Title: Violent conflict and hostility towards ethno-religious outgroups in Nigeria

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Abstract

Although Nigeria has a high incidence of violent conflict and is divided along ethno-religious lines, no study has, to the best of my knowledge, examined the effect of violent conflict on hostility towards ethnic and religious outgroups using representative data for Nigeria, nor the differential effects of violent conflict on outgroup hostility among Nigeria's Muslim and Christian populations. This study does so. To measure outgroup hostility, I developed an additive indicator by combining the responses to two survey questions probing the respondents' willingness to have people from other religions and ethnic groups as neighbors. I measured exposure to violent conflict using the total number of conflict incidents within the 30km buffer around the respondents' dwellings. The instrumental variable regression results showed that among Nigeria's population, violent conflict has a positive effect on outgroup hostility. A plausible mechanism through which this occurs is that violent conflict erodes trust and makes ethnic and religious fault lines salient, which in turn leads to outgroup hostility. When I broke down the data based on religious affiliation and estimated some models using the Muslim and Christian subsamples of respondents, the analysis showed that violent conflict has a positive effect on outgroup hostility among Christians. These results are robust to alternative operationalizations of outgroup hostility, different buffer sizes, and different estimation techniques. Among Muslims, violent conflict rather had a weak positive effect; however, this result was not robust to alternative operationalizations of outgroup hostility.

Keywords: *Violent conflict, Conflict exposure, Outgroup hostility, Ethnicity, Religion, Nigeria.*
JEL classification: D74, J15, N37

1.0. Introduction

A cursory look at Nigeria reveals that it has a dyadic structure comprising of a predominantly Christian Southern Region and a predominantly Muslim Northern Region. Although there are some overlaps between the two regions, the contrast between them is quite stark. "Christians and Muslims tend to view each other with suspicion." (Campbell and Page, 2018, p. 83). The overlap between religion and ethnicity makes the fault line between the two regions even more salient. This North-South bifurcation is apparent when one looks at Nigeria through the lens of the nine civilizations into which Samuel Huntington divided the world: Nigeria's Northern Region was associated with Islamic

civilization, while the Southern Region was associated with African civilization (Huntington, 1996). Writing two years prior to Nigeria's independence from British rule, Coleman (1958) observed that one of the major fault lines in Nigeria was "the rivalry between the peoples of the southern provinces and the Muslim peoples of the north, isolated as they were in their Northern fortress by an official policy of controlled acculturation." (p. 331).

Islam first came to Northern Nigeria between the eleventh and fourteenth centuries through the trans-Sahara trade between the Hausa people of Northern Nigeria and merchants from the Maghreb states. Besides the exchange of tangible commodities, there was also a diffusion of cultural and religious values (Falola and Heaton, 2008, pp. 244-246). Islam gained a stronger foothold in the region between 1804 to 1808, when a cleric of Fulani ethnicity, Usman dan Fodio, launched a jihad against the rulers of the Hausa kingdoms. The jihad is also referred to as the "Fulani War" because Usman dan Fodio's army consisted mainly of people of Fulani ethnicity. This successful jihad resulted in a reversal of social fortune for the Fulani, who had previously been treated as second-class citizens by their Hausa overlords, prohibited from owning slaves, and subjected to exorbitant cattle taxes for grazing their cattle in Hausaland (Van Raay, 1975, pp. 18-23). It also led to the establishment of the Sokoto Caliphate, which consisted of several emirates. The caliphate was in existence for a century until its conquest by British forces at the beginning of the 20th century (Kirk-Greene, 1965, pp. 43-44). Today the ethnic boundary between members of the Hausa and Fulani ethnic groups is quite blurred due to intermarriage (Diamond, 1988, p. 21), with the common religion of Islam further cementing the bond between members of the two ethnic groups (Albert, 1996, p. 88).

The advent of Christianity in Nigeria can be traced to the fifteenth century when Portuguese traders visited Southern Nigeria. Yet the religion did not initially gain traction and was largely confined to the coastal regions (Ogunsola, 1974, p. 3). It was not until the 1840s that Christianity started to gain a foothold, propagated by freed slaves from Sierra Leone and missionaries from the West (Falola and

Heaton, 2008, p. 87; Ogunsola, 1974, pp. 3-5). Christian missionary evangelization was concentrated in Southern Nigeria because the Muslim rulers in the Northern Region, in an effort to preserve their religious way of life, were hostile towards the Christian missionaries (Albert, 1996, pp. 88-89). In fact, after the defeat of emirate forces and the eventual surrender of the emirs to British authority, the emirs had specifically asked the British not to tamper with their religious way of life. This explains why Lord Lugard, Nigeria's first Governor-General, had clearly stated that "Government will in no way interfere with the Mohammedan religion." during his speech at Sokoto in 1903 (Kirk-Greene, 1965, p. 44). Most of the peoples in the Southern Region eventually substituted their pagan religions for Christianity. In 1914, the British government merged the Northern and Southern Protectorates, which were previously distinct entities, to form Nigeria. An examination of the amalgamation report shows that the merger was driven by administrative convenience and financial expediency without any consideration for the cultural differences between the diverse people who were being brought together (Lugard, 1919, pp. 7-8). Sir. Ahmadu Bello, one of Nigeria's founding fathers, referred to the amalgamation as a mistake (Sklar, 1963, p. 128).

After the conquest of Northern Nigeria, the British government appropriated the existing institutions and even used the local Hausa language in the administration of the province. Christian missionaries were also forbidden from proselyting in the Northern Region. Conversely, the policies of Westernization and Christianization were pursued fervently in Southern Nigeria because the population there was more open to Western Influence (Campbell and Page, 2018, p. 78; Diamond, 1988, p. 26; Coleman, 1958, p. 333). Most of the schools in precolonial and colonial Nigeria were built by Christian missionaries, who had total control over the educational sector. This is because the colonial government was uninterested in the education of the native population. Due to the prohibition of Christian missionary evangelization in Northern Nigeria, its population was less exposed to Western education than its counterpart in the South, where missionary activity flourished. This led to an

educational and developmental gap between both regions that still persists today. This explains why Achebe (1983, p. 46) asserted that the Hausa/Fulani in Northern Nigeria had been held back by "a wary religion." However, it also needs to be stressed that the goal of the missionaries was to propagate Christianity and not educate the native population. Education rather served as a potent tool in the advancement of this goal, especially among children, who were more pliable than adults. "School education provided a stepladder to Christianity because it taught pupils to read and write in English, which in turn made it easier for them to understand the proselytizing of Christian evangelizers and to read the Bible." (Siollun, 2021, p. 267).

The shortage of educated personnel among the population in Northern Nigeria, coupled with the reluctance of the Muslim Hausa-Fulani population to associate with the British, whom they regarded as infidels, prompted the British government to bring in migrants from the Southern Region to cater to their needs. The Hausa-Fulani had an aversion towards the Southern immigrants, especially because they had assimilated Western values and embraced the *abominable* religion of the imperialists – Christianity. To mitigate the risk of conflict between the immigrants and the Hausa-Fulani natives, the colonial government implemented a policy of residential segregation in which they established a special quarter, called *Sabon Gari,* where the immigrants were to live. The goal of this policy was to minimize contact between the native Hausa-Fulani population and the Southern immigrants. These quarters were established in the Northern cities of Kano, Zaria, and Kaduna (Albert, 1996, pp. 94-95; Gale, 1980). In his 1962–63 study of Hausa migrants who had emigrated to Southern Nigeria (particularly in Yoruba towns) for the purpose of trade, Cohen (1969) found that they also lived separately from the host population in enclaves called *Sabo* (an abridged form of *Sabon Gari*). These enclaves, which were headed by a Hausa chief called *Sarkin Hausawa*, were "established on the basis of Hausa cultural distinctiveness under the Hausa motto: 'Our customs are different.'" (p. 9).

After Nigeria's independence from British colonial rule in 1960, it remained divided along

ethnic and religious lines. Tafawa Balewa, Nigeria's first prime minister, blatantly said Nigeria existed only on paper (Siollun, 2009, p. 12). Obafemi Awolowo, one of Nigeria's founding fathers, referred to the country as a "mere geographical expression" (Awolowo, 1947, pp. 47-48). "Certain basic underlying differences in history, culture, temperament, and levels of development and acculturation provided the classical setting for intergroup friction." (Coleman, 1958, p. 351). As will be discussed in more detail in section 3, Nigeria's historical timeline has been punctuated by violent ethno-religious conflicts. Despite Nigeria's turbulent history, coupled with the central role that religion and ethnicity have played in shaping its trajectory, no study has, to the best of my knowledge, empirically examined the effect of exposure to violent conflict on hostility towards ethnic and religious outgroups using representative data for Nigeria, nor the differential effects of violent conflict on outgroup hostility among Nigeria's Muslim and Christian populations. This study does so. I have deliberately infused this section of the study with historical analysis because Nigeria's present condition cannot be fully grasped without reference to its past.

To measure exposure to violent conflict, I drew buffers with a radius of 30km around the geolocations of the respondents using QGIS software and counted the total number of violent conflict incidents within the buffers. I was able to do this because I relied on the Afrobarometer survey data (BenYishay et al., 2017) and the Armed Conflict Location and Events Database (ACLED) dataset (Raleigh et al., 2010), which are both geocoded. I measured outgroup hostility by combining the responses to two survey questions probing the respondents' willingness to have people from other religions and ethnic groups as neighbors. I focus specifically on religion and ethnicity in this study because of the central role that they have played in shaping Nigeria's past, as well as its present.

This study finds that among the Nigerian population, exposure to violent conflict has a positive effect on hostility towards ethno-religious outgroups. A plausible mechanism through which this occurs is the erosion of trust which makes ethnic and religious fault lines salient. This in turn

strengthens cohesion within the ingroup members and makes them less accommodating of members of outgroups. However, when I broke down the data based on religious affiliation and estimated some models using the Christian and Muslim subsamples of respondents, the analysis showed that violent conflict has a positive effect on outgroup hostility among Christians. These results are robust to alternative operationalizations of outgroup hostility, different buffer sizes, and different estimation techniques. Among Muslims, violent conflict rather had a weak positive effect; however, this result was not robust to alternative operationalizations of outgroup hostility.

