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KINSHIP AND CONFLICT:
EVIDENCE FROM SEGMENTARY LINEAGE SOCIETIES IN SUB-SAHARAN AFRICA

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Kinship and Conflict: Evidence from Segmentary Lineage Societies in Sub-Saharan Africa
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ABSTRACT

We test the long-standing hypothesis that ethnic groups that are organized around ‘segmentary lineages’ are more prone to conflict. Ethnographic accounts suggest that in segmentary lineage societies, which are characterized by strong allegiances to distant relatives, individuals are obligated to come to the aid of fellow lineage members when they become involved in conflicts. As a consequence, small disagreements often escalate to larger-scale conflicts involving many individuals. We test for this link between segmentary lineage and conflict across 145 African ethnic groups in sub-Saharan Africa. Using a number of estimation strategies, including an RD design at ethnic boundaries, we find that segmentary lineage societies experience more conflicts and particularly ones that are retaliatory, long in duration, and large in scale.

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A data appendix is available at <http://www.nber.org/data-appendix/w24209>

1. Introduction

Conflicts are a common feature of the modern world. In 2013, there were 34 ongoing civil wars, 18 in Asia and the Middle East, 14 in Africa and 2 in the Americas.¹ Some of these have been very protracted. An example is the conflict between the Lord's Resistance Army and the Ugandan state, which can be traced back to 1987 or the civil conflict in Mindanao, the southern island of the Philippines, which has been ongoing since the late 1960s (Allen and Vlassenroot, 2010). These conflicts cause a great deal of damage and loss of human life. In 2013 alone, an estimated 70,451 people died fighting in civil conflicts and 10.7 million civilians were newly displaced, resulting in a total stock of 33 million people being displaced due to fighting.²

In this study, we test a long-standing hypothesis from the field of anthropology about the relationship between conflict and the kinship structure of a society, namely whether an ethnic group is organized into segmentary lineages. Although in Western cultures, the central kinship unit is the nuclear family, in most of the world, people live within much more complex social structures, connected by extended kin networks. Segmentary lineage organization is one such social structure. The first defining characteristic of this organizational form is unilineal descent, where people trace their ancestry either through the male line (patrilineal) or female line (matrilineal), but not both. Typically, ancestry is traced back to a common often mythical founder, after whom the tribe or society is named. Examples are *Samale* and *Orma* who are the common ancestors of the Somali and Oromo (Ahmed, 2013b, p. 20). The second feature is the presence of sub-sets or segments of a full lineage, which function as coherent autonomous groups (Smith, 1956, pp. 39–40). The lineage segments take a 'corporate form,' meaning that they are important for organizing a range of activities and functions that are political, judicial, and administrative in nature (Fortes, 1953).

Figure 1 displays a hypothetical patrilineal segmentary lineage system. In the figure, triangles indicate men and the straight lines indicate descent, with each row of triangles indicating a generation. All individuals in the figure descend from a common ancestor indicated by "I." Also shown in the figure are various segments of the full lineage. The segments are of different sizes: The smallest is the "Minimal Segment," the next larger is the "Minor Segment," and the largest is the "Major Segment."

¹These figures are based on the authors' calculations using the UCDP/PRIO Armed Conflict Dataset.

²These figures are from the UCDP Battle-Related Deaths Dataset and the UNHCR Statistical Yearbook, 2013.

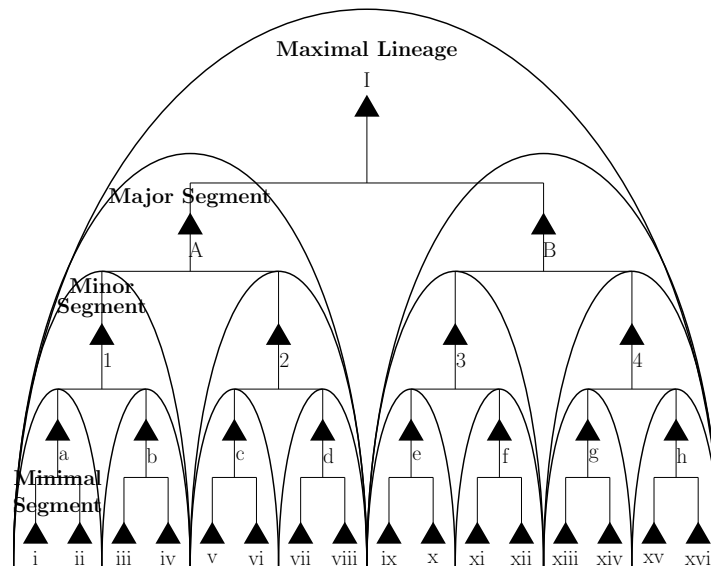


Figure 1: The figure provides a representation of a hypothetical segmentary lineage society.

Although it is true that, from a biological perspective, descent is universal among human societies, in terms of social significance, descent varies significantly. For example, not all groups trace descent through unilineal lineages. Another common kinship form is cognatic descent where individuals can simultaneously belong to two sets of groups and trace their lineage through either their mother's relatives, father's relatives, or both. Many small-scale societies, for example, hunter-gatherer groups such as the Hadza or San, have no established elaborate kinship system at all. In addition, the importance placed on a society's kinship system, as well as the associated responsibilities and obligations, also vary widely. Unlike in a segmentary lineage society, where lineage and kinship are of the utmost importance, in many societies other structures, like social class or location of residence, are more important. In others, completely different types of social structures, such as age sets and age grades, provide the main way of organizing societies, both administratively and politically.

A number of scholars in the anthropology literature have hypothesized that there is a relationship between the social structure of groups and the prevalence of violence and conflict. More specifically, it is argued that segmentary lineage societies are prone to engage in more conflicts, and in ones that are longer in duration and larger in scale. This is not because segmentary lineage societies harbor particular grievances, but because the social structure facilitates the mobilization of combatants when a dispute or conflict occurs. To see why this is the case, consider Figure 1. An important aspect of segmentary lineage societies is that lineages and segments, and one's

responsibility to them, are of the utmost importance. In the figure, if individual “i” were to have a dispute with individual “ix” within a segmentary lineage system, this would mean that all individuals belonging to “Major Segment A” would be allied with and come to the defense of individual “i.” Similarly, all individuals in “Major Segment B” would be allied with and come to the defense of individual “ix.” Thus, a dispute between two individuals escalates into a dispute between two large communities. Outside of segmentary lineage systems, where these allegiances are absent, the dispute might comprise, at most, a small number of friends or immediate family members of the two involved in the dispute.

In general, the number of individuals involved in a conflict will depend on the genealogical distance of those involved in the dispute. Because of one’s membership in a set of nested segments and the strong obligations to one’s kin within the segments, in segmentary lineage societies, small-scale disputes can easily escalate into larger-scale, sustained fighting or even full-blown warfare. In the modern context, and particularly in Africa, the region of our study, conflict often takes the form of civil conflict, where the external enemy is the government. However, even in this context, the same characteristics of segmentary lineage societies are still relevant. The structure allows segments to effectively mobilize against the common enemy, which in the setting of civil conflicts is the government.

This characteristic of segmentary lineage systems has been thoroughly studied by anthropologists. For example, Sahlins (1961, pp. 323, 333) argues that “segmentary lineage organization is a successful predatory organization in conflicts with other tribes... [Conflict], even if it has been initiated by a small lineage segment, pits ‘all of us’ against ‘them’.” Along similar lines, Evans-Pritchard (1940a, p. 142) describes the organization of the Nuer, a segmentary lineage group: “Each segment is itself segmented and there is opposition between its parts. The members of any segment unite for war against adjacent segments of the same order and unite with these adjacent segments against larger sections.” The logic is also illustrated by a traditional Bedouin proverb that is roughly translated as: “I against my brothers; my brothers and I against my cousins; my cousins, my brothers, and I against the world.” (e.g., Barth, 1973, p. 13; Combs-Schilling, 1985, p. 660).

In this study, we take this long-standing hypothesis to the data and test for a relationship between the presence of segmentary lineage organization and conflict today. There are a number of benefits to moving beyond the case study evidence. First, it is unclear whether the cases that

have been examined in the anthropology literature are representative. Our empirical strategy has the advantage of being able to estimate an average effect across the ethnicities in our sample. Second, the ethnographic studies are primarily from before the 1970s, and so it is possible that the strength of segmentary lineage organization, and the obligations that go with it, have weakened in recent decades. Although there are examples of segmentary lineages being important for recruitment in modern conflicts (e.g., Stearns, 2013), our findings provide systematic evidence that is relevant to this question. Third, our analysis also makes progress on the mechanisms that underly the relationship between segmentary lineage and conflict. The ethnographic literature has focused on retaliation and escalation mechanism. Because of this, once a conflict starts, it is more likely to escalate into a larger-scale and more-prolonged conflict than would be the case in non-segmentary lineage societies. In our analysis, we test explicitly for such mechanisms.

Information on the presence of segmentary lineage systems is not available from existing ethnographic databases such as the *Ethnographic Atlas* or the *Standard Cross-Cultural Sample*. Therefore, we collect data using published ethnographies, the primary source being the *Ethnographic Survey of Africa*, which is a series of studies, produced from the 1940s until the 1970s and edited by Daryll Forde. Using the definition from Middleton and Tait (1958), we code an ethnic group as having a segmentary lineage organization if: (1) there is a recognized and known unilineal descent system; (2) segments of the lineage take a ‘corporate form’, meaning that they are sub-units that affect administrative functions and political positions; and (3) lineages and genealogical relationships influence one’s location of residence. If any of these three characteristics are known to not be present, the group is coded as not having a segmentary lineage organization. If information about any of the three characteristics is missing, then the ethnic group is coded as missing and not included in our analysis.

We restrict our analysis to ethnic groups from Africa, both because the ethnographic data are most readily available, systematically documented, and comparable within Africa, and because the geo-coded micro-level conflict data that we use are only available for Africa. In the end, we are able to definitively categorize 145 African ethnic groups, 74 of which are segmentary lineage societies and 71 of which are not. This comprises an estimated 212 million people or approximately 38% of the population of sub-Saharan Africa.

We use conflict data from the Armed Conflict Location and Event Data Project (ACLED), a geo-coded data set that catalogs information about each conflict event in Africa from 1997–2014.

The database includes information on the location, date, and other characteristics of “politically violent events.” By linking the geo-coded conflict data with a digitized map of the traditional locations of ethnic groups, we are able to calculate the frequency of conflicts that occur within the territory of each ethnic group.³

Our empirical analysis comprises two estimation strategies. The first is to estimate the cross-ethnicity relationship between the traditional presence of a segmentary lineage organization and the intensity of conflict within the territory of the ethnic group from 1997–2014. We find a consistent and robust positive relationship between the two. Segmentary lineage groups experience more conflicts. This is true whether we measure conflict intensity using incidence, duration, or number of fatalities. We also find a positive relationship for conflicts of different types; namely, all conflicts, civil conflicts, non-civil conflicts, and localized within-group conflicts. The magnitudes of the estimated effects are sizeable. For example, segmentary lineage groups tend to experience approximately double the conflict incidents of groups without segmentary lineages.

We find that these relationships are very similar when we control for an extensive set of covariates, which include: country fixed effects, historical covariates (political centralization, historical development as measured by settlement complexity, and patrilineal descent), and a host of geographic covariates (agricultural suitability, altitude, distance from the equator, amount of land inhabited by the ethnic group, distance from the center of an ethnic group to the nearest country border, an indicator for the ethnic group being split by a national border, and historical malaria exposure as measured by the prevalence of the sickle cell trait).

Since the conditional correlations potentially suffer from the standard inference concerns that plague cross-sectional estimates, namely the presence of omitted factors, including those that are unobservable to the researcher, we also implement a second set of estimates that attempt to address the presence of omitted factors that may bias our estimates. We first restrict attention to pairs of ethnic groups that share a border and where one has a segmentary lineage organization and the other does not. In our sample, there are 68 such pairs. We then take 10km-by-10km grid-cells to be the unit of observation and implement a regression discontinuity (RD) identification strategy, where we estimate the effect of segmentary lineage organization on conflict across grid-

³The strategy of using location to link conflicts to ethnic groups follows the methodology of Michalopoulos and Papaioannou (2016). The same logic has also been used to measure the average incomes of ethnic groups (e.g., Michalopoulos and Papaioannou, 2013, 2014, Alesina, Michalopoulos and Papaioannou, 2016).

cells that are close to the border, while controlling for two-dimensional running variables.

We first verify that the accuracy of the ethnic boundaries by using data from the third to sixth rounds of the Afrobarometer surveys, which report information on the exact location (latitude and longitude) and self-reported ethnicity of respondents. The RD estimates shows a sharp discontinuity in ethnicity exactly at the mapped ethnicity boundaries. This confirms the validity of the boundaries and their use in the RD estimation.

We find that the RD estimates are qualitatively identical to our OLS estimates. The relationships between segmentary lineage organization and our measures of conflict are all positive and highly significant. These findings are robust to different bandwidths and to different methods of controlling for the two-dimensional running variables.

The benefit of the RD estimates over the OLS estimates is that omitted factors, even those that are unobservable, are better accounted for. As long as the omitted factors vary smoothly over space – for example, because physically close units have similar geography, climate, and history – they will be taken into account by the RD estimation strategy. However, the strategy is deficient if there are omitted factors that also vary discontinuously at the border. To explore the potential importance of this issue, we first check for differences in observable characteristics between societies with and without segmentary lineages. We find that the two groups are balanced on a wide variety of observable covariates. This finding is consistent with arguments suggesting that the emergence of segmentary lineage systems was an idiosyncratic process and, therefore, is uncorrelated with environmental, social, or structural factors (Evans-Pritchard and Fortes, 1940, Smith, 1956, Salzman, 1978, Kelly, 1983). We also conduct a series of placebo tests where we examine pairs of adjacent ethnic groups that have the same segmentary lineage status but differ in other dimensions. We then test for discontinuities based on these alternative ethnicity-level characteristics. We find no evidence that the other characteristics affect conflict.

The most-commonly cited reason for a link between segmentary lineage organization and conflict is that the segmented structure and the strong allegiances cause initially-small disputes to escalate into larger-scale conflicts. If an individual is wronged or becomes involved in a conflict or dispute, lineage mates must come to their defense. We undertake a number of strategies to test for such a mechanism. The first identifies conflict incidents that appear to be responses to previous incidents and separately estimate the effects of segmentary lineage on conflicts that are retaliatory and those that are not. We find that while segmentary lineage is associated with more

conflict of both types, the association is larger for retaliatory conflicts.

