The fear factor is a main thing: how radio influences anxiety and political attitudes

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Abstract:

We investigate how being exposed to media influences levels of anxiety and political attitudes in conflict-affected areas. Exploiting exogenous variation in signal strength of a radio station in South Sudan's Western Equatoria State, we compare original qualitative and quantitative data from areas with differing radio coverage. Civilians living in areas with more exposure to radio are more afraid of attacks by the Lord's Resistance Army (LRA). This anxiety means civilians rely more on a civilian militia, the arrow boys, and less on the state army. Hence media, through fear, can contribute to changing social and political structures.

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Introduction

Can the power of media be harnessed to positive effect to improve situations of violent conflict? In conflict situations, media has been considered both as contributing to hatred, most prominently during the Rwandan genocide (Yanagizawa-Drott, 2012), as well as a force for peacebuilding (Paluck and Green, 2009a; Paluck and Green, 2009b; Orme, 2010; BBC Media Action, 2012). Setting up a radio station has become standard UN practice in post-conflict situations (Orme, 2010). However, the role of media in situations of violent conflict or developing countries, be it a positive or a negative one, is under-theorised and empirical evidence is scarce (Paluck and Green, 2009b; Schoemaker and Stremlau, 2014).

The same cannot be said of theories and empirical studies on the role of media in developed countries without violent conflict. In these contexts, media is sometimes thought to cultivate fear (Furedi, 1997; Furedi, 2005). Numerous theories describe how media might influence risk estimation, ranging from rational choice models (Fielding and Shortland, 2009) to theories emphasizing 'automatic' and subconscious modes of thinking (Tversky and Kahneman, 1973; Gerbner, Gross, Morgan and Signorielli, 1980). Research on the fear-inducing effect of media goes back more than thirty years (Gerbner et al., 1980) but whether and through what mechanism media contributes to anxiety remains subject of debate and evidence is heavily dominated by studies in developed countries. The potential fear-inducing effect of media is of interest especially in light of a growing literature on the role of emotions in the formation of political attitudes, in

which anxiety plays a particularly prominent role (for an overview see Neuman, Marcus, Crigler and Mackuen, 2007). This suggests that the impact of emotions and anxiety in particular might not be limited to the personal domain. Feeling anxiety might possibly have wider social and political consequences.

We situate our interdisciplinary examination of the impact of exposure to media at the intersection of these three literatures. We examine whether intensity of exposure to media is related to increased anxiety and whether increased anxiety has an impact on political attitudes in a post-conflict situation. We find evidence for both relationships and investigate the mechanism through which they operate.

To do so, we exploit exogenous variation in the signal strength of a specific radio station, Yambio FM, in what was at the time of research South Sudan's Western Equatoria State (WES). Controlling for distance to the points of transmission, residual variation in signal strength of Yambio FM is likely due to geographical factors such as minor differences in elevation blocking the line of sight between transmitter and receiver. We use this residual variation in signal strength to study how the quality of radio reception influences fear of being a victim of violence by the Lord's Resistance Army (LRA), the consequences of such fear for political attitudes, and the implications of our findings for media as a peacebuilding tool. We show that residual variation in signal strength is unrelated to actual LRA activity. It is also unrelated to various demographic characteristics of individuals, which mitigates concerns that signal strength or geographic factors impacting signal strength are related to our outcomes of interest—fear and political attitudes—through some intervening factor. The main alternative radio

station, UN-run Radio Miraya, uses a different type of transmitter and reception of this station does not correlate to reception of Yambio FM. Thus, the pattern of variation observed is unique to Yambio FM. Yambio FM broadcasts 'come home' messages, which aim to encourage LRA fighters to defect, in addition to broadcasting general information about the security situation—during which the LRA is regularly mentioned (Lancaster and Cakaj, 2013). We draw on original qualitative (a textual analysis of 70 open-ended interviews or group meetings) and quantitative (a survey of 433 individuals in ten villages) data from areas with different degrees of reception of Yambio FM.

We first show that people living in a village with better reception of Yambio FM report significantly higher levels of fear of an LRA attack. The degree of exposure to media appears to contribute to a general sense of anxiety. This result is robust to controlling for a number of factors that might influence levels of anxiety, such as actual LRA activity, presence of other armed forces, distance to the two nearby international borders with the Central African Republic (CAR) or the Democratic Republic of Congo (DRC), mobile phone network coverage, personal experience of displacement and date of enumeration.

We then explore two theoretical mechanisms that connect exposure to media to anxiety: the availability heuristic (Tversky and Kahneman, 1973) and a rational choice model emphasizing the cost of obtaining information (Fielding and Shortland, 2009). Interview data provides suggestive evidence in favour of the availability heuristic over the rational choice model. Our subsequent investigation of the effect of anxiety on

political attitudes shows that fear has an impact beyond the personal domain. Interviewees described a disconnect between what they heard in the media—where it was suggested that a threat exists, thus causing anxiety—and the action taken by so-called official actors. Crucially the South Sudanese army (Sudan People's Liberation Army, SPLA) is not seen to be acting upon this threat and seemingly disregard it. The experience of such disconnect contributes to legitimizing a new authority structure: a local civilian protection militia called the 'arrow boys.' Crucially, the legitimacy of the arrow boys in these areas goes beyond matters of security, altering social and political structures in the affected areas. We find evidence that higher levels of fear, as predicted by radio reception, are related to increased reliance on the arrow boys and decreased reliance on the SPLA, although we do not obtain strong results across all quantitative indicators of political attitudes.

Two competing theories provide an explanation for the relationship between anxiety and political attitudes. Interview data is most consistent with 'Affective Intelligence' (Marcus, Neuman and Mackuen, 2000).

We thus conclude that in this case, exposure to media does contribute to a climate of fear. The mismatch of such anxiety with the action taken by official actors has an impact on political attitudes, enforcing the position of the arrow boys as a social and political authority. Thus, this paper provides evidence that in the context of violent conflict in a developing country, media creates fear and that this fear influences political attitudes that in turn can contribute to changing social structures. The findings suggest caution when implementing media-based interventions in such situations.

The remainder of this paper is organised as follows. Section two summarises the literature on media and anxiety, anxiety and political attitudes and media in violent conflict. Section three provides background on the case study. Section four describes data, methods and research design. Section five presents the results on media and anxiety, and section six the results on anxiety and political attitudes. Section seven concludes.

Theory and literature

This study contributes to three strands of literature, the literature on media and anxiety, literature on anxiety and political attitudes, and literature on media in conflict contexts. The first two strands of literature share an interest in the role of behavioural processes, such as automatic (World Bank, 2015) or heuristic (Neuman et al., 2007*)* decision making. Empirically, these literatures are heavily dominated by studies of developed countries, most notably the US. This study contributes to these literatures by providing empirical evidence for the relationship between media and anxiety, as well as anxiety and political attitudes, in a developing country context. Furthermore, investigating the processes underlying these relationships, the study provides evidence for the relevance of two specific automatic or heuristic processes in these contexts. Few studies in the literature and media and conflict have so far investigated importance of behavioural processes, problematizing a direct link between information, attitudes and behaviour (with the exception of Paluck and Green, 2009b).

Media and anxiety

The idea that media reporting on particular risks leads to fear has a long intellectual tradition: the Cultural Indicators research project started research on this topic in the 1960s (Gerbner et al., 1980). A number of theoretical models, based on different theoretical premises, explain how exposure to media could increase perceived risk, specifically the risk of becoming a victim of violence. Tversky and Kahneman (1973) formulated the concept of 'availability' which may explain the link between media and risk estimation (Tversky and Kahneman, 1973). These authors argued that individuals often use automatic processes to estimate risks, rather than effortful deliberation. The effect of automatic or heuristic—rather than strictly rational—decision-making has gained prominence in international development thinking with the publication of the 2015 World Development Report (World Bank, 2015). Availability is such an automatic processes. It poses that individuals judge the probability of an event by the ease with which an example of such an event comes to mind. If media reporting makes examples of adverse events more available, exposure to media may lead individuals to think that adverse events occur more frequently than they really do.

More recently, Fielding and Shortland (2009) propose that a link between exposure to media and risk perception is consistent with a (bounded) rational choice model they term 'costly information'. In situations when obtaining further information on adverse events is difficult, it may be rational for individuals to take the frequency of media reporting as an indicator of the probability of these events (Fielding and Shortland, 2009).

Despite the strong theoretical basis, empirical evidence on the link between media and fear is mixed (for three overviews see Heath and Gilbert, 1996; Eschholz, 1997; Wahlberg and Sjoberg, 2000). This study provides empirical evidence that a link between media and fear also exists in the context of a developing country. This is especially relevant since empirical literature is heavily dominated by US-based studies. Furthermore, we contribute to the debate on whether this relationship is best explained by a (bounded) rational choice or a heuristic model, providing suggestive empirical evidence in favour of the latter.

Anxiety and political attitudes

A recent upsurge in research on the role of emotions in political thinking suggests that the impact of anxiety may extend beyond the personal sphere (Neuman et al., 2007). An influential theory is Marcus et al.'s 'Affective Intelligence' (Marcus et al., 2000), which posits that when faced with a familiar situation requiring a political opinion, cognitive decision making—that is weighing of all options—is too costly. This means that individuals rely on heuristic processes, including habit or partisan attitudes, to shape their political attitude (Marcus et al., 2000). In unexpected and uncertain situations, however, cognitive decision making does pay off. A feeling of anxiety signals to individuals whether they are in a familiar or unexpected situation. When anxious, individuals actively seek out additional information (for example about the plans and behaviour of political figures) and engage in high-involvement cognitive decision making. The authors stress that emotions such as anxiety thus can have an impact that is

'largely functional and rational' (Mackuen et al., 2007, p.126). Anxiety thus helps individuals in forming a political opinion closer to their true preference while avoiding the unnecessary costs of seeking and processing information.

Other theories propose a more direct role for emotion, and a more decided departure from rationality. An individual's emotion when confronted with a political actor may directly translate into a political attitude, so-called 'Affect Transfer' (Ladd and Lenz, 2008; Ladd and Lenz, 2011). Relatedly, individuals may use information to build up a positive or negative affective tag attached to a political actor and then forget the initial information relatively quickly. Once a tag is created, individuals find it easier to process information that is consistent with this tag. Hence, new information contradicting the existing tag is not given adequate weight, and an individual's political attitude may only very slowly, if at all, be updated to a point close to their true preference (Cassino and Lodge, 2007).

Limited empirical evidence exists for the link between anxiety and political attitudes (Neuman et al., 2007). Our study provides such evidence in the context of a developing country, again distinguishing between the two processes through which emotions may influence political attitudes. We are finding evidence in favour of Affective Intelligence.

Media and violent conflict

Finally, this paper contributes to the literature on the role of media in peacebuilding or statebuilding especially in situations affected by violent conflict. The power of media, particularly of radio, in these contexts has been greatly emphasised in policy literature

(BBC Media Action, 2012). Orme for example, states that '[UN radio stations] have helped end violent conflict and make political transition possible' (Orme, 2010, p.8). In post-genocide Rwanda, radio is indeed found to have contributed to changes in individual behaviour, if not attitudes (Paluck and Green, 2009b). Other studies investigating whether broadcasting hate speech over the radio can incite violence and deepen divides in societies, again most prominently in Rwanda, had mixed results (Straus, 2007; Yanagizawa-Drott, 2012).

Evidence that media adequately performs a prominent role in either peacebuilding or statebuilding is, however, weak (Schoemaker and Stremlau, 2014). Little empirical work has been done on the effects of media in conflict situations (Paluck and Green, 2009b); research into the statebuilding impact of radio is scarce. The present study provides implications for the statebuilding impact of radio, and is a case in point for the relevance of examining behavioural processes connected to media and conflict.