This study proceeds as follows: Section 2 reviews the literature on intergroup conflict. Section 3 discusses some selected conflict events in Nigeria's history. Section 4 operationalizes the variables that will be used to estimate the regression model, presents the summary statistics, and specifies the general form of the model to be estimated. Section 5 presents the regression results and discusses them. Section 6 summarizes the paper and concludes.

2.0. Theoretical considerations

Some studies have shown the tendency for people with similar characteristics to flock together – a phenomenon referred to as homophily. McPherson et al. (2001, p. 416) defined homophily as "the principle that a contact between similar people occurs at a higher rate than among dissimilar people." This section focuses particularly on ethnic and religious homophily. In an experimental study conducted in France, Adida et al. (2015) found that religion was the strongest predictor of homophily. Other socio-demographic factors like race, ethnicity, age, gender, and class were statistically insignificant in their model. Moreover, their results showed that the preference for associating with people of a similar religious belief was present across the different religious categories which included Muslims, Christians and atheists. Yilmaz and Bashirov (2022) conducted a qualitative study among Australian Muslim youths to determine the mechanisms behind religious homophily. Their results, which are based on 64 semi-structured interviews, showed that the "drinking culture" among the

Anglo-Australian majority population made Australian Muslims reluctant to develop close friendships with them. Moreover, they found that "Religious homophily overrode ethnic differences, allowing young Muslims to build friendships with other Muslims from various parts of the Muslim world." (p. 8). Relying on data from a longitudinal study conducted in the state of North Rhine-Westphalia in Germany, Leszczensky and Pink (2017) examined the effect of religion and religiosity on intra and inter-group friendship among adolescents in nine schools. They found that religion was a stronger predictor of homophily than religiosity. Both Christian and Muslim youths preferred having people of the same religion as friends. Moreover, they found that "Christian and non-religious youths…were more hesitant to befriend their Muslim peers than each other." (p. 80).

Some studies have focused on ethnic homophily. Jacquemet and Yannelis (2012) conducted a correspondence test to determine whether ethnic homophily influenced hiring discrimination in the Chicago labor market. They sent out identical resumes for a job, with the names on the resumes signaling the ethnicity of the applicants. Resumes with Anglo-Saxon names received about one-third more callbacks than the other two categories of resumes that either had African-American names or 'foreign names' with no particular ethnic association. Moreover, they found higher levels of discrimination among employers located in suburban areas characterized by a lower level of ethnic diversity than those who were in cities. A limitation of their study is that they had no information about the individual making the hiring decision and went with the assumption that he/she was white. In a study conducted among secondary school students in the Netherlands, Stark and Flache (2012) found that friendship among students belonging to the same ethnic group in ethnically heterogeneous schools was not necessarily driven by preference for people of the same ethnicity, but rather by preference for friends with similar opinions towards a common interest. This was especially so when ethnicity correlated with opinions towards certain shared interests. The implication of their results is that ethnic homophily was rather an unintentional outcome.

Allport (1954) did not specifically use the term "homophily" in his classic book entitled *The*

Nature of Prejudice, but rather the term "separateness", to describe the proclivity among people to establish relationships with members of their ingroup – e.g. people with a common religion, race, class, or ethnicity. Separateness, he argued, was not necessarily driven by prejudice, but rather by convenience. This is because "It requires less effort to deal with people who have similar presuppositions." (p. 17). He argued that even though the existence of an ingroup logically implied the existence of an outgroup, ingroup membership did not necessarily mean hostility or negative attitudes towards members of the outgroup. He acknowledged that hostility towards outgroup members could foster cohesion within the ingroup, but he also pointed out that hostility towards outgroup members was not a necessary condition for cohesion within the ingroup: "hostility to outgroups, though not necessary for in-group solidarity, can serve to strengthen it." (p. 50). Brewer (1999) concurred with Allport: "Indeed, ingroup love can be compatible with a range of attitudes toward corresponding outgroups, including mild positivity, indifference, disdain, or hatred." (p. 30). Conversely, Greenwald and Pettigrew (2014) contend that ingroup favoritism is not innocuous because it often leads to discrimination, even more so than direct hostility towards members of the outgroup.

Allport (1954) identified five stages through which people might act out their prejudiced attitudes towards outgroups, with each stage being more severe than the preceding one: The first, *antilocution*, consisted of the verbal expression of antagonism towards the outgroup but did not involve any form of action. Although most prejudice never went beyond this stage, this did not necessarily make it harmless: "Violence is always an outgrowth of milder states of mind. Although most barking (antilocution) does not lead to biting, yet there is never a bite without previous barking." (p. 57). The second, *avoidance*, involved the prejudiced person making deliberate effort to avoid members of the outgroup, even if this came at his or her expense. The third, *discrimination*, involved excluding members of the outgroup from opportunities that were beneficial to them, for instance, in terms of employment, the allocation of housing, access to education, and political rights. The fourth stage, *physical attack*,

involved violent actions that threatened the physical wellbeing of the outgroup. *Extermination*, the last stage in the escalation process, consisted of systematized violent events like pogroms, massacres, and genocides, which were driven by the goal of obliterating members of the outgroup.

In this study, I contend that exposure to violent conflict leads to hostility towards ethnic and religious outgroups. A plausible mechanism through which this occurs is that violent conflict erodes trust and makes ethnic and religious fault lines salient (Tuki, 2023; Kijewski and Freitag, 2018; Rohner et al., 2013; De Juan and Pierskalla, 2016), which in turn makes people less accommodating of ethnic and religious outgroup members. Conversely, some studies have shown that exposure to violent conflict could have a positive effect on outgroup trust and prosocial behavior (Greiner and Filsinger, 2022; Blattman, 2009; Bellows and Miguel, 2009). I acknowledge that outgroup hostility could also lead to violent conflict, but I am particularly interested in the opposite relationship. Taking into consideration Nigeria's history of ethno-religious violence, coupled with the crucial role that religion and ethnicity have played in shaping its past and present, I expect exposure to violent conflict to have a positive effect on outgroup hostility.

3.0. Intergroup conflicts in Nigeria

A look at Nigeria's timeline shows that it has gone through all the five stages of escalation identified by Allport (1954) at different points in its checkered history. Nigeria had previously comprised of two regions – the Northern and Southern Regions, but this changed in 1939, when the British divided the Southern Region into the Eastern and Western Regions (Coleman, 1958, p. 322). This division led to the formation of a tripod structure, such that each region was dominated by one of Nigeria's three major ethnic groups: The Northern Region was dominated by the Hausa/Fulani, the Eastern Region was dominated by the Igbo, and the Western Region was dominated by the Yoruba. In the 1950s and the first half of the 1960s, each region had a presiding political party, whose support base consisted mostly of members of the dominant ethnic group residing there (Falola and Heaton,

2008, p. 153; Akinyele, 1996, p. 75). The Hausa/Fulani in the Northern Region were the main supporters of the Northern Peoples' Congress (NPC), the Yoruba in the Western Region were the main supporters of the Action Group (AG), and the Igbos in the Eastern Region were the main support base of the National Council of Nigeria and the Cameroons (NCNC). Regionalism was deeply entrenched in politics during this period: the leaders of the dominant parties were more concerned with the needs of their support base rather than that of the larger Nigerian population. Moreover, the dominant parties in each region did not hesitate to punish the constituents who had voted for the opposition parties by depriving them of infrastructure and social amenities (Diamond, 1988, pp. 39-40). This fostered ethnic divisions and regionalism, which in turn made it difficult for Nigeria to develop a strong sense of national identity.

Although colonialism is generally portrayed as an extractive and exploitative institution that has contributed to the underdevelopment of African countries (Acemoglu and Robinson, 2012; Rodney, 1982), the quest to end colonialism in Nigeria was not very straightforward. Nigeria gained independence from British rule in 1960, but it probably would have achieved this goal four years prior were it not for the adversarial relationship between the dominant political parties in the three regions. In 1953, the NCNC and the AG supported a motion calling for the date of Nigeria's independence to be set for 1956. The leader of the NPC, Sir. Ahmadu Bello, was reluctant to accept the motion because he thought Nigeria was not yet ripe for self-rule. The reluctance of the NPC to support the motion strengthened the bond between the NCNC and AG, which had previously been rivals. Together, they mounted pressure on the NPC and the population in the Northern Region, urging them to support self-rule. The Northern leaders were ridiculed and referred to as "imperialist stooges", who were incapable of making decisions for themselves. This heightened the tensions between the Northern Region and the other two regions. The NCNC and AG remained committed to their goal of self-government and sent delegations to the Northern Region, specifically Kano, to garner support. This

led to the four-day Kano riot between Northerners and Southerners that claimed 36 lives (Coleman, 1958, pp. 398-400).

The killings during the Kano riots had a systematic pattern. The 15 Northerners who were killed resided in the predominantly Christian area, *Sabon Gari*, while the 21 Southerners who were killed, resided outside *Sabon-Gari*, in the predominantly Muslim areas. In the aftermath of the riot, residential segregation along ethnic and religious lines became more salient, because the few Hausa/Fulani residing in *Sabon-Gari* who had survived fled to the predominantly Muslim areas, while the surviving Southerners who were residing in the predominantly Muslim areas fled to *Sabon-Gari* (Albert, 1996, p. 97). The real motive behind the NPCs opposition to early independence was the fear that the Northern Region would be dominated by the Eastern and Western Regions (i.e. Southern Region). The Northern Region's resistance to Western influence ensured that it lagged far behind the other two regions in the areas of education, housing, healthcare and other developments associated with modernization (Coleman, 1958, pp. 330-331). Moreover, most of the positions in the civil service in the North were filled by immigrants from the South due to the shortage of educated personnel among the northern population (Falola and Heaton, 2008, p. 150-153) The Northern leaders did not mind prolonging the yoke of colonialism in pursuit of their regional interest.