The second test that we undertake separately estimates the relationship between segmentary lineage organization and the frequency of conflicts of different sizes, namely those with: no fatalities, 1–10 fatalities, 11–100 fatalities, and more than 100 fatalities. We find that although segmentary lineage organization is associated with a greater incidence of conflicts of all types, the estimated relationship is systematically stronger, both in terms of magnitude and statistical significance, the larger the conflict.

The final test explicitly examines the effect of segmentary lineage organization on the duration (i.e., offset) of existing conflicts and on the onset of new conflicts. We find that the presence of a segmentary lineage organization has a positive effect on the duration of conflicts (i.e., negative effect on the probability of conflict offset). The estimated effects are large in magnitude, highly significant, and robust across specifications. By contrast, we find that the effect of segmentary lineage on conflict onset, although also positive, are much smaller in magnitude, often statistically insignificant, and not robust across specifications.

Overall, the evidence provides support for retaliation and escalation being important channels behind the relationship between segmentary lineage organization and conflict. We also test for a host of other channels through which segmentary lineage could affect conflict, including through economic wellbeing, public goods provision, risk sharing, and exclusion from national political power. We find no evidence that these factors are affected by segmentary lineage organization. Thus, it is unlikely that these are mechanisms that explain the conflict findings.

Our findings contribute to a better understanding of the incidence, intensity, and duration of conflict in developing countries.⁴ This literature has proposed various types of explanations, many based on the dichotomy between ‘greed’ and ‘grievance’ (Collier and Sambanis, 2005). Greed factors include the presence of ‘lootable wealth,’ such as oil or diamonds (Weinstein, 2006, Ross, 2004, 2006), or foreign aid (De Ree and Nillesen, 2009, Nunn and Qian, 2014, Crost, Felter and Johnston, 2014). On the grievance side, conflict could be induced by inequality within society (Cederman, Gleditsch and Buhaug, 2013), the presence of ethnic cleavages (Montalvo and Reynal-Querol, 2005, Esteban, Mayoral and Ray, 2012), distrust (Rohner, Thoenig and Zilibotti, 2013), arbitrary national boundaries (Michalopoulos and Papaioannou, 2016), the lack of political accountability and democracy (Gleditsch and Ruggeri, 2010) or other types of exploitative

⁴See Blattman and Miguel (2010) for an overview of this literature.

institutions (Richards, 1996, Wood, 2003). Also potentially important are factors that influence the opportunity cost of engaging in conflict (Miguel, Satyanath and Saiegh, 2004, Debos, 2011, Hoffman, 2011, McGovern, 2011, Dube and Vargas, 2013, Debos, 2016). A final recurrent theme in the literature is that conflict – namely, civil conflict – occurs as a consequence of state weakness, as proxied by real per capita GDP (Fearon and Laitin, 2003) or measured more directly by state history (Depetris-Chauvin, 2014). Most closely related to the focus of our research is the recent analysis by Konig, Rohner, Thoenig and Zilibotti (2017), which shows the importance of cross-group network structures and alliances. Our findings complement this line of research by also showing the importance of within-group social structure for conflict.

Our findings also contribute to a well-established anthropological literature that, through case studies, has hypothesized and documented the effects that segmentary lineage structures have on conflict (e.g., Evans-Pritchard, 1940a,b, Bohannon, 1958, Kelly, 1985, Lewis, 1994, 1989, Salzman, 2007, Zeman, 2009, Stearns, 2013, Ahmed, 2013b, Hoehne, 2015). While the studies recognize that segmentary lineage organization can potentially affect all types of conflict, their focus tends to be on the effects that segmentary lineages have on within-ethnicity conflict. Our estimates test for this directly by examining the effects of segmentary lineage organization on localized within-group conflicts, as well as extending this line of inquiry and asking whether the same mechanisms are also important for civil conflicts.

Our findings also contribute to a deeper understanding of the long-run consequences of the pre-colonial characteristics of African societies. A number of important studies have documented the importance of historical political centralization for economic outcomes today (e.g., Gennaioli and Rainer, 2007, Michalopoulos and Papaioannou, 2013). Although this is clearly an important determinant of subsequent outcomes, our analysis shows that other dimensions – namely, social structure and the nature of kinship – are also important. Our focus on this dimension of social structure connects our findings to previous studies that also examine the importance of various dimensions of social structure within developing countries. For example, La Ferrara (2007), Gneezy, Leonard and List (2009), La Ferrara and Milazzo (2011) and Lowes (2016) study the importance of matrilineal versus patrilineal inheritance, while Bau (2016) studies the importance of matrilineal versus patrilineal residence. Dunning and Harrison (2010) show how the social custom of cross-cutting alliances called “cousinage” influences the appeal of ethnic political appeals in Mali. Greif (1994) examines the institutional divergence between Genoa and other

parts of the Mediterranean by positing differences in underlying kinship relations, which did not allow the Genoese to use community enforcement mechanisms in contractual relations and Greif and Tabellini (2010), building on a large historical literature, use a similar argument to explain the historical divergence between Europe and China. More recently, studies have examined the relationship between the strength and scope of kinship networks and democracy (Schulz, 2017), corruption (Akbari, Bahrami-Rad and Kimbrough, 2017), and morality, psychology, and economic behavior (Enke, 2019).

The difference between attitudes towards and treatment of family members versus non-family members has a basis in biology (Hamilton, 1963, Henrich and Henrich, 2007) and has been applied to study problems of economic development (Banfield, 1958). Kinship, as measured by the strength of family ties, has also been extensively used in the literature on social networks (Ansell and Padgett, 1993, Naidu, Robinson and Young, 2015), and has been shown to be associated with a range of economic, social, and political outcomes (Alesina and Giuliano, 2014). In the political economy literature, family ties have also been explored as sources of political power and dynastic politics (Dal Bo, Dal Bo and Snyder, 2009, Querubín, 2016, Cruz, Labonne and Querubin, 2017).

The paper proceeds as follows. In the next section, we review the existing anthropological explanations for why some societies are organized along the basis of segmentary lineages and others are not. We then discuss case study evidence which makes a causal link between segmentary lineage organization and conflict. Section 3 discusses the data and, in particular, the coding of segmentary lineage structure based on ethnographic sources. Section 4 presents our OLS estimates and section 5 presents our RD estimates. Section 6 investigates causal mechanisms, including retaliation and escalation channels that have been the focus of the anthropology literature. Section 7 discusses the relevance of our findings for ethnic groups outside of Africa. Section 8 concludes.

2. Background

A. The Determinants of Segmentary Lineage Organization

Why some societies are organized in segmentary lineages and not others has been a longstanding question in anthropological research. Although several theories have been presented to explain the origin of segmentary organization, there is, as of yet, no agreed upon explanation. One

school of thought hypothesizes that the physical environment is an important determinant. For example, a number of scholars postulate that if the environment is such that a group can survive without significant travel outside their tribal sub-group's territory, then associations outside of the group do not form and this tends to maintain a segmentary lineage system (Evans-Pritchard, 1969, Forde, 1953, 1970, Verdon, 1982). Thus environments that fail to facilitate long-distance trade will tend to promote the presence of segmentary lineage organization.

Another line of reasoning argues that segmentary lineage organization is not determined by the environment but is an ideology or culture that emerges through a complex evolutionary process that leads to the emergence of the organization form in a manner that appears idiosyncratic (Smith, 1956, Salzman, 1978, Kelly, 1983). Empirical evidence testing these hypotheses remains scarce. A recent exception is Enke (2019), who documents a relationship between the historical disease environment of a society and the strength of kinship ties. While strong kinship is not the same as the presence of segmentary lineage organization, there is likely a relationship between the two. Motivated by this finding, which suggests the potential importance of ecological conditions for the emergence of segmentary lineage organization, our analysis checks for balance between segmentary lineage and non-segmentary lineage groups across an extensive set of covariates and we also control for a large number of covariates in our OLS analysis. In addition, our RD analysis compares locations that are geographically very close to each other and, thus, should have very similar ecological conditions.

B. The Relationship between Segmentary Lineage and Conflict

Numerous studies have documented examples of an apparent link between segmentary lineage organization and the initiation and/or propagation of conflict. Many point out the strong effect that segmentary lineage organization can have on the exacerbation of small conflicts. Once a conflict begins, segmentary lineage structure results in an essentially automatic mobilization of additional combatants, which makes resolving the conflict much less likely.

One of the best-studied segmentary lineage societies is the Somali, whose social structure is dominated by segmentary organization. Anthropologist Ioan Lewis (1961) argues that the segmentary lineage system plays a major role in propagating conflict in Somalia. He writes that "quarrels between individuals which result in loss of life or property or both are often quickly followed by retaliation where there is little thought of negotiation. Within a clan bitter feuds

develop and persist, often for many years and sometimes generations, erupting spasmodically as later incidents occur, and being temporarily forgotten only in the context of wider hostilities” (Lewis, 1961, p. 243).

Segmentary lineage organization has also been associated with more-organized forms of conflict, like political violence. In his book *Blood and Bone*, Ioan Lewis (1994) describes the link between segmentary lineage organization and organized violence in the Somali region during the 1980s. After the Ogaadeen war of 1977–1978, there was an upsurge of “tribalism,” which was led by the President Siad Barre, whose goal was to consolidate the position of his own clan and family. Rather than develop a national identity, his strategy was to recruit as many tribal segments as possible within the segmentary system. In turn, this caused segments opposed to the government to build allegiances among their own segments (Lewis, 1994, pp. 225–226). That is, the “segmentary structure allowed both the government and opposition to mobilize large swaths of the lineage system” (Lewis, 1994, p. 232). This societal polarization along tribal and genealogical lines lays at the foundation of Somalia’s subsequent political conflict.

The relationship between lineage organization and violent conflict continues to be important. A 2015 Rift Valley Institute Report reaffirms its importance in a discussion of an upsurge of conflict during 2006. It describes how the military efforts of the Warsangeli and Dubays fighters is “in line with the segmentary logic of the northern Somali society as a whole: as soon as a common threat emerges from outside, members of a descent group unite at the highest necessary level (sub-clan, clan, or clan-family). Conversely, in the absence of such a threat, a group breaks up into smaller units that fend for themselves” (Hoehne, 2015, p. 217).

The Somali example clearly illustrates the obligations that arise due to segmentary lineages and how these can cause individuals to align with large portions of society against common threats and to become involved in conflicts even if they are otherwise far removed from the source of the conflict. This effect has also been documented among several other segmentary lineage groups. The Nuer, an ethnic group from South Sudan that strictly abides by segmentary lineage organization, have been well studied. Evans-Pritchard (1940a) describes this obligation among the Nuer of South Sudan, writing that they “state this structural principle clearly in the expression of their political values. Thus they say that if the Leng tertiary section of the Lou tribe fights the Nyarkwac tertiary section – and, in fact, there has been a long feud between them – the villages which compose each section will combine to fight.” (Evans-Pritchard, 1940a, p. 142).

Numerous other segmentary lineage societies also exhibit this same pattern. Lienhardt (1958) describes this same allegiance structure among the Dinka. Bohannon (1958) describes it amongst the Tiv of Nigeria, another segmentary lineage society and provides the specific example of fighting between the Morov of MbaKetsa and MbaHura of Tondov. In this case also, the segmentary structure facilitated recruitment to conflict, which significantly escalated a feud that began between just two tribal segments (Bohannon, 1958, p. 46).

The link between segmentary lineage and contemporary civil conflict is nicely illustrated by events in the Eastern DRC, which is a location of persistent conflict since 1994. One of the more prevalent rebel groups in the region today are the Raia Mutomboki. As their name, which is “angry citizens” in Swahili, indicates, the groups comprise populations of villagers who have mobilized for self-defense. The population, which is a segmentary lineage group called the Rega, first mobilized in a spontaneous and decentralized manner from 2005–2007 and then again in 2011. The success of this group is believed to have been due, in part, to their segmentary lineage structure, which enabled the near-automatic mobilization of fighters against their common enemy, the FDLR (Stearns, 2013). It is very plausible that the Raia Mutomboki, who are among the most prevalent and well-known rebel groups in the region today, would not have emerged without their segmentary lineage organization.

C. Other Systems of Kinship

Those societies without segmentary lineage organization comprise our control group. A common alternative organization form is centered around the village, which is led by a village chief. Radcliffe-Brown (1950, p. 42) describes this form of organization, referring specifically to the Lozi and Bemba of modern Zambia: “The typical corporate group in that region is a village constituted, by the persons who attach themselves to a headman. . . This group is an open, not a closed group; that is, individuals or families may join or leave it, moving from one village to another. It is usual that a number of the inhabitants of a village at any time should be related, either by cognatic ties or through marriage with the headman or with one another, but they do not form a unilineal kin group, which is by its constitution a ‘closed’ group.”

Radcliffe-Brown (1950, p. 43) also describes why unilineal descent (lineage traced through the male line only or the female line only) is important for segmentary lineage organization and why cognatic descent (tracing lineage through both the male or female lines) is not compatible with

segmentary lineage organization: "It is the corporate kin group... that controls the use of land, whether for hunting, for pastoral life, or for cultivation; that exacts vengeance for the killing of a member, or demands and receives an indemnity... A continuing social structure requires the aggregation of individuals into distinct separated groups, each with its own solidarity, every person belonging to one group of any set... In kinship systems cognatic kinship cannot provide this; it is only made possible by the use of the principle of unilineal descent."⁵ Analyses of cognatic kinship groups illustrate that they are very different in structure from segmentary lineage groups. Most important for thinking about the mechanisms linking social structure and conflict is the fact that segmentary lineage societies are closed in a way cognatic societies are not and that all of the functions that a corporate group might undertake – social, political, judicial, or administrative – are fused together in a segmentary lineage group. These elements seem to create a far greater social solidarity in segmentary lineage societies and much greater ability to engage in collective action. This is not so in societies with cognatic kinship, where there is typically a clear differentiation between kinship relations and political relations (Fortes, 1953, p. 26; Gluckman, 1951, p. 31).

Writing about the Lozi of Zambia, Max Gluckman (1950) makes a similar point: "No corporate unilineal group of kinsmen exists among the Lozi. Every child... has a right to make its home in a village of either of its mother's parents and to inherit there. It also has these rights with the kin of its father... There are no broadly based unilineal groups associating in common rights of residence, ownership, inheritance, production etc." (Gluckman, 1950, pp. 171, 173). Thus, it is clear that the social organization of ethnic groups, like the Bemba or Lozi, who base groups on villages, is very different from segmentary lineage organization, in which kinship ties are pre-determined, clearly defined, and form distinct non-overlapping groups (e.g., segments). While the Bemba and Lozi had centralized states, their form of village/chief organization can also be found among ethnic groups that were stateless, such as the nearby Tonga (Colson, 1951). This system is also common among groups in other parts of Africa, with the most well-studied groups being the Wabena of Tanzania and the Ankole and Toro of Uganda (Gluckman, 1950, p. 178).

