Powerless groups, b) Discriminated (cases where active discrimination prevents group members from access to power), c) Separatist (instances of separatist autonomy where a group may hold de facto local authority due to secession), and d) Regional Autonomy (where a group may have some regional autonomy at the sub-state level, e.g., in provinces). We include separate dummy variables for the first three categories in the analyses of excluded ethnic groups.
- Downgraded: a dummy variable indicating whether a group has experienced a decrease in access to power during the past two years.
- Logged group size: the demographic size of a group as the proportion of the country's politically relevant groups (which can be seen as an approximate measure of relative power).

- War history: a count of the number of previous conflicts a given group has fought.
- Log of GDP per capita: drawn from the Penn World Tables (Summers and Heston 1991).
- Logged country population size: drawn from the World Development Indicators (various years).
- Peace years of time since conflict (or first observation) and cubic splines: following the approach suggested by Beck, Katz and Tucker (1998) to account for duration dependence in binary time-series–cross-section analyses.

The results for the core model of the risk of conflict after adding the variables indicating group polygyny and whether states allow for polygamy under common law are shown in Table 1. Model 1 shows the results for a logistic regression of ethnic conflict onset for all groups in the EPR data. Model 2 provides the results only for groups classified as politically excluded. Model 3 provides the results of a multinomial logit, distinguishing between conflicts with territorial aims, or secessionist conflicts, and conflicts where the insurgents seek control over the government. Models 4, 5 and 6 all follow the same setup, but also include a multiplicative interaction term between group polygyny and legal polygamy.

With regards to estimated effects of polygyny on civil war, we note that we find a positive coefficient for states that allow for polygamy under common law, but there is no residual effect for groups that have polygyny. Indeed, the estimated coefficient is negative, albeit not statistically significant, suggesting that a polygynous group in a state that does not permit polygyny (as Kanazawa interprets the case of Kurds in Turkey) actually would

Table 1: Estimates of the risk of civil war by ethnic group, EPR data

Variable	(1) all groups	(2) excluded groups	(3) multinomial logit territorial government	(4) all groups	(5) excluded groups	(6) multinomial logit territorial government
Excluded	1.304*** (0.24)			1.288*** (0.24)		
Powerless		0.189 (0.34)	0.471 (0.43)		0.190 (0.34)	0.489 (0.44)
Discrimated		0.765* (0.45)	0.776 (0.67)		0.772* (0.45)	0.830 (0.69)
Separatist		2.195** (0.95)	3.390*** (1.26)		2.189** (0.95)	3.317*** (1.22)
Downgraded	1.636*** (0.40)	1.832*** (0.46)	1.637*** (0.56)	1.643*** (0.41)	1.833*** (0.46)	1.927*** (0.63)
Logged group size	0.304*** (0.100)	0.442*** (0.13)	0.259* (0.15)	0.300*** (0.10)	0.441*** (0.13)	0.600*** (0.19)
War history	0.738*** (0.17)	0.506 (0.34)	-0.178 (0.65)	0.725*** (0.16)	0.503 (0.34)	1.297*** (0.25)
Log(GDP) p.c.	-0.340*** (0.11)	-0.294** (0.14)	-0.0820 (0.25)	-0.336*** (0.11)	-0.292** (0.14)	-0.553*** (0.21)
Log(population)	-0.0333 (0.092)	0.0542 (0.13)	0.257* (0.15)	-0.0330 (0.093)	0.0549 (0.13)	-0.279 (0.20)
Peaceyears	-0.159** (0.073)	-0.174** (0.085)	-0.238** (0.095)	-0.159** (0.073)	-0.175** (0.085)	-0.0788 (0.16)
Polygyny	0.00484 (0.21)	-0.258 (0.26)	-0.132 (0.41)	-0.312 (0.50)	-0.387 (0.53)	0.373 (0.64)
Legal polygyny	1.059*** (0.25)	1.000*** (0.31)	1.088** (0.54)	0.999*** (0.27)	0.979*** (0.32)	1.322*** (0.49)
polygyny × legal polygamy						
Constant	-3.877*** (1.39)	-4.390** (1.92)	-8.257*** (2.62)	-3.848*** (1.39)	-4.398** (1.92)	-8.308*** (2.61)
Observations	24445	16498	16498	24445	16498	16498

Robust standard errors in parentheses

Coefficients for the non-linear splines of peace years not reported

*** p<0.01, ** p<0.05, * p<0.1

have a lower predicted probability of conflict. The consistency of results across models 1 and 2 indicate that our conclusion does not depend on whether the analysis considers only politically excluded groups or not. Model 3 further suggests that the effect of legal polygamy has a larger impact on the log-odds of conflicts over the government than the log-odds of territorial conflicts. The results for the other features considered are generally consistent with Cederman, Wimmer and Min (2010), and we refer to the original study for further discussion.