Prior to the Kano riots, there was the 1945 Hausa-Igbo riot in Jos where a dispute between an Igbo and a Hausa merchant morphed into a violent inter-ethnic conflict between members of the associated ethnic groups. Plotnicov (1971) observed that competition between members of the Hausa and Igbo ethnic groups in the trades business, the poverty and hardship that came along with the end of the second World War, and residential segregation, were crucial in fueling the conflict. The Igbos lived in a segregated quarter called *Sarkin Arab's Ward*, which made it easy for them to be targeted by the angry Hausa Mob. The Igbos retaliated by regrouping and attacking members of the Hausa ethnic group. Interestingly, members of the Hausa ethnic group who reside in the predominantly-Igbo

Eastern Region also live in segregated settlements called *Abakpa Quarters* (Albert, 1996, p. 86). The two incidents discussed so far could be tied to the concept of separateness. Allport (1954) observed that separateness could lead to intergroup conflict because "People who stay separate have few channels of communication. They easily exaggerate the degree of difference between groups, and readily misunderstand the grounds for it." (p. 19). Although segregation could emanate from legislation, as shown by the case of *Sabon Gari* in Northern Nigeria, segregated settlements could also be "established by the immigrants themselves through their continuous aggregation in given locations within an urban system." (Albert, 1996, p. 86). "It is not always the dominant majority that forces minority groups to remain separate. They often prefer to keep their identity, so that they need not strain to speak a foreign language or to watch their manners." (Allport, 1954, p. 18).

A major event that marred Nigeria's history is the pogroms of 1966 which led to the massacre of the Igbos in the tens of thousands, especially those residing in Northern Nigeria. A group of young army officers, mostly of Igbo ethnicity, had launched a coup that toppled Nigeria's first civilian government in 1966. Most of the fatalities from the coup were Northerners of high status, including Nigeria's first prime minister, Tafawa Balewa, the premier of the Northern Region, Sir Ahmadu Bello, and senior personnel in the army. The premier of the Western Region, Samuel Ladoke Akintola, who was of Yoruba ethnicity, was also killed during the coup. Given the ethnicity of the perpetrators, coupled with the fact that top government officials of Igbo ethnicity like the president and the premiers of the Eastern and Midwest Regions, had not been killed during the coup, the coup was interpreted as an attempt by the Igbos to dominate the other ethnic groups. Moreover, the most senior military officer at the time, Major General Johnson Aguiyi-Ironsi, who was of Igbo ethnicity, took over the reins of power (Siollun, 2009, pp. 77-80). Disgruntled by the high death toll of Northerners during the coup, Northern soldiers soon launched a counter coup that led to the death of Aguiyi-Ironsi. Subsequently, the Northern soldiers systematically targeted and killed their Igbo colleagues. "Within

three days [after the coup] every Igbo soldier was either dead, wounded, or fleeing for their life." (Siollun, 2009, p. 124). Subsequently, the Northern soldiers moved into the civilian domain and began killing civilians of Igbo ethnicity and destroying their properties. This led to the mass exodus of the Igbos to their homeland in the Eastern Region (Achebe, 2012, pp. 82-83; Siollun, 2009, pp. 127-138). The Igbos no longer felt safe in a united Nigeria. The military administrator of the then Eastern Region, Colonel Chukwuemeka Ojukwu, proclaimed the Eastern Region as the independent state of Biafra, and this led to the three-year civil war that claimed over a million lives between 1967 to 1970 (Ekwe-Ekwe, 1990). Although the war ended in 1970 with the defeat of Biafran forces and the reincorporation of Biafra into Nigeria, separatist agitations persist in Eastern Nigeria today (Tuki, 2022).

I have deliberately put more emphasis on conflict events that occurred over five decades ago in this section because I am particularly keen on highlighting the historical roots of Nigeria's present-day divisions. The present is predicated upon the past, and the legacies of the past are not easily shaken off. 12 of the 19 states in Northern Nigeria adopted shariah law in the early 2000s (Olaniyi, 2011), further accentuating the Northern-Southern dichotomy in the country. A literacy in English gap still exists between the states in the Northern and Southern Regions, with the latter region surpassing the former (Nigerian National Bureau of Statistics, 2010). Ethno-religious conflicts and residential segregation along ethnic and religious lines persist (Scacco and Warren, 2021; Eke, 2022; Angerbrandt, 2011, 2018; Mustapha et al., 2018). Religion continues to play a fundamental role in the daily lives of Nigerians. "For most Nigerian Christians and Muslims, the Western concept of a rigid separation between religious and secular spheres is incompatible with 'true religion.'" (Campbell and Page, 2018, p. 76). The World Values Survey (WVS) conducted in 2018 shows that 61 percent of Nigerians think it is good to have "a system governed by religious law in which there are no political parties or elections." The WVS survey also shows that 70 percent of the population agree that their religion is the only acceptable religion (Haerpfer, 2022; Ingelhart et al., 2014).

4.0. Data and methodology

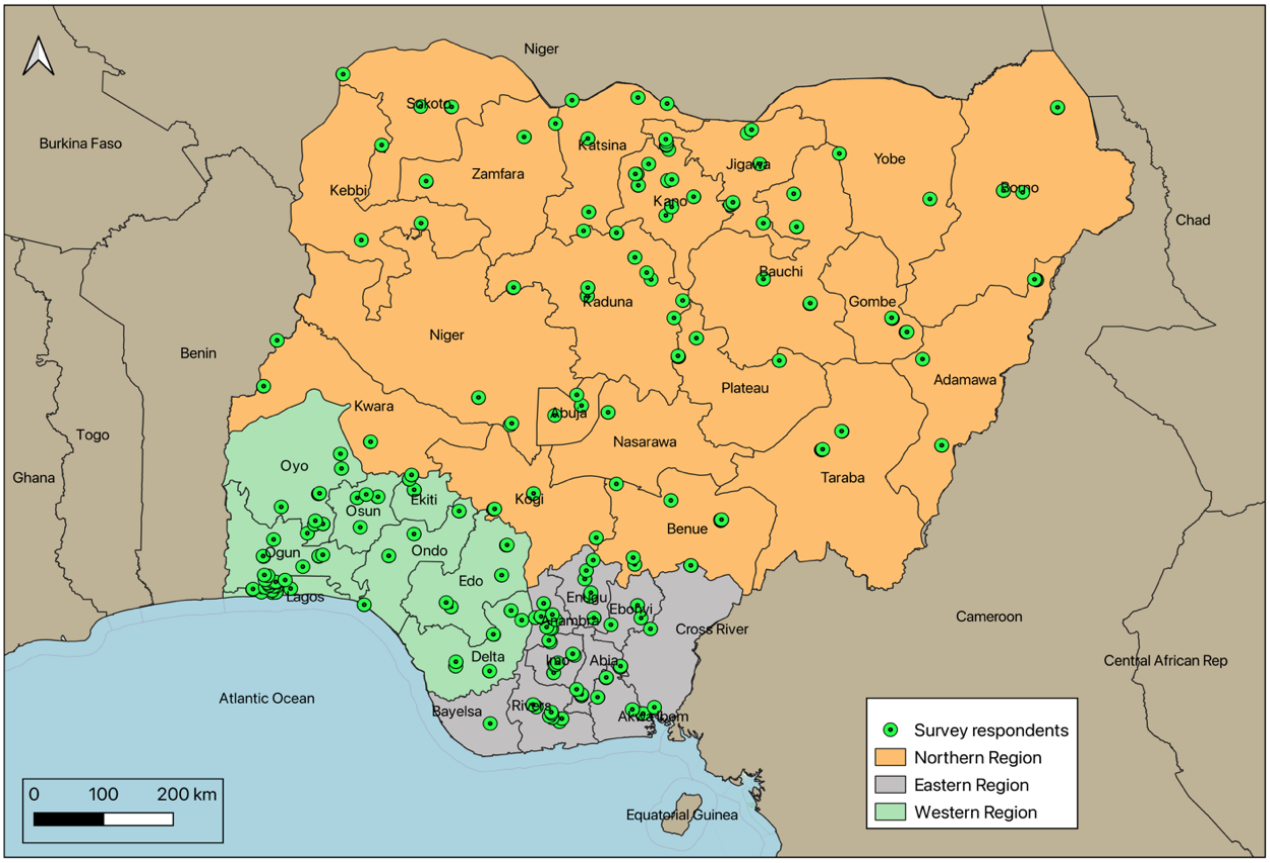

Figure 1: Distribution of survey respondents across Nigeria's states and regions

Note: The figure shows Nigeria's 36 states and the federal capital territory – Abuja, Nigeria's three major administrative regions that were created in 1939, and the geolocations of the survey respondents. The shapefile containing Nigeria's administrative boundaries was developed by UNOCHA. It could be accessed at: https://data.humdata.org/dataset/nga-administrative-boundaries

This study relies primarily on the Round 7 Afrobarometer survey data collected in 2017 (BenYishay et al., 2017).[1] The dataset comprises of 1,600 observations and is representative for Nigeria. As shown in figure 1, respondents were drawn from each of Nigeria's 36 states, as well as the federal capital territory – Abuja. Of Nigeria's 774 local government areas (LGAs) (i.e. municipalities), data were collected from 147 of them. The respondents were at least 18 years old, with males and females equally represented in the ratio 50:50.

4.1. Operationalization of the variables

[1] To access the Afrobarometer dataset and the survey questionnaire visit: https://www.afrobarometer.org/

4.1.1. Dependent variable

***Outgroup hostility*:** This is an additive indicator that measures the respondents' willingness to have people from other religions and ethnic groups as neighbors. It was derived by combining the responses to the following questions: "For each of the following types of people, please tell me whether you would like having people from this group as neighbors, dislike it, or not care: (a) People of a different religion; (b) People from other ethnic groups," with the responses measured on a five-point scale ranging from "1 = Strongly dislike" to "5 = Strongly like." For easy interpretation of the regression results, I inverted the ordinal values assigned to the response categories by subtracting each of them from 6. This allows higher values to denote a higher level of outgroup hostility and vice versa. The additive indicator ranges from 2 to 10.

