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Who killed in Rwanda's genocide? Micro-space, social influence and individual participation in intergroup violence

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Who kills? Micro-space, social influence, and individual participation in inter-group violence

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Abstract

In episodes of inter-group violence, which group members participate and which do not? Although such violence is frequently framed as occurring between distinct ethnic, racial, or sectarian groups, it is easily overlooked that it is usually only a subset of the group's members who in fact participate in the violence. In predicting participation, extant research has privileged an atomistic approach and identified individual attributes indicative of a predisposition for violence. I suggest instead that a situational approach should complement the atomistic paradigm and present evidence that an individual's micro-spatial environment is an important predictor of differential participation into inter-group violence. Using GIS data on 3426 residents from one community, I map the household locations of participants, non-participants, and victims of Rwanda's 1994 genocide. I find that participants are likely to live either in the same neighborhood or in the same household as other participants. Specifically, as the number of violent to non-violent individuals in an individual's neighbourhood or household increases, the likelihood of this individual's participation also increase. In explaining these neighbourhood and household effects, I suggest social influence is the mechanism at work. As micro-spatial distance decreases, micro-social interaction increases. Neighbors and household members exert influence for and against participation. Participation then may be as much the product of social interaction as of individual agency. What neighbours and family members think, say, and do may influence participation in collective action such as inter-group violence. The conceptualization of neighborhoods and households as micro-spheres of influences suggests the importance of social structure as a determinant of participation.

Keywords: Africa, Rwanda, GIS, micro-space, neighbourhood effect, genocide, ethnic violence, social influence, social structure, collective action

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In episodes of inter-group violence, which group members participate and which do not? In Osh, Kyrgyzstan between June 4th and 10th 1990, Kyrgyz herders pursued their Uzbek farmer neighbors, often on horseback, in communal clashes that resulted in over 5000 crimes of murder, rape, and pillage (Tishkov, 1995). In Gujarat, India, Hindu mobs targeted their Muslim neighbors in retaliation for an orchestrated attack on Hindus in a train, provoking riots that eventually claimed the lives of 790 Muslims and 290 Hindus between February 28th and June 15th 2002 (Wilkinson, 2006). In communities across Rwanda, Hutu systematically hunted down their Tutsi neighbors in a collective effort to exterminate them between April 6th and July 3rd 1994 (Fujii, 2009). As these examples of communal violence, ethnic riots, and mass killings suggest, collective violence between groups is a persistent and destructive human phenomenon that has affected social stability in distinct regions and in different forms.

Although such violence is frequently framed as being between two groups, it is easily overlooked that it is usually only a subset of the group's members who in fact participate in the violence. In Rwanda for example, an estimated one in five Hutu men committed an act of violence during the genocide (McDoom, 2009). Extraordinary as this statistic is, it still means that four out of five Hutu men did *not* commit violence. What then predicts who participates and who does not?

To address this question, the article tests the importance of one simple situational variable: micro-space. It suggests that the significance of micro-space has hitherto been underestimated in our growing understanding of the various predictors of participation. Existing research has pursued a primarily atomistic approach and pointed to individual characteristics associated with a disposition to participation. This article suggests, however, that an individual's micro-spatial environment may predict participation in a mob, riot, or massacre just as an individual's age, gender, or socio-economic status may do so.

To test the importance of micro-spatial factors the article draws on a well-known case of inter-group violence: Rwanda's 1994 genocide. It examines one community that experienced violence

and uses Geographic Information Science (GIS) technology to geo-code the homes of all 3426 residents and to construct a map showing the spatial distribution of the killers, non-killers, and victims. In analyzing these data the paper identifies two principal micro-spatial predictors of participation. First, it finds a 'neighborhood effect'. Participants often live in the same neighborhood as other participants. Formally, if an individual lives in a neighborhood comprising a high proportion of other participants in the violence, the odds of his participation increase. Second, the paper finds a 'household effect.' Participants also usually live in the same household as other participants. Formally, if an individual lives in a household comprising a high proportion of other participants, the odds of his participation again increase. In short, the data suggest that where you live matters for participation.

Moreover, the paper suggests these neighborhood-level and household-level effects are the result of a social process. As micro-spatial distance decreases, micro-social interaction increases. Atomistic processes resulting from the better-known individual-level predictors of age, gender, and socio-economic status neither solely predict participation nor account for the finding that where you live matters. More specifically, it suggests the likely mechanism is what is broadly termed 'social influence'. Individuals who live close together may influence each other through processes such as collective socialization or peer-group pressures, among other mechanisms. Neighbors and family members then may have influenced individuals for and against participation in Rwanda's violence. Theoretically, the existence of such micro-spheres of influence would suggest the importance of social structure in predicting participation in violent phenomena. This would in turn suggest that policy interventions aimed at preventing such violence may be more effective if also targeted at households and communities as a whole, rather than solely at violence-prone individuals in isolation.

The paper has two further empirical findings for Rwanda's violence. First, contrary to conventional wisdom, it was not young, unattached men, 'loose molecules' (Kaplan, 1994: 2), who were most

likely to participate in the violence. The participant's profile instead pointed to middle-aged men with wives and children. Second, the data show that children, and overwhelmingly girl children, were much more likely to survive than adults and boy children. As ethnicity in Rwanda is patrilineal, it corroborates the genocidal or 'eliminationist' character of the violence. Without males, the Tutsi could not reproduce as an ethnic group.

The paper is structured as follows. In the first section I review extant theories and empirical studies of individual participation in various forms of violence, and set out several hypotheses based on this. In the second section I present the research design, data, and methods used to test these propositions and in the third section I present the results of both descriptive and inferential statistical analyses. In the fourth section I consider alternative interpretations of the data and finally I conclude with a discussion of the implications for our understanding of inter-group violence.

Theoretical framework

Scope conditions

Riots, lynchings, ethnic and sectarian killings, pogroms, communal violence, atrocities, massacres, and genocidal violence may all be instances of inter-group violence. Despite their apparent differences, these various forms of inter-group violence in fact share several characteristics. The violence (i) is collective, i.e. it is not the work of individuals acting alone, but of groups of individuals acting together; (ii) is committed primarily by civilians rather than security professionals authorized and organized by the state such as soldiers and policemen; and (iii) requires the group identity of the perpetrators and victims to be integral and not incidental to the participation and targeting. This definition is narrower than the concept of 'collective violence' (Tilly, 2003) given the importance of group identity. It is, however, broader than the concept of 'ethnic violence' (Brubaker & Laitin, 1998) as groups may form around class, political, and ideological identities as well as tribal, language, or religious identities.

Existing theory and evidence on participation in violent phenomena

A considerable body of work has adopted a methodologically atomistic approach employing individual-level attributes to predict participation in various forms of violence. Empirical studies have identified socio-demographic characteristics, notably age and gender, as robust predictors of participation, and have provided more contingent support for socio-economic attributes.