Background

Ezo and Tambura

This study is based on data gathered in two counties of what was at the time (2013) the South Sudanese state of Western Equatoria. The two counties, Ezo and Tambura, border the DRC and CAR respectively and lie up to a day's travel by car, or between 60 and 160 kilometres as the crow flies, away from the state capital Yambio. Both Ezo and Tambura are densely forested. Small-scale agriculture is the dominant livelihood. The

population of Ezo and Tambura is linguistically and ethnically remarkably homogenous: 92.5 per cent of respondents are likely Azande, as they speak Pazande as their first language. Few respondents appear to be Pazande-speaking refugees from CAR or DRC: 96.3 per cent of respondents say their nationality is South Sudanese.

LRA in Western Equatoria

The LRA's beginnings lie in 1986 events in Uganda, the year President Yoweri Museveni took power.[3] Northern Uganda's rebellion against the new president proved the most successful, emerging later as the LRA under the leadership of Joseph Kony. Having had bases in Eastern Equatoria State since the early 1990s (Prunier, 2004), the LRA moved into what was then Sudan's WES in 2005 (Schomerus, 2007). LRA activity subsided during the Juba Peace Talks between the LRA, and the Government of Uganda held from 2006−2008 (Schomerus, 2008; Atkinson, 2010; Schomerus, 2012). Residents of WES remained suspicious of the rebel presence and of the government's willingness to protect (Gordon, Vandewint and Lehmeier, 2007; Schomerus and Tumutegyereize, 2009). In December 2008, the talks ended with a military offensive on the LRA camp in the DRC, executed by the Ugandan army with US support (Atkinson, 2009). Ugandan forces have been present in Ezo County and just across the border in the CAR since that time, more recently as part of an African Union military response that also includes soldiers from the SPLA and CAR. US military advisors have been supporting the Ugandan forces in this operation since 2011 as part of US legislation against the LRA

(11th Congress of the United States of America, 2010; Schomerus, Allen and Vlassenroot, 2011). UN peacekeepers are also based in the area.

Since the poorly planned military offensive (Atkinson, Lancaster, Cakaj and Lacaille, 2012) the LRA has been present in the DRC, the CAR and South Sudan; however attacks and movement have decreased considerably since 2009, especially in South Sudan. The LRA Crisis Tracker, a database compiling reports of LRA-related incidents, including sightings, abductions and instances of violence, reports significant drops in the number of events in 2009 and 2010 (LRA Crisis Tracker, 2015). Only two events were reported in 2012 and none in the 12 months preceding the 2013 survey. Interviews suggest a similar pattern. There was, explained an international aid worker, only one 'genuine LRA attack in Ezo', which happened in 2009.[4] Even once heavily affected areas appear free of LRA attacks in later years. In one *boma*—South Sudan's smallest administrative unit, essentially a village—where ten people were reported killed by LRA since 2008, the last reported LRA attack had been in March 2011. In late 2013, after our period of research, there was a brief moment of activity and sightings, although the exact nature of the perpetrators was unclear. Even at the height of LRA activity in South Sudan, levels of reported LRA-related violence were significantly lower than in DRC and CAR (Human Rights Watch, 2009). While each single violent incident is a tragedy, it is fair to say that there were few LRA attacks in WES.

Yambio FM

An affiliate of the government radio network, Yambio FM has been this area's main broadcaster since 2009, suffering sporadic interruptions between February and July 2013 due to equipment failure (Nashion, 2013b; Nashion, 2013a). Broadcasting from Yambio town, Yambio FM transmits general security information, which can also include reports on LRA attacks in the neighbouring countries. In addition, Yambio FM's broadcasts include 'come home' messages, which are targeted radio announcements to LRA fighters with messages that encourage them to defect. These 'come home' messages—sometimes recorded by people the fighters know personally—have been used extensively in northern Uganda (Ginifer, 2006; Brisset-Foucault, 2011). Reach has been increased to cover areas of LRA operations in the Democratic Republic of Congo (DRC), the Central African Republic (CAR), and South Sudan (Invisible Children, 2013; Lancaster and Cakaj, 2013). It is important to note that these messages are broadcast in South Sudan even at a time when they are unlikely to reach any LRA fighters.

Data, Methods and Research Design

This paper combines qualitative and quantitative methods, and data gathered through interviews and as well as a survey of individuals. An initial analysis of qualitative work—mainly interviews, publications and official records—informed the formulation of our research question and survey design. Both methods were used to investigate the impact

of radio on anxiety, and the impact of anxiety on fear. Interview data furthermore sheds some light on the mechanisms through which these variables are connected.

This interdisciplinary approach has strengths and weaknesses. Working across methods and disciplines enabled us to develop a complex research question that would not naturally emerge in a quantitative approach. Using data from two methods seems to allow for an accurate representation of the effects under investigation. Being able to corroborate qualitative findings on how people perceive their security situation with quantitative data makes our findings more convincing and we could develop a perspective on both individual experiences as well as broadly measurable phenomena.

Data

The qualitative data is primarily drawn from interviews with some interviews that informed the research question dating back to 2006. The most relevant interviews—about 70 open-ended interviews or group meetings—were conducted between December 2012 and May 2013 in Ezo and Tambura Counties, largely in *bomas* randomly selected for the quantitative survey. We quote 25 interviewees directly with a brief description of the respondent and location of the interview. Other responses have informed our findings. We selected respondents for the interviews in various ways: because they hold a position of authority in the community, represent a particular community, or because we encountered them in a snowballing fashion. We assured respondents anonymity.

Quantitative data was gathered through a survey of individuals in Ezo County and adjacent areas of Tambura County in May 2013. In total, we surveyed 433 individuals in ten *bomas*. We randomly selected seven (out of 26) *bomas* in Ezo and three (out of nine) *bomas* in the two southern-most *payams* (the next level administrative unit) of Tambura County.

Within these *bomas*, we randomly selected households from lists that the headmen (local administrators who work with the chiefs) either kept or drew up on the spot. We selected a maximum of 44 households in each *boma*, which in two cases meant all households in the *boma*. Within the households, the individual respondent was again selected at random from a list of individuals over 18 years within the household. A numbered list of household members was drawn up with the household head or another readily available member of the household, and a random person selected by physically drawing a number using numbered bottle caps. Enumerators resident in the two counties administered all questionnaires in the local language Pazande. The survey report gives more detailed information (Rigterink, Kenyi and Schomerus, 2014). We also obtained the GPS coordinates of a central point in each *boma* using a satellite phone.

From the survey data, we derived indicators for the quality of reception of Yambio FM in the *boma*, for individual level of fear of the LRA and for individual attitudes towards a civilian protection militia (the arrow boys) and the government army (the SPLA). An overview of relevant survey questions and the indicators derived from these is given in Figure 1.

Figure 1: Relevant questions from survey in Ezo and Tambura counties, WES

Figure 1 here

In addition to original data, we use data from the LRA Crisis Tracker: the date and geographical location of events classified as abductions, violence, looting, sightings, clashes and displacement related to the LRA. Using this data and the geographical location of the villages surveyed, we calculated the straight line distance between the village and the single closest LRA event and the average distance to the ten closest LRA events in the last one, two and five years respectively. We also calculated the distance between the village and the towns of Yambio (the location of the transmitter of Yambio FM), Ezo and Tambura. The latter two are the potential locations of two relay stations of Yambio FM. Lastly, during the second survey round in January and February 2015, we also asked respondents whether they could receive one of the few alternative radio stations that can be received in the region, Radio Miraya FM.

Research design

To investigate the impact of media on individual perceptions of security and political attitudes, we exploit plausibly exogenous variation in the quality of reception of Yambio FM. Our preferred specification uses variation in radio reception at the *boma*, rather than the individual level. In the latter case, estimates of the effect of having a radio capable of receiving Yambio FM on fear of the LRA might be biased upward if individuals who

already have great fear of the LRA put more effort into seeking out information about them. Nevertheless, in the online appendix, we also present a model at the individual level, including *boma* fixed effects.

Figure 2 illustrates variation in quality of reception of Yambio FM at the *boma* level. We exploit the fact that although Yambio FM's signal becomes weaker with the distance to Yambio, this decrease is not uniform. For example, *bomas* nine and ten are within walking distance of each other, but reception of Yambio FM differs substantially between them. Residual variation in the quality of reception of Yambio FM, controlling for straight line distance Yambio (the location of the transmitter) and Ezo and Tambura (the possible locations of two relay stations) is likely due to geographic factors blocking the line of sight to the transmitter, such as minor differences in elevation or overgrowth. These geographic factors are plausibly unrelated to other factors creating fear of the LRA for a number of reasons. First, these factors are not necessarily close to the *boma* in question, they merely have to be in the line of sight between *boma* and transmitter. Second, variation in geographic factors is minor: the difference between the lowest and highest point in our research area for example is less than 350 meters. Third, even if minor geographic differences impeding radio reception are related to LRA activity, mountainous and forested areas are usually associated with more, not less activity by violent groups (Collier, Hoeffler and Söderbom, 2004; Buhaug and Rød, 2006). So to the extent that geography and LRA activity are related, this would bias our estimates of the effect of radio on fear downward, not upward. Other authors use similar strategies when

investigating the impact of radio (Olken, 2009; Della, Vigna, Enikolopov, Mironova, Petrova and Zhuravskaya, 2011; Yanagizawa-Drott, 2012).

Figure 2: Ability to receive Yambio FM

Figure 2 here

Nevertheless, we explore the correlation between LRA activity and residual radio reception in Table 1. It displays the (bivariate) correlation between a number of indicators for LRA activity and residual variation in *boma* radio reception after controlling for straight line distance to Yambio, Ezo and Tambura. Residual radio reception is not significantly related to measures of LRA activity derived from the LRA Crisis Tracker (Panel A and B). The same holds true for other potential indicators of LRA activity in panel C: Victimization according to our survey and distance to the border with CAR and DRC respectively, the two countries where the LRA is suspected to be. Hence, we find no evidence that the LRA is more active in areas with better residual radio reception. However, the analysis that follows will also explicitly control for LRA activity.

Table 1: Correlation between residual radio reception and LRA activity

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Table 1 here

Table 2 further explores the exogeneity of reception of Yambio FM (controlling for distance to Yambio, Ezo and Tambura) by investigating whether it is correlated to observed individual characteristics and household asset ownership as an indicator of wealth. In the latter case, we also control for number of children and adults in the household, as larger households likely own more assets out of necessity rather than wealth. As is evident from Table 2, the quality of reception of Yambio FM is not significantly related to any of the assets considered, including radio ownership. Furthermore, it is unrelated to age and educational status. *Boma* radio reception is significantly related to gender, although this coefficient is only significant at the ten per cent level. Hence, Table 1 provides no strong evidence that the quality of reception of Yambio FM is related to some potentially confounding observable individual characteristics. In the subsequent analysis, all these characteristics will be controlled for.

Table 2: Correlation between boma radio reception and observable individual and household characteristics

Table 2 here

Any effect on fear or political attitudes observed may be due to any information broadcast by Yambio FM. However, we have reason to believe that people in WES are especially sensitive to information about the LRA. During qualitative interviews, the LRA appeared at the forefront of people's minds, as general questions such as 'what is life like here' elicited responses about the LRA. From the survey data, the existence of 'come home' messages is better known among respondents than the existence of Yambio FM itself. That said, we cannot distinguish between the impact of exposure to Yambio FM and exposure to LRA-specific information.