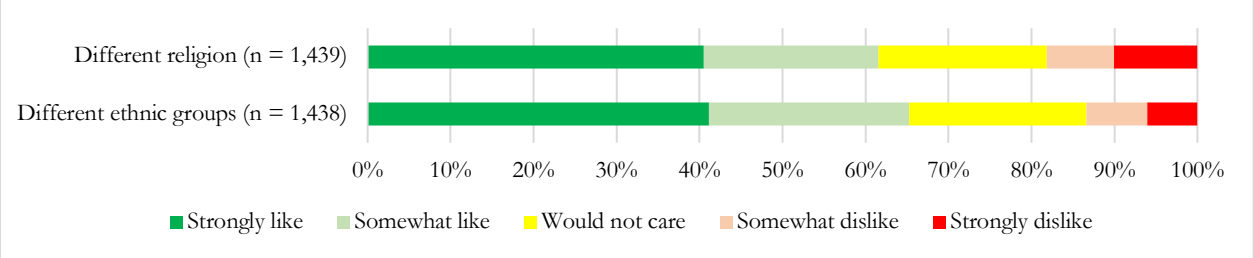

Figure 2: Hostility towards ethnic and religious outgroups

Note: The figure shows the percentage of respondents who chose a particular response category when asked about their willingness to have people from different religions and ethnic groups as neighbors. The dependent variable was derived by combining these two items. Source: Afrobarometer.

The two survey items had a Cronbach Alpha statistic of 0.84, which shows internal consistency. They also had a correlation of 0.72, which indicates the huge overlap between ethnicity and religion in Nigeria. Moreover, the level of hostility towards religious outgroups is slightly higher than that for ethnic outgroups. "Don't know" and "Refused to answer" responses were treated as missing observations. I applied this rule to all the variables derived from the survey instrument.

4.1.2. Explanatory variable

***Violent conflict*:** This measures the total number of violent conflict incidents within the 30km buffer around the dwellings of respondents (See figure 3 for a visualization). I developed the buffers using

QGIS software. This was possible because I relied upon the Afrobarometer survey data and the Armed Conflict Location and Events Database (ACLED) dataset, which are both geocoded. Based on the ACLED dataset, I define violent conflicts as incidents that fall under any of the following categories: Battles, Violence against civilians, and Explosions/Remote violence (Raleigh et al., 2010).[2] Although the ACELD dataset is available starting from 1997 and is updated in real time, I excluded conflict incidents that occurred post-2016. This lags the explanatory variable since the dependent variable is measured in 2017. Moreover, I considered all the incidents within the buffer from 1997 to 2016 because I am particularly interested in the cumulative effect of violent conflict. Some studies have shown that memories of past conflicts could shape action in the present (Wagoner and Brescó, 2016; Tint, 2010).

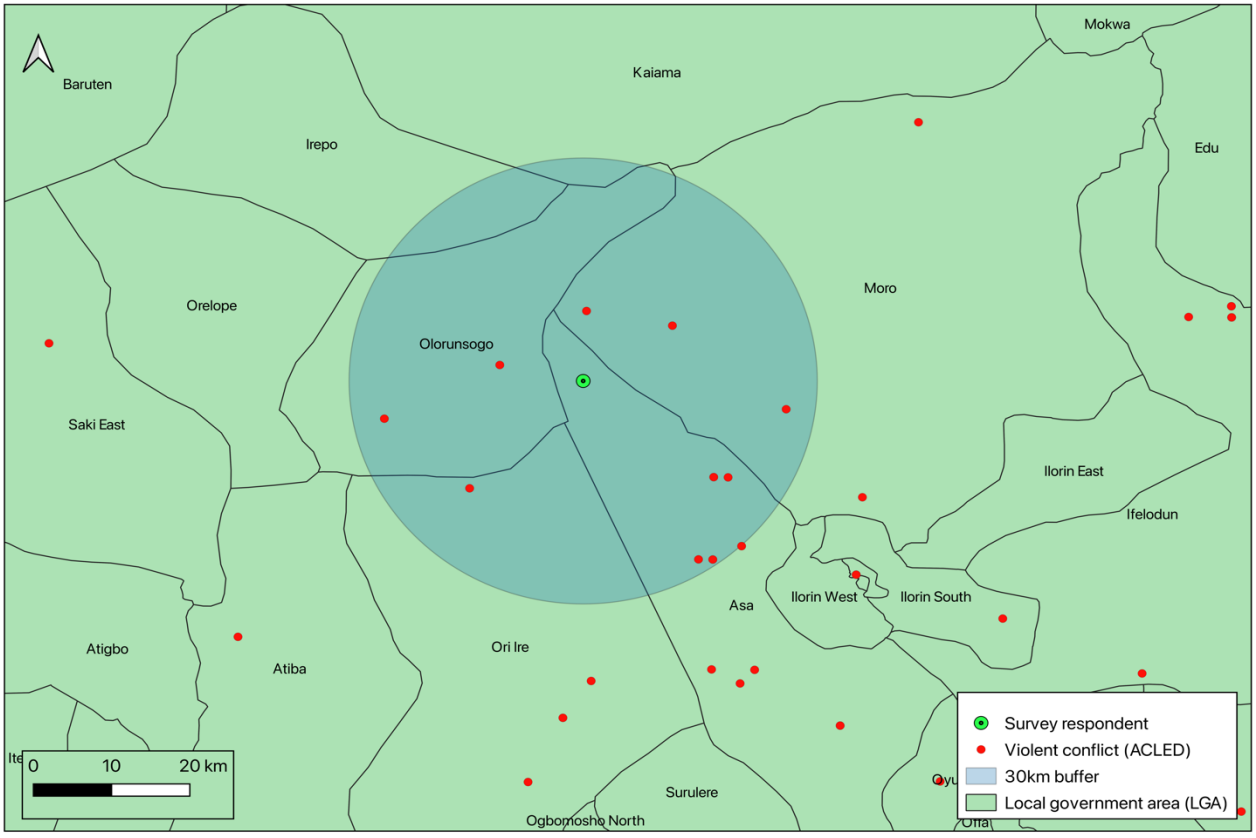

Figure 3: Measuring exposure to violent conflict

Note: Using a single respondent for a demonstrative purpose, the figure shows the 30km buffer around his/her dwelling, and highlights some of the challenges that could arise from measuring exposure to violent conflict using

[2] To access the ACLED dataset visit: https://acleddata.com/

the local government area (LGA) administrative boundaries.

Buffers are a more efficient way of measuring exposure to violent conflict than the LGA administrative boundaries. This is because the spatial area occupied by each buffer is unique for each respondent and allows for more variation in the explanatory variable. It also allows for a direct comparison between the respondents because the buffers are of equal sizes. If I had measured exposure to violent conflict at the LGA level, I would have associated all the respondents in a particular LGA with the total number of conflicts incidents there. This would have been inefficient because some respondents might be more exposed to conflict incidents in a contiguous LGA than those in the particular LGA where they reside. As shown in figure 3, the respondent resides in Asa LGA, yet conflict incidents in Moro, Olorunsogo, and Ori Ire LGAs are closer to his/her dwelling than some incidents in Asa LGA. Another challenge that comes along with working with the administrative boundaries (both at the national and subnational level) is that they are not clearly defined, especially in the latter case. There are a couple of observations where respondents residing close to Nigeria's national border are more exposed to conflicts in the contiguous countries of Cameroon, Chad, Benin, and Niger than those within the particular Nigerian state or LGA where they reside. The use of buffers attenuates these problems. 96 percent of the respondents had at least one violent conflict within the 30km buffer around their dwellings. 31 percent of them had at least 50 incidents.

4.1.3. Control variables

I consider some objective control variables that measure economic performance, poverty, and population size, as well as some individual covariates that measure the respondents' age, gender, religious affiliation, and educational attainment. The control variables are explained in more detail below:

Population size: This measures the total number of people residing within the 30km buffer around the respondents' dwellings in 2016. The dispersion pattern of a population could influence the risk of

conflict. When the population is scattered along the edges of a country rather than being concentrated in an area, for instance due to a rough geographical terrain, this limits the capacity of the state to exert control over the polity, which in turn increases the risk of conflict (Herbst, 2000; Collier and Hoeffler, 2000). The size of the population might also be proxying the level of urbanization. Some studies have found that populations in urban centers have a higher level of outgroup trust than those in rural areas (Xu, 2021; Delhey and Newton, 2005). This is because urban centers are often a melting pot of diverse peoples, and contact between different groups of people could foster tolerance, intergroup trust, and reduce prejudice (Allport, 1954). Since the raw population dataset is gridded, I estimated the population sizes within the buffers using QGIS software. This dataset was obtained from Worldpop at the University of Southampton.[3]

Nighttime light: This measures the mean annual nighttime light pixels within the 30km buffer around the respondents' dwellings in 2016 (Ghosh, et al., 2021). This variable proxies the level of economic activity. Slow economic growth has been found to increase the risk of conflict (Collier, 2008). Economic decline and rising inequality also correlate negatively with trust, which in turn makes ingroup-outgroup boundaries salient. This is because people become risk averse and associate interactions with outgroup members with higher risk (Stewart et al., 2020; Delhey and Newton, 2005). I computed the relevant statistic using QGIS software because the raw nighttime light dataset is gridded. Nighttime light is measured in pixels ranging from 0 to 63, with higher values denoting a higher level of economic activity and vice versa. Source: Earth Observation Group database.[4]

Prevalence of stunting: This measures the proportion of children under the age of 5 within the 30km buffer around the respondents' dwellings, who were classified as stunted in 2013 (Bosco et al., 2017). This variable proxies the socioeconomic wellbeing of the population. Some studies have shown that

[3] To access the population dataset visit: https://www.worldpop.org/
[4] To access the nighttime light dataset visit: https://eogdata.mines.edu/products/dmsp/

poverty causes conflict (Braithwaite et al., 2016; Do and Iyer, 2010). Poverty also correlates negatively with social trust (Gereke et al., 2018; Alessina and La Ferrara, 2000). Since the raw dataset is gridded and also gendered, I computed the relevant statistic for both males and females using QGIS software, and then took the average. Unlike the datasets for violent conflict, nighttime light, and population size which are available for Nigeria and the contiguous countries surrounding it, the prevalence of stunting dataset is available only for Nigeria's administrative boundaries. This implies that for the 120 respondents (i.e. 7.5 percent of the 1600 observations) whose buffers encroach into the contiguous countries, I consider the prevalence of stunting only for the spatial area within Nigeria's administrative boundary. Source: Worldpop Development and Health Indicators database.[5]

Educational level: This measures the educational attainment of the respondents. It was derived from the survey question, "What is your highest level of education?", with the responses on a 10-point ordinal scale ranging from "No formal schooling" to "Postgraduate." People who are educated might be more tolerant than their uneducated counterparts because education exposes them to diverse ideas. This could translate into a lower level of hostility towards ethno-religious outgroups (Jenssen and Engesbak, 1994). Education could reduce the risk of violent conflict by increasing the opportunity cost of rebel participation (Collier and Hoeffler, 2000).