Socio-demographic characteristics: Several theoretical mechanisms have been proposed for why age and gender in particular may matter. First, younger men may be less constrained by family responsibilities and can afford the opportunity costs of participating in such time-consuming and risky activities (Collier and Hoeffler, 2004). Second, younger men experience frustration most acutely when deprived of opportunities for social and economic advancement, especially if their expectations have been raised from receiving education (Choucri, 1974; Goldstone, 2002). Third, younger men are especially susceptible to ideals and are strongly motivated by the urge for change (Huntington, 2002). They are consequently more likely to engage in violent riots and protests. Macro-level research on 'youth bulges' has suggested an association between disproportionate numbers of young men in a population and internal armed conflict (Urdal, 2006), rebellion (Moller, 1968), and revolution (Goldstone, 1991).

Socio-economic characteristics: In contrast with the socio-demographic predictors, the evidence for socio-economic predictors is less conclusive. Theory has nonetheless proposed three central mechanisms: (i) Grievance. Individuals experience frustration when denied the opportunity to achieve what they expect (Gurr, 1970); (ii) Material incentives. Deprived individuals respond more favorably to opportunities for rapid self-enrichment (Popkin, 1979); and (iii) Opportunity cost. Poorer individuals can afford to engage in violent activities as they have little to lose and much to gain (Collier and Hoeffler, 2004).

The evidence to support these mechanisms is mixed. Scacco (2009), in a survey of participants and non-participants in Nigeria's 2001 Christian-Muslim riots, finds poverty mattered only when

measured subjectively and only in interaction with an individual's social connectedness. Verwimp's (2005) economic profile of a Rwandan génocidaire finds that neither an individual's literacy level nor household's landholdings predicted participation. However, individuals who rented in land or worked as unskilled laborers were more likely to participate, though so too were individuals who rented out the land and who employed the unskilled labor. Humphreys and Weinstein (2008). surveyed participants in Sierra Leone's civil war and finds that an individual's income (proxied by whether his home had mud walls) and literacy do predict participation, though so too does his susceptibility to material incentives and social sanctions. McPhail (1971) in a meta-analysis of participation in America's 1960s race riots reviews seven socio-economic variables and concludes that none is a robust predictor of participation.

Ordinary killers: Beyond age, gender, and debatably socio-economic status, a scholarly consensus is crystallizing that violent perpetrators do not possess distinguishing individual characteristics. Ordinary individuals are capable of extraordinary violence. Research on participation in mass killings, notably genocides, has generated perhaps the strongest consensus (Browder, 2003; Waller, 2002). Hannah Arendt (1963:252) first wrote of the 'fearsome, word-and-thought-defying banality of evil' in 1963 to describe Adolf Eichmann, a senior SS commander who oversaw the deaths of tens of thousands of Jews and others during World War II. Browning (1992) constructed biographic profiles of 502 members of a German Police Battalion responsible for the deaths of 83,000 individuals in World War II and concluded they were just ordinary men.

Experimental research in psychology supports this assessment of real-world perpetrators. Milgram (1963) found that 26 of 40 male subjects from New Haven, who responded to an advertisement soliciting paid participants for a memory experiment, were willing to administer increasingly powerful electric shocks when ordered by an individual clothed as a scientist, to the point that the 'victim', an actor who could be heard but not seen by the subject, ceased crying out in pain to simulate unconsciousness. Zimbardo et al. (1973) found in a simulated prison experiment involving

21 American male college students, that of the 11 who played the role of guards, one third became increasingly physically aggressive towards the 10 who played prisoners over the course of one week.

The growing micro-evidence on Rwanda's perpetrators also points to a consensus that the killers were ordinary. Straus (2006: 119) surveyed 210 sentenced, self-confessed perpetrators and concludes that 'Rwanda's killers were ordinary in all but the crimes they committed'. Mironko (2004: 177) interviewed approximately 100 self-confessed Rwandan perpetrators and describes them as among the 'countless ordinary civilians – men, women, and children – who were more informally persuaded to take part in the killing, but who may in fact have killed more innocent people than all the other forces combined'. Fujii (2006: 17) interviewed 82 Rwandans and concludes those who joined in the violence 'were, in every sense of the word, ordinary men (and women)'. This scholarly consensus, however, raises the question behind this paper. If perpetrators indeed are ordinary and possess few distinguishing individual characteristics, what else then predicts their participation?

Micro-space and social mechanisms

One predictor of participation, in addition to the atomistic approach of who you are, may be the structural factor of where you live. Neighborhood is a well-established spatial determinant in a variety of phenomena including voting behaviour (Johnston, 1979); crime and delinquency (Kling, Ludwig, & Katz, 2005); and various health and educational outcomes (Harding, 2003; Sampson, Morenoff, & Gannon-Rowley, 2002). In accounting for the neighborhood effect, these studies point to the presence of other persons in one's micro-spatial environment that activates a *social* process whose effect is independent of *individual-level* processes. The mechanism commonly suggested is 'influence' resulting from social interaction.

Spatial and social proximity: The theoretical intuition linking micro-space and social influence then is that the likelihood of social interaction increases as the spatial distance between individuals

decreases. In a well-known study of voting behaviour, Cox (1969) identified an inverse relationship between distance and acquaintance formation, the implication of which was popularized in the phrase 'people who talk together, vote together' (Miller, 1978). Allen & Fustfeld (1975) showed that co-workers separated by more than 25m walking distance had a significantly lower probability of communicating with each other than those located closer to each other. Mok & Wellman (2007) found that in a urban area the frequency of face-to-face contact between individuals dropped significantly at 5 miles, as did the provision of tangible support, in the context of Toronto, Canada. In the context of rural Rwanda in 1994, where distance-reducing transportation and communication technologies such as vehicles, telephones and the internet were not widely-used, it is likely that social interaction would be particularly sensitive to spatial proximity.

Social influence: The mechanism implicit in social interaction then is social influence. Social psychology has provided a formal definition. 'Social influence can be said to have occurred whenever a person (P) *changes* his behaviour as a result of *induction* by another person or group (the influencing agent or O)'...Induction may be deliberate and intentional, as in those cases where O tries to persuade, order, threaten, express expectations to, or express guidelines to P. On the other hand induction may also be unintentional to varying degrees, as in the case where O sets an example or acts as a role model for P' (Kelman, 1974: 128). Social influence then is a theoretically broad concept that may be (i) conscious or unconscious; (ii) behavioural or attitudinal; and (iii) of short or long duration. As such it encompasses a variety of psycho-social mechanisms including conformity, socialization, peer pressure, compliance, internalization, and identification (Cialdini & Goldstein, 2004).

Social influence and violence: There is considerable and growing evidence of the importance of social influence in accounts of violence. Influence for example is the mechanism implicit in studies of violent phenomena that highlight the importance of social ties and social networks. Interpersonal ties may both facilitate and constrain an individual's actions. In her research on Muslim-Christian

riots in Nigeria, Scacco (2009) finds 'social connectedness' an important determinant of individual participation. In a sample of 174 rioters and 530 non-rioters, she finds that on average participants knew 14 others rioters compared with only 5 for non-participants, and that pre-riot participation in community meetings and membership of voluntary associations, both increased the likelihood of becoming a rioter. Humphreys and Weinstein's (2008) study of participation in Sierra Leone's civil war found that 21% of the 184 non-combatants surveyed had ties to the rebel group (the RUF) compared with 28% of the 46 rebel combatants who reported voluntarily joining the RUF. They infer that social sanctions played an important role in drawing individuals into the rebellion. Sageman (2004) looks at Islamist terrorism and, based on the biographic data of 172 participants in the modern jihad, finds that 75% had either pre-existing social ties to other jihadis or else decided to join with other friends and relatives.