One possible objection to the finding that only polygynous group in countries with legal polygamy have a lower predicted probability of conflict could be that countries with legal polygamy often contain numerous groups that practice polygyny, many of which may engage in conflict. In this case the effect of legal polygamy effect would capture a group effect. To assess this possibility, we added a multiplicative interaction term between group polygyny and legal polygamy to the equations (models 4 to 6). We find that polygynous groups in countries where polygyny is legal under common law are not statistically more likely to engage in conflict. Indeed, the coefficient is significant only in model 6, but the sign is negative, suggesting that polygynous groups in states with legal polygamy are less likely to fight the government than non-polygynous groups under the same legislation.

Some of the features included in the model, such as GDP per capita and legal polygamy, are state level features that do not vary across groups within a country. To ensure that our results do not stem from a disproportionate number of groups originating in specific countries, we have also replicated our analysis with the Fearon and Laitin (2003) model of civil war at the country level. The model proposed by Fearon and Laitin considers the impact

of various political, economic, and geographical state characteristics as predictors of civil conflict. These results are reported in Table 2. As can be seen, for model 1, which considers the onset of any civil war, the coefficient for legal polygamy is positive, albeit not statistically significant. For the set of specifically ethnic conflicts in Model 2, however, the results suggest a positive and significant effect on conflict for states with legal polygamy, similar to what we found for the ethnic group based analysis.

Table 2: Estimates of the risk of civil war, Fearon and Laitin (2003) data

Variable	(1) civil war onset	(2) ethnic war onset
Ongoing war	-0.976*** (0.25)	-0.976*** (0.33)
Log GDP per capita	-0.331*** (0.073)	-0.313*** (0.075)
Log population	0.258*** (0.058)	0.383*** (0.075)
% mountainous terrain	0.233*** (0.085)	0.177 (0.12)
Non-contiguous	0.427 (0.27)	0.345 (0.34)
Oil	0.810*** (0.27)	0.986*** (0.31)
New state	1.676*** (0.35)	1.744*** (0.42)
Instability	0.627*** (0.21)	0.487** (0.25)
Polity2	0.0210 (0.017)	0.0210 (0.019)
Ethnic fractionalization	0.0547 (0.38)	0.423 (0.55)
Religious fractionalization	0.377 (0.54)	1.729** (0.70)
Legal polygamy	0.261 (0.25)	0.588* (0.30)
Constant	-6.801*** (0.63)	-9.179*** (0.88)
Observations	6327	6327

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

It is difficult to see how these results can be regarded as consistent with Kanazawa's claim of discovering a "first law" of civil war, comparable to the democratic peace in the case of interstate conflict. At a purely empirical level, the effect of legal polygamy has a smaller positive effect on the log-odds of conflict than for example the coefficient for ethnic groups that are politically excluded, and it is difficult to see why this then should be regarded as being elevated to a "law" over other features found to affect the risk of civil war. While the democratic peace may be regarded as an empirical law in the sense that we do not have any clear counterexamples of wars between two democracies (see Ray 1993), it is obviously not the case that civil war can only occur in the presence of polygyny or that all societies where polygamy is legal experience civil war.

The fact that any effect of polygyny can only be observed for groups in states where polygamy is encoded in common law raises doubt about the plausibility of Kanazawa's interpretation, namely that constraints on opportunities for reproduction under polygyny leads to frustration and violence indistinguishable from ancestral violence or warfare in pre-industrial societies, in contrast with the organized violence required for interstate war. The proposed explanation based on the "Savanna principle" seems hard to reconcile with the finding that groups in states that allow polygamy are more likely to experience civil war while there is no increase in the risk of conflict for polygynous groups where the state does not endorse polygamy. Kanazawa's emphasis on the effect of polygyny not extending to organized violence also seems undermined by our finding of a relatively larger effect on governmental conflict in Table 1, since an insurgency attacking the state head on normally would require greater capacity and organization than a smaller ethnically based insurgency based in the periphery. In the next section we turn to how existing research

stressing the role of misogyny and violence provides a more plausible interpretation of the results.