In addition to cognatic kinship societies, there are a number of other common forms of organizing society apart from adopting a segmentary lineage organization. For example, there are

⁵As we discuss further below, one of the primary characteristics of segmentary lineage organizations, which is relevant for creating an ethnicity-level measure is whether a society has unilineal descent.

societies, like the Masai in Kenya and Tanzania, whose politics and administration are organized by age – i.e., around age-sets – and not by lineage or descent. Age-based organizations also create obligations, although to those within one’s own age set. One could also imagine that age could also provide a useful axis for mobilization and collective action and there is some evidence that in certain instances it can, either historically (Gluckman, 1940, Eldredge, 2014) or in the modern period (Kurimoto and Simonse, 1998). However, what is distinct about segmentary lineage societies is the number of individuals that can be mobilized through lineage relative to age sets. While an age grade typically consists of tens of people lineage segments consist of hundreds or even thousands of people. Another example is very small scale societies that never develop either unilineal or cognatic kinship in any institutionalized form. Examples include such groups as the Hadza or the San people.

3. Data

A. *Conflict Data (ACLED)*

Our conflict data are from the *Armed Conflict Location and Event Data Project (ACLED)* database, which provides details of all known conflict events within Africa from January 1, 1997 to December 31, 2014. For each conflict event, information is provided on the location (latitude and longitude), the type of incident (riots and protests, battles, violence against civilians, etc), the actors involved (government forces, rebel militia, civilians, protestors, etc), the motivation of the actors (e.g., aimed at taking over land, riots, protests, etc), and the number of fatalities.

Given the possibility that the effect of segmentary lineage systems on conflict may differ depending on the nature of the conflict, our analysis examines four different measures of conflict. The first is the broadest and most aggregate measure, which includes all conflict incidents. The next two measures disaggregate conflict incidents depending on whether or not they are part of a civil conflict, which is defined as fighting between the government military and rebel groups. Thus, the second measure is conflict incidents that are part of a civil conflict, and the third measure is of conflict incidents that are not part of a civil conflict. The last measure that we construct isolates very local conflict incidents where both parties in the conflict are geographically local belonging to the same village or local ethnic group.⁶

⁶Details of the identification of each conflict type are provided in the online Appendix.

For each of the four types of conflict, we construct three measures of the frequency or prevalence of each type: the number of deadly conflict incidents, number of conflict deaths, and number of months from 1997–2014 with a deadly conflict incident. A deadly conflict is one with at least one battle death. In total, we have twelve measures of conflict.⁷

Following the methodology of previous studies (e.g., Michalopoulos and Papaioannou, 2016), we use location to connect conflict incidents to ethnic groups. This is done by combining the location of the conflict event with a digitized version of the map of ethnic boundaries taken from Murdock (1959) to construct measures of the frequency and intensity of conflicts occurring within the territory of each ethnic group.⁸ The use of location to infer those who are involved in the conflicts is motivated by the fact that, in general, conflicts tend to occur close to the homelands of participants. This is most clearly true for disputes and conflicts that do not involve the government military, which tend to be very localized. For conflicts that involve the government military – i.e., conflicts that we refer to as civil conflicts – conflicts also often occur within the ethnic homelands of the combatants. See for example the recent findings of Michalopoulos and Papaioannou (2016).⁹

B. Identifying Segmentary Lineage Societies

The most commonly used source for ethnographic information is the *Ethnographic Atlas*, which contains information on the traditional practices and characteristics of 1,265 ethnic groups. Although this source does include some characteristics of kinship practices, it does not contain information on whether a society is organized according to segmentary lineages. Therefore, to identify the presence or absence of a segmentary lineage system, we relied on the *Ethnographic Survey of Africa*, which is a multi-volume work that compiles ethnographic information from a large number of African ethnic groups. The *Survey*, edited by Daryll Forde, was published over the course of several decades, beginning during the late-1940s, by the International African Institute in London. It is divided into individual volumes, first by region and then by ethnic group, and each entry contains detailed information about the political, social, cultural, and

⁷All measures are positively correlated, with correlation coefficients that range from 0.49–0.84.

⁸The digitized map is taken from Nunn (2008) and is the same map as used in Michalopoulos and Papaioannou (2013, 2014, 2016).

⁹Although it would also be informative to connect ethnic groups to conflict by using information on the participants involved, unfortunately, this strategy is not feasible. It requires detailed information on the ethnicity of the parties involved in each conflict, which is not available. Often, we only have a very general description of the participants, such as “locals”, “protestors”, “civilians”, etc.

economic practices of each ethnic group, as well as a description of the ecological environment inhabited by the group. If a particular group was not included in the *Ethnographic Survey of Africa*, or when the information available was insufficient to determine whether or not it was a segmentary lineage society, we then consulted additional sources, including the references used in the *Ethnographic Atlas* to try to determine if the group had a segmentary lineage structure. Full details of the data construction are provided in the online Appendix.

For a group to be coded as a segmentary lineage society, we required that it satisfy the following three criteria, which are taken from Middleton and Tait's (1958) definition of a segmentary lineage society.

1. The society must be based on unilineal descent, and there must have been direct and explicit evidence that people identify with their lineages and are aware of their genealogical connections to members of other sub-groups.
2. The segments of the lineages must take on a 'corporate form', which means that branching lineage segments must determine administrative functions and political allegiances and that a centralized political authority entirely divorced from the lineage structure does not exist.
3. Lineage and genealogical relationships affect where people live, with those who are more closely related living geographically closer to one another. Thus, we require evidence that there is a geographic organization of residence that is based on the lineage system.

For an ethnic group to be coded as a segmentary lineage society, we required direct evidence that each of the three criteria is satisfied. Likewise, for an ethnic group to be coded as a non-segmentary lineage society, we required direct evidence that any of the three criteria is not satisfied. That is, lack of evidence for a criterion was not sufficient for a variable to be coded as not being a segmentary lineage system. In the end, we are able to code our segmentary lineage society indicator variable for 145 ethnic groups within Africa using the ethnicity classification of Murdock (1959). For the other ethnic groups, the existing evidence was not sufficient to determine with confidence whether an ethnic group is based on segmentary lineage organization or not. Although we do not have data for all ethnic groups in sub-Saharan Africa, the 145 ethnic groups account for 38% of the population of sub-Saharan Africa.¹⁰

¹⁰The figures are calculated using NASA *EarthData* estimates of population density in 2000 and Murdock's ethnic boundary shapefile.

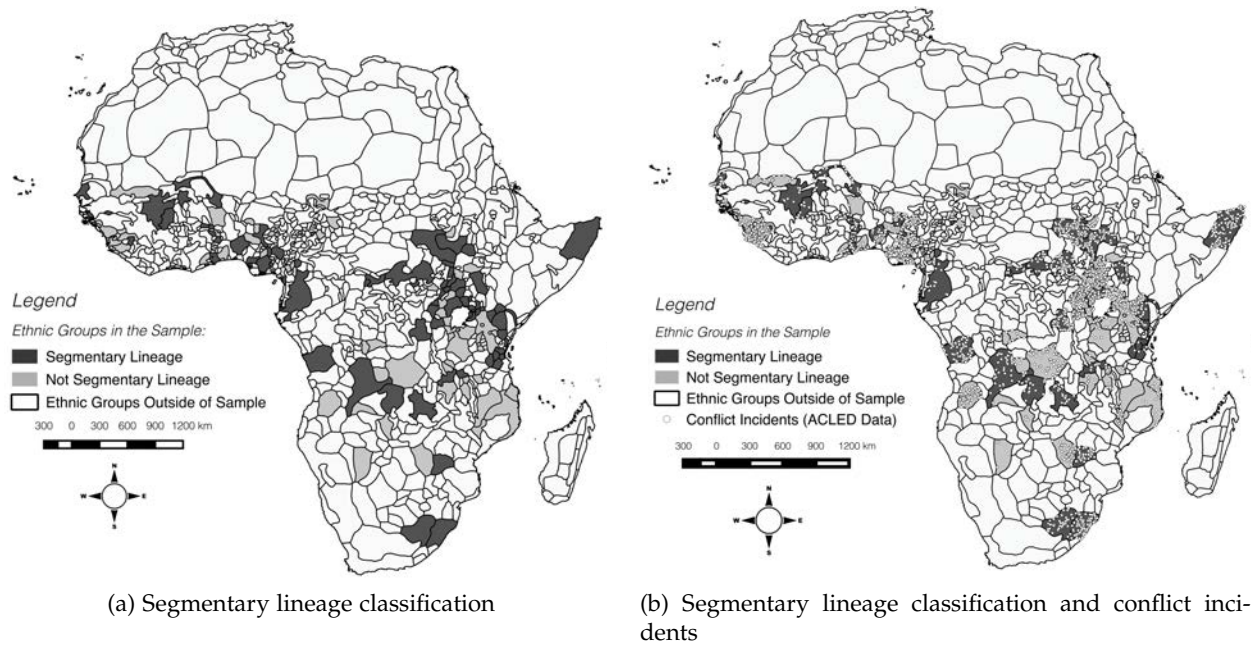


Figure 2: Maps showing the boundaries of ethnic groups, the presence and absence of segmentary lineage organization, and, in Figure 2b, the location of conflict incidents that occur within the boundaries of the ethnic groups in our sample.

As a check on the validity of our coding, after the variable was constructed, we consulted the existing secondary literature for cases where scholars had previously characterized or described specific ethnic groups as having a segmentary lineage organization or not. Reassuringly, in all cases (42 in total), our classification matched the majority consensus.¹¹ These cases are summarized in the online Appendix.¹²

The 145 ethnic groups are shown in Figures 2a and 2b. Segmentary lineage societies are depicted in dark grey and non-segmentary lineage societies in light grey. The map shows that our sample includes ethnic groups from many parts of Africa. In Figure 2b, we add the locations of conflict incidents in the ACLED dataset that occur within the boundaries of the ethnic groups in our sample.

To better understand the extent to which our sample of 145 ethnic groups is representative of the full population of societies within sub-Saharan Africa, we compare the characteristics of the ethnic groups within our sample to the ethnic groups that are outside of our sample but in the

¹¹This is not to say that there is always unanimity within the literature about the classification of every society. For example, Sahlins (1961) argues that the Dinka are not a segmentary lineage society, while Butt (1952) and Middleton and Tait (1958) argue that they are. The difference arises because Sahlins appears to have been using a narrower definition of segmentary lineage than is standard.

¹²The results that we report below are robust to restricting our sample of segmentary lineage ethnicities to those whose coding is verified by secondary sources and omitting from the sample those that cannot be verified.

Ethnographic Atlas. Within the *Ethnographic Atlas*, there are 420 ethnic groups from sub-Saharan Africa, 145 of which are in our sample and 275 of which are not. In Appendix Table A1, we report the averages for and differences between the two groups for nineteen historical, ethnographic, and geographic characteristics. For 16 of the 19 variables examined, we find no statistically significant difference between the two groups (at the 5% level or stronger). The three measures for which the samples appear different are: levels of jurisdictional hierarchy, the natural log of total population, and longitude. Thus, larger groups that have a more centralized political system are more likely to be in our sample. This is not surprising given that larger ethnic groups were more likely to be studied and documented by anthropologists and therefore are more likely to appear in our sample. This difference should be kept in mind when interpreting our results.¹³

C. Descriptive Statistics

Within our sample of 145 ethnic groups, 74 have a segmentary lineage organization, while 71 do not. Average differences between the two groups are summarized in Table 1, which reports the sample mean of and the estimated difference between segmentary lineage and non-segmentary lineage ethnic groups for different covariates. Panel A of the table reports statistics for the twelve conflict measures, constructed from the ACLED database.¹⁴ We observe that for all twelve conflict measures, conflict is significantly higher within segmentary lineage societies. The differences are large. Segmentary lineage groups tend to have 100–200% more conflicts than non-segmentary lineage groups.

Panels B, C, and D of Table 1 report balance for geographic, historical, and contemporary covariates.¹⁵ In contrast to the difference in conflict prevalence, we find little difference between the two groups for these other characteristics. For eighteen of the twenty geographic variables and for twenty-three of the twenty-four historical variables, we find no statistically significant difference. We find that for all seven of the contemporary measures, there is no statistically significant difference between the two groups.

¹³Our sample is slightly more likely to include ethnic groups from the eastern portion of Africa. It is possible that ethnic groups in the region were studied in greater detail than groups from other regions. It is also possible that it is simply due to chance. With almost 20 variables being examined, it is expected that even with actual balance, one of the twenty would be different from zero at a 5% significance level.

¹⁴Four types of conflicts are examined (all, civil, non-civil and local), with their intensities measured using either number of incidents, months of fighting, or deaths.

¹⁵The source and details of each variable are reported in the online Appendix.

Table 1: Balance statistics, reporting average differences between segmentary lineage and non-segmentary lineage societies.