Studies of participation in Rwanda's violence implicitly suggest a link between micro-space and social influence. The research highlights the importance of *face-to-face* interaction. Straus (2006: 136) writes participation was 'the result of direct face-to-face mobilization: individuals, leaders, or groups directly solicited the respondents' participation at commercial centers, on roads, and pathways, or at their homes'. Fujii (2009: 128) points to kinship and friendship ties along with group contagion effects which were 'the sum of shared knowledge and activities and regular face-to-face interactions. They were the product of talking, gossiping, greetings, visiting, sharing beers, and participating in *umuganda* [a Rwandan institution of obligatory labor]'. Neighborhoods and households represent micro-spaces where individuals live in close proximity to one another and are likely to have everyday face-to-face interactions of the kinds described.

Research on genocide perpetrators points to at least two forms of influence resulting from social interaction: horizontal influence from 'peer pressures'; and vertical influence from 'authority.' Browning (1992: 175), based on his work on atrocities committed by members of a German police battalion, writes 'within virtually every social collective, the peer group exerts tremendous pressure

on behaviour and sets moral norms'. Straus (2006: 148) concludes that in Rwanda 'intra-ethnic coercion and pressure appears to have been a central factor driving mass participation in the genocide'. We would hypothesize then that horizontal influence would be stronger in neighborhoods where the number of pro-violence peers relative to anti-violence peers was high. The same logic of influence would apply at the household-level.

H1. As the number of perpetrators relative to non-perpetrators in a neighborhood increases, the likelihood of an individual being drawn into the violence also increases (horizontal peer group influence).

H2. As the number of perpetrators relative to non-perpetrators in a household increases, the likelihood of an individual being drawn into the violence also increases (kinship/family influence).

The second form of influence is 'vertical': the product of leadership and authority. Milgram (1963) first demonstrated in a laboratory experiment how an authority figure, in this case a man dressed in a scientist's white coat, could motivate an ordinary individual to inflict harm on another individual through the administration of what the subject believed were actual electric shocks. Straus (2006: 143) corroborates the importance of authority in Rwanda's violence and writes 'once genocidal violence began in an area, local Hutus who were in charge used their power and authority to mobilize able-bodied men to participate'.

H3. As the proximity to a mobilizing agent or pro-violence authority figure increases, the likelihood of an individual being drawn into the violence also increases (vertical influence).

While research suggests social processes may promote participation in violence, it has also suggested social interaction may reduce inter-group hostility. Influence may also work to deter violence. Allport (1958) first hypothesized that inter-group contact would discourage stereotyping, discrimination, and prejudice as interaction would increase the information each group possesses of the other. Varshney (2001) found that inter-group ties established through participation in formal associations reduced the likelihood of communal violence between Hindus and Muslims in India. We would hypothesize then that counter-violence influence would be stronger in communities where the likelihood of inter-group interaction was high.

H4. As the number of out-group relative to in-group members in a neighborhood increases, the likelihood of an individual being drawn into the violence decreases (inter-group contact).

Research design, data and methods

To test the importance of micro-spatial factors in episodes of inter-group violence, I present data from one community, sector Tare, that experienced violence during Rwanda's genocide of 1994. I start with a synopsis of the Rwandan case followed by a profile of the chosen community and a chronology of how the genocide unfolded in it. I then describe the data collection and operationalization of the dependent and independent variables.

Synopsis of Rwandan genocide

In April 1994 a government-sponsored campaign lasting just over 100 days targeted Rwanda's Tutsi minority and a much smaller number of its moderate Hutu majority for extermination. An estimated 507,000 to 850,000 Rwandans lost their lives (Des Forges, 1999; Prunier, 1998). Their assailants were soldiers, militia, policemen, and ordinary civilians drawn largely from the Hutu population. The genocide was the culmination of a civil war beginning in October 1990 fought between a mainly Tutsi exile rebel group, the Rwandan Patriotic Front (RPF) and a government controlled by a Hutu ruling elite. The roots of the war lay in the Hutu revolution of 1959-62 which overthrew the Tutsi monarchy, sending thousands of Tutsi into exile, and which established a Hutu ethnocracy in its place. Following the revolution and independence from Belgium in 1962, Tutsi remained excluded from Rwandan politics until August 1993 when the civil war led to a power-sharing agreement between the incumbent Hutu regime, new opposition parties, and the Tutsi rebel movement. Hutu hardliners, however, opposed the deal. When Rwanda's Hutu president, Juvénal Habyarimana, who signed the agreement was assassinated on April 6th 1994, a small group of extremists immediately seized the opportunity to establish itself as the new government. Having captured the state, they used its considerable resources to eliminate the moderate opposition and to

implement a genocidal program against the Tutsi 'enemy.' The international community failed to intervene to stop the slaughter. At the same time, government forces and the rebel army re-engaged in combat. Some one hundred days later, the rebels emerged victorious. By one estimate, during this time approximately three-quarters of Rwanda's Tutsi minority were murdered (McDoom, 2009). Rwanda's violence was remarkable then for its speed and for its intensity. Its most unusual characteristic, however, remains the scale of civilian involvement. In practically every community where the Tutsi 'enemy' lived, there were Hutu (and also Twa, Rwanda's third and smallest ethnic minority) who mobilized against them. An estimated one in five Hutu men committed at least one act of violence during the genocide. However, this still meant that four in five Hutu men did not participate in the violence. To reiterate the research question, who then were the minority who joined in the violence and who were the majority who did not?

Profile of selected community

To answer this question I collected data on participants and non-participants in Rwanda's violence from one community or 'sector' that experienced violence during the genocide. Sector Tare is located in south-west Rwanda in what was at the time Maraba commune in Butare prefecture.[1] Its experience of the genocide was not unusual for a Rwandan rural community. 63% of its Tutsi population were killed and 24% of its adult Hutu male population was implicated in the killing. These figures are in line with the national estimates cited above and reinforced Tare's selection as a research site. Demographically, 647 households or 3426 Rwandans lived within its 5.62 square kilometers in April 1994. As with Butare prefecture as a whole, Tare's population density of 609 persons/sq.km then was even higher than the already high national average of 412 persons/sq.km. 215 or 6.3% of Tare's inhabitants were ethnic Tutsi, just slightly lower than the national proportion of 8.4% (Goverment of Rwanda, 1994). Before the genocide, ethnic relations had been good. Tare

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[1] In April 1994 Rwanda comprised 11 prefectures, 145 communes, 1488 sectors, and 9000+ cells. In some areas there was a fifth, unofficial administrative unit: *nyumbakumi* or groupings of approximately ten households represented by an unpaid individual.

boasted 38 inter-ethnic unions, representing 37.2% of all Tutsi, mostly between Hutu men and Tutsi women. Table I summarizes these demographic data.