We have also examined Kanazawa's claim about polygyny having no effect on interstate wars by considering whether dyads involving a country with legal polygamy were more likely to see militarized interstate disputes, based on the model and data presented in Russett and Oneal (2001). Recall that polygyny should not increase the risk of interstate conflict according to Kanazawa's second hypothesis. The results, however, suggest a positive coefficient for legal polygamy on the log-odds of conflict (0.071), which, although not statistically significant at conventional criteria, with a one-sided p-value just above 0.10, seems sufficiently close to cast doubt on the alleged evidence of no relationship.

Finally, we also note that while Kanazawa simply takes polygyny as predetermined, without trying to account for its origins, Goldstein (2001, 246) reviews a number of studies (not cited in Kanazawa) suggesting that polygyny is more common in societies with high mortality due to warfare. These studies, however, interpret the causal arrow to run in the opposite direction from Kanazawa, and see the observed relationship as arising from warfare shaping marital institutions rather than polygyny causing civil war. In other words, polygyny may be a response to an excess "supply" of women without male attachment rather than a constraint on the availability of reproductive women where unsatisfied "demand" causes frustration and violence. The fact that polygyny in practice often tends to consist of marriage to widows and wives of deceased siblings is clearly consistent with this view.

5 Misogyny and Civil War

We have argued that the empirical evidence is difficult to reconcile with Kanazawa's claim about civil war emanating from reproductive frustration in polygynous groups. However, even if we disagree with the evolutionary theory linking polygyny to civil war, we do not dispute that societies with misogyny, or where women are systematically discriminated against, may be more likely to see civil war. Indeed, there is a considerable literature on this topic, which albeit largely ignored by Kanazawa, has shown that societies where men and women have more equal status see less civil war and interstate conflict.⁷ This body of work has also developed what we see as much more plausible theoretical foundations. For example, Melander (2005) emphasizes the commonality between gender roles that legitimize the subordination of women and the dominant warlike role of men (see also Goldstein 2001; Caprioli 2000). Since the emergence of more equal gender roles also strengthens norms of respect and individual inviolability, and extend social norms that reject abuse and violence to a wider sphere, higher gender equality should be associated with less collective violence, including both civil war and interstate war. Another interpretation argues that gender inequality is associated with less conflict since women tend to be

⁷Kanazawa (2009, 32) acknowledges the empirical results presented by Caprioli (2005) on how societies with greater gender inequality are more prone to civil war. However, he ignores the alternative theoretical perspective offered by Caprioli, and simply argues that these empirical findings are consistent with his theory, since “[s]ocieties characterized by greater degrees of gender inequality tend to have higher degrees of resource inequality among men ... and ... are more likely to be polygynous ” (Kanazawa 2009, 32).

less supportive of violence than men. However, although many studies have demonstrated gender effects with respect to aversion to the use of violence (see Togeby 1994; Regan and Paskeviciute 2003), survey data from four countries in the Middle East actually show that these gender differences disappear when taking into account attitudes to gender inequality (Tessler and Warriner 1997).⁸ From this perspective, the fact that states with legal polygamy see a higher risk of civil war can be considered part of a more general link between misogyny and violence. We find it instructive that polygamy seems to become less common with education and female emancipation, and that calls for bans on polygamy are increasing in strength from women's groups in many countries. An interesting recent example of opposition to polygamy in Indonesia, subverting traditional gender roles, featured bodybuilders flexing their muscles while linking polygamy to violence against women.⁹ While evolutionary perspectives such as Kanazawa's argument emphasizing the reproductive motive presumably would see these features as largely inescapable and enduring traits, norms concerning misogyny, gender roles, and violence can plausibly be seen as socially constructed and features that can change quickly over time. Moreover, if polygyny may be in part a response to historic warfare and excess supply of women (if not necessarily in our ancestral environment), then it is less likely to be an enduring institution that will be sustained with lower mortality and greater female emancipation. In

⁸It is of course possible that attitudes to gender inequality and conflict both may be driven by some other phenomenon. However, if the association between the two is sufficiently strong, attitudes to gender inequality would still provide a useful way to predict likely attitudes to conflict.