(1) Variable Name	(2) Sample Mean	(3) SL vs. Not SL	(4) Variable Name	(5) Sample Mean	(6) SL vs. Not SL	(7) Variable Name	(8) Sample Mean	(9) SL vs. Not SL
Panel A: Conflict Variables								
<i>ln (1+Deadly Conflict Incidents):</i>			<i>ln (1+Conflict Deaths):</i>			<i>ln (1+Months of Deadly Conflict):</i>		
All Conflicts	2.556	1.554*** (0.269)	All Conflicts	4.006	2.085*** (0.426)	All Conflicts	2.158	1.246*** (0.217)
Civil Conflicts	2.070	0.972*** (0.297)	Civil Conflicts	3.109	1.800*** (0.443)	Civil Conflicts	1.631	1.043*** (0.215)
Non-Civil Conflicts	2.024	1.034*** (0.248)	Non-Civil Conflicts	3.046	1.910*** (0.361)	Non-Civil Conflicts	1.674	1.108*** (0.197)
Within Group Conflicts	1.266	1.058*** (0.196)	Within Group Conflicts	2.196	1.737*** (0.343)	Within Group Conflicts	1.128	0.916*** (0.169)
Panel B: Geographic Variables								
Land area (km squared)	32,517	8,955 (7,132)	Sorghum maximum yield (kg/ha)	157.9	-2.13 (10.07)	Mean temperature (degrees C)	24.17	-0.202 (0.471)
Distance to nearest border (km)	127.8	-35.23** (17.49)	Potato maximum yield (kg/ha)	58.41	11.51 (16.81)	Split ethnic group (10%), 0/1	0.317	0.0697 (0.0775)
Agricultural suitability index, 0-1	0.569	-0.00379 (0.0282)	Yam maximum yield (kg/ha)	217.7	-7.89 (12.66)	Malaria index, 0-39	14.05	1.213 (1.554)
Maize maximum yield (kg/ha)	277.6	-5.581 (11.78)	SD of agricultural suitability index	1.461	-0.0884 (0.0776)	Tsetse fly suitability index	0.122	-0.226 (0.154)
Cassava maximum yield (kg/ha)	288.6	-7.921 (20.14)	Ecological diversity (Fenske, 2014)	0.344	-0.0025 (0.0362)	Sicke cell allele frequency	0.0590	-0.0125** (0.0056)
Millet maximum yield (kg/ha)	49.27	-3.941 (4.159)	Mean altitude (km)	0.365	0.0286 (0.0569)	Absolute latitude (degrees)	7.70	-1.692* (0.880)
Longitude (degrees)	19.50	3.978 (2.655)	Latitude (degrees)	1.355	0.728 (1.517)			
Panel C: Ethnicity-Level and Historical Variables								
Jurisd. hierarchy (beyond local), 1-5	2.270	-0.417** (0.165)	Property rights in land, 0/1	0.939	-0.0121 (0.0448)	Female particip. in agriculture, 1-6	4.051	-0.352 (0.221)
Jurisd. hierarchy (local), 1-3	1.879	-0.0624 (0.111)	Patrilineal, 0/1	0.697	0.0954 (0.0766)	In slave exports (norm. land area)	0.348	0.113 (0.124)
Settlement pattern complexity, 1-8	5.821	0.228 (0.288)	Matrilineal, 0/1	0.138	-0.0098 (0.0585)	Headmen elected, 0/1	0.0621	-0.0164 (0.0444)
Dependence on agriculture, 0-9	5.834	-0.269 (0.242)	Patrilocal, 0/1	0.783	0.0511 (0.0694)	Moral high God, 0/1	0.172	-0.0485 (0.0632)
Dependence on husbandry, 0-9	2.021	0.0405 (0.233)	Matrilocal, 0/1	0.0420	0.0262 (0.0335)	City in 1800, 0/1	0.0417	-0.0012 (0.0335)
Herding society (Becker, 2019), 0-1	0.207	0.00514 (0.0241)	Polygyny, 0/1	0.855	-0.0906 (0.0581)	Christian mission station, 0/1	0.690	0.0266 (0.0774)
Agricultural intensity, 1-6	3.462	0.108 (0.165)	Cousin marriage, 0/1	0.673	0.0705 (0.0890)	Colonial railroad, 0/1	0.166	0.0483 (0.0619)
Single inheritor for land, 0/1	0.577	-0.0730 (0.0944)	Bride price, 0/1	0.786	0.0778 (0.0685)	In population density in 1960	2.656	0.339 (0.208)
Panel D: Contemporary Variables								
Mean lights in 2010	0.814	0.820 (0.512)	SD of lights in 2010 (norm. by mean)	13.04	-2.102 (2.105)	Growth 2000-2010, mean lights	0.157	0.036 (0.169)
ln (1+mean lights in 2010)	0.311	0.138 (0.088)	ln (1+SD lights in 2010)	2.323	-0.119 (0.142)	SD of lights growth, 2000-2010	0.509	-0.007 (0.104)
Muslim majority religion, 0/1	0.200	-0.0221 (0.0669)						

Notes: The unit of observation is an ethnic group. Columns 1, 5, and 7 report the ethnicity-level characteristics. In Panel A, the characteristics are the 12 baseline measures of conflict. In Panel B, they are geographic variables. In Panel C, they are historical characteristics. In Panel D, they are contemporary characteristics. Columns 2, 5, and 8 report the sample mean of each measure and columns 3, 6, and 9 report the difference in the characteristic between segmentary lineage and non-segmentary lineage groups. The standard error is reported in parentheses and *, **, and *** indicate significance at the 10%, 5%, and 1% levels.

One of the balance tests that is worth mentioning is that we find balance for the traditional reliance on pastoralism measure from Becker (2019). This helps alleviate the concern that segmentary lineage organization might be correlated with a tradition of herding, which is known to be associated with a ‘culture of honor’, which can lead to the escalation of violence and conflict (Nisbett and Cohen, 1996, Grosjean, 2014). The one measure that is statistically different between the two groups is the number of levels of jurisdictional hierarchy beyond the local

community.¹⁶ This is an important characteristic, especially given the existing evidence that this is associated with better development outcomes today (Gennaioli and Rainer, 2007, Michalopoulos and Papaioannou, 2013). Given this, we include this measure of historical state centralization in our baseline set of covariates.

4. OLS Estimates

A. Baseline Estimates

We now turn to OLS estimates of the relationship between segmentary lineage organization and conflict today. For this, we use the following estimating equation:

$$y_i = \alpha_{c(i)} + \beta I_i^{SL} + \mathbf{X}'_i \boldsymbol{\Gamma} + \varepsilon_i, \quad (1)$$

where i denotes ethnic groups and c countries. y_i denotes one of our twelve measures of conflict experienced by ethnic group i . I_i^{SL} is an indicator variable that equals one if ethnic group i is traditionally organized into segmentary lineages and zero if it is not. $\alpha_{c(i)}$ denotes country fixed effects. \mathbf{X}'_i is a vector of ethnicity-level historical and geographic covariates. The geographic controls are: the natural log of the land area occupied by the ethnic group, the natural log of the minimum distance between the ethnic group centroid and a national border, an indicator variable that equals one if the ethnic group is cut by a national border, average altitude, the absolute value of latitude, longitude, average agricultural suitability, and the historical prevalence of malaria measured using the frequency of the sickle cell gene. The historical controls are: pre-industrial political centralization (levels of jurisdictional hierarchy beyond the local community), pre-industrial economic development measured by the complexity of settlement patterns, which is measured on a 1–8 integer scale, and an indicator variable that equals one if the group is patrilineal.¹⁷ The coefficient of interest is β . A positive coefficient indicates that segmentary lineage societies experience more conflict.

Estimates of equation (1) are reported in Table 2. Each panel reports estimates for one of the four conflict types: all conflicts, civil conflicts, non-civil conflicts, and within-group conflicts. Each triplet of columns reports estimates for one of our three measures of conflict intensity: the natural

¹⁶The relationship between segmentary lineage and state centralization is negative and significant with a correlation coefficient of -0.41 .

¹⁷The details of the construction and measurement of each covariate is provided in the online Appendix.

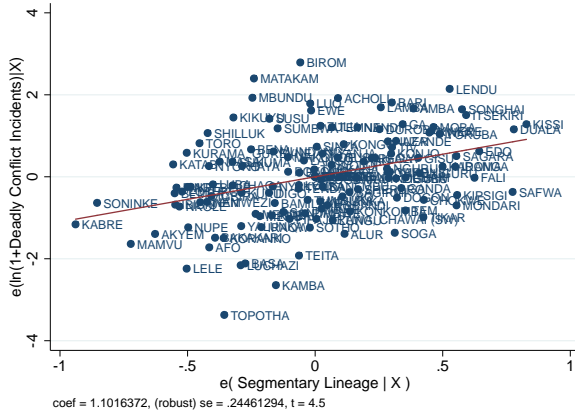
Table 2: Segmentary lineage and conflict: OLS estimates.

Dependent Variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	ln (1+Deadly Conflict Incidents)			ln (1+Conflict Deaths)			ln (1+Months of Deadly Conflict)		
Panel A: All Conflicts									
Segmentary Lineage	1.147*** (0.294)	1.146*** (0.217)	1.102*** (0.245)	1.627*** (0.467)	1.685*** (0.375)	1.439*** (0.420)	0.905*** (0.240)	0.890*** (0.176)	0.869*** (0.195)
Jurisdictional Hierarchy			-0.0641 (0.122)			-0.303 (0.186)			-0.0133 (0.0964)
Mean of Dep. Var.	2.56	2.56	2.56	4.01	4.01	4.01	2.16	2.16	2.16
R-squared	0.530	0.705	0.717	0.555	0.694	0.716	0.525	0.713	0.726
Panel B: Civil Conflicts									
Segmentary Lineage	0.819*** (0.297)	0.790*** (0.245)	0.611** (0.256)	1.306*** (0.497)	1.383*** (0.433)	1.051** (0.460)	0.704*** (0.251)	0.704*** (0.205)	0.577*** (0.216)
Jurisdictional Hierarchy			-0.178 (0.122)			-0.347* (0.184)			-0.112 (0.0925)
Mean of Dep. Var.	2.07	2.07	2.07	3.11	3.11	3.11	1.63	1.63	1.63
R-squared	0.556	0.693	0.716	0.514	0.633	0.670	0.470	0.634	0.657
Panel C: Non-Civil Conflicts									
Segmentary Lineage	0.905*** (0.244)	0.893*** (0.189)	0.993*** (0.218)	1.513*** (0.407)	1.580*** (0.317)	1.637*** (0.371)	0.773*** (0.214)	0.765*** (0.164)	0.848*** (0.185)
Jurisdictional Hierarchy			0.101 (0.114)			0.0552 (0.183)			0.0971 (0.0996)
Mean of Dep. Var.	2.02	2.02	2.02	3.05	3.05	3.05	1.67	1.67	1.67
R-squared	0.584	0.730	0.742	0.518	0.681	0.693	0.524	0.705	0.721
Panel D: Within Group Conflicts									
Segmentary Lineage	0.773*** (0.190)	0.779*** (0.184)	0.800*** (0.204)	1.393*** (0.349)	1.363*** (0.337)	1.320*** (0.385)	0.664*** (0.162)	0.661*** (0.157)	0.684*** (0.174)
Jurisdictional Hierarchy			-0.0399 (0.112)			-0.129 (0.211)			-0.0374 (0.0956)
Mean of Dep. Var.	1.27	1.27	1.27	2.20	2.20	2.20	1.13	1.13	1.13
R-squared	0.586	0.679	0.697	0.576	0.650	0.673	0.583	0.689	0.703
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geographic controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Historical controls	No	No	Yes	No	No	Yes	No	No	Yes
Observations	145	145	141	145	145	141	145	145	141

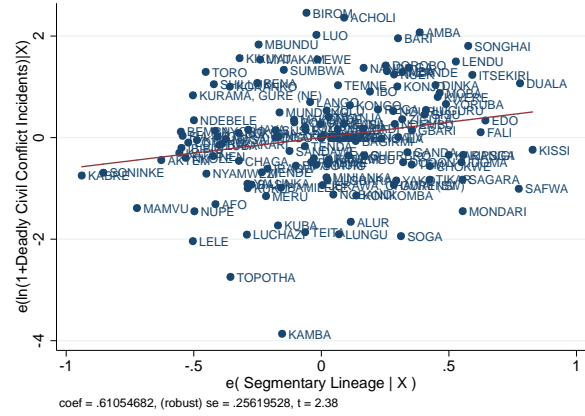
Notes : The unit of observation is an ethnic group. Along with the segmentary lineage variable, in columns 1, 4 and 7, we include country fixed effects. In columns 2, 5 and 8, we add a set of 'geographic controls,' which include the log of the land area occupied by the ethnic group, the log of the minimum distance between the ethnic group centroid and a national border, an indicator variable that equals one if the ethnic group is split by a national border, mean altitude, absolute latitude, longitude, an agricultural suitability index, and the average sickle cell allele frequency in the ethnic group homeland. In columns 3, 6 and 9, we add a set of 'historical controls,' which include historical political centralization (jurisdictional hierarchy beyond the local community), historical settlement pattern complexity, and an indicator for patrilineal societies. The coefficient on the political centralization variable is displayed since it is of independent interest. In Panel A, the dependent variables are constructed using all conflicts in the ACLED data; in Panel B they are constructed using civil conflicts; in Panel C, they are constructed using non-civil conflicts; and in Panel D, they are constructed using within group conflicts. All dependent variables are parameterized as $\ln(1+x)$. Robust standard errors are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels.

log of the total number of deathly conflict incidents (columns 1–3), the natural log of the number of conflict deaths (column 4–6), or the natural log of the number of months of deadly conflict (columns 7–9). For each outcome variable, we report three specifications, each with a different set of covariates. The first specification (in columns 1, 4, and 7) is the most parsimonious and only includes country fixed effects. The second specification (in columns 2, 5, and 8) also controls for the geographic covariates. The final specification (in columns 3, 6, and 9) also controls for historical covariates.

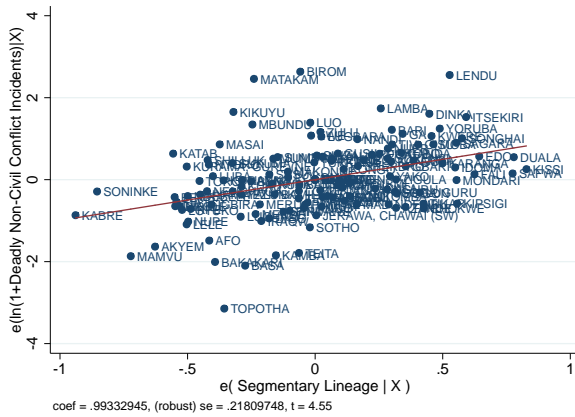
Across all 36 specifications, we estimate a positive and significant relationship between the presence of segmentary lineage organization and conflict. In addition to being statistically signif-



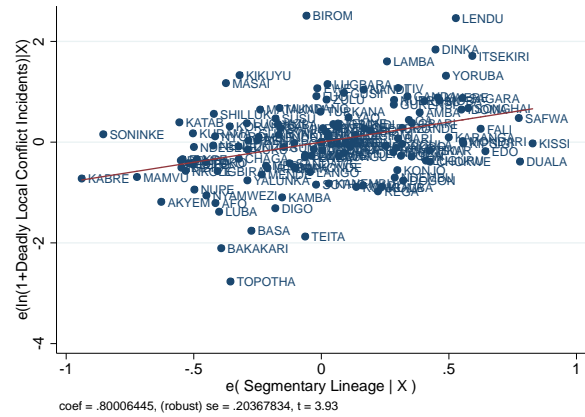
(a) All conflicts.



(b) Civil conflicts.



(c) Non-civil conflicts.



(d) Intra-group conflict.