[Table I here]

Geographically, Tare reinforces Rwanda's reputation as the 'land of a thousand hills' with elevations ranging from 1651m to 1891m and slopes from 1 to 51 degrees. Almost all of its land was cultivated with no forestland and few shrubs or bushes. Economically, as elsewhere in Rwanda, the principal occupation for the majority of Tare's inhabitants was subsistence agriculture. Tare possessed a small commercial center with a market and several small shops selling basic foodstuffs and household goods. The community also benefited from the presence of a tarmac main road linking the two towns of Butare and Gikongoro. A public primary school was also located within the sector and parishioners attended the church situated in the neighboring sector of Rugango.

Violence in Tare began on April 19th 1994, almost two weeks following the president's assassination and the day after a visit to the commune by Rwanda's new extremist president to mobilize the Hutu population. This first attack on a nearby Tutsi enclave was unsuccessful. Following a security meeting the next day, a second attack was launched against the majority of Tare's Tutsi community who had sought refuge in the local parish church and a nearby monastery. Successful, the attack group returned to the first Tutsi enclave the following day to finish what they had started earlier. Over four days and in three episodes of violence, Tare's Tutsi then was almost exterminated.

Data collection and analysis

I collected data on all 3426 of Tare's residents.[2] This included information on their basic demographic characteristics, where and with whom each of them lived, and whether they had

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[2] For 200 of the 3426 residents, data on household size were incomplete in the gacaca registers. These registers related primarily to one of the three cells which constituted Tare sector. I imputed these data for each one of the 200 individuals by calculating the mean

committed, led, or been the targets of violence. The data collection was greatly facilitated by *gacaca*, an innovative local institution of transitional justice adapted to deal with the extraordinary scale of violence committed during Rwanda's genocide. Gacaca empowered local communities to adjudicate on many of the perpetrators' crimes themselves.

One of the first tasks required by gacaca was for the community to conduct a census of all individuals who lived there in *April 1994* immediately before the genocide began. In practice, each of Tare's *nyumbakumi*, a person given responsibility for blocs of ten households in Rwanda, prepared lists for their areas that were then compiled into a single master list for the whole community. The list, completed in 2002 in Tare, recorded the names, ages, and gender of every household member. In 2009, two local research assistants travelled to sector Tare and geo-coded the home of every individual on this list. They consulted residents to ensure they recorded locations of homes as they existed during the genocide to eliminate any bias resulting from individuals relocating following the genocide. The data, collected in August 2009, pertained to the identities and household locations of those resident in Tare in April 1994. The resulting map (Figure 1) shows the spatial distribution of households alongside other important topographical features such as roads, waterways, buildings, administrative boundaries and variation in the elevation and slope.

[Figure 1 here]

Dependent variable

I used a binary dependent variable: whether an individual participated in the violence or not. Participation is defined as joining at least one attack group that killed at least one individual. While a better measure would have been how many people an individual killed, no reliable data on kill

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household size for individuals of the same age based on registers which had these data. As a robustness check against any possible bias arising from these missing data, I ran the regressions with and without the imputed data.

rates exist. Participation in Rwanda's genocide involved many actions other than violence: looting, manning checkpoints, night patrols, denunciation of individuals, provision of moral support to killers, among others. An act of violence, however, remains an important threshold in any spectrum of anti-social behaviour and it still needs to be explained why one fifth crossed this threshold and four-fifths did not.

I considered as participants individuals who committed violent genocide-related crimes. Rwanda's current gacaca law establishes three categories of genocide crime. Category I crimes, the most serious, included the organization of the genocide and acts of sexual violence and torture; category II crimes covered acts of violence against the person; and category III crimes comprised property offenses, most commonly looting. I considered as participants those who committed category II crimes. The project then purposively focused on low-level violent perpetrators, excluding the elite who planned and led the violence and the non-violent opportunists who looted during it. Only one individual in Tare fell into category I.

Subversion of the gacaca process created the risk of bias in the selection of participants. Intimidation of witnesses and cooptation of judges could lead to the acquittal of the guilty and false accusations and spurious confessions to secure lesser sentences could lead to the conviction of innocents (Waldorf, 2006). To address these risks, I relied on two operationalizations of the dependent variable: suspected and convicted participants. Suspects were individuals accused but not necessarily convicted during the gacaca. I compared the official list of suspects (those who stood trial) against a second list established by a lesser-known and informal gacaca process involving self-confessed perpetrators within the prison system. Only if a name appeared on both lists was s/he counted as a suspected participant. Convicts were individuals found guilty through the gacaca process.

Independent variables

H1. The first micro-spatial predictor of participation is residence in a particular neighborhood. To operationalize 'neighborhoods' I drew circular perimeters of defined radii around each resident's home. I constructed neighborhoods of 100m, 200m, 300m, 400m, and 500m radii for each resident and counted the number of participants and non-participants living in each resident's 'neighborhood'. I then calculated the proportion of killers in each neighborhood by dividing the total number of residents by the number of participant-residents, excluding the subject resident. This variable thus approximated the potential for 'horizontal' influence of neighbors on participation or 'peer pressure'. The higher the proportion of killers, the greater the potential for pro-violence influence.

H2. The second micro-spatial predictor is residence in a particular household. I counted the number of participants and non-participant members in each household and calculated the proportion of killers in each household by dividing the overall number of household members by the number of participant-members, excluding the subject individual. This variable thus approximated the potential for influence of family members on participation.

H3. The third micro-spatial predictor is the distance between an individual's home and the home of the nearest mobilizing agent. A mobilizing agent was defined as any individual who planned or led an attack in Tare. This variable thus approximated the potential for 'vertical influence'. To identify mobilizing agents, I conducted two focused group interviews: first with official members of Tare's *gacaca* committee; second with self-confessed perpetrators in the prison system. I compared the lists of names which emerged from both interviews. If a name appeared on both lists, then this individual was counted as a mobilizing agent.

H4. The fourth micro-spatial predictor examines neighborhood again but considers a different effect: interethnic contact. I counted the number of Tutsi and non-Tutsi living in each resident's neighborhood and divided the Tutsi total into the total number of residents to determine the 'out-group density' of the neighborhood. To identify Tutsi households, I relied on two lists: first the

official list of victims produced by gacaca; second a list of survivors compiled by the head of Tare's Tutsi survivors' association.

Control variables

The most robust profile of a participant in various violent phenomena is that of the young male. Controls for age and gender were incorporated in all model specifications including a quadratic term for age as the very young and the very old were likely incapable physically of participation. I also included a control for socio-economic status, notwithstanding the mixed evidence on its significance using spatial location as a proxy. Individuals who lived in areas where land was more costly likely had higher socioeconomic status. Land price was proxied by proximity to the commercial center of Tare and by the suitability of the land for cultivation indicated by its steepness and elevation. In rural contexts with high levels of agro-dependence, spatial measures represent potential substitutes when directly-measured SES data are not readily available. I also controlled for household size as larger households were likely to have more participants. The same logic dictated a control for population density. Neighborhoods with more residents were likely to have more participants. Population density may also have worked through a Malthusian mechanism: too many people, too little land (Verpoorten, 2011). Lastly, I controlled for interethnic unions. Hutu married to Tutsi may be less likely to commit anti-Tutsi violence.