Variation in the quality of reception of Yambio FM is distinct from the quality of reception of the main alternative radio station, UN-run Radio Miraya FM. This station uses a transmitter with a wider range, broadcasting from Juba. From data collected in 2015, reception of Miraya FM is not correlated to reception of Yambio FM: the correlation coefficient between the two is -0.09. The relevance of Miraya FM is limited in WES because it broadcasts in English and Arabic: the survey indicates that more than half of the respondents do not speak either of these languages as their first or second language. As Miraya FM does not broadcast 'come home' messages, we investigate whether reception of Miraya FM is related to fear of the LRA by way of a placebo test.

Analysis

Analysis of both qualitative and quantitative data is based on a comparison of responses of individuals living in villages with differing levels of radio reception. The analysis starts from the qualitative data. We examine themes emerging from qualitative interviews using

textual analysis, by considering villages with different degrees of access to Yambio FM. Doing this, we generate hypotheses on how radio affects civilian's perceptions of security and their political attitudes. All interviews were transcribed and coded using MaxQDA. The inductive coding process focussed on the developing themes under investigation, such as access to and trust in information, description of the perceived security situation, lifestyle choices (for example where to live and what crops to grow), expectations of political actors regarding the security situation and in general. Reponses thus coded were then divided into two groups: responses from individuals living in bomas with above median radio reception according to the survey, and responses of individuals living in bomas with below median radio reception. We then compared the nature of responses in these two groups to develop analytical categories and to generate the hypothesis of a possible link between radio exposure, fear, and political attitudes. These were then tested against the quantitative data.

We analyse quantitative data using the following model:

$$FEARLRA_{bi} = ß_0 + ß_1 BRR_b + ß_2 \boldsymbol{DISTANCE_b} + ß_3 \boldsymbol{X_i} + \varepsilon_{bi} \quad (1)$$

where $FEAR\ LRA_{bi}$ is the individual-specific level of fear of the LRA, measured as detailed in Figure 1, BRR_b is *boma* radio reception, $\boldsymbol{DISTANCE_b}$ is a vector including the straight line distance from the *boma* to Yambio, Ezo and Tambura respectively and $\boldsymbol{X_i}$ is a vector of individual-specific control variables including all observable characteristics in Table 2. As $FEARLRA_{bi}$ is measured on a four-point scale, we use an ordered probit model to estimate (1), although similar results are obtained using an

ordered logit model. The literature on media and anxiety implies $ß_1 > 0$. Standard errors in all models are clustered at the *boma* level.

To investigate the relationship between anxiety and political attitudes, we estimate this set of models:

$$ATTARROWBOYS_{bi} = ß_0 + ß_1 \widehat{FEARLRA_\iota} + ß_2 \boldsymbol{DISTANCE_b} + ß_3 \boldsymbol{X_i} + \varepsilon_{bi} \quad (2)$$

$$ATTSPLA_{bi} = ß_0 + ß_1 \widehat{FEARLRA_\iota} + ß_2 \boldsymbol{DISTANCE_b} + ß_3 \boldsymbol{X_i} + \varepsilon_{bi} \quad (3)$$

$ATT\ ARROW\ BOYS_{bi}$ and $ATT\ SPLA_{bi}$ are individual-specific indicators for the respondent's attitude towards Arrow Boys and the SPLA respectively. We experiment with various indicators of this. $FEARLRA_i$ in both models is considered endogenous and is instrumented for using boma radio reception (BRR_b). All models are estimated by IVprobit.

One concern with the IV strategy is that reception of Yambio FM may influence political attitudes directly, by broadcasting information about the arrow boys or the SPLA. This would violate the exclusion restriction. We judge this unlikely in the case of the arrow boys. The arrow boys are organised at the community level and the way they have engaged with communities is much more directly than through radio. In interviews, respondents did not mention getting information about the arrow boys over the radio. When talking about their attitudes towards the SPLA, respondents to the interviews did not mention receiving information about this actor over the radio either, and instead referred to their personal observations. Nevertheless, to the extent that respondents

receive information about the arrow boys or SPLA by way of Yambio FM, our IV strategy conflates the impact of fear of the LRA and the impact of having access to this information.

Media and anxiety: Fear as an effect of quality of reception of Yambio FM

Main results

In qualitative interviews, respondents acknowledged the absence of LRA activity close to them but expressed fear that the LRA would return and a deep sense of insecurity overall. Despite describing their fear of the LRA, respondents also noted that the LRA had not appeared in a long time, often acknowledging without being prompted that the LRA was, in fact, far away. This suggests that 'objective' information on risk—in this case the lived experience that the LRA had not been in the area for a long time—does not match people's perceptions of being at high risk of an LRA attack. Not having experienced an LRA attack for a long time does not lessen the constant fear that has become a feature of everyday lives. Although the LRA has barely been present in South Sudan, people living in Tambura and Ezo Counties experience their situation as being acutely risky at all times. In a community meeting in one affected *boma*, respondents summed up why the impression that the LRA is near matters. Although the last LRA attack happened years ago 'until now when people are in the bush [to tend to their

fields], they fear that LRA is coming. It brings trouble to their minds."[5] 'The fear factor is a main thing,' was how one international respondent summed up the damaging effect of permanently hearing about the LRA.[6]

This high level of fear is also reflected in survey responses: 75 per cent of the respondents report having feared an LRA attack 'often' in the past year. This corresponds strongly with the picture that emerged from qualitative research: Fear is high, regardless of what the actual security situation has been.

A comparison of the responses from areas with different levels of radio reception suggests that individuals in areas with above median radio reception are more likely to express anxiety about the LRA. In areas with above median radio reception, people described their fear of the LRA and the long-term effects of LRA presence in practical terms, recounting concretely how fear influenced their day-to-day lives. Members of a women's group described how women from both sides of the border with the DRC were no longer moving across and that free movement was now a prerogative of armed men: 'Before LRA we used to go and buy rice and palm oil from there, sometimes nuts.'[7] A middle-aged man described how 'life before LRA was not bad, but with some problem, but people used to go without fear. Since LRA, people cannot even go 200 meters to cultivate. And we are still scared of the people they killed. So life before was good because there was no fear. Now there is still fear in our heart."[8] In a third *boma,* an executive chief explained how convincing people to return to their villages had taken

two years since the last reported LRA attack: 'Some are still reluctant because they fear LRA can come back."[9]

In areas with below median radio reception, while the LRA more generally often came up, fear was specifically mentioned only once. In this case, fear of the LRA was used as an example in a different context—as a reason to support a government headed by a to-be-crowned Zande King—and clearly placed in the past: 'The king will alert [the people] what is coming. Because in the past [the people] received [security] information late. Like the insecurity of the LRA, they did not know [the LRA] were coming, but the king would have alerted [the people].'[10]

Quantitative data confirms the finding that people who live in areas with better reception of Yambio FM fear the LRA more, are substantially more scared in their everyday lives, and live their lives accordingly. Table 3 shows the results of estimating model (1). It shows a consistent, positive and statistically significant relationship between radio reception and fear of the LRA. Our baseline results in column (1) indicate that *boma* level reception of Yambio FM is positively related to fear of the LRA. This effect is substantial in size: the model suggests that moving from the lowest to highest level of radio coverage observed in our sample is associated with an increase in probability that a respondent reports to fear the LRA 'often' from 61.4 per cent to 92.4 per cent, holding all control variables at their mean level.

Table 3: Reception of Yambio FM and fear

Table 3 here

Colum (2) of Table 3 shows that similar results are obtained when using an ordered logit instead of an order probit model. Column (4) shows the result of a placebo test. One may be concerned that the observed effect of radio reception on fear is due to the reception of other radio stations, or that radio reception in general is related to some confounding factor influencing fear, such as remoteness. If either explanation holds, one would expect *boma* level reception of Miraya FM to also have a significant and positive effect on fear of the LRA. However, column (4) shows that this is not the case. In fact, reception of Miraya FM is negatively related to fear of the LRA. Columns (5) and (6) give an indication of the effect of quality of reception of Yambio FM on people's daily activities. We focus on activities taking place when it is dark, as respondents most often perceive these activities as unsafe. Inhabitants of areas with better radio coverage were significantly more likely to say they feared going to their fields at night (column 5) and travelling to another village by night (column 6). Overall we find that being able to receive Yambio FM is associated with increased fear.

Although we have shown earlier that *boma* radio reception is uncorrelated to LRA activity, one may be concerned that these results are driven by actual LRA activity. **Table** explicitly controls for the measures of LRA activity presented in **Error! Reference source not found.**. In the interest of brevity, we omit the coefficients on all other control variables.

Table shows that indicators for LRA activity are generally not significantly related to fear of the LRA. Columns (1) and (2) show that controlling for years since the last victim of LRA violence in the *boma* does not affect the results; the size of the coefficient on *boma* radio reception increases compared to the baseline estimates when including these two variables. Columns (3)-(6) use LRA Crisis Tracker data on LRA activity. Our results are qualitatively unaffected in column (4) and (5), but the coefficient on *boma* radio reception loses statistical significance in the models presented in columns (3) and (6). Although this could imply that earlier results are spurious, it is also possible that adding three more *boma* level variables for distance creates multicolinearity, inflating the standard errors and causing the coefficient of interest to lose significance. In this context, it is important to note that in both columns, the coefficients of interest lose statistical significance due to an increase in the size of the standard error, not due to a decrease in the size of the coefficients. Calculating the correlations between the six measures of LRA activity from column (3) and column (6) and the three variables in the $\boldsymbol{DISTANCE_b}$ vector, reveals that the two sets of variables are indeed strongly correlated. Out of the 18 correlation coefficients, 12 exceed 0.4 and three exceed 0.75. Entering the six indicators for LRA activity in the baseline specification separately results in the coefficient on *boma* radio reception to be statistically significant at the 1 per cent level in all cases.

Table 4: Controlling for LRA activity

Table 4 here

These arguments, combined with the unchanged results in the other models presented in **Table** and the lack of statistical significance of most of the indicators for LRA activity leads us to conclude that our baseline results are at least reasonably robust to controlling for actual LRA activity. Results in the online appendix to this articles furthermore show that the relationship between *boma* radio reception and fear of the LRA is unaffected by controlling for the presence of other armed forces, distance to the CAR or DRC border, phone coverage, displacement and date of enumeration.

Thus, in accordance with theories on media and anxiety, we find that those who are able to better receive Yambio FM's broadcasts are more afraid of the LRA, regardless of what their own experience about the risk of an LRA attack tells them.

Mechanisms: Yambio FM and Fear

Now that we have established that the relationship between reception of Yambio FM and fear of the LRA is reasonably robust, we turn to the mechanisms connecting media and fear. Because the processes described by the costly information and availability mechanisms may be mostly subconscious, we cannot definitively rule out either mechanism. However, interview data provide suggestive evidence in favour of the availability mechanism.

We have already seen that interview respondents in areas with above median radio reception were very specific about instances when they had experienced fear of the LRA: when going across the border to the market, when going to cultivate, when making decisions on whether to return to their original village after having fled. Respondents in areas with below median radio reception did not bring up such specific examples. This appears to be more consistent with the availability mechanism, hypothesizing that media coverage of a phenomenon makes it easier for people to recall similar instances and that they therefore judge them to be more likely. It is not obviously consistent with the costly information mechanism.