Figure 3: The figure reports partial correlation plots where the dependent variable is the natural log of the number of conflict incidences of the reported conflict type. All specifications include country fixed effects, geographic covariates, and historical covariates.

icant, the estimates are also quantitatively meaningful. For example, according to the estimates for the number of deadly conflict incidents (columns 1–3 of panel A), a segmentary lineage society experiences 104–116% more incidents than a society that does not have a segmentary lineage organization. The estimated effects also remain very similar as we add additional covariates. This is important since it informs the likelihood that unobservables are driving our estimates.¹⁸

In Figure 3, we report partial correlation plots for each type of conflict, measured by number of incidents, and from the specification that includes country fixed effects, the geographic controls, and the historical controls (column 3). For each conflict type, the relationship appears general and to not be driven by a small number of influential observations.

¹⁸Formal tests of this are reported in Appendix Table B4 of the online Appendix. They indicate that it is unlikely that the estimated effects are due to unobservable characteristics.

An important assumption in our baseline estimates is that the fact that ethnic group i has segmentary lineages only affects conflict within group i 's own territory. However, it is possible that segmentary lineage groups could induce conflict not only in their homelands but also in the land of adjacent groups (e.g., if they launch attacks into neighboring territories). We test for such spillover effects by augmenting equation (1) with the addition of two variables intended to capture such spillover effects. The first is $SL_i^{Neighbor} = \sum_{k \in K_i} I_k^{SL}$, where k indexes neighbors, K_i is the set of neighbors of ethnic group i , and I_k^{SL} is an indicator that equals one if neighbor k is segmentary lineage. The second is $Non SL_i^{Neighbor} = \sum_{k \in K_i} I_k^{Non SL}$, where $I_k^{Non SL}$ is an indicator variable that equals one if neighbor k is not a segmentary lineage group. We are able to include both measures in equation (1) due to ethnic groups that are uncoded and therefore not defined as segmentary lineage or non-segmentary lineage. Thus, $SL_i^{Neighbor} + Non SL_i^{Neighbor} \neq 1$. The measures capture the relationship between the average segmentary lineage status of an ethnic group's neighbors and conflict in the ethnic group's territory. The estimates, which are reported in Appendix Table A2, show no evidence that being next to a segmentary lineage group increases conflict.¹⁹ In none of the 48 specifications that we estimate is either spillover measure statistically different from zero. In addition, the direct effect of segmentary lineage on conflict remains very similar in magnitude and significance when we account for spillovers.

Our measure of segmentary lineage organization is comprised of three parts, each of which must be satisfied for a group to be coded as having segmentary lineages. Thus, the variable can be thought of as a triple interaction between three indicator variables, each of which measures one of the three parts of the definition. We check the sensitivity of the estimated effects to explicitly controlling for indicators for each of the components of the definition. The estimates, which are reported in Appendix Table A3, show that the importance of segmentary lineage organizations is robust to controlling for each component of the definition. This provides reassurance of the importance of segmentary lineage organization itself and not just because it is correlated with, for example, unilineal descent.

Our construction of the segmentary lineage organization variable relied on direct coding using existing ethnographic sources. In the end, we are able to identify whether or not segmentary lineages were present for 145 ethnic groups. While the information needed for the coding is not

¹⁹The table has one fewer observation than for our baseline estimates. This is because one of the groups in our sample is an island and so has no immediately adjacent ethnic groups.

present in the *Ethnographic Atlas*, an alternative strategy is to use what information is available from the source to create an imputed proxy measure of segmentary lineage organization that is available for a wider range of ethnic groups. To do this, we identified the variables in the *Ethnographic Atlas* that most closely correspond to each component of the definition of segmentary lineage organization: (1) variables *v17* and *v19*, which report the largest matrilineal and patrilineal kin group; (2) variable *v15*, which contains information about whether communities are segmented and whether clans exist or not; and (3) variable *v12*, which contains information about the local of post-marital residence.

To construct a proxy measure of segmentary lineage organization from these variables, we first create a set of indicator variables, one for each category of each chosen variable, including a category for when the variable is coded as missing in the *Ethnographic Atlas*.²⁰ We then estimate the relationship between our ethnography-coded segmentary lineage variable and all fixed effects and their interactions using the study's sample of 145 ethnic groups. We use a restricted set of predictors using LASSO with the extended Bayesian information criterion (EBIC) to predict the prevalence of segmentary lineage organization for all African ethnic groups that are in the *Ethnographic Atlas*.²¹ The correlation between our baseline measure and the imputed measure is 0.65, suggesting that the variables in the *Ethnographic Atlas* have predictive power. The distribution of the imputed measure, which is continuous, is shown in Appendix Figure A1. The distribution highlights a conceptual shortcoming of the measure. While for many ethnic groups the value lies close to zero or close to one, for many the measure takes on an intermediate value close to 0.5. Given that the characteristic of interest is discrete, these are difficult to interpret. With this shortcoming in mind, we estimate the relationship between conflict and our imputed segmentary lineage measure, using an extended sample that includes all of Africa. The estimates, which are reported in Appendix Table A4, show that using this alternative strategy yields estimates that are qualitatively identical to our baseline OLS estimates.

B. Robustness and Sensitivity Checks

We now turn to an examination of the sensitivity and robustness of our baseline OLS estimates. Our baseline estimates identify an ethnic group as participating in a conflict by the location of the

²⁰This is because a number of observations (68 of 473) have missing values for at least one variable.

²¹The LASSO coefficients are reported in online Appendix Table B3.

conflict. An alternative strategy is to identify a group as participating in a conflict if the ethnic group is explicitly mentioned in the description of the participants of the conflict or conflict summary in the ACLED data. Since the ACLED data infrequently mention the ethnicity of those participating in the conflict, this strategy means that a large number of conflicts are not matched to an ethnic group. Specifically, only 9.1% of the conflicts in our baseline can be matched using this method. With this important caveat in mind, we report estimates using this alternative method in columns 1–3 of Appendix Table A5. We also check the robustness of our estimates to the use of data from an alternative source, the *Uppsala Conflict Data Program - Georeferenced Event Dataset* (UCDP GED), which has also been widely used in studies of conflict in sub-Saharan Africa (e.g., Miguel et al., 2004, Brückner and Ciccone, 2010).²² The estimates are reported in columns 4–6 of Appendix Table A5. For both alternative strategies for measuring conflict, we continue to find a sizeable positive and significant relationship between segmentary lineage and conflict.

We next check the sensitivity of our estimates to measures of historical conflict, which we construct using data from Besley and Reynal-Querol (2014) or Jaques (2007). Our estimates of interest, which are reported in Appendix Table A6, remain significant and their magnitudes similar when we account for the historical conflict.

Another potential concern is that our results may be driven by a small number of events with very intensive fighting that may be particularly influential in the regressions. Although the partial correlation plots reported in Figures 3a–3d do not appear to show that the estimates are due to a small number of influential observations, we test this formally by re-estimating our baseline specification after dropping observations identified as influential using Cook’s distance or observations with values of conflict in the top five percent. The estimates, which are reported in panels A and B of Appendix Table A7, show that both strategies yield estimates that are similar to the baseline estimates. Given our use of location to link conflicts to ethnic groups, in panel C, we check the robustness of our estimates to omitting conflicts for which the location is known only at the province level and not a smaller administrative unit. Such conflicts comprise 4.75% of conflicts. The estimates of interest remain robust.

An alternative estimation strategy to OLS is to use propensity-score matching to compare each

²²There are a number of differences between this data source and the ACLED source that we use. First, this source begins in 1991, six years earlier than the ACLED data. Second, unlike the ACLED data, this source has a minimum mortality threshold (25 fatalities in a calendar year) that has to be met for the conflict to appear in the dataset. Thus, checking the robustness of our findings to this alternative data source also checks the robustness of our estimates to using a slightly different time period and a higher death threshold.

segmentary lineage society to the non-segmentary lineage society that is most similar, based on a range of observable characteristics.²³ Estimates, matching using either location, the baseline set of geographic and historical controls, or the baseline set of controls with the added condition that the matched pair must have the same level of jurisdictional hierarchy, are reported in Appendix Table A8. The matching procedure generates estimates that are very similar to our baseline OLS estimates. The last check that we perform is to use negative binomial and Poisson models in our estimation. The estimates, which are reported in Appendix Table A9, show that these alternative estimators yield very similar estimates.

C. Heterogeneous effects

We now turn to the question of whether the effects of segmentary lineage organization are differential depending on the characteristics of the country that the ethnic group is predominantly within. The estimates are reported in Appendix Table A10. Examining heterogeneity by a country's British legal origin, being a former British colony, having a rural independence movement, per capita income, its polity measure, rule of law, and ethnic homogeneity, we fail to find evidence of heterogeneity.

We also test for differential effects depending on ethnicity characteristics. We examine: an ethnic group's historical intensity of slave exports, its traditional level of jurisdictional hierarchy beyond the local community, the presence of traditional village elections, an indicator for the ethnic group being split by a national border, the presence of colonial missions, the presence of a colonial railway, an indicator for Islam being the majority religion, the presence of a capital city, the presence of diamond deposits, and the presence of petroleum. The estimates, which are reported in Appendix Table A11, indicate heterogeneity for one of the eleven characteristics. If there is a capital city within the ethnic group's territory, then the effect of segmentary lineage organization is not statistically different from zero. This is consistent with Michalopoulos and Papaioannou (2014)'s finding that traditional ethnic characteristics are less important close to capital cities, where national institutions matter more.

The final form of heterogeneity that we examine is motivated by prior evidence of a relationship between rainfall and conflict within sub-Saharan Africa (e.g., Miguel et al., 2004, Rogall, 2014, König et al., 2017). Building on these findings, we test whether the effects of adverse rainfall

²³We use nearest neighbor matching based on Mahalanobis distance.

shocks differ by segmentary lineage status. Using rainfall data from the Tropical Rainfall Measuring Mission (TRMM) satellite, which beginning in 1998, are available at a 0.25-by-0.25-degree spatial resolution and at three-hour intervals, we calculate the average daily precipitation (in thousands of millimeters per day) experienced by each ethnic group in each month of our sample period. We then estimate:

$$y_{i,t} = \sum_{j=1}^6 \gamma^j y_{i,t-j} + \beta_1 \text{Neg Shock}_{i,t} + \beta_2 I_i^{SL} + \beta_3 \text{Neg Shock}_{i,t} \times I_i^{SL} + \mathbf{X}'_e \boldsymbol{\Omega} + \alpha_t + \varepsilon_{i,t}, \quad (2)$$

where i continues to index ethnic groups and t months from January 1998 to December 2014. $y_{i,t}$ denotes one of our measures of conflict intensity in the territory of ethnic group i during month t . $\text{Neg Shock}_{i,t}$ is a measure of adverse rainfall shocks experienced by ethnic group i in month t . This is calculated as the average monthly rainfall of ethnic group i over the sample period minus the rainfall experienced by ethnic group i in month t ; thus, a higher number means less rainfall. I_i^{SL} is our segmentary lineage indicator variable. Equation (2) also includes time-period fixed effects α_t and six lags of the dependent variable, $\sum_{j=1}^6 \gamma^j y_{i,t-j}$. Given the high frequency of the panel, it is important to account for lagged conflict. We include all lags of the dependent variable that are statistically significant, which is six. The coefficient of interest is β_3 , which tells us whether the effects of adverse rainfall shocks are different for segmentary lineage societies.

Estimates of equation (2) are reported in Appendix Table A12. Consistent with previous estimates, we find that adverse rainfall shocks are associated with greater conflict (e.g., Miguel et al., 2004). However, in line with other studies, we also find that this relationship is not always significant (e.g., Ciccone, 2013, Buhaug, Nordkvelle, Bernauer, Bohmelt, Brzoska, Busby, Ciccone, Fjelde, Gartzke, Gleditsch, Goldstone, Hegre, Holtermann, Koubi, Link, Link, Lujala, O'Loughlin, Raleigh, Scheffran, Schilling, Smith, Theisen, Tol, Urdal and van Uexkull, 2014). Importantly, we find that the weak positive relationship between adverse rainfall and conflict masks systematic heterogeneity. The estimated effect of adverse rainfall is much stronger for segmentary lineage groups. For non-segmentary lineage groups, the estimated relationships are not statistically different from zero.

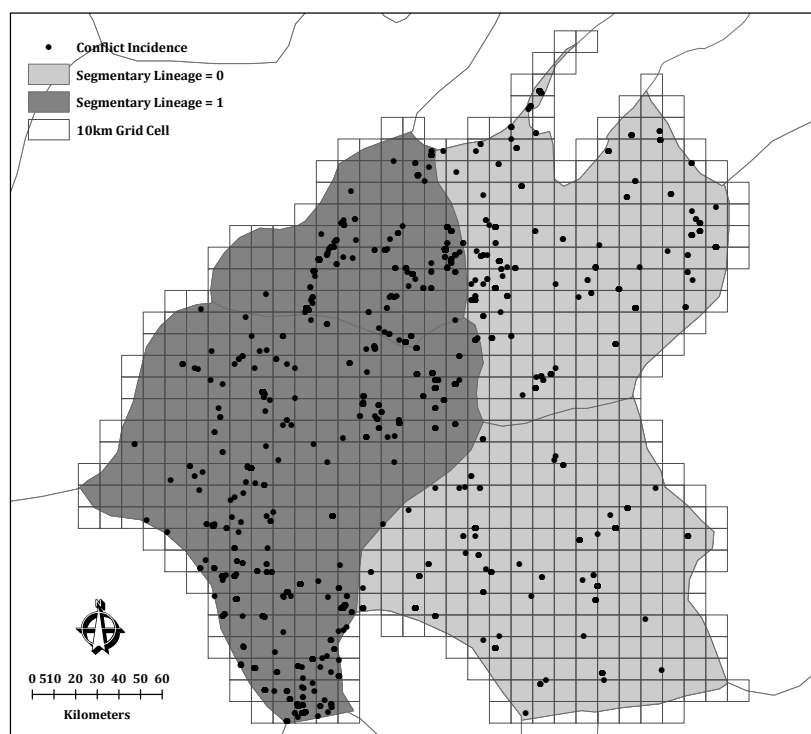


Figure 4: An illustration of the RD setting: ethnicity pairs, deadly conflict incidents, and 10km grid-cells. The two segmentary lineage ethnic groups shown are Ambo (top) and Konjo (bottom), and the two non-segmentary lineage groups shown are Toro (top) and Nkole (bottom) (all in Western Uganda).