Robustness checks

I estimate the predictors of participation for the subpopulation of Hutu men aged 15 and higher given the very low probability that Tutsi and very young children participated in the violence. I report six fully unrestricted models that specify all four independent variables and all ten control variables. These models include two alternative definitions of the dependent variable (convicts and suspects) and construct neighborhoods of 100m, 200m, and 300m radii. An online appendix contains a further 26 model specifications. These specify neighborhoods of 400m and 500m radii; estimate models through stepwise backward selection and likelihood ratio tests to eliminate

statistically insignificant variables; and specify nested models that examine the micro-spatial predictors independently of each other. The appendix also contains a correlation matrix to identify any problematic levels of multicollinearity.

Results

Overall I find support for the view that micro-space is an important determinant of participation in inter-group violence. Specifically, neighborhoods and households represent important micro-spaces that predict participation. Where you live matters. The data suggest 'social influence' as the likely mechanism and point to several different forms of 'influence' that share the same theoretical logic: spatial proximity increases the likelihood of social interaction and consequently social influence.

H1.   The data indicate that participants often reside in neighborhoods with high concentrations of other participants as residents. Importantly, the finding is not simply that participants often live close together in the same neighborhood. It is that the number of participants *relative* to non-participants in the neighborhood matters for drawing other residents into the violence. The importance of this ratio then is suggestive of influence. In particular it suggests horizontal influence or 'peer pressures' from neighbors. The descriptive statistics (Table II) show that the mean proportion of convicts living in a 100m radius of a resident is almost twice as many for convicts as for non-convicts. At a 200m radius the difference persists but is a little smaller. As the radius increases, the differences between participants and non-participants broadly continue to grow smaller as a theory of 'influence' would predict.

<div align="center">

[Table II here]

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The multivariate model corroborates this 'neighborhood effect' (Table III). The effect is statistically significant for neighborhoods defined using 100m and 200m radii (models 1, 2, 3, & 4). The effect is robust for both convicted and suspected perpetrators, the two dependent variables considered, and controlling for the neighborhood's population density. To express this in

probabilistic terms, the odds of an individual participating increase by 4% for every single percentage point increase in the proportion of *convicted* perpetrators living within a 100m radius. The odds increase by 3% for *suspected* perpetrators in the same neighborhood. This effect, as one would expect, tapers off as the neighborhood widens. At 300m the effect disappears altogether for convicted perpetrators.

[Table III here]

H2: The results also point to a second type of influence: family pressure. Individuals who live in households which contain at least one other participant are also more likely to be pulled into the violence than individuals who live in households where no-one else participates in the violence. Descriptive statistics indicate that participants live in households whose mean proportion of other participants is nearly ten times higher for convicts than non-convicts. This household effect persists in the multivariate model. Formally, each percentage point increase in the proportion of other participants in the household increases the odds of becoming a perpetrator oneself by anywhere from 21 to 25%. This finding is robust across all six models reported, at the 1% significance level, and controlling for household size.

H3. Although the results strongly suggest the influence of neighborhood and household on participation, support for vertical influence from above is more tentative. Descriptive statistics suggest that individuals who lived close to a mobilizing agent were more likely to become participants than individuals who lived further away. On average convicted participants lived 170m from the nearest mobilizing agent compared with 220m for non-participants. The multivariate logistic regression confirms the significance of this difference when using stepwise backward elimination. Its significance, however, is more fragile when using the unrestricted model specification. The effect exists only in neighbourhoods defined at 100m and only for suspected participants. Greater caution should be exercised then in interpreting the importance of vertical influence compared with peer and family pressures.

H4. Whereas contact with other participants increases the odds of committing violence, contact with ethnic targets does not reduce this likelihood. The presence of Tutsi households within an individual's neighborhood did not lower the likelihood of the individual's participation in anti-Tutsi violence. Interethnic contact between neighbours appears to exert a weaker effect than intra-ethnic contact between participants.

'Young men' and violence

Consistent with theory men were much more likely than women to participate in the violence. Over 95% of suspected and convicted perpetrators were male. Multivariate analysis indicates the odds of participation were over approximately 80 times greater for men among convicted participants and 50 times greater for suspected participants. The findings for age, however, were more surprising. Men aged 15-24 years, the age bracket theory predicts to be most likely to participate, were not the most over-represented group among perpetrators. Men in the age brackets of 25-34 and 35-44 were most likely to join in the violence. 37.8% of all convicted perpetrators fall into the 25-34 age bracket compared with only 13.7% of non-perpetrators. In Rwanda, the average age at first marriage for men is 26.8 years. Participants then often had wives and children. The regression analysis confirms that being a household head increased the odds of participation at least six times. These findings cast doubt on the theoretical argument that it is those without responsibilities who can most afford the opportunity cost of participation. It was instead those individuals with the greatest obligations who answered the call to arms and mobilized against Tutsi. This finding, although *prima facie* inconsistent with the 'youth bulge' hypothesis, may be attributable to the particular type of violence committed. Youth bulges increase the risk of domestic armed conflicts where the violence is often directed against the state. In genocides, however, the violence is often committed with the support of the state. Such violence may attract individuals with different risk profiles.

Analysis of perpetrator, victim, and survivor data

Consistent with the widely-held view, the genocide involved an extraordinary civilian mobilization. Of the 853 adult Hutu males (aged 15 and older) who lived in Tare in 1994, 188 or 22.0% were suspected perpetrators, and 91 or 10.7% were convicted perpetrators. Just over 1 in 5 Hutu men then are suspected of committing an act of violence in Tare, in line the national estimate. The survival rates tell an equally chilling story. Of the 215 Tutsi who lived in Tare at that time, 136 or 63.6% were killed during the genocide. Nearly two-thirds of this ethnic group then were exterminated, again consistent with the national estimate.

The basic profile of the survivors is also revealing. Of the 79 Tutsi survivors, 61 or 77.2% were female and only 18 or 22.8% were male. All of them were children under the age of 15. No adults survived. In Rwanda ethnicity is patrilineal. The targeting of males then strongly suggests a genocidal intent to eliminate the Tutsi as an ethnic group. The data also show that the vast majority (92.6%) of the victims were not killed in their homes, but in places they had gathered together to seek refuge. The largest massacre site was the Rugango Parish church. The refuge Tutsi sought in churches, schools, health centres and many similar places facilitated the work of their killers. There was little safety in numbers in Rwanda.

Alternative interpretations of the data

The data support descriptive, not causal inferences regarding the importance of spatial factors (King, Keohane, & Verba, 1994). The research design did not involve exogenously manipulating the spatial distance between households and measuring what effect on individual participation this manipulation had. The locations of households were already determined at the time they were measured. The article then cannot definitively exclude the possibility that some unobserved heterogeneity explains the observed correlation between spatial proximity and participation and that a mechanism other than social influence was at work.