Judging how well-informed they felt, people in areas with above median radio reception were rather reluctant to characterise radio as a solid means of communication and information gathering. Interview respondents in semi-structured interviews expressed mistrust about information broadcasted. When asked how radio reception helped them in being informed, one respondent in an area with above median radio reception was reluctant to credit the radio with much information value. By way of example, he said that he had heard that the Americans were sending 200 or 100 military personnel, and that they were stationed in the nearby town of Nzara, 'but we have not seen them.'[11] The information about foreign troops only became valuable to him after he was connected to the troops through a personal contact. A disconnect between what people heard on the radio and their experience of the situation was often described: 'We just heard of [the Ugandan army] by the roadside and we heard on radio about other soldiers. But we have not seen them. There is no evidence. How do you prove they are there?'[12]

Respondents in areas with above median radio reception indicated that they actively sought out information from other sources, which they trust more. These included crossborder communication, hunters observing LRA tracks and border residents patrolling the forest.[13] In a different area with above median radio reception, people had no expectation that they could rely on the radio for good information: 'Nobody told us LRA is no longer in area, [that] we can come back. We make patrol to find out.'[14]

Respondents in areas with below median radio reception also spoke about seeking out other sources of information, but statements to this effect were often coupled with expressions of resignation about living in information isolation: 'We have limited idea about issues to do with Yambio, only our own *boma*.'[15] It was noted that hearsay was abundant: 'I heard through rumors that [US soldiers] came, very many and they took them by plane to the jungle to the LRA. But I don't know how true it was.'[16] Some respondents felt lack of information more acutely: 'People are always complaining that the government is neglecting us and not giving any information. It is true, there is nothing here to show the presence of the government.'[17] Respondents also spoke about gathering bits of information when travelling to the state capital: 'I was in Yambio when I heard about AU forces. I have seen UN forces in Yambio, but there is no other news.'[18]

Interviews suggest that people in areas with above median radio reception put little trust in information received over the radio and actively seek out other sources of information. This does not square well with the costly information mechanism, which suggests that individuals use information received over the radio as a shorthand indicator

for risk because seeking out additional information is too costly. The vivid description of the reasons for fear in areas with above median radio reception appears most consistent with the availability mechanism.

Fear and political attitudes: changing social and political structures

Main results

In this section, we examine how fear of the LRA contributes to changing political and social structures. Fear, increased by access to Yambio FM, influences social and political structures in Ezo and Tambura Counties. We find that because authorities such as the SPLA, or the government in general, were not seen to be acting on the perceived risk—or at times seen to be perpetuating a situation of insecurity and uncertainty—our respondents' reliance on existing government authority decreased. In response to this, a local militia called the arrow boys emerged as the counterpoint to official actors, who in the eyes of many respondents provide a more credible response to the security threat posed by the LRA. Respondents in areas with better radio reception, and consequent higher fear of the LRA, rely more on the arrow boys and less on the SPLA compared to respondents in areas with less access to Yambio FM.

Respondents expected information on LRA presence broadcast over the radio, which they perceive as 'official' information, to elicit a protection response from official actors. However, in respondents' experience this did not happen. The action taken by the official armed actors is regarded as limited. Lack of protection for the affected civilian

population has been a well-documented problem with the LRA presence in South Sudan, CAR and DRC (Schomerus and Tumutegyereize, 2009; Atkinson et al., 2012; Schomerus and de Vries, 2014) so people's observation that nobody acts on the information about LRA presence is a fair judgment. Many respondents explained how they had reported information on LRA movement to government or SPLA to no avail. Based on repeated experiences that no appropriate action was taken by official actors, we found during qualitative interviews a notable sentiment that civilians were being used as a pawn or deliberately neglected.

A typical response came from a man in a *payam* centre: 'What is really our doubt is: we don't know to what extent our government has gone to solve the problem. That's why we are still hiding here.'[19] Another man explained: 'When [there was a] high rate of LRA activities, the government knew very well that LRA was killing civilians, but they did not send security forces….There might be a policy behind the government acting this way. We asked that question. We failed to understand this problem…So finally it was the youth who are defending the community.'[20]

The 'youth' this respondent refers to are the civilian militia called the arrow boys, which emerged as a new authority due to their visible action against the LRA. In the eyes of civilians, the legitimacy of actors hinges on plausibly linking information dispensed and actions taken. Since both the armed forces are seen as inactive, the trust in official actors is rapidly diminished by the mismatch of information and action. This creates a gap, which others actors—in this case the arrow boys—fill.

The history of the WES 'youth' defense groups starts when the local population was under intercommunal pressure and the LRA arrived in 2005; a partial result of the intercommunal tensions was that the SPLA showed little interest in protecting civilians. When the LRA launched a new series of attacks after a 2008 military intervention on their camp across the border in DRC, members of the community in Maridi—a county east of Yambio—mobilised as a protection militia. Having expanded into other communities, an increased number of these groups of civilians started patrolling the roads and the bush for LRA movement from 2009 onwards (Schomerus and Tumutegyereize, 2009; Koos, 2014; Schomerus and De Vries, 2014; Schomerus, 2015; Schomerus and Rigterink, 2016).

In qualitative interviews it became clear that the name arrow boys obscures that women and adults also join. The membership swells when there is information about possible LRA movement or other security threats, making it difficult to state numbers with certainty. One respondent estimated that 'arrow boys and girls are more than 40 per cent of the population.'[21] Our survey results suggest that this is realistic. Of 425 respondents, 209 indicate that they themselves or at least one member of their household had been a member of the arrow boys in the previous 12 months. Given an average adult household size of three, this would put arrow boy membership anywhere between 16 and 50 per cent of the population.

The arrow boys are seen as more effective in dealing with the (perceived) threat of the LRA, compared to the SPLA and the government for a number of reasons. First, the arrow boys were seen as taking fast and reliable action in the face of (perceived) security

threats. 'These guys are going to the bush to see if there are footmarks by the LRA. If they don't see, they can tell people' was how one resident summed up this up.[22] A member of a women's group explained: 'In case of insecurity, the people who do most of the protection are the arrow boys. Because we don't have any other solution for insecurity, this is a good solution.'[23] A representative of a women's group explained why for her, the youth (which she named as being synonymous with the arrow boys) now represent the only trustworthy authority:

> 'I prefer to go to the youth with a problem because youth are very fast at making decisions. One example is LRA: There was a recent attack, and the information was circulated. And the arrow boys were the first group to follow them. The youth crossed past my house and said: 'This mama, we cannot leave her alone.' So some stayed behind to give me protection.'[24]

It is worth noting that despite the fact that many respondents outlined how the arrow boys had followed LRA footsteps and chased them away, most of these events had occurred a while back or had not been confirmed as attacks. However, the arrow boys continued to follow up rumours of LRA movement.

The credibility of the SPLA in the eyes of the population is further undermined, and that of the arrow boys bolstered, by the dynamics between these two actors. Having observed the SPLA not offering protection and not acting on information about LRA presence, the soldiers are considered an impediment to the arrow boys, with numerous

interviewees reporting how the SPLA refused cooperation. 'There were even accusations that the SPLA fought the arrow boys,' explained a woman. 'But the arrow boys were brought up by the community to protect the community. That [should have been] the work of the SPLA. So people even accuse the government [of actively contributing to the community's lack of security].'[25] A typical story of how the SPLA interacts with arrow boys came from a group of arrow boys based in a remote village. They explained that they deliberately do not inform the SPLA because in 2011 the SPLA told the arrow boys to split up and go into the bush in two directions. The SPLA then changed direction to shoot at the arrow boys. One arrow boy was reportedly injured.[26] A woman gave an example of how government officials are seen to manipulate information, and how this creates distrust. She explained that the former WES governor had publicly denied the presence of the LRA in the state and dismissed the arrow boys' importance: 'A representative of the president! So people felt so marginalised….And she even said citizens should not take a spear.'[27]

Overall, qualitative findings suggest that fear of the LRA contributes to more favorable political attitudes toward the arrow boys, but more negative political attitudes towards the SPLA.

Table 5 below examines the relationship between fear of the LRA and political attitudes using the quantitative data, showing results from estimating models (2) and (3).

Table 5: Reception of Yambio FM and political attitudes

Table 5 here

The results in table 5 provide support for our qualitative findings, although this is not consistent across all indicators. The results in column (3) and (4) are strongest: in areas with more fear of the LRA (as predicted by *boma* radio reception) respondents are significantly more likely to say they would turn to the arrow boys when fearing for their safety and significantly less likely to say they would turn to the SPLA. This effect is again substantial in size: a move from the lowest to the highest degree of reception of Yambio FM in the sample, with all control variables at their mean levels, is associated with an increase in the probability that a respondent would go to the arrow boys for protection from 22.35 per cent to 41.89 per cent. It is also associated with a decrease in the probability that a respondent would go to the SPLA for protection from 57.34 per cent to 0.16 per cent.

The signs on the coefficients of interest in the remaining columns of table 5 is consistent with the qualitative findings. Columns (1) and (2) would suggest that respondents in areas with better access to Yambio FM are more likely to have actually reported concerns to the arrow boys and less likely to report to the SPLA, but the coefficient is only significant for the SPLA. Signs in columns (5) and (6) are again consistent, but using trust as an indicator of political attitudes, neither coefficient on fear of the LRA is significant. The online appendix shows that some similar results are obtained for a

model using individual radio reception including *boma* fixed effects, although again results are not consistent across indicators of political attitudes.

It is further noteworthy that few of the control variables appear to be systematically related to the political attitudes under investigation. One exception is age: older respondents appear significantly less likely to have a political attitude favouring the arrow boys, whereas they are more likely to have a positive attitude vis-à-vis the SPLA. It is possible to consider that older respondents better remember the SPLA as rebels fighting the government of northern Sudan, thus associating South Sudan's independence more strongly with the SPLA.

In sum, qualitative and quantitative results suggest that fear of the LRA, partially explained by exposure to Yambio FM, is associated with more positive political attitudes towards the arrow boys, and more negative political attitudes vis-à-vis the SPLA. Quantitative results, however, are not consistent across all indicators.

Fear and political attitudes: mechanisms

Two theoretical mechanisms explaining the connection between anxiety and political attitudes were proposed: Affect Transfer and Affective Intelligence. Negative feelings related to the LRA may directly transfer to political actors positively or negatively associated with the LRA (Affect Transfer), or anxious individuals may make a greater cognitive effort to form a political opinion, instead of relying on habit or patriotism (Affective Intelligence). To distinguish between these two mechanisms, we again turn to the qualitative interviews.

In areas with above median radio reception, people often stressed that participation in the arrow boys came with great sacrifices in the short term—no food or water in the bush, long walks in pursuit of footprints, risk of being killed—and long term with regards to loss of vocational or educational opportunities for themselves or their children, since loss of income also means not being able to pay school fees. In these areas, the arrow boys were directly linked to the LRA phenomenon.[28]

Often the actions of the arrow boys were contrasted with those of the SPLA or the government, with the terms SPLA and government often used interchangeably. Both SPLA and government were portrayed as actively refusing to help people, as summed up by one respondent in his narrative of how the arrow boys came about: 'All chiefs called for a meeting and advised youth that they needed to defend themselves. Otherwise they were all going to die and government was not coming to help them.'[29] One respondent recounted his experience with the government army: 'It has never happened that the SPLA has followed the LRA into the bush.'[30]

In areas with below median radio reception, support for the arrow boys in interviews appeared equally strong as in areas with above median radio reception. Yet in stark contrast many functions for the arrow boys were proposed, some actual and some imagined for the future. One of these functions suggested was as a permanent protection force against future attacks by other groups—which are often seen and described in antagonistic terms using ethnicity: 'The other reason for keeping the arrow boys around is for Dinka tribe. Because these are not rational people and they are looking to fight.'[31] One arrow boy described the function of his group for the community: 'They are

soldiers, police in the community. There is no government.'[32] Or as one arrow boy phrased the desire of the population to have the arrow boys in a permanent position of authority it: 'People want to stay with arrow boys.'[33] It was proposed that they could become the personal force or militia of the proposed Zande King: '[The arrow boys] will keep the group and if the king is crowned, they will turn into the militia of the king to protect the community.'[34]

The above suggests that respondents in areas with above median reception of Yambio FM expressed more clearly in interviews what the arrow boys were presently doing, and linked their attitudes about the SPLA to information obtained through observation. In areas with above median reception of Yambio FM, the envisioned tasks of the arrow boys were broader and less well-defined and positive attitudes versus the arrow boys were expressed without accompanying information on their actions. Overall, it would appear that respondents in areas with better reception of Yambio FM, and consequently with higher fear of the LRA, base their political attitudes on more concrete information. This would be consistent with the Affective Intelligence mechanism, but is hard to square with Affect Transfer.