5. Spatial Regression-Discontinuity Estimates

A. Baseline Estimates

Despite the robustness of our OLS estimates and the fact that our findings are similar when we account for a range of observable characteristics, there remains the concern that there are unobservables that may be biasing our estimates. For example, if ethnic groups have a persistent unobservable propensity to engage in conflict and if this affected whether ethnic groups adopted a segmentary lineage form of social organization in the past, then this unobservable trait could bias our estimates of interest. In this case, we would observe a relationship between segmentary lineage systems and conflict today even if no causal relationship exists. These unobservable traits could originate from a range of different sources, including the physical environment or historical experiences. Similarly, there may be unobservable contemporary factors, like the extent to which the rule of law is able to reach more remote locations from the capital city or the quality of transportation and communication infrastructure. These, and similar factors, might have direct effects on conflict.

Given this possibility, we also implement an alternative estimation strategy. Since unobservable factors are, by definition, unobservable, the strategy we undertake is to examine and compare locations that are geographically close, but where one location is inhabited by a segmentary lineage society and the other by a society without segmentary lineages. For this analysis, a 10km-by-10km grid-cell is the unit of observation and the sample consists of grid-cells within pairs of contiguous ethnic groups where one ethnicity has segmentary lineages and the other does not. Figure 4 illustrates the setup, showing grid-cells and pairs of contiguous ethnic groups, one of which has segmentary lineages and the other does not. The figure also shows the locations of deadly conflict incidents.

Our strategy is to use a regression discontinuity (RD) estimation method that restricts the sample to grid-cells that are sufficiently close to the ethnic boundaries and estimates the causal effect of segmentary lineage organization on the incidence of conflict using the estimated difference in conflict at the ethnic boundary. The benefit of this strategy is that it accounts for unobservable factors that vary smoothly across space. Therefore, as long as the determinants of unobservable traits – like geography, history (including the effects of historical conflict), idiosyncratic shocks, state presence etc. – vary smoothly, the unobservable traits will be accounted for by the RD strategy.

Our RD estimating equation is as follows:

$$y_{ip} = \omega_p + \gamma I_{e(i)}^{SL} + f(location_{ip}) + \mathbf{Z}'_i \boldsymbol{\Gamma} + \varepsilon_{ip} \quad (3)$$

where i indexes a 10-kilometer grid-cell, e ethnicities (80 in total), and p ethnicity pairs where one ethnic group has segmentary lineages and the other does not (68 in total). y_{ip} is a measure of the extent of conflict in grid-cell i which is within ethnicity pair p . $I_{e(i)}^{SL}$ is an indicator variable that equals one if cell i belongs to the ancestral homeland of an ethnic group e that traditionally had a segmentary lineage organization. $f(location_{ip})$ denotes a polynomial that controls for a smooth function of the geographic location of grid cells. In our baseline specification, we use a location's Euclidian distance from the border as the running variable, and, following Gelman and Imbens (2014), use a local linear specification, estimated separately on both sides of the border. We also report estimates using several other functional forms. ω_p denotes fixed effects for each ethnicity-pair. The vector \mathbf{Z}'_i denotes a vector of covariates that includes country fixed effects, as well as the following set of grid-cell level geographical controls: elevation, agricultural suitability,

and an indicator if the grid-cell is intersected by a national border.²⁴ The sample includes all grid cells of all pairs of ethnic groups that share a border and where one has segmentary lineages and the other does not.²⁵ The sample is further restricted to grid-cells that are within a certain distance of the border of the two ethnic groups, either 60, 80, or 100 kilometers.

As with the OLS, the RD strategy estimates the effects of a group's social organization on conflict in its territory. Therefore, the estimation will not capture, and might even be biased by, effects on conflicts that occur outside of the ethnic group's territory. Given this, as before, we will examine the effects on the same range of conflict types, including localized conflicts for which we expect all fighting to occur within the territory of the participants. At first glance, it might seem unclear as to whether an RD estimator is appropriate for civil conflicts since the fighting might not occur in the territory of the ethnic group participating in the conflict. While our view is that we should let the data speak on this issue, *ex ante*, there is reason to expect civil conflicts to occur in the territory of the insurgents. Anecdotal accounts suggest that segmentary lineage groups are able to better mobilize against the government and more effectively attacks on government forces (e.g., Stearns, 2013). The government forces then retaliate, which tends to be within the territory of the segmentary lineage groups. Thus, even with civil conflicts, one may observe a discontinuity at the boundaries of segmentary lineage groups.

As a first step, we first verify the validity of the Murdock (1959) ethnic boundaries that we use in the RD analysis. An important assumption when using the ethnic boundaries is that they coincide with actual discontinuities in ethnic affiliation today. We verify this by examining how ethnic affiliation changes at ethnicity boundaries using data from rounds 3–6 of the *Afrobarometer Surveys*, which record the ethnicity of respondents, as well as their location of residence. Combining this with the ethnicity map from Murdock (1959), we examine whether there is a discontinuity ethnic affiliation at the boundaries of the ethnicity pairs in our sample. Estimates of this are reported in Figure 5. The *y*-axis displays the fraction of the population in a bin that are a member of the segmentary lineage society whose border we are examining and the *x*-axis is distance in kilometers from the border, with positive numbers indicating distances inside of the segmentary lineage territory and negative numbers indicating distances outside of it. We find that there is a discontinuous change in the fraction of the population that report that they are

²⁴Details, including sources of these measures, are provided in the online Appendix.

²⁵If an ethnic group is adjacent to more than one ethnic group of different treatment status, then the ethnic group can be a part of multiple pairs.

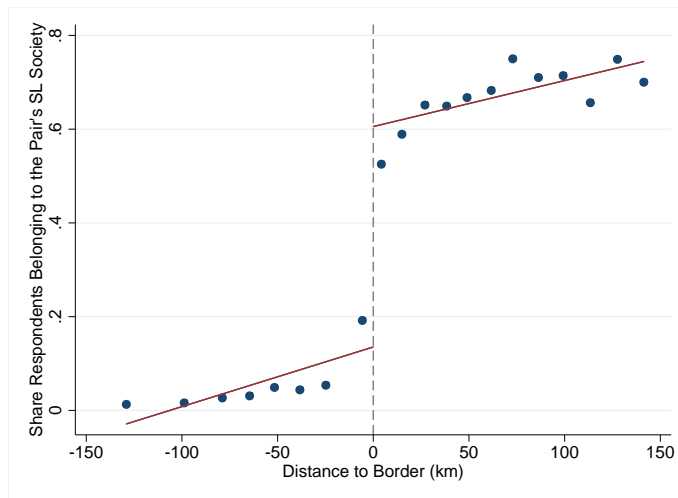


Figure 5: This graph presents the relationship between self-reported ethnicity and geographic location based on survey data from Rounds 3–6 of the *Afrobarometer* Survey. Data are aggregated for all borders between segmentary lineage and non-segmentary lineage societies in our sample. The x -axis reports geographic distance. Positive values imply kilometers into the territory of the segmentary lineage society and negative values are kilometers into the non-segmentary lineage society. The y -axis measures the fraction of the population at each distance that identifies as being a member of the segmentary lineage group.

members of the segmentary lineage group precisely at the border.²⁶

The next step of the analysis is to examine the raw data for the RD sample. Figures 6a–6d show bin scatterplots (with 20 bins) of the unconditional relationship between each of the four types of conflict and the distance from the ethnicity boundary. Even in the raw data, a discontinuity at the border is apparent. We observe a discontinuous increase in conflict on the segmentary lineage side of the border.

We next turn to the full RD estimates. Estimates of equation (3), for each of our three conflict measures (incidents, deaths, and months), are reported in Table 3. For each outcome, we report three specifications, each in a different column. In the first, we only include ethnicity pair fixed effects; in the second, we add country fixed effects; and in the third, we add the set of geographic controls. Each panel of the table reports estimates for a different type of conflict, either all conflicts, civil conflict, non-civil conflicts, and within-group conflicts. All estimates use a restricted sample of grid cells within 60km of the ethnicity-pair border. We find that in every specification, and irrespective of the measure of conflict, the estimated effect of segmentary lineage systems on conflict is positive and statistically significant. We also find that for each

²⁶ In Appendix Figure A2, we report the relationship for each round of the *Afrobarometer* separately. In all rounds, we see a sharp discontinuity at the ethnic boundaries.

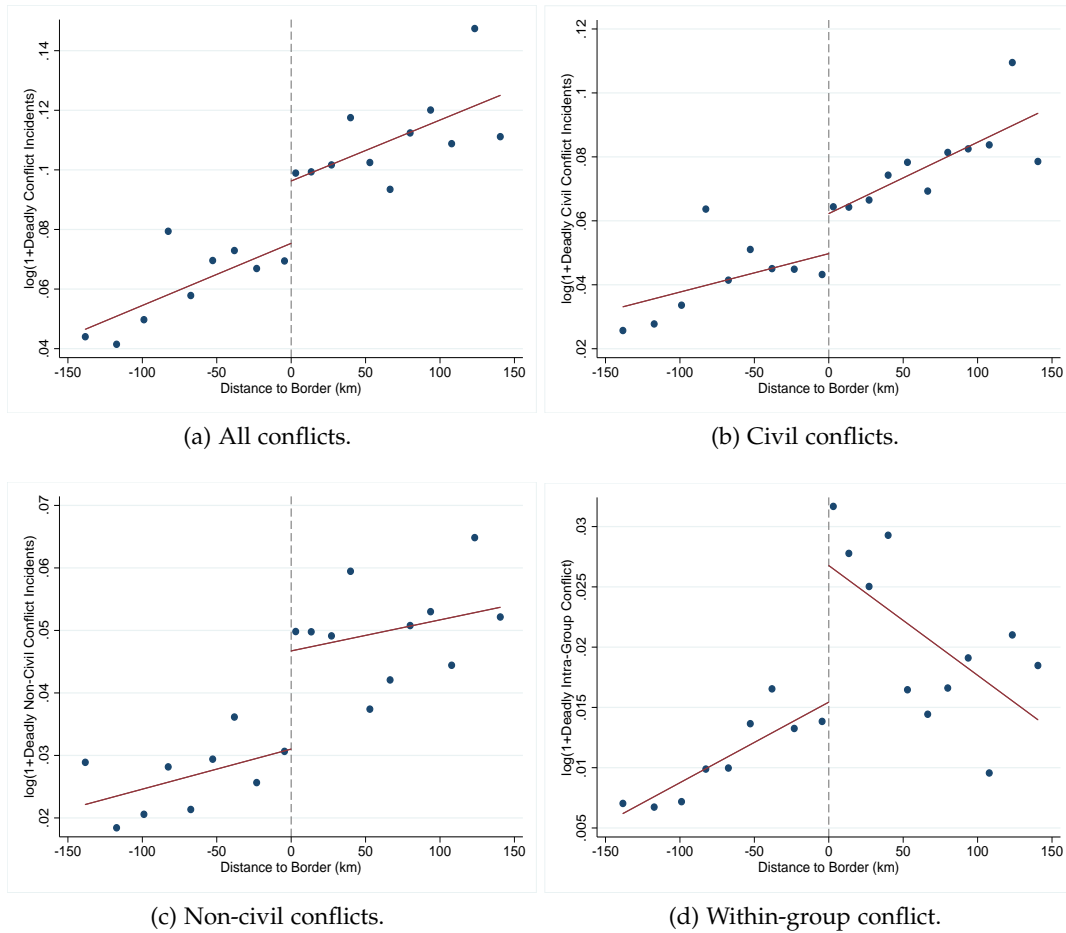


Figure 6: This figure presents a binscatter plot (with 20 bins) of the unconditional relationship between conflict incidence and distance from the border. The y -axis reports the natural log of one plus the number of deadly conflict incidents for each of the four different types of conflict. The x -axis reports distance (in kilometers) from the borders between segmentary lineage and non-segmentary lineage societies. The border is at kilometer 0, and positive values indicate kilometers in the territories of segmentary lineage societies.

outcome, the magnitude of the estimated effect is similar in the different specifications.²⁷

According to the estimated RD coefficients, segmentary lineage organization is associated with an increase in conflict of 0.08 to 0.10 standard deviations.²⁸ These estimates are smaller than those from the cross-ethnicity OLS regressions (reported in Table 2). According to the OLS estimates, segmentary lineage organization is associated with an increase in conflict of 0.33 to 0.62 standard deviations. Thus, the magnitudes of the OLS estimates are much larger than those from the RD estimates. One explanation for this difference is that the local estimate of segmentary lineage organization close to the border is smaller due to spillover effects. Being close to a

²⁷The partial correlation plots for the RD estimates are reported in Appendix Figure A3.

²⁸See online Appendix Tables B1 and B2 for summary statistics.

Table 3: Segmentary lineage and conflict: RD estimates.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Sample: Observations Less Than 60 km from Ethnic Boundary									
Linear Running Variable in Euclidean Distance to the Border									
Dependent Variable:	ln (1+Deadly Conflict Incidents)			ln (1+Conflict Deaths)			ln (1+Months of Deadly Conflict)		
Panel A: All Conflicts									
Segmentary Lineage	0.0420*** (0.0158)	0.0373** (0.0153)	0.0378** (0.0152)	0.0862*** (0.0283)	0.0791*** (0.0283)	0.0805*** (0.0278)	0.0323** (0.0128)	0.0283** (0.0126)	0.0287** (0.0124)
R-squared	0.095	0.122	0.122	0.084	0.088	0.088	0.094	0.116	0.116
Panel B: Civil Conflicts									
Segmentary Lineage	0.0301** (0.0134)	0.0263** (0.0125)	0.0263** (0.0124)	0.0563** (0.0238)	0.0503** (0.0238)	0.0505** (0.0235)	0.0237** (0.0102)	0.0201** (0.00981)	0.0200** (0.00979)
R-squared	0.103	0.139	0.139	0.088	0.092	0.092	0.101	0.132	0.132
Panel C: Non-Civil Conflicts									
Segmentary Lineage	0.0253*** (0.0088)	0.0237*** (0.0087)	0.0241*** (0.0086)	0.0600*** (0.0175)	0.0570*** (0.0168)	0.0579*** (0.0166)	0.0223*** (0.0082)	0.0211** (0.0081)	0.0214*** (0.0080)
R-squared	0.047	0.050	0.050	0.044	0.047	0.048	0.050	0.052	0.052
Panel D: Within Group Conflicts									
Segmentary Lineage	0.0133** (0.0058)	0.0130** (0.0059)	0.0130** (0.0058)	0.0302** (0.0129)	0.0286** (0.0126)	0.0288** (0.0124)	0.0103* (0.0052)	0.0100* (0.0053)	0.0100* (0.0052)
R-squared	0.035	0.036	0.036	0.034	0.035	0.036	0.036	0.037	0.038
Ethnicity Pair FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Geographic Controls	No	No	Yes	No	No	Yes	No	No	Yes
Ethnic Groups	80	80	80	80	80	80	80	80	80
Observations	10,739	10,739	10,739	10,739	10,739	10,739	10,739	10,739	10,739

Notes: The unit of observation is a 10km-by-10km grid cell. In columns 1-3, the outcome variable is the number of conflicts that resulted in at least one death; in columns 4-6, the dependent variable is the number of conflict deaths; and in columns 7-9, the dependent variable is the number of months during the sample period with at least one conflict, all parameterized as $\ln(1+x)$. All regressions include a linear polynomial in distance to the border and ethnic group pair fixed effects (68 pairs total). Columns 2-3, 5-6, and 8-9 also include country fixed effects and columns 3, 6, and 9 include a set of geographic controls: elevation, agricultural suitability, and an indicator variable that equals one if a grid cell intersects with a national border. In Panel A, the dependent variables are constructed using all conflicts in the ACLED data; in Panel B, they are constructed using civil conflicts; in Panel C, they are constructed using non-civil conflicts; and in Panel D, they are constructed using within-group conflicts. Standard errors, clustered at the ethnicity level, are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels.

segmentary lineage group may also increase conflict. Consistent with this interpretation, Figure 6 and Appendix Figure A3 show that it is often the case that within the non-segmentary lineage territory conflict is higher closer to the boundary. However, we found no evidence of spillover effects in our OLS analysis. Thus, it remains unclear to what extent spillovers can explain this difference.