⁹An interesting see <http://www.thejakartapost.com/news/2009/10/26/bodybuilders-flex-muscles-against-polygamy.html>.

sum, a focus on misogyny seems much more consistent with patterns of violence around the world and trends in conflict over time than the Savanna principle.

The relative importance of legal polygamy and misogyny for conflict can in principle be tested empirically. To do so we rely on data collected by Cingranelli and Richards (2005) on human rights in general and women's political, social, and economic rights in particular.¹⁰ Cingranelli and Richards (2005) provide annual data on women's political, social, and economic rights for the period 1981 to 2004 on an ordinal scale with four levels. A value of 0 corresponds to a case where women have no rights whatsoever, while 3 indicates that these rights are guaranteed, enforced and with some notable effects.¹¹ We constructed a summary indicator (CIRI) that is the sum of the women's economic, political and social rights indicators, rescaled to range from 0 to 1. Some of the individual component variables are not available for various country-years, and to maximize the coverage we in these cases used the available data rescaled to the same range.

The empirical results when adding the indicator for women's rights based on Cingranelli and Richards (2005) to the Fearon and Laitin model are reported in Table 3. Since the data are available from 1981 and onwards only, the number of cases is obviously reduced considerably. The results for models 1 and 4 indicate that the coefficient for legal polygamy is positive, but not significant, both for the onset of civil and ethnic civil war when the temporal domain is restricted in this manner.¹² However, the results

¹⁰We obtained this data through the Quality of Government Dataset (see Teorell, Charon, Samanni, Holmberg and Rothstein 2009).

¹¹See Cingranelli and Richards (2005) and <http://www.humanrightsdata.org> for further details on the data and coding.

¹²We interpret this as an aggregation issue. We also estimated the group level analyses

for models 2 and 5 indicate that the CIRI women's rights indicator is negatively associated with conflict and statistically significant, both for all civil wars and the smaller set of ethnic civil wars. Moreover, models 3 and 6 show that the estimated coefficients for legal polygamy are further reduced towards 0 when included with the CIRI women's rights indicator, while the coefficients for the CIRI women's rights indicator remain negative and statistically significant. Although data constraints prevent a more comprehensive analysis, we conclude that our analyses of the available data suggest that legal polygamy at best is a special case of more general misogyny, and that there is little support for Kanazawa's interpretation that the empirical results for gender equality on civil war simply reflect the more fundamental implications of polygyny.

Table 3: Estimates of the risk of civil war, Fearon and Laitin (2003) data

Variable	1: CW	2: CW	3: CW	4: ECW	5: ECW	6: ECW
Ongoing war	-1.551*** (0.53)	-1.524*** (0.51)	-1.578*** (0.51)	-1.682*** (0.63)	-1.612*** (0.59)	-1.656*** (0.58)
Log GDP per capita	-0.503*** (0.13)	-0.487*** (0.13)	-0.478*** (0.13)	-0.522*** (0.15)	-0.500*** (0.16)	-0.492*** (0.15)
Log population	0.237** (0.092)	0.264*** (0.089)	0.238** (0.097)	0.272*** (0.10)	0.292*** (0.095)	0.270*** (0.10)
% mountainous terrain	0.262** (0.13)	0.185 (0.12)	0.227* (0.13)	0.168 (0.15)	0.108 (0.14)	0.144 (0.15)
Non-contiguous	1.013** (0.50)	1.232** (0.50)	1.182** (0.52)	1.345*** (0.51)	1.543*** (0.49)	1.473*** (0.51)
Oil	0.388 (0.42)	0.167 (0.49)	0.253 (0.46)	0.416 (0.46)	0.201 (0.54)	0.307 (0.50)
New state	3.252*** (0.79)	3.203*** (0.76)	3.262*** (0.83)	3.049*** (0.89)	3.017*** (0.87)	3.067*** (0.95)
Instability	0.475 (0.39)	0.385 (0.38)	0.379 (0.40)	0.141 (0.44)	0.0622 (0.43)	0.0495 (0.45)
Polity2	0.0530** (0.024)	0.0511** (0.024)	0.0567** (0.023)	0.0434* (0.025)	0.0408 (0.025)	0.0461* (0.024)
Ethnic fractionalization	0.264 (0.76)	0.337 (0.65)	0.131 (0.75)	0.326 (0.82)	0.445 (0.73)	0.223 (0.82)
Religious fractionalization	0.398 (0.82)	0.358 (0.86)	0.559 (0.84)	1.079 (0.90)	0.972 (0.94)	1.197 (0.91)
Legal polygyny	0.693 (0.44)		0.505 (0.46)	0.657 (0.44)		0.510 (0.45)
CIRI		-3.169*** (1.12)	-2.877** (1.19)		-2.979** (1.18)	-2.719** (1.26)
Constant	-6.386*** (1.08)	-5.005*** (1.15)	-5.130*** (1.19)	-6.921*** (1.24)	-5.622*** (1.29)	-5.764*** (1.32)
Observations	2521	2521	2521	2521	2521	2521