Changing the community structure

South Sudan has struggled as a centrally-governed state, both prior to and after independence. On the state level, alienation from the central government has been a regularly expressed sentiment. In WES, where general alienation from the SPLM/A has become further focussed through the LRA issue, the trust invested in the arrow boys has

become a general counterpoint to what is perceived to be a hostile regime. The crucial shift is that the arrow boys have gradually also taken on societal functions that ought to fall under the remit of other state actors. These include judiciary or law enforcement tasks that reach well beyond the tasks of a protection militia.

Through the protection work, explained one respondent, the arrow boys had earned a permanent place in the community. 'In a situation where LRA is not there, the government should keep arrow boys to guard the area like a police man. The government needs to look at a way to keep the arrow boys busy… they have helped the community and government a lot.'[35]

One community leader explained the relationship between the formal government officials and those holding authority within the community: 'When there is any decision to be taken, the *payam* administrator calls the chief, the youth, the arrow boys.'[36] Another respondent explained: 'When there is a problem in the community and the court is not aware of it, the arrow boys will alert the court to that issue.'[37] Asked to whom she would turn with a community or personal safety issue, one woman explained: 'The last person to go to with a problem is the *payam* administrator because he only takes information from arrow boys and police. So I would go to arrow boys and police first.'[38] Representatives of another community argued that even with no LRA attacks reported or to be expected, 'It's good to maintain the arrow boys. They know all their borders. If something is happening, they can inform the government.'[39] Another chief explained that the arrow boys should also be 'responsible for home guards in areas where army cannot reach.'[40]

The arrow boys' authority leaves a number of loose ends. One respondent, who holds a leadership position in the community, explained: 'If the situation is now [calm], there is no LRA, I'm trying to have an institution to train [the arrow boys], transform them to normal citizens. We can train them in carpentry, because if you leave them like this they can even turn against the community. What will happen? Who will they be? Will they be good citizens?'[41]

Conclusion

We aimed to investigate the impact of access to media, specifically Yambio FM, on individual perceptions of security, and on political attitudes. We conclude that people with better reception of Yambio FM express greater anxiety regarding their security situation, regardless of whether or not the security information they hear matches their experience of the situation. Thus improved access to media is found to increase fear, decrease reliance on official actors and strengthen reliance on a civilian militia. We can see a contribution of media to the altering of community structures with a profound impact on the social fabric of WES. We provide evidence for a fear-inducing effect of media, and for the impact of anxiety on political attitudes in the context of a developing and conflict-affected country. Furthermore, we distinguish between various theoretical mechanisms explaining these relationships, finding suggestive evidence in favour of Availability and Affective Intelligence respectively. That these heuristic responses to information possibly exist implies that policies focused on media and information may have unexpected and unintended consequences.

Assessing unintended consequences of 'come home' messages appears especially important given that one of the NGOs working on this recommends making 'come home' messages more effective by increasing their reach and frequency. We cannot show that increased fear and the resulting contribution to changing authority structures is due to 'come home' messages specifically. However, if an instinctive response to the lack of access to security information is to increase its frequency—regardless of the level of security threats—the phenomena examined in this paper might be magnified.

Our findings suggest an urgent need for empirical investigation of the role of media in situations of violence conflict. The media's function as a peacebuilding and statebuilding tool needs research with a focus on the intersection of information and action. To the extent that we believe that increasing reliance on the arrow boys and decreasing reliance on the state army is the opposite of statebuilding, we provide evidence from one case suggesting media does decidedly not contribute to how statebuilding is generally understood. The role information plays in forming authority, as well as in influencing social and political structures in areas with limited state capacity remains unclear. If media's aim is, as stated by BBC Media Action, to support self governance, then the lack of understanding of these links is dramatic. As we have seen in Ezo and Tambura Counties, such self governance might follow unexpected patterns and create new realities for ordinary citizens who are exposed to media.

Endnotes

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[3] For a comprehensive introduction to the LRA rebellion from a number of angles, see Allen, T. and Vlassenroot, K. (2010). *The Lord's Resistance Army : myth and reality* London: Zed..
[4] International aid worker, Ezo, 2013
[5] Community meeting, Tambura, 2013
[6] International aid worker, Ezo Town, 2013
[7] Women's Group, Tambura, 2013
[8] Community meeting, Tambura, 2013
[9] Executive Chief, Ezo, 2013.
[10] *payam* chief, Tambura, 2013.
[11] Executive Chief, Ezo, 2013.
[12] Women's Group, Ezo, 2013
[13] Arrow Boys, Ezo, 2013
[14] Community meeting, Ezo, 2013
[15]Community meeting, Ezo, 2013
[16] Woman interviewee, Ezo, 2013
[17]Woman interviewee, Ezo, 2013
[18]Community meeting, Ezo, 2013
[19] Chief, Ezo, 2013.
[20] Male in his 30s, Tambura, 2013
[21] Senior chief, Yambio, 2012
[22] Community meeting, Ezo, 2013.
[23] Women's association, Tambura, 2013
[24] Chairperson women's association, Tambura, 2013
[25] Religious sister, Tambura, 2013
[26] Arrow boys, Ezo, 2013
[27] Religious sister, Tambura, 2013
[28] Executive Chief, Ezo, 2013
[29] Executive Chief, Ezo, 2013
[30]Arrow Boys, Tambura, 2013
[31] payam chief, Tambura, 2013
[32] Arrow Boys, Tambura, 2013
[33] Three young men, Tambura, 2013
[34] Arrow Boys, Tambura, 2013. See also Schomerus and Rigterink, 2016.
[35] Youth group, Tambura, 2013

[36] Spiritual leader, Ezo, 2013
[37] Chief, Tambura, 2013
[38] Chairperson women's association, Tambura, 2013
[39] Community meeting, Ezo, 2013
[40] Chief, Ezo, 2013
[41] Chief, Tambura, 2013

References

11th Congress of the United States of America. (2010). Lord's Resistance Army Disarmament and Northern Uganda Recovery Act of 2009. *Public Law 111-172*.

Allen, T. & Vlassenroot, K. (2010). *The Lord's Resistance Army : myth and reality*. London: Zed.

Atkinson, R.R. (2009). *From Uganda to the Congo and beyond: Pursuing the Lord's Resistance Army*. New York, NY: International Peace Institute.

Atkinson, R.R. (2010). 'The realists in Juba'? An analysis of the Juba Peace Talks. *In* T. Allen & K. Vlassenroot (Eds.) *The Lord's Resistance Army: Myth and Reality*. London/ New York: Zed Books.

Atkinson, R.R., Lancaster, P., Cakaj, L. & Lacaille, G. (2012). Do no harm: assessing a military approach to the Lord's Resistance Army. *Journal of Eastern African Studies,* 6(2)**,** 371-382. http://dx.doi.org/10.1080/17531055.2012.669591

BBC Media Action. (2012). *Country Case Study: South Sudan. Support to media where media freedoms and rights are constrained.* London: BBC Media Action.

Brisset-Foucault, F. (2011). Peace-making, power configurations and media practices in northern Uganda: A case study of Mega FM. *Journal of African Media Studies,* 3(2)**,** 205-225. http://dx.doi.org/10.1386/jams.3.2.205_1

Buhaug, H. & Rød, J.K. (2006). Local determinants of African civil war 1970-2001. *Political Geography,* 25(3)**,** 315-335. doi:10.1016/j.polgeo.2006.02.005

Cassino, D. & Lodge, M. (2007). The primacy of affect in political evaluations. *In* W.R. Neuman, G.E. Marcus, M. Mackuen & A.N. Crigler (Eds.) *The affect effect: Dynamics of emotion in political thinking and behavior* (101-123). Chicago, IL: University of Chicago Press.

Collier, P., Hoeffler, A. & Söderbom, M. (2004). On the duration of civil war. *Journal of Peace Research,* 41(3)**,** 253-273. doi: 10.1177/0022343304043769

Dellavigna, S., Enikolopov, R., Mironova, V., Petrova, M. & Zhuravskaya, E. (2011). *Cross-border media and nationalism: evidence from Serbian radio in Croatia.* Cambridge, MA: National Bureau of Economic Research.

Eschholz, S. (1997). The media and fear of crime: A survey of the research. *University of Florida Journal of Law & Public Policy,* 9**,** 37-60. doi: 0.1177/1741659005057644

Fielding, D. & Shortland, A. (2009). Does television terrify tourists? Effects of US television news on demand for tourism in Israel. *Journal of Risk and Uncertainty,* 38(3)**,** 245-263. Retrieved from http://www.jstor.org/stable/41761384

Furedi, F. (1997). *Culture of fear: Risk-taking and the morality of low expectation.* London and Washington, DC: Cassell.

Furedi, F. (2005). *Politics of fear.* London: Continuum.

Gerbner, G., Gross, L., Morgan, M. & Signorielli, N. (1980). The "mainstreaming" of America: Violence Profile No. 11. *Journal of Communication,* 30(3)**,** 10-29. doi: 10.1111/j.1460-2466.1980.tb01987.x

Ginifer, J. (2006). *Internal Review of DfID's engagement with the conflict in Northern Uganda.* London: DFID.

Gordon, S., Vandewint, C. & Lehmeier, S. (2007). *Reluctant Hosts: The Impact of the Lord's Resistance Army on Communities in Western Equatoria State, Southern Sudan.* Nairobi: Worldvision.

Heath, L. & Gilbert, K. (1996). Mass Media and Fear of Crime. *American Behavioral Scientist,* 39(4)**,** 379-386. doi: 10.1177/0002764296039004003

Human Rights Watch. (2009). *The Christmas Massacres: LRA attacks on Civilian in Northern Congo.* New York: Human Rights Watch.

Invisible Children. (2013). "Come Home" Broadcasts. http://invisiblechildren.com/program/come-home-broadcasts/.

Koos, C. (2014). Why and how civil defense militias emerge: The case of the arrow boys in South Sudan. *Studies in Conflict & Terrorism,* 37(12)**,** 1039-1057. doi: 0.1080/1057610X.2014.962439

Ladd, J.M. & Lenz, G.S. (2008). Reassessing the Role of Anxiety in Vote Choice. *Political Psychology,* 29(2)**,** 275-296. doi: 10.1111/j.1467-9221.2008.00626.x

Ladd, J.M. & Lenz, G.S. (2011). Does Anxiety Improve Voters' Decision Making? *Political Psychology,* 32(2)**,** 347-361. doi: 10.1111/j.1467-9221.2010.00805.x

Lancaster, P. & Cakaj, L. (2013). *Loosening Kony's Grip: Effective Defection Strategies for Today's LRA.* Washington, DC: The Resolve.

LRA Crisis Tracker. (2015). LRA Crisis Tracker. Invisible Children.

Marcus, G.E., Neuman, W.R. & Mackuen, M. (2000). *Affective Intelligence and Political Judgement*. London: University of Chicago Press.

Nashion, J. (2013a). Yambio FM Breaks Down. *Gurtong News*.

Nashion, J. (2013b). Yambio FM Resumes Broadcasting. *Gurtong News*.