Demographic covariates: This includes the age, gender, and religious affiliation of the respondents. Religious affiliation is measured using a dummy variable that takes a value of 1 if the respondent identifies as Christian and 0 if Muslim. I derived the binary variable by collapsing the various Christian and Muslim denominations into two separate categories. Since I am particularly interested in the relationship between Christians and Muslims, I treated the respondents (n = 20) who belonged to neither of these religious groups as missing observations. Gender is measured using a dummy variable

[5] To access the prevalence of stunting dataset visit: https://hub.worldpop.org/geodata/summary?id=1268

that takes the value of 1 if the respondent is male and 0 if female.

4.1.4. Instrumental variable

Forest cover: This variable measures the proportion of land area within the 30km buffer that consists of forests. More specifically, it was derived by dividing the total forest pixels within the buffer by the total land cover pixels. The raw dataset was obtained from the Global Land Cover (GlobCover) datatset, which classifies the land area across the globe into 22 categories (Bontemps et al., 2011).[6] I define forests as pixels ranging from classes 20 to 120. I relied on the 2009 version of the GlobCover dataset, which is the most recent. Since the raw dataset is gridded, I computed the relevant statistics using QGIS software.

Although I contend in this study that violent conflict leads to outgroup hostility, the reverse is also possible: People with a high level of outgroup hostility might be those who are exposed to violent conflict. This leads to the problem of reverse causality. To mitigate this problem, I have lagged the explanatory variable by considering only conflict incidents that occurred prior to 2017 – the year in which the dependent variable is measured. However, omitted variable bias might still be a problem because there might be some variables in the error term that influence outgroup hostility which I may not have controlled for in the regression model. To address this problem, I adopt an instrumental variable regression approach. I use forest cover as an instrumental variable for violent conflict. I expect that forest cover would plausibly not directly influence hostility towards ethnic and religious outgroups, except though the mechanism of violent conflict. Some empirical studies have shown that forest cover increases the risk of conflict because it provides strategic military advantages to insurgent groups (Schaub and Auer, 2022; Do and Iyer, 2010; Fearon and Laitin, 2003).

[6] To access the GlobCover dataset and the codebook/validation report visit: http://due.esrin.esa.int/page_globcover.php

Nigeria's forests have made it difficult for the Nigerian military to win a decisive victory against insurgent groups in the country. This is because the insurgent groups are familiar with the topographical terrain in the forests and often exploit this knowledge to their advantage. In Borno State, which is located in Northeastern Nigeria, *Sambisa* forest has served as a fortress for the radical Islamist group, *Boko Haram*. In 2014, over 200 girls were kidnapped from a boarding school in the town of Chibok and held captive in the forest (Kayode, 2014; Grill and Selander, 2014). Although most of them have been rescued, some are still yet to be found (Khalid and FitzGerald, 2022). In 2021, gunmen abducted about 300 girls from a boarding school in Zamfara State, which is located in Northwestern Nigeria. The girls, who were held captive in the forest, were later released after negotiations between the state government and the abductors (Akinwotu, 2021). In March 2022, gunmen attacked a train in Kaduna State, killing 10 people and the abducting several others who are still being held captive in forests (Nda-Isiah, et al., 2022; Akinwotu, 2022). The Kaduna State governor has recently called for the forests in the state to be carpet-bombed to eliminate terrorists residing there (Sunday, 2022).

4.2. Summary statistics and analytical technique

Table 1: Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
Outgroup hostility$^{\phi}$	1437	4.389	2.351	2	10
Violent conflict (20km)	1592	44.352	84.346	0	470
Violent conflict (30km)	1592	67.886	106.807	0	475
Violent conflict (40km)	1592	89.542	118.158	0	516
Nighttime light (20km)	1592	4.106	7.358	0	30.351
Nighttime light (30km)	1592	3.1	5.191	0	20.104
Nighttime light (40km)	1592	2.521	3.764	0	12.783
Prevalence of stunting (20km)	1592	0.326	0.15	0.129	0.647
Prevalence of stunting (30km)	1592	0.331	0.147	0.136	0.634
Prevalence of stunting (40km)	1592	0.334	0.144	0.151	0.625
Log Population size (20km)	1592	13.346	1.25	10.904	16.253
Log Population size (30km)	1592	14.032	1.116	11.536	16.39
Log Population size (40km)	1592	14.5	1.019	12.077	16.45
Educational level	1445	4.513	2.155	0	9
Religious affiliation	1428	0.569	0.495	0	1
Gender	1448	0.501	0.5	0	1
Age	1447	32.658	12.428	18	80
Forest cover (20km)	1592	0.582	0.242	0.074	0.982
Forest cover (30km)	1592	0.599	0.223	0.056	0.985

Forest cover (40km)	1592	0.606	0.208	0.056	0.985	
Would you like having people of a different religion as neighbors?		**Strongly like (1)**	**Somewhat like (2)**	**Wouldn't care (3)**	**Somewhat dislike (4)**	**Strongly dislike (5)**
Outgroup hostility (Religion)†	1439	40.51	21.06	20.29	8.06	10.08
Would you like having people of a different ethnicity as neighbors?		**Strongly like (1)**	**Somewhat like (2)**	**Wouldn't care (3)**	**Somewhat dislike (4)**	**Strongly dislike (5)**
Outgroup hostility (Ethnicity)†	1438	41.1	24.2	21.35	7.3	6.05

Note: ϕ *is the dependent variable,* † *denote variables that are subsets of the main dependent variable.*

Table 1 presents the summary statistics of the variables that will be used to estimate the regression model. The general form of the model to be estimated could be expressed thus:

$$y_t = \beta_0 + \beta_1 Violent\ conflict_t + \beta_2 X'_t + \varepsilon_t$$

Where y_t is the dependent variable which measures the degree of hostility towards ethnic and religious outgroups at time t, X'_t is a vector of control variables that have been discussed in the preceding section, β_0 is the intercept, β_1 and β_2 are the coefficients of the explanatory and control variables respectively, while ε_t denotes the error term. The model will be estimated using two-stage least squares (2SLS) regression.

5.0. Results and discussion

5.1. Association between forest cover and violent conflict

Table 2 presents the results of ordinary least squares (OLS) regression models examining the relationship between forest cover and violent conflict. In the baseline model where no control variables were added – model 1 – forest cover was significant at the one percent level and carried a negative sign. This suggests an inverse association between forest cover and the incidence of violent conflict, which is incongruent with the a priori expectation. In model 2 where I added control variables, forest cover retained its positive sign but its significance level dropped to 5 percent. The *anomalous* relationship between forest cover and violent conflict might not necessarily be wrong, especially when Nigeria's topography and the distribution of violent conflicts across the country are considered. The

ACLED dataset shows that 70 percent of the 14,247 violent conflicts that occurred in Nigeria between 1997 and 2021 were in the Northern Region, while the remaining 30 percent were in the Southern Region (Raleigh et al., 2010). The northernmost part of Nigeria is proximate to the *Sahara Desert* and the climate there is dry and the land is arid with sparse vegetation. The southernmost part of Nigeria is bounded by the Atlantic Ocean, and a large swathe of the land area in the Southern Region falls within the rainforest vegetation zone. Moreover, the amount of rainfall and vegetation cover in Nigeria increases as one moves southwards from the north.

Table 2: First stage regressions

Violent conflict#ϕ	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
	All data	**All data**	**North**	**North**	**South**
Forest cover#	-34.281***	-20.231**	44.645***	52.518***	-30.209***
	(11.983)	(7.845)	(15.742)	(15.25)	(5.434)
Nighttime light#		16.078***		5.422***	17.584***
		(0.469)		(2.035)	(0.334)
Prevalence of stunting#		-103.245***		-239.527***	-71.409**
		(16.049)		(25.39)	(29.636)
Log Population size#		-1.006		29.112***	-3.05
		(2.32)		(4.333)	(2.565)
Educational level		1.524*		1.844	-0.731
		(0.844)		(1.34)	(0.705)
Religious affiliation		-24.319***		-28.989***	-0.743
		(4.333)		(7.608)	(3.326)
Gender		-1.296		-3.912	0.356
		(3.201)		(5.831)	(2.164)
Age		0.29**		0.631***	0.044
		(0.13)		(0.24)	(0.087)
Constant	88.418***	77.209**	13.732	-294.689***	89.734**
	(7.658)	(33.111)	(8.593)	(56.924)	(41.127)
Observations	1592	1424	772	682	742
R-squared	0.005	0.705	0.01	0.243	0.94

Note: *ϕ is the dependent variable, standard errors are in parenthesis, *** p<0.01, ** p<0.05, * p<0.10. # denotes variables measured at the buffer level (i.e. 30km radius). All models are estimated using ordinary least squares (OLS) regression.*

Given this background, the positive correlation between forest cover and the incidence of conflict in models 1 and 2 should not be surprising. A common thread running through the cases of abductions discussed in section 4.1.4 is that they all occurred in the Northern Region. There might be fewer forests in the North than the South, but the insurgent groups operating in the former region tend to exploit the military advantages that the few forests there provide to the fullest. In the Southern Region where most of the land area is forested, the relationship between forest cover and the incidence

of violent conflict might be less clearly defined compared to the North. If this logic holds, then I should find a positive correlation between forest cover and the incidence of violent conflict when I estimate a model that considers only the observations in the Northern Region. As shown in model 3, this is the case. The positive association between forest cover and violent conflict persists when I include control variables as shown in model 4. When I estimated a model using the observations in Southern Nigeria, as shown in model 5, forest cover carried a negative sign. Taking the distribution of the conflict incidents across Nigeria into consideration, coupled with Nigeria's climate and topography, I nevertheless proceed with using forest cover as an instrumental variable.