One plausible alternative interpretation is that participants in the violence may share some similar but unobserved individual characteristic that causes them to live in the same neighborhood. Perpetrators may all be poor for example and thus compelled to live on either small quantities of land or on inexpensive low quality land in the same area. This concentration of killers then may be the result of individual socioeconomic status rather than social influence. In other words the spatial clustering may be the product of an atomistic rather than social process.

While an interpretation based on unobserved individual characteristics cannot be conclusively ruled out, there are four persuasive arguments in support of an independent neighborhood effect and of social influence as the most likely mechanism at work. First, the neighborhood-level variables operationalized are strongly suggestive of a social process. Thus it is not the *absolute* number of killers in the neighborhood that matters, but the number of killers *relative* to non-killers. This would suggest then that participation responds to the balance between pro-violence and anti-violence forces in the community. Second, we control for those atomistic individual characteristics that extant theory and evidence have suggested may matter for participation. Neither age, gender, nor socioeconomic status accounts for the spatial clustering. Moreover, a scholarly consensus is forming that perpetrators are ordinary individuals and possess few distinguishing characteristics. Third, if killers did share some unobserved distinguishing characteristic that explains why they live in the same neighborhood, we would expect the number of individuals with this characteristic to rise as the number of people living in the neighborhood also rises. However, I control for neighborhood population density and find it has no effect on the likelihood of participation. This finding also speaks to possible 'feasibility' and 'Malthusian' interpretations of the data. We could hypothesize that when many people live in the same neighborhood, the coordination costs of mobilizing them would decrease and collective violence would become more feasible. We could also hypothesize that in densely-populated communities where land is scarce, individuals may

possess some material incentive or grievance to eliminate their neighbors. Yet neighborhood population density proved insignificant.

Finally, contextual knowledge of Rwanda's rural land economy also suggests it was very unlikely that killers moved in order to live together in the same neighborhood. In 1994 land in Rwanda was overwhelmingly acquired through family inheritance or gift rather than through market purchases (André & Platteau, 1998). It would be unusual for someone to buy land in order to become neighbors with someone else. When land was purchased it was usually the result of a forced distress sale and related to agricultural land rather than the land on which the home dwelling was constructed. More commonly, Rwandan fathers gifted land to their sons upon marriage and the gift became definitive upon death. Sons would usually then build their own home dwelling (*ingo* in Kinyarwanda) on the inherited land close to their parents (Lame, 1996). Consequently, family members often became neighbors. Assuming preferences to participate in violence are not genetically transmitted but are socially acquired, prolonged and regular contact with family members then may influence the formation of shared preferences, attitudes, and beliefs. Individuals may not be born with their parents' prejudices, but they may be socially influenced to learn and internalize them.

Discussion and conclusion

This article provided evidence for micro-spatial factors to be added to our growing knowledge of the predictors of individual participation in inter-group violence. In particular, it points to neighborhoods and households as important micro-spaces whose characteristics affect whether an individual may participate in violence. Specifically, it finds the likelihood of participation increases if the individual lives in a neighborhood or in a household with a high concentration of other participants relative to non-participants.

Furthermore, the article suggests the process at work within these neighborhoods and households is social in character. Specifically, it suggests social influence as the mechanism. The theoretical

logic is that micro-social interaction increases as micro-spatial distance decreases. The decision to participate in inter-group violence then is better conceptualized as resulting from social interaction than from individual calculus made in isolation. Where you live matters because what your neighbors think, say, and do also matter.

In assessing these findings, two caveats should be noted. First, as discussed, the research design permits only predictive not causal claims. It cannot exclude the possibility that unobserved heterogeneity explains the micro-spatial findings. Participants may for example share some individual characteristic that explains why they live in the same neighborhood. As also discussed, however, there are several strongly suggestive reasons for thinking that the identified neighborhood and household-level characteristics have a distinct effect independent of any underlying, unobserved individual-level characteristic. Second, related to this, the article does not claim that micro-space is the only or most important predictor of participation in such violence. Consistent with theory, age and gender also proved to be substantively significant predictors. The article does not exclude the possibility of predictors other than those suggested by extant theory and evidenced in this paper.

More broadly, these findings highlight the micro-sociological foundations of inter-group violence and hold several theoretical implications. First, participation in inter-group violence may best be conceptualized as an expression of collective behavior rather than of individual action. How other members of the collective behave influences how you yourself behave. The socially interdependent character of the process should be recognized in explanations of participation, particularly in rationalist models premised on methodologically individualist approaches to decision-making. Second, these findings ask us to reconsider the largely positive light in which social capital is seen. As people live closer together, the chances of forming social ties increase. While tie formation is usually seen as helpful to building trust, these ties may also have a dark side. As Rwanda's violence suggests, they may be used for vicious as well as virtuous ends. Third, while these

findings do not negate the role of individual agency, they do highlight the importance of social structure in inter-group violence. This would be consistent with the theoretical view that structure and agent should be seen as complementary rather than opposing forces in explanations of individual behaviour (Giddens, 1984). From a policy perspective, the recognition of households and neighborhoods as influential social structures would suggest that interventions aimed at preventing such violence should target communities as a whole, in addition to individuals in isolation. For example, a workshop that brings together potential participants to teach respect for and trust in members of the other group may be more effective if also accompanied by a community-wide awareness campaign to promote mutual tolerance and understanding between groups.

Finally, in keeping with the micro-analytic trend in studies of social violence (King, 2004), an avenue for further research would be to examine how social influence works across different forms of inter-group violence. As an umbrella concept social influence subsumes diverse social mechanisms: peer pressure, coercion, conformity, compliance, obedience, identification, internalization, and role-modelling for example. It would be useful to know which specific mechanism(s) is at work not only in genocidal violence but also in ethnic riots, pogroms, lynchings, and sectarian killings. Quantitative spatial data of the kind used here are not well-suited for such an exercise which would better employ different techniques and data.

Data replication
The dataset, codebook and framework for the empirical analysis in this article can be found at
http://www.prio.no/jpr/datasets.

Allen, Thomas J & Alan R Fustfeld (1975) Research laboratory architecture and the structuring of communications. *R&D Management* 5(2): 153-164.

Allport, Gordon W (1958) *The Nature of Prejudice* (Abridged ed.) Garden City, NY: Doubleday.

André, Catherine & Jean-Philippe Platteau (1998) Land relations under unbearable stress: Rwanda caught in the malthusian trap. *Journal of Economic Behavior & Organization* 34(1): 1-47.

Arendt, Hannah (1963) *Eichmann in Jerusalem : A report on the Banality of Evil*. London: Viking.

Browder, George C (2003) Perpetrator character and motivation: An emerging consensus? *Holocaust and Genocide Studies* 17(3): 480-497.

Browning, Christopher R (1992) *Ordinary Men : Reserve Police Battalion 101 and the Final Solution in Poland* (1st ed.) New York: Harper Collins.