The difference might also be explained by the fact that, as shown in Figure 5, close to the border within segmentary lineage territory, much less than 100% of the population actually belongs to a segmentary lineage group. We investigate this by estimating the relationship between the

share of the population that belongs to a segmentary lineage society and conflict using a “fuzzy” RD design, where the segmentary lineage indicator $I_{e(i)}^{SL}$ is used as an instrument for the actual population share. Because we require information on ethnic distribution of the population, the sample is restricted to grid-cells that individuals from the *Afrobarometer*. The 2SLS fuzzy RD estimates, which are reported in Appendix Table A13 along with the baseline RD estimates using the same sample, imply much larger causal effects of segmentary lineage organization. The fuzzy RD estimates are consistently 3.5 times larger than the OLS estimates. Thus, much of the difference between the RD and OLS estimates can be explained by imperfect compliance of individuals to the ethnicity boundaries.

B. *Validity and Sensitivity Checks*

We now check the sensitivity of our estimates to a range of robustness checks, which include: alternative specifications for the running variable, different restrictions on the window of observations that are included in the sample, and estimation using Poisson or negative binomial models. The estimates are reported in Appendix Table A14, where each column reports estimates using a different restriction on the range of observations included in the sample (60km, 80km, or 100km), and each panel reports different running variables and estimators.²⁹ In panel A, for reference, we report estimates for the baseline specification from Table 3. In panels B and C, we use the baseline running variable, but use a negative binomial and Poisson estimator. In panels D to I, we report estimates using a series of additional running variables, including latitude and longitude (and their interaction) instead of Euclidean distance, which allows us to control more directly for features that vary over two-dimensional space. In panel D, we include the baseline running variable interacted with 14 cluster indicator variables, where a cluster is defined as a set of contiguous ethnic groups. Thus, in this specification, the coefficient on the running variable is allowed to differ for different ethnic groups in the same region. In panel E, rather than using the distance from the border as the running variable, we use latitude and longitude and interact both with the 14 cluster indicator variables. In panel F, we include quadratic polynomials in latitude and longitude, with each component of the polynomial interacted with the 14 cluster indicators. Panels G–I are equivalent to panels D–F, except instead of interacting distance or

²⁹The estimates are for total conflicts. The estimates for civil conflicts, non-civil conflicts, and within-group conflicts are similarly robust.

latitude and longitude with 14 cluster indicator variables, we interact them with 68 pair indicator variables. Although these are demanding specifications (the running variable in Panel I, for example, consists of 340 variables) by allowing the running variable to vary for each ethnicity pair we are able to control for specific conflict patterns around each border segment. In the end, the estimates using any of these alternative specifications are similar to the baseline RD estimates. The estimated coefficients all remain positive and similar in magnitude, and in nearly every specification, they remain statistically significant.

An additional robustness check that we perform concerns the precision of the location data for conflicts. This is particularly important for the RD estimates since they are derived from differences in conflict intensity between areas that are geographically close. Thus, we re-estimate equation (3) after excluding conflict incidents for which only the province of the conflict is known and nothing finer. These low-precision conflicts comprise 4.75% of observations in the ACLED dataset. The estimates, which are reported in Appendix Table A15, show that our estimates are nearly identical when these observations are omitted.

One assumption of the RD approach is that unobservables vary smoothly across the borders. Although this is impossible to test directly, we glean evidence about the validity of this assumption by estimating whether there appears to be a discontinuity at the border for the following observable variables: elevation, slope, average temperature, the presence of a body of water, suitability for the cultivation of cereals,³⁰ the percentage of land that is currently under cultivation, the presence of petroleum, the presence of diamonds, the number of mission stations during the early colonial period, an indicator for the presence of a colonial railway, and an indicator for the presence of a pre-colonial explorer route.³¹ We check for discontinuities by estimating equation (3) with each variable as the dependent variable. Table A16 reports estimates using the specification from column 2 of Table 3. For each of the eleven variables, the coefficient on the segmentary lineage indicator is always small in magnitude and it is never statistically different from zero.

Although we find no evidence of discontinuities in geographic or historical factors, there remains the concern that other ethnic characteristics, besides segmentary lineage organization, may also vary discontinuously at the boundaries. To threaten the validity of our RD estimates, any other ethnic differences must have an independent effect on contemporary conflict. To check

³⁰Cereals include: wheat, wetland rice, dryland rice, maize, barley, rye, pearl millet, foxtail millet, sorghum, oat, and buckwheat.

³¹See the online Appendix for the details of each measure.

Table 4: RD estimates for other ethnicity-level characteristics.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Placebo Characteristic:	Jurisdictional Hierarchy			Historical Settlement Complexity			First Principal Component of Jurisdictional Hierarchy FE & Settlement Complexity FE			First Principal Component of Jurisdictional Hierarchy FE, Settlement Complexity FE & Patrilineal Indicator		
Dependent Variable:	Incidents	Deaths	Months	Incidents	Deaths	Months	Incidents	Deaths	Months	Incidents	Deaths	Months
Ethnicity with Larger Value	-0.0293 (0.0255)	-0.0162 (0.0308)	-0.0119 (0.0141)	-0.0291 (0.0229)	-0.0711 (0.0434)	-0.0232 (0.0189)	-0.0132 (0.0125)	-0.0226 (0.0180)	-0.0121 (0.0097)	0.0238 (0.0195)	0.0211 (0.0267)	0.0103 (0.0119)
Ethnicity Pair FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ethnic Groups	74	74	74	79	79	79	98	98	98	98	98	98
Observations	9,174	9,174	9,174	10,441	10,441	10,441	15,250	15,250	15,250	15,250	15,250	15,250
R-squared	0.221	0.175	0.171	0.191	0.125	0.127	0.200	0.145	0.142	0.199	0.144	0.142

Notes: The unit of observation is a 10km-by-10km grid cell. All regressions include a linear running variable in distance to the border and both ethnicity-pair fixed effects and country fixed effects. The dependent variables are our baseline measures of conflict, each parameterized as $\ln(1+x)$. In columns 1-3, the independent variable of interest is an indicator variables that equals one if an ethnic group has a greater number of levels of jurisdictional hierarchy than its pair; in columns 4-6, it is an indicator variable that equals one if an ethnic group has greater historical settlement complexity; in columns 7-9, it is an indicator variable that equals one if an ethnic group has a greater first principal component estimated using jurisdictional hierarchy fixed effects and historical settlement complexity fixed effects; in columns 10-12, it is an indicator variable that equals one if an ethnic group has a greater first principal component estimated using jurisdictional hierarchy fixed effects, settlement complexity fixed effects, and an indicator for patrilineal societies. Standard errors, clustered at the ethnicity level, are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level.

for this possibility, we conduct a series of ‘placebo’ estimates where we undertake the same procedure as for our baseline RD estimates except that ethnicity pairs are created, and treatment and control defined, using ethnicity characteristics other than segmentary lineage. We then re-estimate equation (3) to obtain estimates of the impact of the characteristic on conflict. To ensure that the estimates do not reflect the effect of segmentary lineages on conflict, the sample only includes ethnicity pairs for which both ethnicities of the pair have the same classification of segmentary lineage organization.

The RD estimates are reported in Table 4 for our three measures of all conflicts. The estimates for civil conflicts, non-civil conflicts, and localized conflicts are qualitatively identical. Each triplet of columns reports estimates examining a different set of ethnic characteristics. In columns 1–3, we compare adjacent ethnic pairs with the same segmentary organization coding, but with different levels of jurisdictional hierarchy beyond the local community. We define the ‘treated’ ethnicity to be the ethnicity of the pair with more levels of jurisdictional hierarchy. We find no estimated effect of this characteristic on conflict. Columns 4–6 report the same estimates but using historical settlement complexity as the characteristic of interest. In columns 7–9, we use the first principal component from a factor analysis that uses indicator variables for each category of the jurisdictional hierarchy and the settlement pattern variables. In columns 10–12, we use the first principal component from a factor analysis that, in addition to the variables from columns 7–9, also includes our baseline set of historical control variables (see Table 2).³²

We find that in each of the 36 specifications reported, the estimated effects of the alternative

³²The factor loadings for both principal components are reported in Table B5 in the paper’s online appendix.

Table 5: Segmentary lineage and retaliation.

	(1)	(2)	(3)	(4)	(5)	(6)
	Dep Var: Number of Deadly Incidents that are:					
	Retaliatory Conflicts			Non-Retaliatory Conflicts		
	One Month Window	Three Month Window	Six Month Window	One Month Window	Three Month Window	Six Month Window
Segmentary Lineage	1.594*** (0.436)	1.349*** (0.404)	1.346*** (0.404)	0.995*** (0.223)	0.964*** (0.210)	0.958*** (0.204)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Geographic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Historical Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	141	141	141	141	141	141

Notes: The unit of observation is an ethnic group. All columns include country fixed effects, the full set of geographic controls, and the full set of historical controls. All reported coefficients are negative binomial estimates. A retaliatory conflict is defined as a conflict event that is between conflict actors who fought in the past month, three months or six months, depending on the window used. In columns 1-3, the dependent variable is the number of retaliatory conflict events in the ethnic group. In columns 4-6, it is the number of non-retaliatory conflict events in the ethnic group. Robust standard errors are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels.

ethnic characteristics are all small in magnitude and statistically insignificant. Thus, although our RD estimates find a strong relationship between segmentary lineage organization and conflict today, we do not find that other factors, like historical political centralization or economic development, affect conflict.

6. Mechanisms

A. Escalation and Retaliation

The estimates from the OLS and RD analysis suggest that segmentary lineage organization is associated with more conflict. We now turn to an examination of specific causal mechanisms that could explain this finding. Our analysis starts by exploring mechanisms that have been the central focus of the anthropological literature; namely, retaliation and escalation, which arise due to the obligations to come to the defense of the members of one's lineage.

As a test of the retaliation mechanisms, we examine whether segmentary lineage organizations experience more conflicts that are retaliatory. We define a conflict as being a retaliation if it occurs within a fixed amount of time (1, 3, or 6 months) of a previous conflict that involved the same actors. We use a negative binomial model to estimate equation (1) separately for conflicts that are retaliations and those that are not. The estimates, which are reported in Table 5, show that while segmentary lineage organization has a positive effect on both types of conflict, it is greater

Table 6: Segmentary lineage and conflict of different scales.

	(1)	(2)	(3)	(4)
	Number of Conflict Incidents with:			
	0 Deaths	1-10 Deaths	11-100 Deaths	100+ Deaths
Segmentary Lineage	0.758*** (0.255)	1.139*** (0.263)	1.333*** (0.331)	2.254*** (0.501)
Mean of Dependent Var.	131.11	40.57	12.41	2.54
Country FE	Yes	Yes	Yes	Yes
Geographic Controls	Yes	Yes	Yes	Yes
Historical Controls	Yes	Yes	Yes	Yes
Observations	141	141	141	141

Notes : The unit of observation is an ethnic group. The dependent variables are the number of conflict events with zero deaths (column 1), the number of conflict events with 1-10 deaths (column 2), the number of conflict events with 11-100 deaths (column 3), and the number of conflict events with over 100 deaths (column 4). All columns report negative binomial estimates. All specifications include country fixed effects and the full set of geographic and historical controls. Robust standard errors are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels.

for retaliatory conflicts than not. We also find that these differences are statistically significant (see Appendix Table A17). Thus, consistent with the focus of the anthropological literature, segmentary lineage organization does appear to have a particularly strong effect on increasing the incidence of conflicts that are retaliatory.

Following a similar logic, we also examine the effect of segmentary lineage organization on conflicts of different sizes. If retaliation and escalation are important mechanisms, then we expect that segmentary lineage organization will lead to a disproportionate increase in the incidence of larger-scale conflicts. To examine this, we use a negative binomial model to estimate equation (1) with the number of conflict incidents of each of the following sizes as dependent variables: incidents with 0 deaths, 1-10 deaths, 11-100 deaths, or 100+ deaths. The estimates, which are reported in Table 6, show that the magnitude of the coefficient increases systematically with the scale of the conflict. That is, consistent with escalation being important, the largest effects are for larger-scale conflicts.

We further test for both mechanisms by studying the effect of segmentary lineage organization on conflict duration, estimated using a duration model where the dependent variable is conflict offset. While our primary interest is in the effects of segmentary lineage organization on conflict offset, for completeness, we also examine affects on conflict onset. Both are estimated using the following discrete-time logistic hazard model (Jenkins, 1995):

$$\log \left[\frac{h_{i,t}^{event}}{1 - h_{i,t}^{event}} \right] = \psi(t) + \gamma I_{e(i)}^{SL} + \mathbf{X}'_{e(i)} \boldsymbol{\Omega} + \epsilon_{i,t}, \quad (4)$$

where e indexes ethnic groups, i episodes of interest (either conflict or peace), and t years into the episode. The sample comprises all episodes of either conflict or peace, depending on whether we are examining offset or onset. $h_{i,t}^{event}$ is the discrete-time hazard rate: $h_{i,t}^{event} = \text{prob}(T_i = t | T_i \leq t; \mathbf{X})$, where T_i denotes the time at which the episode ends (i.e., event of interest occurs). We assume that $h_{i,t}^{event}$ follows a logistic distribution and estimate $\psi(t)$ using a third-order polynomial.