5.2. Effect of violent conflict on outgroup hostility

Table 3: Regression models examining the effect of violent conflict on outgroup hostility I

Outgroup hostility$^{\phi}$	**Full sample**			**Religious subsamples**		
	(1)	**(2)**	**(3)**	**(4) (Xtian)**	**(5) (Muslim)**	**(6) (Muslim)**
Violent conflict#	0.025**	0.071**	0.025**	0.052***	-0.025	0.002*
	(0.01)	(0.031)	(0.011)	(0.013)	(0.023)	(0.001)
Nighttime light#		-1.273**	-0.423**	-0.954***	0.302	-0.037
		(0.508)	(0.167)	(0.225)	(0.299)	(0.033)
Prevalence of stunting#		7.256**	3.53**	-3.204	-3.492	2.951***
		(2.984)	(1.503)	(1.961)	(5.754)	(0.996)
Log Population size#		0.477**	-0.015	0.22	0.659	0.032
		(0.187)	(0.153)	(0.217)	(0.571)	(0.135)
Educational level		-0.287***	-0.189***	0.00	-0.105	-0.183***
		(0.088)	(0.041)	(0.059)	(0.086)	(0.043)
Religious affiliation		1.901**	0.395			
		(0.823)	(0.257)			
Gender		-0.208	-0.338***	0.035	-0.929***	-0.901***
		(0.251)	(0.13)	(0.182)	(0.22)	(0.18)
Age		-0.026*	-0.009	-0.008	0.007	-0.003
		(0.013)	(0.005)	(0.007)	(0.012)	(0.006)
Constant	2.58***	-4.437	4.057**	2.407	-1.339	3.983**
	(0.729)	(3.252)	(1.791)	(3.475)	(5.122)	(1.779)
Ethnic group dummies	No	No	Yes	Yes	Yes	Yes
Observations	1437	1413	1413	806	607	607
R-squared						0.187
Durbin statistic	20.018***	20.36***	5.849**	19.226***	2.11	
Wu-Hausman statistic	20.258***	20.511***	5.719**	18.889***	2.04	

Note: *ϕ is the dependent variable, standard errors are in parenthesis, *** p<0.01, ** p<0.05, * p<0.10. # denotes variables measured at the buffer level (i.e. 30km radius). All models are estimated using two-stage least squares (2SLS) regression, except for model 6 which is estimated using OLS regression.*

Table 3 reports the second-stage regression results of models examining the effect of exposure to violent conflict on hostility towards ethno-religious outgroups. In model 1 – the baseline model –

violent conflict carried the expected positive sign and was significant at the five percent level. This supports the hypothesis that exposure to violent conflict leads to an increase in outgroup hostility. In model 2 where I added the control variables, violent conflict remained significant at the five percent level and retained its positive sign. However, the size of its coefficient increased from 0.025 to 0.071. In model 3 where I added dummies for all the ethnic groups, violent conflict was still significant at the five percent level and retained its positive sign. However, the size of the coefficient decreased from 0.071 to 0.025. Among the control variables, worth highlighting is the statistical insignificance of religious affiliation, which had been significant in model 2 and carried a positive sign. If I had taken this finding at face value, I would have interpreted it as a positive correlation between Christian self-identification and outgroup hostility. However, religion and ethnic identity overlap to a great extent in Nigeria; including dummies for all the ethnic groups in model 3 makes it possible to better capture the effect of religious affiliation on outgroup hostility.

To check for heterogeneous effects, I broke down the data based on religious affiliation and estimated some models using the Christian and Muslim subsamples of respondents. As shown in model 4 which was estimated using the Christian subsample, violent conflict was significant at the one percent level and carried a positive sign. This suggests that among Christians, exposure to violent conflict has a positive effect on hostility towards ethno-religious outgroups. Moreover, the coefficient of violent conflict in model 4 was larger than that in model 3 – an identical model based on the full sample. This indicates that exposure to violent conflict has a larger effect on outgroup hostility among Christians than among Nigerians in general.

In model 5 which was estimated using the Muslim subsample of respondents, violent conflict was statistically insignificant. To check if endogeneity was indeed present, I conducted a test. As shown in the bottom two rows of table 3, the Durbin and Wu-Hausman statistics were significant in all the models except for model 5. This indicates that endogeneity was present in models 1 to 4, and the use

of an instrumental variable approach in these models was appropriate. Since endogeneity was not present in model 5, I estimated model 6 which is still based on the Muslim subsample of respondents, using simple OLS regression. Violent conflict was significant at the 10 percent level and carried a positive sign, indicating that among Muslims, exposure to violent conflict has a direct effect on outgroup hostility. The results reported in table 3 are robust to alternative buffer sizes (See table A1 in the appendix).

5.3. Robustness check

Table 4: Regression models examining the effect of violent conflict on outgroup hostility II

Outgroup hostility$^{\phi}$	**Religious component**			**Ethnic component**		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Violent conflict#	0.007***	0.008***	0.006***	0.007***	0.008***	0.006***
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)
Nighttime light#		-0.044***	-0.03**		-0.039***	-0.023**
		(0.013)	(0.012)		(0.012)	(0.011)
Prevalence of stunting#		0.259	0.382		0.076	0.091
		(0.19)	(0.354)		(0.166)	(0.32)
Log Population size#		0.107***	0.085*		0.092***	0.078*
		(0.036)	(0.044)		(0.033)	(0.042)
Educational level		-0.038***	-0.05***		-0.039***	-0.053***
		(0.013)	(0.017)		(0.013)	(0.017)
Religious affiliation		0.071	0.022		0.074	0.075
		(0.049)	(0.081)		(0.048)	(0.078)
Gender		-0.08**	-0.142**		-0.041	-0.078
		(0.039)	(0.057)		(0.034)	(0.049)
Age		-0.002	-0.002		-0.00	-0.00
		(0.001)	(0.002)		(0.001)	(0.002)
Intercept 1	0.353***	1.659***	1.015*	0.36***	1.504***	0.987*
	(0.114)	(0.408)	(0.59)	(0.114)	(0.379)	(0.562)
Intercept 2	0.66***	1.973***	1.491**	0.729***	1.85***	1.504***
	(0.047)	(0.457)	(0.593)	(0.039)	(0.431)	(0.57)
Intercept 3	1.016***	2.344***	2.056***	1.156***	2.256***	2.115***
	(0.064)	(0.525)	(0.619)	(0.09)	(0.505)	(0.609)
Intercept 4	1.228***	2.569***	2.399***	1.418***	2.506***	2.497***
	(0.112)	(0.57)	(0.646)	(0.151)	(0.556)	(0.648)
Ethnic group dummies	No	No	Yes	No	No	Yes
Observations	1439	1415	1415	1438	1414	1414
Log likelihood	-10867.231	-10627.001	-10539.218	-10789.985	-10558.963	-10470.767

Note: *ϕ is the dependent variable, standard errors are in parenthesis, *** p<0.01, ** p<0.05, * p<0.10. # denotes variables measured at the buffer level (i.e. 30km radius). All models are estimated using IV ordered probit regression.*

It is possible that the positive effect of violent conflict on outgroup hostility among the Nigerian population is influenced by the way that the dependent variable was operationalized. To check whether violent conflict influences the ethnic and religious components of outgroup hostility

differently, I disaggregated the dependent variable and estimated some models using its respective components. Since each component is measured on a five-point ordinal scale, I estimated the models using instrumental variable ordered probit regression. Table 4 reports the results.

Models 1 to 3 examine the effect of violent conflict on hostility towards religious outgroups only. In model 1 – the baseline model – violent conflict carried a positive sign and was significant at the one percent level. This indicates that among the Nigerian population, exposure to violent conflict leads to hostility towards religious outgroups. In model 2 where I added the control variables, violent conflict remained significant at the one percent level and retained its positive sign. Keeping all covariates at their mean levels, the analysis showed that a one unit increase in the number of violent conflicts within the 30km buffer around the respondents' dwellings increases the likelihood of them choosing the "Strongly dislike" response category by 0.5 percent when asked about their willingness to have people from other religions as neighbors.[7] In model 3 where I added dummy variables for all the ethnic groups, violent conflict retained its positive sign and remained significant at the one percent level.

Models 4 to 6 examine the effect of violent conflict on hostility towards ethnic outgroups only. In model 4 – the baseline model – violent conflict carried a positive sign and was significant at the one percent level. This indicates that among Nigerians, exposure to violent conflict leads to hostility towards ethnic outgroups. In model 5 where I added the control variables, violent conflict retained its positive sign and remained significant at the one percent level. Keeping all covariates at their mean levels, the analysis showed that a one unit increase in the number of violent conflicts within the 30km buffer around the respondents' dwellings increases the likelihood of them choosing the "Strongly dislike" response category by 0.5 percent when asked about their willingness to have people from other

[7] Table A3 in the appendix reports the marginal effects at the mean for model 2

ethnic groups as neighbors.[8] The size of the effect of violent conflict on the ethnic and religious components of outgroup hostility are identical, which might be indicative of the huge overlap between religion and ethnicity in Nigeria, which makes the population conflate both. In model 6 where I added dummies for all the ethnic groups, violent conflict remained significant at the one percent level and retained its positive sign. The correlations between the error terms of the first- and second-stage regressions for all the models reported in table 4 were statistically significant, which indicates that endogeneity was indeed present and the use of an instrumental variable approach was appropriate. These results are robust to an alternative estimation method and different buffer sizes (See Table A2 in the appendix).