CW: civil war onset, ECW: ethnic civil war onset. Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

for period post 1980, with no notable differences.

6 Conclusion

Research on conflict has always been a highly interdisciplinary research area. We are in principle open to the idea that evolutionary approaches may be helpful for understanding political phenomena and conflict (see, for example Fowler and Schreiber 2008). However, efforts to provide contributions to existing questions from new angles can often be strengthened if they consider existing theoretical arguments and research and proceed in an open and transparent manner. We conclude from our reexamination that Kanazawa's analysis seems problematic and that there is little evidence for Kanazawa's first law of civil conflict. Moreover, we think that Kanazawa's evolutionary explanation linking polygyny and conflict through reproduction as the ultimate human motivation is unlikely to be particularly helpful understanding civil war, and it seems unfortunate to deemphasize the political motivation for violence and the fact the frequency of civil war varies dramatically over time. On a more constructive note, however, we also think that the empirical results suggest that a continued focus on misogyny and how the relative status of women may be associated with differences in the propensity to use violence can provide helpful insights into understanding the context of civil war and peace.

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7 Appendix

Table 4: Descriptives statistics for country level analyses

Variable	Observations	Mean	Std. Dev.	Min	Max
Civil war onset	6327	0.017	0.137	0.000	4.000
Ethnic conflict onset	6327	0.012	0.117	0.000	4.000
Ongoing war	6327	0.134	0.341	0.000	1.000
Log GDP per capita	6327	3.636	4.352	0.048	53.901
Log population	6327	9.065	1.460	5.403	14.029
% mountainous terrain	6327	2.175	1.410	0.000	4.557
Non-contiguous	6327	0.178	0.383	0.000	1.000
Oil	6327	0.128	0.334	0.000	1.000
New state	6327	0.026	0.158	0.000	1.000
Instability	6327	0.146	0.353	0.000	1.000
Polity2	6327	-0.396	7.554	-10.000	10.000
Ethnic fractionalization	6327	0.389	0.286	0.001	0.925
Religious fractionalization	6327	0.366	0.219	0.000	0.783
Legal polygamy	6327	0.266	0.442	0.000	1.000
CIRI	2521	0.465	0.194	0.000	1.000

Table 5: Descriptives statistics for group level analyses

Variable	Observations	Mean	Std. Dev.	Min	Max
Ethnic conflict onset	24445	0.006	0.074	0.000	1.000
Incompatibility onset	24445	0.008	0.117	0.000	2.000
Excluded	24445	0.675	0.468	0.000	1.000
Powerless	24445	0.286	0.452	0.000	1.000
Discrimated	24445	0.169	0.375	0.000	1.000
Separatist	24445	0.009	0.092	0.000	1.000
Downgraded	24445	0.015	0.121	0.000	1.000
Logged group size	24445	-3.498	2.173	-10.807	0.000
War history	24445	0.067	0.278	0.000	3.000
Log GDP per capita	24445	7.839	1.124	3.327	11.611
Log population	24445	10.218	1.891	5.755	14.076
Peace years	24445	23.125	16.247	0.000	59.000
Polygyny	24445	0.131	0.337	0.000	1.000
Legal polygamy	24445	0.307	0.461	0.000	1.000