Brubaker, Rogers & David D Laitin (1998) Ethnic and nationalist violence. *Annual Review of Sociology* 24: 423-452.

Choucri, Nazli (1974) Population dynamics and local conflict - cross-national study of population and war. *Population Index* 40: 453.

Cialdini, Robert B & Noah J Goldstein (2004) Social influence: Compliance and conformity. *Annual Review of Psychology* 55: 591-621.

Collier, Paul and Anke Hoeffler (2004) Greed and grievance in civil war. *Oxford Economic Papers* 56(4): 563-595.

Cox, Kevin R (1969) The voting decision in a spatial context. *Progress in Geography* 1(1): 81-117.

Des Forges, Alison (1999) *Leave none to tell the story : Genocide in rwanda*: Human Rights Watch; International Federation of Human Rights.

Fujii, Lee Ann (2006) *Killing neighbours: Social dimensions of genocide in Rwanda.* George Washington University, Washington DC.

Fujii, Lee Ann (2009) *Killing Neighbors : Webs of Violence in Rwanda*. Ithaca, NY: Cornell University Press.

Giddens, Anthony (1984) *The Constitution of Society : Outline of the Theory of Structuration*. Cambridge: Polity.

Goldstone, Jack (1991) *Revolution and Rebellion in the Early Modern World*. Berkeley ; Oxford: University of California Press.

Goldstone, Jack (2002) Population and security: How demographic change can lead to violent conflict. *Journal of International Affairs* 56(1): 3-21.

Goverment of Rwanda (1994) Récensement général de la population et de l'habitat au août 1991: Résultats définitifs [General census of the population and housing in August 1991]. Kigali, Rwanda: Ministère du Plan.

Gurr, Ted Robert (1970) *Why Men Rebel*. Princeton, NJ: Princeton University Press.

Harding, David J (2003) Counterfactual models of neighborhood effects: The effect of neighborhood poverty on dropping out and teenage pregnancy. *American Journal of Sociology* 109(3): 676-719.

Humphreys, Macartan & Jeremy M Weinstein (2008) Who fights? The determinants of participation in civil war. *American Journal of Political Science* 52(2): 436-455.

Huntington, Samuel P (2002) *The Clash of Civilizations and the Remaking of World Order*. London: Free.

Johnston, Ronald J (1979) *Political, Electoral, and Spatial Systems: An Essay in Political Geography*. Oxford: Clarendon.

Kaplan, Robert (1994) The coming anarchy: How scarcity, crime, overpopulation, tribalism, and disease are rapidly destroying the social fabric of our planet. *The Atlantic Monthly* (http://www.theatlantic.com/magazine/archive/1994/02/the-coming-anarchy/304670/).

Kelman, Herbert C (1974). Further thoughts on the processes of compliance, identification, and internalization. In: J T Tedescht (ed.) *Perspectives on social power*. Chicago: Aldine.

King, Charles (2004) The micropolitics of social violence. *World Politics* 56(03): 431-455.

King, Gary; Robert O Keohane & Sidney Verba (1994) *Designing Social Inquiry : Scientific Inference in Qualitative Research*. Princeton, NJ: Princeton University Press.

Kling, Jeffrey R; Jens Ludwig & Lawrence F Katz (2005) Neighborhood effects on crime for female and male youth: Evidence from a randomized housing voucher experiment. *The Quarterly Journal of Economics* 120(1) : 87-130.

Lame, Danielle De (1996) Une colline entre mille ou le calme avant la tempête. Transformations et blocages au Rwanda rural [One hill among a thousand or the calm before the storm]. *Musée Royal de l'Afrique Centrale*.

McDoom, Omar Shahabudin (2009) *The Micro-politics of Mass Violence: Authority, Opportunity, and Security in Rwanda's genocide*. London: London School of Economics.

McPhail, Clark (1971) Civil disorder participation: A critical examination of recent research. *American Sociological Review* 36(6): 1058-1073.

Milgram, Stanley (1963) Behavioral-study of obedience. *Journal of Abnormal Psychology,* 67(4): 371-378.

Miller, William L (1978) *Electoral Dynamics in Britain since 1918*. New York: St. Martin's.

Mironko, Charles (2004) *Social and Political Mechanisms of Mass Murder: An Analysis of the Perpetrators in the Rwandan Genocide*. Yale, New Haven.

Mok, Diana & Barry Wellman (2007) Did distance matter before the internet?: Interpersonal contact and support in the 1970s. *Social Networks* 29(3): 430-461.

Moller, Herbert (1968) Youth as a force in modern world. *Comparative Studies in Society and History* 10(3): 237-260.

Popkin, Samuel L (1979) *The Rational Peasant : The Political Economy of Rural Society in Vietnam*. Berkeley: University of California Press.

Prunier, Gérard (1998) *The Rwanda Crisis : History of a Genocide*. London: Hurst & Co.

Sageman, Marc (2004) *Understanding Terror Networks*. Philadelphia, PA: University of Pennsylvania Press.

Sampson, Robert J; Jeffrey D Morenoff & Thomas Gannon-Rowley (2002) Assessing "neighborhood effects": Social processes and new directions in research. *Annual Review of Sociology* 28: 443-478.

Scacco, Alexandra (2009) *Who Riots? Explaining Individual Participation in Ethnic Violence*. Columbia University.

Straus, Scott (2006) *The Order of Genocide : Race, Power, and War in Rwanda*. Ithaca: Cornell University Press.

Tilly, Charles (2003) *The Politics of Collective Violence*. Cambridge, New York: Cambridge University Press.

Tishkov, Valery (1995) 'Don't kill me, I'm a Kyrgyz!': An anthropological analysis of violence in the Osh ethnic conflict. *Journal of Peace Research,* 32(2): 133-149.

Urdal, Henrik (2006) A clash of generations? Youth bulges and political violence. *International Studies Quarterly* 50(3): 607-629.

Varshney, Ashutosh (2001) Ethnic conflict and civil society - India and beyond. *World Politics* 53(3): 362-398.

Verpoorten, Marijke (2011) Leave none to claim the land a Malthusian catastrophe in Rwanda? Belgium (http://www.ua.ac.be/download.aspx?c=.IOB&n=91990&ct=83467&e=281065).

Verwimp, Philip (2005) An economic profile of peasant perpetrators of genocide - micro-level evidence from Rwanda. *Journal of Development Economics* 77(2): 297-323.

Waldorf, Lars (2006) Mass justice for mass atrocity: Rethinking local justice as transitional justice. *Temple Law Review,* 79(1): 1-87.

Waller, James (2002) *Becoming Evil : How Ordinary People Commit Genocide and Mass Killing*. Oxford ; New York: Oxford University Press.

Wilkinson, Steven I (2006) *Votes and Violence: Electoral Competition and Ethnic Riots in India*: Cambridge University Press.

Zimbardo, Philip; Craig Haney & Curtis Banks (1973) Interpersonal dynamics in a simulated prison. *International Journal of Criminology & Penology,* 1(1): 69-97.