Table 5: Regression models examining the effect of violent conflict on outgroup hostility III

Outgroup hostility$^{\phi}$	**Religious component**		**Ethnic component**	
	(1)	**(2)**	**(3)**	**(4)**
	(Xtian)	**(Muslim)**	**(Xtian)**	**(Muslim)**
Violent conflict#	0.009***	-0.006*	0.009***	-0.002
	(0.001)	(0.003)	(0.001)	(0.006)
Nighttime light#	-0.097***	-0.015	-0.084***	-0.023
	(0.02)	(0.016)	(0.019)	(0.02)
Prevalence of stunting#	-0.987**	1.4*	-0.314	1.367***
	(0.461)	(0.816)	(0.44)	(0.47)
Log Population size#	0.249***	-0.012	0.271***	-0.028
	(0.058)	(0.039)	(0.059)	(0.057)
Educational level	0.01	-0.055	-0.017	-0.071**
	(0.017)	(0.035)	(0.017)	(0.03)
Gender	0.024	-0.259	0.074	-0.322**
	(0.054)	(0.164)	(0.055)	(0.131)
Age	-0.003	-0.002	-0.002	0.002
	(0.002)	(0.002)	(0.002)	(0.003)
Intercept 1	3.539***	-0.544	3.973***	-0.654
	(0.833)	(0.496)	(0.849)	(0.74)
Intercept 2	3.903***	-0.143	4.369***	0.049
	(0.846)	(0.56)	(0.867)	(0.811)
Intercept 3	4.365***	0.311	4.877***	0.81
	(0.865)	(0.728)	(0.891)	(0.946)
Intercept 4	4.684***	0.539	5.195***	1.266
	(0.879)	(0.834)	(0.908)	(1.047)
Ethnic group dummies	No	No	No	No
Observations	807	608	806	608
Log likelihood	-5966.074	-4575.253	-5936.434	-4551.155

Note: ϕ *is the dependent variable, standard errors are in parenthesis, ***p<0.01, **p<0.05, *p<0.10. # denotes variables measured at the buffer level (i.e. 30km radius). All models are estimated using IV ordered probit regression.*

[8] Table A4 in the appendix reports the marginal effects at the mean for model 5

Table 5 reports the results of some more robustness checks that I conducted using the religious subsamples and the respective religious and ethnic components of outgroup hostility. In model 1, violent conflict was significant at the one percent level and carried a positive sign, indicating that among Christians, violent conflict has a positive effect on hostility towards religious outgroups. Keeping all covariates at their mean levels, the analysis showed that a one unit increase in the number of violent conflicts within the 30km buffer around the Christian respondents' dwellings increases the likelihood of them choosing the "Strongly dislike" response category by 0.2 percent when asked about their willingness to have people from other religions as neighbors.[9] In model 2 which was estimated using the Muslim subsample of respondents, violent conflict was significant at the 10 percent level and carried a negative sign. This suggests that among Muslims, exposure to violent conflict rather has a negative effect on outgroup hostility. Keeping all covariates at their mean levels, the analysis showed that a one unit increase in the number of violent conflicts within the 30km buffer around the Muslim respondents' dwellings reduces the likelihood of the them choosing the "strongly dislike" response category by 0.1 percent when asked about their willingness to have people from other religions as neighbors.[10]

Models 3 and 4 examine the effect of violent conflict on hostility towards ethnic outgroups among Christians and Muslims respectively. As shown in model 3, violent conflict was significant at the one percent level and carried a positive sign, indicating a positive effect of violent conflict on hostility towards ethnic outgroups among Christians. Keeping all covariates at their mean levels, the analysis showed that a one unit increase in the number of violent conflicts within the 30km buffer around the Christian respondents' dwellings increases the likelihood of them choosing the "Strongly disagree" response category by 0.2 percent when asked about their willingness to have people from

[9] Table A5 in the appendix reports the marginal effects at the mean for model 1
[10] Table A6 in the appendix reports the marginal effects at the mean for model 2

other ethnic groups as neighbors. The size of the effect is identical with that in model 1, which might be indicative of the tendency among Christians to associate ethnicity with religion. As shown in model 4, which was estimated using the Muslim subsample of respondents, violent conflict does not have a statistically significant effect on hostility towards ethnic outgroups.

6.0. Conclusion

This study examined the effect of exposure to violent conflict on hostility towards ethno-religious outgroups using representative survey data for Nigeria. The results showed that exposure to violent conflict has a positive effect on outgroup hostility among Nigerians. A mechanism through which this occurs is that exposure to violent conflict erodes trust and makes ethnic and religious fault lines salient, which in turn leads to hostility towards ethnic and religious outgroups. This finding is robust to different buffer sizes, different estimation techniques, and alternative operationalizations of outgroup hostility. When I broke down the data based on religious affiliation and estimated some models using the Muslim and Christian subsamples of respondents, the analysis showed that violent conflict had a positive effect on outgroup hostility only among Christians. Among Muslims, exposure to violent conflict rather had a negative effect on outgroup hostility.

This study also showed that the ethnic and religious divisions in present-day Nigeria are rooted in its past. This highlights the tendency for the past to persist and shape the present. If the Nigerian government wants to reduce both violent conflict and outgroup hostility, it would have to adopt a policy that tackles these two factors simultaneously because each one reinforces the other. For instance, the government could reduce the incidence of violence by equipping its security agencies with the requisite skills and equipment needed to respond promptly and effectively to conflict situations, while simultaneously pursuing policies that foster social cohesion and elevate a shared national identity over ethnic and religious identities, e.g. by encouraging inter-ethnic and inter-religious dialogue.

However, given the high level of religiosity among Nigerians, coupled with the huge importance that they attach to their ethnic and religious identities, it might be difficult to develop a strong sense of national identity among the diverse peoples who constitute Nigeria. Moreover, it is not uncommon for the elites to exploit these ethnic and religious divisions for their selfish political gain. This might disincentivize them from genuinely pursuing a policy that elevates a shared national identity over ethnic and religious identities.

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Appendix

Table A1: Replicating Table 3 using alternative buffer sizes

Outgroup hostility$^{\phi}$	**Full sample**		**Religious subsamples**			
	(1) (20km)	**(2) (40km)**	**(3) (20km) Xtian**	**(4) (40km) Xtian**	**(5) (20km) Muslim**	**(6) (40km) Muslim**
Violent conflict#	0.031**	0.025*	0.06***	0.043***	0.003***	0.002*
	(0.013)	(0.013)	(0.019)	(0.012)	(0.001)	(0.001)
Nighttime light#	-0.311**	-0.626**	-0.65***	-1.116***	-0.034	-0.06
	(0.123)	(0.293)	(0.187)	(0.278)	(0.022)	(0.049)
Prevalence of stunting#	2.65**	4.473**	-1.385	-3.631*	2.796***	2.973***
	(1.227)	(2.186)	(2.224)	(1.945)	(0.949)	(1.029)
Log Population size#	0.078	-0.118	0.465**	-0.204	-0.001	0.062
	(0.114)	(0.234)	(0.232)	(0.274)	(0.128)	(0.143)
Educational level	-0.165***	-0.199***	-0.024	-0.016	-0.176***	-0.188***
	(0.038)	(0.047)	(0.069)	(0.056)	(0.043)	(0.042)
Religious affiliation	0.357	0.372				
	(0.25)	(0.274)				
Gender	-0.325**	-0.339**	0.03	0.05	-0.901***	-0.898***
	(0.133)	(0.132)	(0.214)	(0.174)	(0.181)	(0.18)
Age	-0.013**	-0.008	-0.017*	-0.008	-0.003	-0.003
	(0.006)	(0.006)	(0.009)	(0.007)	(0.006)	(0.006)
Constant	3.435**	4.845**	-0.548	7.909*	4.5***	3.537*
	(1.481)	(2.449)	(3.653)	(4.165)	(1.615)	(1.912)
Ethnic group dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1413	1413	806	806	607	607
R-square					0.189	0.188
Durbin statistic	6.607**	4.248**	20.885***	15.342***		
Wu-Hausman statistic	6.465**	4.15**	20.563***	14.998***		

Note: *ϕ is the dependent variable, standard errors are in parenthesis, *** p<0.01, ** p<0.05, * p<0.10. # denotes variables measured at the buffer level. The buffer size at which the relevant variables (including the instrumental variable) are measured is specified in the header. All models are estimated using two-stage least squares regression, except for models 5 and 6 which are estimated using OLS regression.*

The regression results reported in table A1 replicate the results reported in table 3 in the main article using alternative buffers with radii of 20km and 40km.