Neuman, W.R., Marcus, G.E., Crigler, A.N. & Mackuen, M. (2007). Theorizing Affect's Effects. *In* W.R. Neuman, G. E. Marcus, A.N. Crigler & M. Mackuen (Eds.) *The Affect Effect*. London: University of Chicago Press.

Olken, B.A. (2009). Do Television and Radio Destroy Social Capital? Evidence from Indonesian Villages. *American Economic Journal: Applied Economics,* 1(4)**,** 1-33. doi: 10.1257/app.1.4.1

Orme, B. (2010). *Broadcasting in UN Blue: The Unexamined Past and Uncertain Future of Peacekeeping Radio*. Washington DC: National Endowment for Democracy.

Paluck, E.L. & Green, D.P. (2009a). Deference, Dissent, and Dispute Resolution: An Experimental Intervention Using Mass Media to Change Norms and Behavior in Rwanda. *American Political Science Review,* 103(4)**,** 622-644. doi: 10.1017/S0003055409990128

Paluck, E.L. & Green, D.P. (2009b). Prejudice Reduction: What Works? A Review and Assessment of Research and Practice. *Annual Review of Psychology,* 60**,** 339-367. doi: 10.1146/annurev.psych.60.110707.163607

Prunier, G. (2004). Rebel movements and proxy warfare: Uganda, Sudan and the Congo (1986-99). *African Affairs,* 103(412)**,** 359-383. doi: 10.1093/afraf/adh050

Rigterink, A.S., Kenyi, J.J. & Schomerus, M. (2014). *Report of the Justice and Security Research Programme Survey in Western Equatoria State, South Sudan (first round May 2013)*. London: London School of Economics and Political Science.

Schoemaker, E. & Stremlau, N. (2014). Media and Conflict: an assessment of the evidence. *Progress in Development Studies,* 14(2)**,** 181-195. doi: 10.1177/1464993413517790

Schomerus, M. (2007). *The Lord's Resistance Army in Sudan: A history and overview (Working Paper 8)*. Geneva: The Small Arms Survey.

Schomerus, M. (2008). *Violent legacies: Insecurity in Sudan's Central and Eastern Equatoria (Working Paper 13)*. Geneva: The Small Arms Survey.

Schomerus, M. (2012). Even eating you can bite your tongue: Challenges and dynamics at the Juba peace talks with the Lord's Resistance Army (unpublished doctoral thesis). London School of Economics and Political Science (LSE), London.

Schomerus, M. (2015). *Protection and militarisation in Western Equatoria*. Juba: USAID/VISTAS.

Schomerus, M., Allen, T. & Vlassenroot, K. (2011). Obama takes on the LRA: Why Washington sent troops to Central Africa. *Foreign Affairs*, 15 November.

Schomerus, M. & De Vries, L. (2014). Improvising border security: 'A Situation of Security Pluralism' along South Sudan's Borders with the Democratic Republic of Congo. *Security Dialogue,* 45(3 (Special Issue *Governance of Border Security in Practice*))**,** 1-16. doi: 10.1177/0967010614532156

Schomerus, M. & Rigterink, A. (2016). *Non-state security providers and political formation in South Sudan: The case of Western Equatoria's arrow boys.* Waterloo: Center for Security Governance.

Schomerus, M. & Tumutegyereize, K. (2009). *After Operation Lightning Thunder: Protecting communities and building peace.* London: Conciliation Resources.

Straus, S. (2007). What is the relationship between hate radio and violence? Rethinking Rwanda's "Radio Machete". *Politics Society 2007,* 35(4)**,** 609-637. doi: 10.1177/0032329207308181

Tversky, A. & Kahneman, D. (1973). Availability: A Heuristic for judging frequency and probability. *Cognitive Psychology,* 5**,** 207-323. doi: 10.1016/0010-0285(73)90033-9

Wahlberg, A.A.F. & Sjoberg, L. (2000). Risk perception and the media. *Journal of Risk Research,* 3(1), 31-50. doi:10.1080/136698700376699

World Bank. (2015). *World Development Report 2015: Mind, Society, and Behavior.* Washington, DC: The World Bank.

Yanagizawa-Drott, D. (2012). *Propaganda and conflict: Theory and evidence from the Rwandan genocide (Working Paper).* Cambridge, MA: Harvard University.

Online Appendix

The fear factor is a main thing: How radio influences anxiety and political attitudes

Anouk S. Rigterink and Mareike Schomerus

Individual model

Method

We estimate the following model using individual level reception of Yambio FM:

$$FEARLRA_{bi} = \alpha_b + ß_1 INDIVIDUALRR_i + ß_2 \boldsymbol{X_i} + \varepsilon_{bi} \quad \text{(A1)}$$

where $INDIVIDUAL\ RR_i$ is individual radio reception, an indicator equalling one if the respondent's household has a working radio that can receive Yambio FM. Note that this specification includes *boma* fixed effects, which makes including the $\boldsymbol{DISTANCE_b}$ vector obsolete.

Model (A1) has the advantage of allowing the inclusion of boma-fixed effects, capturing any time-invariant boma-specific factors related to both fear of the LRA and individual radio reception that may bias the estimate of $ß_1$. However, this specification disregards the main source of variation (between bomas) and spill-over effects are likely strong

within the boma, biasing the estimate of $ß_1$ downwards. Furthermore, note that Model (A1) introduces a new source of endogeneity, since households that decide to buy a radio may be systematically different from those that do not. Model (A1) requires an ordered logit or probit model with fixed effects.

However, both ordered logit and ordered probit are maximum likelihood estimators, and maximum likelihood cannot consistently estimate parameters in finite samples in the presence of fixed effects (Lancaster, 2009) (Colin Cameron and Miller, 2013). Therefore, we use the 'Blow-Up and Cluster' ordered logit estimator (bucologit) (Baetschmann,Staub and Winkelmann, 2011). The idea underlying this estimator is that a fixed effects logit model (with a dichotomous dependent variable) can be estimated consistently using conditional maximum likelihood estimation (CML) (Chamberlain, 1979). One could simply transform the ordinal variable into a dichotomous one - using some cut-off point - and estimate by CML, but this would not use all available information, and would thus be inefficient. One alternative is to estimate results for every possible cut-off point and then combine these estimates. The bucologit estimator does both in a single step, by replacing every observation by as many copies of itself as there are possible cut-off points and estimating CML on the thus expanded sample. In the context of our four-point scale, this implies that observations for villages in which responses vary across the full scale are duplicated three times, observations for villages in which respondents' answers do not use one extreme of the scale are duplicated twice, etc. Bomas in which all respondents gave the same answer contain no within-boma

variation and are dropped (for $FEAR\ LRA$, this applies to one boma). Beatschmann et al. (2011) show that the bucologit estimator is theoretically consistent, that it is never outperformed by other commonly used consistent estimators and outperforms the latter in small samples (Baetschmann *et al.*, 2011).

We investigate the impact of individual level radio reception on political attitudes using the following models:

$$ATTARROWBOYS_{bi} = \alpha_b + ß_1 INDIVIDUALRR_i + ß_2 \boldsymbol{X_i} + \varepsilon_{bi} \quad \text{(A2)}$$

$$ATTSPLA_{bi} = \alpha_b + ß_1 INDIVIDUALRR_i + ß_2 \boldsymbol{X_i} + \varepsilon_{bi} \quad \text{(A3)}$$

Because of the difficulties in estimating an IV model with fixed effects and an ordinal or dichotomous dependent variable, we estimate a reduced form, including radio reception in the model directly. These models will be estimated by bucologit estimator for dependent variables measured on an ordinal scale and by logit estimator with fixed effects for dichotomous ones.

Results

Table A1 presents the results on radio and fear from individual model (A1). As highlighted before, this exploits within-*boma* variation in ability to receive Yambio FM only, and as such is a more stringent test of the hypothesis. Using this model, we fail to find evidence that exposure to Yambio FM increases fear: the coefficient on individual

radio reception is positive, yet statistically insignificant for any of the indicators of fear used.

Table A1: Radio and fear individual model

Table A1 here

Table A2 presents the results for a reduced form individual model (A2 and A3), with *boma* fixed effects. Note that the number of observations is substantially lower for columns (2) and (4). This is because reporting an issue to the SPLA, and a respondent saying that he/she would go to the SPLA for protection are rare. In six and two *bomas* respectively, this did not occur at all, and there is no within-*boma* variation to exploit. These *bomas* are dropped from the relevant regressions.

Table A2: Radio and political attitudes individual model

Table A2 here

In the case of the relationship between Yambio FM and fear, the model using individual radio reception failed to reproduce the results obtained using *boma* radio reception. In this case, however, some similar results are found. Respondents with individual access to

Yambio FM brought significantly more issues to the Arrow Boys in the past year, and are significantly more likely to (hypothetically) go to the Arrow Boys for protection. The equivalent coefficients for the SPLA have the expected sign, but are not significant (the loss of observations likely contributes to this). No support for the hypothesis presented is found for the trust variables.

Robustness checks

Distance to border, phone ownership, migration and date-of-interview fixed effects

Table A3 addressed a number of other potential concerns regarding the robustness of the relationship between reception of Yambio FM and fear of the LRA. We omit the coefficients on the control variables for brevity.

Table A3: Robustness checks

Table A3 here

One such concern may be that radio coverage is better in *boma*s closer to the border with either DRC or CAR, and that inhabitants of these *boma*s are also more afraid of the LRA, either because the LRA is closer to them or because they feel more isolated. Therefore,

columns (1) and (2) of Table A3 include the straight-line distance from the *boma* to the DRC and CAR border respectively as control variables. Controlling for distance to the CAR border causes the coefficient on *boma* radio reception to decrease slightly in size. However, it is still significant at the ten per cent level. Controlling for distance to the DRC border does not meaningfully change our baseline results.

Column (3) of Table A3 investigates phone coverage. We may imagine that phone and radio coverage are correlated, and that information on the LRA received over the phone may be the actual driver of fear, rather than radio. Column (3) takes the number of phones owned in a *boma* as a proxy for the quality of phone coverage, since inhabitants of *bomas* without coverage are less likely to own a phone. Column (3) does not provide evidence that the observed relationship between *boma* radio reception and fear of the LRA is driven by phone coverage.

Another cause for concern may be displacement. Ezo and Tambura Counties have experienced high rates of displacement. It is possible that areas with better radio coverage experienced higher rates of displacement, and that those who have been displaced experience higher levels of fear, even after returning to their original place of residence. Alternatively, those who fear the LRA more intensely may have moved to places with better radio reception, perhaps because they think they can protect themselves better there. Out of these two explanations, the first appears most likely: our data indicates that out of the 60 per cent of respondents that indicate they have been

displaced, more than 50 per cent now live at their original place of residence, whereas less than 10 per cent moved somewhere else.

Column (4) of Table A3 includes an indicator equaling one if the respondent is a continuous (non-displaced) resident of the *boma*. Column (5) includes an indicator equaling one if the respondent has moved to the *boma* from somewhere else. Coefficients on both indicators have the expected sign. However, our original results are robust to including both indicators, suggesting that our results are not driven by displacement.

Furthermore, one may be concerned that the results are somehow driven by higher numbers of minorities living in areas with better radio reception. Column (6) of Table A3 shows our baseline regression, excluding respondents that do not have South Sudanese nationality, or that indicate that they do not speak Pazande as their first language. As may be evident, respondents to our survey are very homogenous, and only 27 individuals are excluded. This does not affect the original results.