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Table I. Comparative Profile of Tare Sector, Rwanda

	Sector tare	Average sector in Butare prefecture	Average sector in Rwanda
Population (households)	3426 (647)	3862 (835)	5192 (1090)
Ethnic Hutu & Ethnic Twa	3211 (93.7%)	82.7%	91.6%
Ethnic Tutsi	215 (6.3%)	17.3%	8.4%
Surface area (cultivable land)	5.62 km^2	8.49 km^2	12.58 km^2
Population density in April 1994*	609 persons/ km^2	455 persons/ km^2	413 persons/ km^2
All interethnic unions	38	NA	NA
All suspects (% Hutu men)	194 (24.2%)	26.5%	19.5%
Convicted suspects	94	NA	NA
All victims	136 (63.3%)	70%	73.7%
Killed inside Tare	10 (7.4%)	NA	NA
Killed outside Tare	126 (92.6%)	NA	NA
All survivors	79 (36.7%)	30.0%	26.3%
Male survivors	18 (22.8%)	NA	NA
Female survivors	61 (77.2%)	NA	NA

Sources: (Goverment of Rwanda 1994; McDoom 2009) *Projected from 1991 Census data*

Table II. Descriptive statistics of predictors of participation in Rwanda's genocide

	Non-convicts				Convicts			
	mean	sd	min	max	mean	sd	min	max
Gender	0.50	0.50	0	1	0.97**	0.18	0	1
Age in 1994	25.14	18.72	1	94	33.60**	11.58	15	63
Household head	0.23	0.42	0	1	0.80**	0.40	0	1
Interethnic union	0.01	0.11	0	1	0.01	0.05	0	0.50
Convicts in 100m neighborhood (%)	3.30	4.35	0	50	6.15**	8.47	0	33.3
Convicts in 200m neighborhood (%)	3.63	2.94	0	21.4	6.80**	10.27	0	100
Convicts in 300m neighborhood (%)	3.73	1.95	0	15.6	3.94	1.83	0	8.33
Convicts in 400m neighborhood (%)	3.77	1.56	0	11.5	3.90	1.33	0.85	6.98
Convicts in 500m neighborhood (%)	3.80	1.29	0	13.5	4.01	1.34	0.90	11.5
Tutsi in 100m neighborhood (%)	4.45	12.61	0	100	2.91	9.39	0	50
Tutsi in 200m neighborhood (%)	4.44	8.35	0	45.5	4.23	7.67	0	37.8
Tutsi in 300m neighborhood (%)	4.45	7.03	0	38.9	5.33	8.09	0	29.7
Tutsi in 400m neighborhood (%)	4.52	6.05	0	32.8	5.39	7.00	0	28.4
Tutsi in 500m neighborhood (%)	4.62	5.25	0	30.2	5.68	6.42	0	30.4
Killers in hh (%)	0.06	1.10	0	25	0.56**	3.27	0	25
Household size	6.07	2.40	1	13	5.05**	1.97	1	9
Pop density 100m (sq km)	932.80	553.66	31.8	2673.5	921.64	613.73	31.8	2673.5
Pop density 200m (sq km)	657.25	330.11	7.94	1634.9	647.87	339.72	15.9	1531.7
Pop density 300m (sq km)	561.49	244.17	10.6	1258.0	563.96	259.30	98.9	1233.2
Pop density 400m (sq km)	489.01	180.79	11.9	856.9	494.95	188.99	85.5	844.9
Pop density 500m (sq km)	433.11	141.61	44.6	704.0	441.34	146.40	66.2	698.9
Prox. to nearest mobilizer (km)	0.22	0.20	0	1.12	0.17*	0.16	0	0.77
Prox. to community's center (km)	1.32	0.68	0.016	2.94	1.28	0.71	0.060	2.78
Elevation of household (metres)	1775.39	48.54	1651	1891	1781.40	47.11	1664	1878
Slope of household (degrees)	17.03	7.87	1.11	51.1	17.56	7.67	1.76	34.5

Table III. Predictors of participation in Rwanda's genocide using subpopulation of Hutu males aged 15 and over

	100m neighborhood		200m neighborhood		300m neighborhood	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	Suspects	**Convicts**	**Suspects**	**Convicts**	**Suspects**	**Convicts**
Gender	46.38** (25.29)	78.42** (84.20)	50.66** (28.14)	78.72** (84.04)	48.79** (26.61)	81.81** (87.93)
Age in 1994	1.07 (0.04)	1.02 (0.06)	1.09* (0.05)	1.04 (0.06)	1.07 (0.04)	1.01 (0.06)
Age squared	0.88** (0.04)	0.90 (0.06)	0.85** (0.04)	0.88* (0.07)	0.87** (0.04)	0.91 (0.06)
Household head	6.24** (1.78)	6.74** (2.45)	5.91** (1.72)	6.47** (2.39)	6.51** (1.87)	7.54** (2.73)
Interethnic union	0.07 (0.13)	0.16 (0.29)	0.05 (0.10)	0.16 (0.28)	0.05 (0.10)	0.14 (0.25)
Killers in neighborhood (%)	1.03* (0.01)	1.04† (0.02)	1.11** (0.02)	1.20** (0.05)	1.10** (0.03)	1.02 (0.07)
Tutsi in neighborhood (%)	1.00 (0.01)	0.99 (0.02)	0.99 (0.02)	0.98 (0.02)	1.00 (0.02)	1.01 (0.02)
Killers in household (%)	1.23** (0.05)	1.24** (0.09)	1.22** (0.05)	1.21** (0.09)	1.22** (0.05)	1.25** (0.09)
Household size	0.95 (0.05)	0.89* (0.06)	0.96 (0.05)	0.90 (0.06)	0.95 (0.05)	0.88* (0.06)
Pop density (100 persons/sq km)	0.96* (0.02)	0.99 (0.02)	0.96 (0.04)	0.99 (0.05)	0.97 (0.05)	1.01 (0.06)
Prox. to nearest mobilizer (km)	0.12** (0.09)	0.30 (0.28)	0.28 (0.24)	0.85 (0.87)	0.29 (0.26)	0.30 (0.31)
Prox. to community's center (km)	1.21 (0.25)	1.14 (0.29)	0.96 (0.22)	1.01 (0.27)	1.03 (0.24)	1.15 (0.31)
Elevation of household (hectometers)	1.31 (0.41)	1.44 (0.56)	1.21 (0.40)	1.59 (0.66)	1.34 (0.43)	1.42 (0.56)

Slope of household (degrees)	0.99 (0.01)	0.99 (0.02)	0.98† (0.01)	0.98 (0.02)	0.98 (0.01)	0.99 (0.02)
N	1160	1142	1160	1142	1160	1142
Pseudo R^2	0.367	0.320	0.403	0.352	0.377	0.315

Logistic regression using binary dependent variable (participant/non-participant). Odds ratios reported. Values > 1 indicate a positive relationship and values < 1 indicate a negative relationship. Standard errors in parentheses; † indicates $p < 0.10$, * $p < 0.05$, ** $p < 0.01$