Table A2: Robustness checks using an alternative estimation method and different buffer sizes

Outgroup hostility$^{\phi}$	**Religious component**			**Ethnic component**		
	(1) (30km)	**(2) (20km)**	**(3) (40km)**	**(4) (30km)**	**(5) (20km)**	**(6) (40km)**
Violent conflict$^{\#}$	0.012**	0.005***	-0.007***	0.013**	0.005***	-0.007***
	(0.006)	(0.002)	(0.002)	(0.006)	(0.002)	(0.002)
Nighttime light$^{\#}$	-0.214**	-0.024***	-0.027	-0.214**	-0.022**	-0.022
	(0.093)	(0.009)	(0.021)	(0.087)	(0.009)	(0.018)
Prevalence of stunting$^{\#}$	1.945**	0.407	0.229	1.643**	0.039	0.103
	(0.833)	(0.386)	(0.278)	(0.784)	(0.371)	(0.221)
Log Population size$^{\#}$	0.011	0.084*	0.067	-0.025	0.08*	0.049
	(0.085)	(0.045)	(0.053)	(0.08)	(0.044)	(0.043)
Educational level	-0.094***	-0.058***	-0.031	-0.096***	-0.063***	-0.033
	(0.022)	(0.016)	(0.023)	(0.021)	(0.016)	(0.025)
Religious affiliation	0.155	0.028	0.007	0.245*	0.092	0.046
	(0.142)	(0.095)	(0.051)	(0.134)	(0.092)	(0.058)
Gender	-0.22***	-0.168***	-0.088	-0.121*	-0.094*	-0.049
	(0.072)	(0.058)	(0.069)	(0.068)	(0.056)	(0.045)
Age	-0.006**	-0.003	-0.002	-0.003	-0.00	-0.00
	(0.003)	(0.002)	(0.002)	(0.003)	(0.002)	(0.001)
Constant	1.898*			2.135**		
	(0.992)			(0.934)		
Intercept 1		0.608	-0.088		0.605	-0.287
		(0.628)	(0.688)		(0.609)	(0.568)
Intercept 2		1.17*	0.209		1.229**	0.036
		(0.624)	(0.868)		(0.604)	(0.757)
Intercept 3		1.837***	0.563		1.964***	0.418
		(0.621)	(1.096)		(0.603)	(1.005)
Intercept 4		2.242***	0.777		2.424***	0.658
		(0.621)	(1.238)		(0.605)	(1.167)
Ethnic group dummies	No	No	Yes	No	No	Yes
Estimation method	2SLS	IV-Probit	IV-Probit	2SLS	IV-Probit	IV-Probit
Observations	1415	1415	1415	1414	1414	1414
Log likelihood		-10193.947	-10684.913		-10124.841	-10617.157

Note: ϕ *is the dependent variable, standard errors are in parenthesis, *** p<0.01, ** p<0.05, * p<0.10. # denotes variables measured at the buffer level. The buffer size at which the relevant variables (including the instrumental variable) are measured is specified in the header. All models are estimated using IV ordered probit regression, except for models 1 and 4 which are estimated using two-stage least squares regression. .*

The regression results reported in table A2 replicate the results reported in table 4 in the main article using a different estimation method and alternative buffers with radii of 20km and 40km.

Table A3: Marginal effects at the mean for model 2 in Table 4

Outgroup hostility (Religion)$^{\phi}$	**Strongly like (1)**	**Somewhat like (2)**	**Wouldn't care (3)**	**Somewhat dislike (4)**	**Strongly dislike (5)**
Violent conflict#	-0.003***	-0.002**	-0.001	0.00	0.005**
	(0.00)	(0.001)	(0.002)	(0.001)	(0.003)
Nighttime light#	0.015**	0.01***	0.006	-0.003	-0.029***
	(0.007)	(0.002)	(0.006)	(0.004)	(0.006)
Prevalence of stunting#	-0.089	-0.06	-0.035	0.015	0.169
	(0.074)	(0.039)	(0.04)	(0.028)	(0.109)
Log Population size#	-0.037**	-0.025***	-0.014	0.006	0.07***
	(0.018)	(0.006)	(0.015)	(0.01)	(0.019)
Educational level	0.013**	0.009***	0.005	-0.002	-0.025***
	(0.006)	(0.002)	(0.005)	(0.004)	(0.007)
Religious affiliation	-0.024	-0.017	-0.01	0.004	0.046
	(0.019)	(0.011)	(0.012)	(0.007)	(0.032)
Gender	0.028	0.019**	0.011	-0.005	-0.052**
	(0.017)	(0.008)	(0.012)	(0.008)	(0.023)
Age	0.001	0.00	0.00	-0.00	-0.001
	(0.001)	(0.00)	(0.00)	(0.00)	(0.001)

Note: *$\phi$is the dependent variable, # denotes variables measured at the 30km buffer level, standard errors are in parenthesis, *** p<0.01, ** p<0.05, * p<0.10. Numbers in parenthesis below the response categories are the ordinal values assigned to them.*

Table A4: Marginal effects at the mean for model 5 in Table 4

Outgroup hostility (Ethnicity)$^{\phi}$	**Strongly like (1)**	**Somewhat like (2)**	**Wouldn't care (3)**	**Somewhat dislike (4)**	**Strongly dislike (5)**
Violent conflict#	-0.003***	-0.002**	-0.001	0.001*	0.005*
	(0.00)	(0.001)	(0.002)	(0.001)	(0.003)
Nighttime light#	0.013**	0.011***	0.004	-0.005	-0.024***
	(0.006)	(0.002)	(0.007)	(0.004)	(0.007)
Prevalence of stunting#	-0.026	-0.021	-0.009	0.009	0.047
	(0.058)	(0.044)	(0.021)	(0.021)	(0.098)
Log Population size#	-0.031*	-0.025***	-0.011	0.011	0.057***
	(0.017)	(0.007)	(0.017)	(0.01)	(0.02)
Educational level	0.013*	0.011***	0.005	-0.005	-0.024***
	(0.007)	(0.003)	(0.007)	(0.004)	(0.008)
Religious affiliation	-0.025	-0.02	-0.009	0.009	0.046
	(0.019)	(0.012)	(0.015)	(0.009)	(0.03)
Gender	0.014	0.011	0.005	-0.005	-0.025
	(0.013)	(0.009)	(0.008)	(0.006)	(0.02)
Age	0.00	0.00	0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

Note: *$\phi$is the dependent variable, # denotes variables measured at the 30km buffer level, standard errors are in parenthesis, *** p<0.01, ** p<0.05, * p<0.10. Numbers in parenthesis below the response categories are the ordinal values assigned to them.*

Table A5: Marginal effects at the mean for model 1 in Table 5

Outgroup hostility (Ethnicity)$^{\phi}$	**Strongly like (1)**	**Somewhat like (2)**	**Wouldn't care (3)**	**Somewhat dislike (4)**	**Strongly dislike (5)**
Violent conflict#	-0.005***	-0.00	0.002***	0.001***	0.002***
	(0.001)	(0.00)	(0.00)	(0.00)	(0.00)
Nighttime light#	0.055***	0.00	-0.018***	-0.015***	-0.021***
	(0.009)	(0.001)	(0.004)	(0.003)	(0.004)
Prevalence of stunting#	0.556**	0.001	-0.186**	-0.156**	-0.214**
	(0.248)	(0.014)	(0.086)	(0.072)	(0.096)
Log Population size#	-0.14***	-0.00	0.047***	0.039***	0.054***
	(0.03)	(0.004)	(0.011)	(0.009)	(0.013)
Educational level	-0.006	-0.00	0.002	0.002	0.002
	(0.01)	(0.00)	(0.003)	(0.003)	(0.004)
Gender	-0.013	-0.00	0.005	0.004	0.005
	(0.031)	(0.00)	(0.01)	(0.009)	(0.011)
Age	0.002	0.00	-0.001	-0.001	-0.001
	(0.001)	(0.00)	(0.00)	(0.00)	(0.00)

Note: *$\phi$is the dependent variable, # denotes variables measured at the 30km buffer level, standard errors are in parenthesis, *** p<0.01, ** p<0.05, * p<0.10. Numbers in parenthesis below the response categories are the ordinal values assigned to them.*

Table A6: Marginal effects at the mean for model 2 in Table 5

Outgroup hostility (Ethnicity)$^{\phi}$	**Strongly like (1)**	**Somewhat like (2)**	**Wouldn't care (3)**	**Somewhat dislike (4)**	**Strongly dislike (5)**
Violent conflict#	0.004	-0.001	-0.002	-0.001*	-0.001***
	(0.004)	(0.002)	(0.002)	(0.00)	(0.00)
Nighttime light#	0.01	-0.003	-0.004	-0.001	-0.002
	(0.007)	(0.003)	(0.003)	(0.001)	(0.002)
Prevalence of stunting#	-0.885***	0.247	0.371***	0.126	0.141
	(0.166)	(0.228)	(0.086)	(0.082)	(0.152)
Log Population size#	0.008	-0.002	-0.003	-0.001	-0.001
	(0.024)	(0.007)	(0.01)	(0.004)	(0.004)
Educational level	0.035***	-0.01	-0.015***	-0.005	-0.006
	(0.009)	(0.009)	(0.004)	(0.004)	(0.006)
Gender	0.163***	-0.046	-0.069***	-0.023	-0.026
	(0.039)	(0.041)	(0.02)	(0.016)	(0.029)
Age	0.001	-0.00	-0.001	-0.00	-0.00
	(0.001)	(0.001)	(0.001)	(0.00)	(0.00)

Note: *$\phi$is the dependent variable, # denotes variables measured at the 30km buffer level, standard errors are in parenthesis, *** p<0.01, ** p<0.05, * p<0.10. Numbers in parenthesis below the response categories are the ordinal values assigned to them.*

Table A7: Marginal effects at the mean for model 3 in Table 5

Outgroup hostility (Ethnicity)$^{\phi}$	**Strongly like (1)**	**Somewhat like (2)**	**Wouldn't care (3)**	**Somewhat dislike (4)**	**Strongly dislike (5)**
Violent conflict#	-0.005***	0.00	0.002***	0.001***	0.002***
	(0.001)	(0.00)	(0.00)	(0.00)	(0.003)
Nighttime light#	0.047***	-0.001	-0.019***	-0.012***	-0.015***
	(0.009)	(0.001)	(0.004)	(0.003)	(0.003)
Prevalence of stunting#	0.178	-0.005	-0.071	-0.047	0.056
	(0.247)	(0.008)	(0.099)	(0.065)	(0.078)
Log Population size#	-0.153***	0.004	0.061***	0.04***	0.048***
	(0.03)	(0.004)	(0.013)	(0.009)	(0.011)
Educational level	0.01	-0.00	-0.004	-0.003	-0.003
	(0.01)	(0.00)	(0.004)	(0.003)	(0.003)
Gender	-0.042	0.001	0.017	0.011	0.013
	(0.031)	(0.001)	(0.012)	(0.008)	(0.01)
Age	0.001	-0.00	-0.00	-0.00	-0.00
	(0.001)	(0.00)	(0.00)	(0.00)	(0.00)

Note: *$\phi$is the dependent variable, # denotes variables measured at the 30km buffer level, standard errors are in parenthesis, *** p<0.01, ** p<0.05, * p<0.10. Numbers in parenthesis below the response categories are the ordinal values assigned to them.*