It should also be noted that on or around 25 April 2013, Yambio FM temporarily stopped broadcasting due to a defective transmitter. It resumed broadcasting roughly three months later. The breakdown took place shortly before the start of survey data collection, in May 2013. This may have affected the research, either by influencing the measurement of the quality of radio reception, or because of a waning impact of Yambio FM after the temporary stop. We deem both unlikely. First, the question 'can your radio receive Yambio FM' was framed in general terms, making it unlikely that respondents would have answered 'no' purely because they were *temporarily* unable to receive Yambio

FM. Indeed, reported ability to receive Yambio FM is high for all *bomas* visited. Second, all data was gathered over the course of the month immediately following Yambio FM's breakdown, a period likely too short to expect its impact to disappear entirely. It is important to realize that this should bias our results *downward*. Hence any impact of Yambio FM found in our analysis could be considered a lower bound to its true impact when fully operational. The temporary stop in broadcasting might bias our results, if respondents in bomas the survey team visited at a later date – and longer after the temporary stop - were more likely report they could not receive Yambio FM *and* more afraid of the LRA. The mitigate these concerns, we present a specification including date-of-enumeration fixed effects. Column (7) of Table A3 shows that including date-of-enumeration fixed effects has no meaningful effect on the coefficient of interest.

Presence of security forces

One may suspect that armed forces provide better protection against an LRA attack to inhabitants of *boma*s with poor radio reception. This is slightly counterintuitive: it is perhaps more logical to suspect that *boma*s that are more easily reached by a radio signal are also more easily reached by armed forces. However, there may be some logic to the argument if armed forces focus their protection efforts on remote or difficult to reach areas.

We deem this implausible; first of all because we have seen no evidence that other armed forces have a greater presence in remote areas. Quite the reverse: the largest bases of the

UN or the SPLA are near the county capitals. Furthermore, interviews suggest that armed forces such as the UN, the SPLA and the UPDF are perceived as ineffective in providing protection against the LRA.

Nevertheless, Table A4 shows our baseline specification, including five indicators for whether the respondent has seen US, UN, AU, SPLA or UPDF soldiers respectively, in the past year. Confirming information obtained through interviews, none of these indicators is significantly related to fear of the LRA. Controlling for these indicators has little to no effect on the coefficient for *boma* radio reception: our results appear robust to controlling for the presence of other armed forces.

Table A4: Controlling for presence of other armed forces

Table A4 here

References

Baetschmann, G., Staub, K.E. & Winkelmann, R. (2011). Consistent estimation of the fixed effects ordered logit model. *Working Paper Series, Department of Economics.* Zurich: University of Zurich.

Chamberlain, G. (1979). Analysis of Covariance with Qualitative Data. *The Review of Economic Studies,* 47 (10) . 225-238, Retrieved from http://www.jstor.org/stable/2297110

Colin Cameron, A. & Miller, D.L. (2015). A Practitioner's Guide to Cluster-Robust Inference. *The Journal of Human Resources*, 50 (2), 318-371. doi: 10.3368/jhr.50.2.317

Lancaster, T. (2009). The incidental parameter problem since 1948. *Journal of Econometrics,* 95(2)**,** 391-413. doi: 10.1016/S0304-4076(99)00044-5

Figure 1: relevant questions from survey in Ezo and Tambura counties, WES

Question	Scale
Radio	
Owns working radio 'Do you or a member of your household own a radio that works?'	Dichotomous (yes, no)
Boma radio reception IF YES: can your radio receive Yambio FM? [From January/February 2015 survey]: IF YES: can your radio receive Miraya FM?	Percentage (100 minus percentage of radio owners in boma unable to receive Yambio FM / Miraya FM)
Fear	
Fear LRA 'In the past year, how often did you fear that the LRA would come and attack your village?'	4-point (never, rarely, sometimes, often)
Fear to travel between villages / Fear to go to field 'In the past month, did you do any of the following activities: travel between villages at night, go to your field at night? IF YES: Did you feel safe doing so? [no indicates fear] IF NO: Did you not do so because this is unsafe?'[yes indicates fear]	Dichotomous indicator of fear equalling 1 if the respondent did the activity, but felt unsafe, or do not do the activity because it was unsafe, and 0 otherwise.
Political attitudes	
Trust arrow boys / SPLA 'How often do you trust [the arrow boys/SPLA]?'	Dichotomous (1 for always and most of the time, 0 for rarely and never).
Would go for protection to arrow boys / SPLA 'When you are afraid to be harmed by someone outside your family, who would you turn to, to get protection?'	Dichotomous (arrow boys / SPLA mentioned or not)
Brought issue in front of arrow boys / SPLA 'In the last 12 months, did you report an issue or concern to [the arrow boys/SPLA]?'	Dichotomous (yes, no)
Experience of LRA violence *Years since last (personal) LRA victim in boma* 'During your lifetime, did any of the following happen to you'? IF YES: 'In which year', 'By whom?' 1. Member of immediate family killed 2. Injured or maimed in an attack / crossfire? (personal) 3. House burned down or destroyed? (personal) 4. Abducted? (personal) 5. A family member abducted?	Continuous Years since respondent then resident in *boma* reported being victim of LRA violence (personally)

Figure 2: Ability to receive Yambio FM

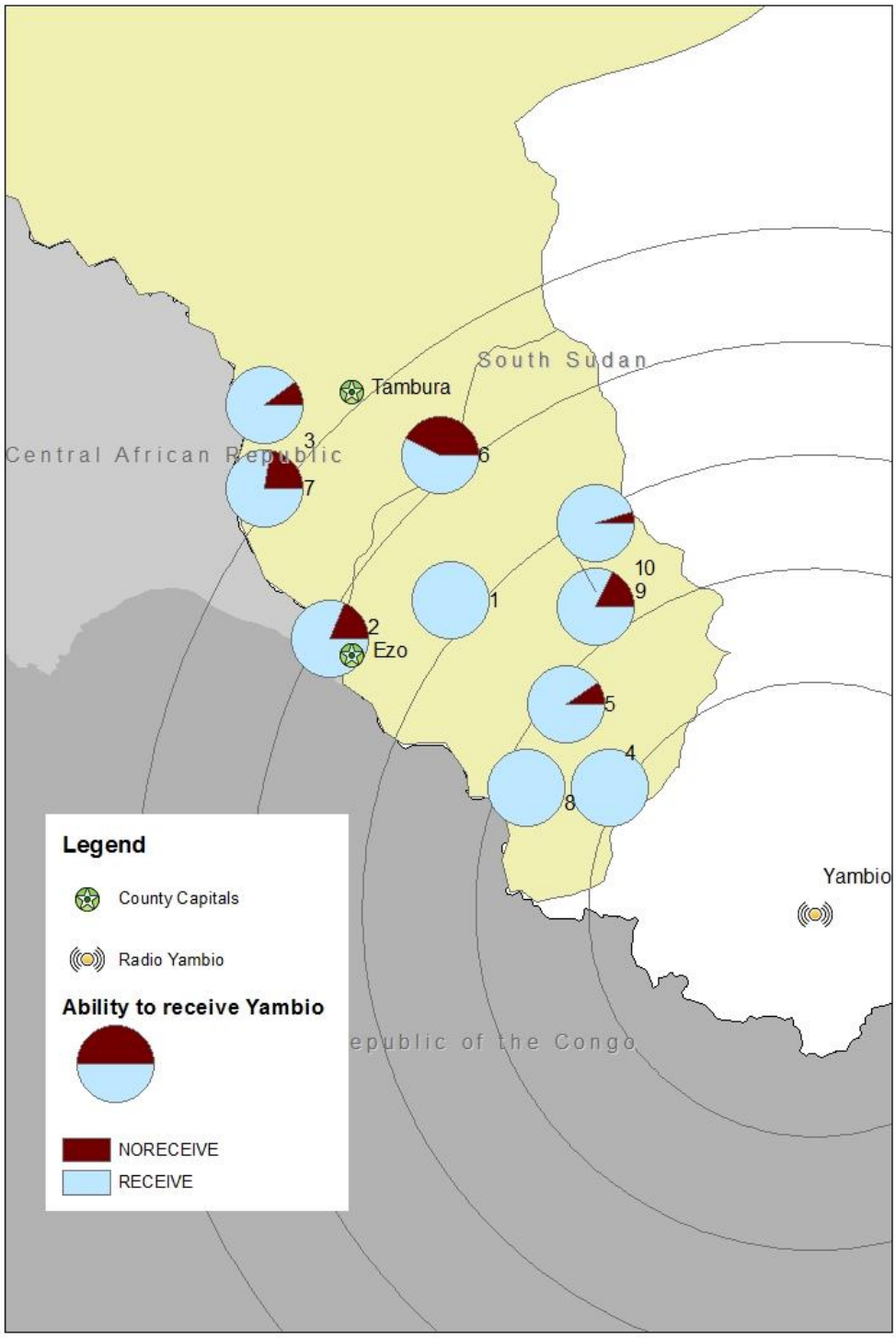

Table 1: Correlation between residual radio reception and LRA activity

A: Distance to closest LRA incident…	
in the last year	-0.0317
	(0.9306)
in the last year, involving civilians	-0.0513
	(0.8881)
in the last 2 years	0.0569
	(0.8759)
in the last 2 years, involving civilians	-0.0252
	(0.9449)
in the last 5 years	0.4234
	(0.2228)
in the last 5 years, involving civilians	0.2425
	(0.4996)

B: Average distance to the 10 closest LRA incidents…	
in the last year	-0.0525
	(0.8856)
in the last year, involving civilians	-0.0407
	(0.9112)
in the last 2 years	-0.0688
	(0.8503)
in the last 2 years, involving civilians	-0.0287
	(0.9373)
in the last 5 years	0.1539
	(0.6713)
in the last 5 years, involving civilians	0.0956
	(0.7928)

C:Other boma characteristics	
Years since last LRA victim in boma	0.0349
	(0.9238)
Distance to border CAR	-0.084
	(0.8174)
Distance to border DRC	0.06
	(0.8693)

p-values in parenthesis.
Significance: * 10% level, ** 5% level, *** 1% level

Table 2: Correlation between boma radio reception and observable individual and household characteristics

	(1) Number of huts in compound	(2) Number of goats /sheep owned by household	(3) Number of poultry owned by household	(4) Number of bicycles owned by household	(5) Household owns working radio (indicator)	(6) Age	(7) Years of education	(8) Gender
	OLS	OLS	OLS	OLS	Probit	OLS	OLS	Probit
Boma radio reception	0.00723	-0.0113	0.101	0.00336	0.219	3.892	-0.166	1.158*
	(0.00700)	(0.0291)	(0.0872)	(0.00431)	(0.711)	(6.683)	(0.176)	(0.678)
Distance to Yambio	-0.198***	0.621**	0.854	-0.00643	-0.433	-50.90	-1.281	-13.81*
	(0.0734)	(0.305)	(0.915)	(0.0452)	(7.417)	(70.64)	(1.864)	(7.185)
Distance to Ezo	-0.229***	0.251	-0.0364	0.00974	-5.827	-33.49	-0.684	-8.097*
	(0.0449)	(0.187)	(0.560)	(0.0277)	(4.482)	(43.22)	(1.141)	(4.338)
Distance to Tambura	-0.215**	0.575	0.705	0.00191	5.567	10.87	-1.669	-9.570
	(0.100)	(0.417)	(1.248)	(0.0617)	(10.03)	(96.08)	(2.536)	(9.829)
Number of adults in household	0.00232***	0.00334***	0.0141***	0.000841***	0.0494*			
	(0.000264)	(0.00110)	(0.00329)	(0.000162)	(0.0263)			
Number of children in household	0.00383***	0.00672***	0.0181***	0.00141***	0.149***			
	(0.000401)	(0.00167)	(0.00499)	(0.000247)	(0.0402)			
Constant	0.0511***	-0.116**	-0.219	-0.00108	-1.320	41.59***	0.772**	1.514
	(0.0130)	(0.0540)	(0.162)	(0.00800)	(1.352)	(12.38)	(0.327)	(1.249)
Observations	433	433	433	433	429	433	433	433