While the expected value of γ in equation (4) is clear for conflict offset, this is less clear for conflict onset. The anthropological literature has not highlighted onset as being a particularly important mechanism. Intuitively, the effects on onset might be ambiguous. As an example, one could reason that if segmentary lineage organization causes conflicts to escalate, then this might be foreseen and conflicts prevented from starting in the first place. On the other hand, if individuals know their lineage will mobilize on their behalf should a conflict start, segmentary lineage organization might also lead to higher levels of conflict onset. Similarly, within the civil conflict context, segmentary lineage groups might be more willing to initiate conflict against the government, knowing that they have large numbers of combatants due to their ability to effectively mobilize. In a separate note Moscona, Nunn and Robinson (2019), we formalize these ideas and show that, in a standard conflict model, the effect of segmentary lineage organization on conflict size/duration is unambiguously positive, while its effect on conflict onset can be positive or negative. Thus, in the end the relationship between segmentary lineage and conflict onset is an empirical question.

The estimates, which are reported in Table 7, indicate that segmentary lineage organization is associated with greater escalation of conflict. We find a robust negative relationship between segmentary lineage organization and conflict offset. Once a conflict starts, in segmentary lineage societies, each year, it is less likely to end and, therefore, tends to last longer. We also find some evidence, although much weaker, that segmentary lineage organization might be associated with the start of new conflicts. We estimate a positive relationship between segmentary lineage organization and conflict onset. However, relative to the escalation effects, the estimated onset effects are smaller in magnitude, less robust, and less precisely estimated.

We turn next to evidence for the social obligations that underlie the retaliation and escalation mechanisms; namely, that individuals have strong obligations to help out and avenge wrongdoings towards family members. While we do not have direct measures of the strength of obligations pertaining to participation in conflict, we do have measures of the strength of ties

Table 7: Segmentary lineage and conflict offset (duration) or conflict onset.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Conflict Offset				Conflict Onset			
	All	Civil	Non-civil	Local	All	Civil	Non-civil	Local
Segmentary Lineage	-0.828*** (0.238)	-1.021*** (0.270)	-0.743*** (0.255)	-0.662** (0.259)	0.325 (0.283)	0.496* (0.259)	0.530** (0.238)	0.393 (0.249)
<i>Marginal Effect at Mean</i>	<i>-0.083</i>	<i>-0.186</i>	<i>-0.125</i>	<i>-0.127</i>	<i>0.049</i>	<i>0.060</i>	<i>0.072</i>	<i>0.042</i>
Third-degree polynomial of duration	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geographic Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Historical Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean of Dep. Var.	0.18	0.28	0.23	0.30	0.23	0.20	0.21	0.17
Ethnic Groups	125	115	116	112	113	130	126	131
Observations	1,164	937	893	725	1,094	1,410	1,346	1,600

Notes : The unit of observation is an ethnic group and year. Columns 1-4 report estimates of a discrete time hazard model for the incidence of conflict offset. In this context, survival is continued conflict. Columns 5-8 report estimates of a discrete time hazard model for incidence of conflict onset. In this setting, survival is continued peace. Coefficient from the logistic model are reported, along with marginal effects evaluated at the mean in italics. Standard errors, clustered at the ethnicity level, are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels.

to family and lineage as measured by one's self-reported trust of family members relative to non-family members. This relationship has been previously documented in by Moscona, Nunn and Robinson (2017), but we revisit the findings here. The estimates, which are reported in Appendix Table A18, show that segmentary lineage groups have a larger (positive) difference in their trust of family members relative to their trust in various non-family individuals. This shows that, as expected, members of segmentary lineage groups have particularly strong ties with family members relative to their ties with non-kin.

Overall, the estimates reported here (retaliation, scale, duration, and trust in family) are consistent with the emphasis on the escalation and retaliation channels that are emphasized in the ethnographic literature. Because segmentary lineage societies mobilize a large number of combatants, they have particularly large effects on the duration and scale of conflicts. Once a conflict starts, it is much more likely to escalate and turn into a large, prolonged conflict with many battle deaths. As well, our retaliation estimates suggest that an important part of the escalation may be due to retaliatory conflicts, which are disproportionately higher among segmentary lineage groups.

B. *Other potential mechanisms*

To gain a deeper understanding of the importance of other mechanisms, we now examine additional outcomes that could be affected by segmentary lineage organization and themselves be important for conflict.

The first set of outcomes that we examine are proxies of the economic prosperity of ethnic groups. If ethnic groups that have segmentary lineage organization tend to be less developed economically, with lower incomes, less wealth, less education, and less access to public goods, this might affect the likelihood that they participate in conflict. The first strategy that we employ is to measure economic prosperity using the household wealth index from the *Demographic and Health Surveys* (DHS). We link households to ethnic groups using the ethnicity of the household head. In our regressions, we examine cross-household variation, controlling for the age and age squared of the household head, and clustering at the ethnicity level. The second strategy is to use the average density of nightlights in the territory of each ethnic group as a measure of prosperity.³³ The third strategy is to use respondents' years of education as a proxy of economic prosperity and to estimate individual level regressions linking individuals to ethnic groups using their self-reported ethnicity. All three strategies generate similar conclusions. As reported in Appendix Table A19, we find no evidence that segmentary lineage groups are less economically prosperous. If anything, they tend to have more wealth, higher nightlight density, and are more educated (both men and women), although these estimates are often imprecise and not different from zero.

We also examine individual-level variation in the presence of public goods using data from the *Afrobarometer*. The estimates, which are reported in Appendix Table A20, show that there is no relationship between an individual's belonging to a segmentary lineage ethnic group and the presence of public goods in their location of residence. The coefficients for some public goods are positive and some are negative and the average effect across all public goods is close to zero and statistically insignificant.

Another potential mechanism is economic inequality, which could lead to greater conflict, particularly within group conflict. We consider this possibility using two measures of an ethnic group's inequality: the standard deviation of night light density within an ethnic group's territory

³³The use of nightlights as a proxy for economic development follows, among others, Henderson, Storeygard and Weil (2012), Michalopoulos and Papaioannou (2013), and Michalopoulos and Papaioannou (2014).

and the Gini coefficient of the wealth index of households in the DHS. The estimates, which are reported in Appendix Table A21, indicate no consistent relationship with inequality. Some estimates are positive and other are negative and they are insignificant in all cases but one. Thus, it is unlikely that greater inequality is an important channel.

A factor that is related to wealth and inequality is risk-sharing. It is possible that segmentary lineage groups are particularly successful at facilitating risk-sharing due to strong social connections within lineages, and this may affect conflict. Although information needed to measure risk-sharing is difficult to obtain there is one question in the Afrobarometer that does provide some information that is relevant. They ask respondents whether they have received remittances from “friends or relatives outside of the country” in the past year. While the question includes “friends” in addition to “family”, evidence indicates that within Africa, the vast majority of overseas remittances are between family members (e.g., Bloch, 2005). Thus, the question provides some indication of international risk-sharing between family members. The estimates, which are reported in Appendix Table A22, show that although segmentary lineage groups are more likely to have received overseas remittances, the estimated effects are imprecisely estimated and are never statistically significant.

The next mechanism that we consider is an ethnic group’s involvement in national politics. If segmentary lineage groups tend to have less access to national power, then this might explain the greater prevalence of civil conflicts among these groups. We use two measures to test for this. The first measure is constructed using the *Ethnic Power Relations* (EPR) database, which identifies the extent to which each “politically relevant” ethnic group is “excluded from state power at the national level.” It further categorizes excluded groups into those who are powerless due to active discrimination by the government and those who are powerless but not because of active discrimination. We examine the relationship between segmentary lineage and the share of years from 1960–2017 that the ethnic group was: excluded from power for any reason, powerless because of active discrimination, or powerless but not because of discrimination. The second measure is Francois, Rainer and Trebbi (2015), who provide annual information from ten African countries since independence on the share of all cabinet positions in the national government (and the share of top cabinet positions) that are held by each ethnic group. With this measure, we examine the determinants of each ethnic group’s representation in government while conditioning on their representation in the total population.

The estimates are similar regardless of which measures we use. We do not find a relationship between segmentary lineage organization and representation in national politics. The estimated relationships, which are reported in Appendix Tables A23 and A24, are all small in magnitude and statistically insignificant

7. Implications of Findings and External Relevance

Our findings provide insight into a previously untested determinant of conflict. Although our findings hold for all forms of conflict, they are potentially the most informative for civil conflicts, which helps us to better understand why some armed non-state actors have been better able to recruit soldiers than others. As an example of a group that has been successful in this dimension consider Boko Haram in Northern Nigeria. It is very difficult to explain their success using standard determinants. Our findings suggest that a missing element may be the social structure of the societies involved. Boko Haram has recruited primarily from the Kanuri people who historically constituted a segmentary lineage society. This connection has been highlighted by Akbar Ahmed (2013b, p. 129), who documents that they tend to recruit where segmentary lineage structures are most prominent.

Our analysis has been restricted to Africa because of the rich ethnographic data and geocoded sub-national conflict data. However, it is possible that the documented relationship is also present outside of Africa. For example, Osama bin Laden and many individuals recruited to Al Qaeda were, and are, Yemeni, which are also “are organized around a segmentary lineage system, with elders and councils, a spirit of egalitarianism, and a code of honor guiding society that emphasizes courage, loyalty, hospitality, and revenge” (Ahmed, 2013b, p. 110). The same logic of lineage-based obligation and revenge among segmentary groups in Africa also applies to the Yemeni. According to Paul Dresch (1989), “If a man from a village in Khamis Abu Dhaybah or Kharif kills someone from Arhab [a district in Yemen]... a debt exists between the two tribes... a man’s immediate kin are involved (those who Islamic law recognizes as always *al-dam*), but men much further from the particular antagonist may also be drawn in. If a man from section A of our tribe kills someone from another tribe, that other tribe might perhaps kill someone in a quite different section of ours, section B” (pp. 84–85).

It is possible that a better understanding of segmentary lineage societies will shed new light on key international security issues. Ahmed (2013b) points out a broad correlation between areas

of high-intensity Islamist violence and areas where society is structured based on segmentary lineage organization. In a 2013 speech, Ahmed claimed the following: “Here is a correlation for you. Ask yourselves: where are [US] drones most used? They are really segmentary lineage systems: the Pashtuns in Afghanistan and Pakistan tribal areas, mainly in Waziristan; among the Somali segmentary lineage system; the Yemenis’ segmentary lineage system; the Kurds in eastern Turkey, segmentary lineage system; the Tuareg in West Africa, segmentary lineage system. An immediate correlation. So there is some connection that we can identify... Take a look at these mutant militant groups that are emerging: the TTP (Tehrik-i-Taliban Pakistan), for example. Where is it coming out of? It’s coming out of a specific tribe, a specific clan. Al Shabaab: tribal. Tribal: Boko Haram in West Africa. Again, because we tend to jump on Islam as the explanation for what’s going on, we are missing this whole tribal basis of the discussion. All of these are coming out of straight segmentary lineage system backgrounds.” (Ahmed, 2013a)

Philip Salzman extends this reasoning and argues that Islam, at its inception, was structured as an amalgamation of segmentary lineage societies and was designed to unite these tribes against outsiders (Salzman, 2007, pp. 137–138). Thus, the entire Islamic world comprises the largest tribal segment that is compelled to unite against any non-Muslim – infidels, the West, or the dar al-harb. For Salzman, an understanding of segmentary organization is crucial to understanding all Islam-fueled violence.

Such arguments are not confined to the writings of academics. Philip Zeman (2009), a strategist with the U.S. Marine Corps, has argued that there is a strong relationship between segmentary organization and “terror.” Members of Islamist extremist groups commonly come from societies with strong segmentary traditions, and there are explicit links between tribal organization and violent extremism. Thus, for national-security purposes, there is a “need for in-depth understanding of tribal systems and influences” (Zeman, 2009, p. 682).

8. Conclusion

We have tested a long-standing hypothesis from the field of anthropology about the relationship between segmentary lineage organization and conflict. A rich ethnographic literature suggests that this organizational form creates an obligation to come to the defense of one’s lineage mates when they become involved in a conflictual situation. Thus, segmentary lineages result in large numbers of men being mobilized for warfare any time there is a dispute or conflict. To investigate

these ideas, we collected information from existing ethnographic sources on the social structure of 145 ethnic groups within sub-Saharan Africa.

We began our analysis by examining the cross-ethnicity relationship between the historical presence of a segmentary lineage system and conflict today. We found a strong positive relationship between the presence of segmentary lineages in a society and all measures of conflict examined; namely, all conflicts, civil conflicts, conflicts other than civil conflicts, and localized within-group conflicts. We then examined pairs of neighboring ethnic groups where one ethnic group is traditionally organized into segmentary lineages and the other is not. Examining variation across 10km-by-10km grid-cells, we estimated the effect of segmentary lineage organization on conflict using a regression discontinuity (RD) estimator. The strategy allowed us to better control for any omitted factors that change smoothly over space, such as geographic factors, ecological characteristics, or historical shocks. Consistent with the OLS estimates, here too we found a strong positive relationship between segmentary lineage organization and all measures of conflict.

Motivated by the ethnographic literature which suggests that the primary mechanisms through which segmentary lineages affect conflict is retaliation and the escalation of conflicts, we then turned to an examination of these mechanisms. We tested for the importance of retaliation by identifying conflicts that appear to be retaliations against previous conflicts. They occur shortly after a previous conflict involving the same actors. We found that while segmentary lineage is associated with more conflicts that are retaliatory and non-retaliatory, the magnitude of the association is larger for retaliatory conflicts. To examine the escalation mechanism we studied the effect of segmentary lineage on conflict onset and offset (i.e., duration). We found strong evidence that segmentary lineage organization tends to prolong conflicts after they start. By contrast, the estimated effects on conflict onset, although positive, were smaller in magnitude and often insignificant. Consistent with this, we also found that the effect of segmentary lineage on larger-scale conflicts with more battle deaths was greater than smaller-scale conflicts with fewer battle deaths.

Although our analysis has focused specifically on the African context, our results are potentially applicable outside of Africa, where segmentary lineage organization is also common. Outside of Africa, and especially in the Middle East, there are many examples of prolonged conflicts involving groups that are traditionally organized in segmentary lineages. Thus, it is

possible that segmentary lineage organization may be an important determinant of conflict not just within Africa but globally.

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