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3: Reception of Yambio FM and fear

	(1) Fear LRA	(2) Fear LRA	(3) Fear LRA	(4) Fears to travel between villages	(5) Fears to go to field
	oprobit	ologit	oprobit	probit	probit
Boma radio reception	2.676**	5.072**		0.743*	1.970***
	(1.236)	(2.564)		(0.406)	(0.531)
Boma reception of radio Miraya FM			-3.897**		
			(1.644)		
Distance to Yambio	-10.10	-27.33	-11.19	-1.632	-1.788
	(14.36)	(30.01)	(12.77)	(4.749)	(4.176)
Distance to Ezo	-11.55**	-20.68**	-31.59**	-13.58***	-18.62***
	(5.603)	(10.11)	(13.48)	(1.992)	(3.191)
Distance to Tambura	-13.55	-36.18	5.791	-0.227	3.056
	(19.54)	(40.97)	(10.97)	(4.904)	(4.773)
Gender	0.113	0.101	0.0225	-0.279*	-0.612***
	(0.102)	(0.218)	(0.0897)	(0.150)	(0.122)
Age	0.905*	0.0162*	0.00989*	0.638	0.122
	(0.549)	(0.00938)	(0.00561)	(0.492)	(0.475)
Years of education	-0.502*	-0.793	-0.392	-0.251	-0.0762
	(0.272)	(0.549)	(0.275)	(0.164)	(0.238)
Number of adults in household	-0.140	-0.258	-0.122	0.00669	-0.0418
	(0.0905)	(0.164)	(0.0934)	(0.0671)	(0.0545)
Number of children in household	0.0973***	0.171***	0.0934***	0.0379	0.0347
	(0.0311)	(0.0620)	(0.0332)	(0.0280)	(0.0301)
Number of huts in compound	8.119	16.71	8.187	-9.233**	0.169
	(9.507)	(17.59)	(10.16)	(4.696)	(4.705)
Number of poultry owned by household	0.146	0.288	0.350	-0.0776	-0.253
	(0.500)	(0.960)	(0.503)	(0.479)	(0.451)
Number of goats/sheep owned by household	0.483	0.680	0.0590	-0.925	-0.291
	(1.123)	(2.228)	(0.950)	(1.417)	(1.616)
Number of bicycles owned by household	-4.021	-11.15	-4.449	7.294	6.281
	(8.321)	(14.54)	(8.354)	(12.53)	(13.14)
Owns working radio (indicator)	-0.175**	-0.342**	-0.155**	0.0983	0.0893
	(0.0790)	(0.146)	(0.0686)	(0.226)	(0.188)
Constant				0.447	-0.406
				(0.782)	(1.044)
Observations	423	423	427	427	425

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

Table 1: Controlling for LRA activity

FEAR LRA	(1) oprobit	(2) oprobit	(3) oprobit	(4) oprobit	(5) oprobit	(6) oprobit
Boma radio reception	3.256***	4.327***	2.908	4.428**	4.932***	4.390
	(0.810)	(0.886)	(2.864)	(2.220)	(1.193)	(2.762)
Years since last LRA victim in boma	0.339					
	(0.231)					
Years since last personal LRA victim in boma		0.103				
		(0.0904)				
Distance to closest LRA-related incident…						
Last year			-7.761*			
			(4.143)			
Last 2 years			5.093			
			(4.175)			
Last 5 years			-2.480			
			(7.821)			
Involving civilians last year					-3.177	
					(4.149)	
Involving civilians last 2 years					5.028**	
					(2.116)	
Involving civilians last 5 years					-6.928***	
					(1.514)	
Distance to 10 closest LRA-related incidents…						
Last year				-0.234		
				(0.766)		
Last 2 years				0.429		
				(0.522)		
Last 5 years				-0.654		
				(0.684)		
Involving civilians last year						0.478
						(1.262)
Involving civilians last 2 years						0.00104
						(1.935)
Involving civilians last 5 years						-0.774
						(1.237)
Observations	423	423	423	423	423	423

Robust (clustered) standard errors in parentheses

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

Table 5: Reception of Yambio FM and political attitudes

	(1) ivprobit	(2) ivprobit	(3) ivprobit	(4) probit	(5) ivprobit	(6) ivprobit
Instrument: Boma radio reception	Brought issue in front of		Would go for protection to		Trust in	
	arrow boys	SPLA	arrow boys	SPLA	arrow boys	SPLA
Fear LRA	1.210	-2.046***	1.582***	-2.132***	1.198	-0.415
	(1.095)	(0.358)	(0.398)	(0.297)	(1.107)	(2.640)
Distance to Yambio	11.34	-28.95*	-7.172	4.685	-20.92**	-22.79
	(18.64)	(16.58)	(9.910)	(7.402)	(9.553)	(19.81)
Distance to Ezo	3.126	-5.980	7.810**	-3.960	1.657	-22.80**
	(6.089)	(7.767)	(3.880)	(2.957)	(6.124)	(9.005)
Distance to Tambura	9.445	-17.06	-11.89	9.286	-13.46	-9.878
	(22.80)	(16.48)	(11.07)	(8.554)	(13.72)	(25.72)
Gender	0.134	0.258	-0.0358	0.0982	0.147	0.227
	(0.284)	(0.188)	(0.153)	(0.0981)	(0.280)	(0.206)
Age	-0.0180*	0.0142*	-0.00511	0.00682**	-0.0158***	0.000512
	(0.00974)	(0.00839)	(0.00433)	(0.00343)	(0.00537)	(0.00910)
Years of education	0.370	-0.277	0.437***	-0.259	0.301	-0.445
	(0.301)	(0.264)	(0.169)	(0.255)	(0.220)	(0.339)
Number of adults in household	0.0768	-0.0873	0.0863	-0.0782	0.0400	-0.107
	(0.0893)	(0.0838)	(0.0721)	(0.0679)	(0.100)	(0.155)
Number of children in household	0.0861	0.107***	-0.0167	0.0574***	-0.0224	-0.0218
	(0.106)	(0.0251)	(0.0350)	(0.0206)	(0.0445)	(0.0897)
Number of huts in compound	-17.01*	-10.74*	-2.333	4.507	-13.36*	10.95
	(10.32)	(6.099)	(7.948)	(6.437)	(7.509)	(12.22)
Number of poultry owned by household	0.554	0.808**	0.432***	0.0437	-0.168	-0.380
	(0.609)	(0.380)	(0.123)	(0.267)	(0.409)	(0.376)
Number of goats/sheep owned by household	-0.765	1.644	-0.616	-0.203	0.407	-0.383
	(0.747)	(1.412)	(0.455)	(1.275)	(0.943)	(1.065)
Number of bicycles owned by household	-32.88	-5.447	-18.13**	0.282	1.764	12.59
	(25.19)	(11.23)	(9.187)	(5.937)	(11.92)	(12.39)
Owns working radio (indicator)	0.483	-0.211**	0.313**	-0.0925	0.416*	0.0196
	(0.342)	(0.0937)	(0.135)	(0.0925)	(0.218)	(0.217)
Constant	-7.155***	10.55***	-5.194**	6.626***	0.564	5.873
	(2.444)	(2.657)	(2.373)	(1.187)	(4.909)	(8.254)
Observations	423	423	414	414	415	417

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

Table A1: Radio and fear individual model

	(1) Fear of LRA	(2) Fears to travel between villages	(3) Fears to go to field
Individual radio reception	0.0138	0.176	0.0118
	(0.244)	(0.250)	(0.262)
Gender	0.0588	-0.424*	-1.044***
	(0.155)	(0.240)	(0.261)
Age	0.0129	0.0123	0.00345
	(0.0112)	(0.00885)	(0.00923)
Years of education	-0.502	-0.389	0.0553
	(0.423)	(0.362)	(0.380)
Household composition adults	-0.218	0.00544	-0.0438
	(0.176)	(0.0739)	(0.0765)
Household composition children	0.185***	0.0672	0.0620
	(0.0611)	(0.0480)	(0.0495)
Asset: number of houses	13.37	-14.33*	0.334
	(16.90)	(8.485)	(8.773)
Asset: number of poultry	0.626	-0.101	-0.206
	(0.852)	(0.659)	(0.692)
Asset: number of goats and sheep	-0.686	-1.272	-0.623
	(2.381)	(2.181)	(2.068)
Asset: number of bicycles	-19.32	8.725	4.480
	(17.31)	(13.86)	(14.50)
Observations	721	424	422

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

Table A2: Radio and political attitudes individual model

	(1) logit	(2) logit	(3) logit	(4) logit	(5) bucologit	(6) bucologit
	Brought issue in front of		Would go for protection to		Trust in	
	Arrow Boys	SPLA	Arrow Boys	SPLA	Arrow Boys	SPLA
Individual radio reception	0.964**	-0.919	0.629**	-0.745	0.0254	0.282
	(0.456)	(1.731)	(0.263)	(0.748)	(0.211)	(0.255)
Gender	0.446	0.865	0.0202	0.291	0.289	-0.0426
	(0.467)	(1.263)	(0.258)	(0.572)	(0.263)	(0.299)
Age	-0.0368*	0.0715	-0.00232	0.0185	-0.00957	0.00654
	(0.0195)	(0.0523)	(0.00952)	(0.0209)	(0.00878)	(0.0101)
Years of education	0.563	-0.158	0.763*	0.204	0.0907	-0.175
	(0.679)	(1.678)	(0.398)	(0.810)	(0.329)	(0.320)
Household composition	-0.0290	-0.188	0.0416	0.336**	0.0885	0.0692
adults	(0.133)	(0.426)	(0.0772)	(0.147)	(0.103)	(0.128)
Household composition	0.313***	0.252	0.0944*	0.00145	0.0605	-0.0747
children	(0.0922)	(0.287)	(0.0511)	(0.119)	(0.0835)	(0.0478)
Asset: number of houses	-34.84**	-78.44	4.857	-33.34	-16.53	17.77
	(17.24)	(62.56)	(8.853)	(21.59)	(10.24)	(13.49)
Asset: number of poultry	1.355	3.654	1.163*	-1.061	1.119	-0.242
	(1.073)	(2.357)	(0.679)	(2.037)	(0.847)	(0.726)
Asset: number of goats	0.298	34.93	0.108	-3.494	1.723	-1.677
and sheep	(3.083)	(21.36)	(1.960)	(9.632)	(1.903)	(1.256)
Asset: number of bicycles	-74.79**	-4.416	-58.22***	61.10	-21.57	5.964
	(31.65)	(94.06)	(16.37)	(39.92)	(13.96)	(7.773)
Observations	426	170	417	330	751	1,053

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A3: Robustness checks

FEAR LRA	(1) oprobit	(2) oprobit	(3) oprobit	(4) oprobit	(5) oprobit	(6) oprobit	(7) oprobit
Boma radio reception	3.632***	1.859*	2.076*	2.606**	2.573**	5.160**	4.730***
	(0.982)	(1.028)	(1.182)	(1.242)	(1.196)	(2.630)	(1.428)
Distance to DRC	-5.640***						
	(2.139)						
Distance to CAR		-6.012					
		(4.238)					
Boma phone ownership			-0.0487**				
			(0.0198)				
Resident indicator				-0.297			
				(0.184)			
Movee indicator					0.555**		
					(0.262)		
Date of interview fixed effects	NO	NO	NO	NO	NO	NO	YES
Observations	423	423	423	423	423	396	422

Robust (clustered) standard errors in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table A4: Controlling for presence of other armed forces

FEAR LRA	(1) oprobit	(2) oprobit	(3) oprobit	(4) oprobit	(5) oprobit
Boma radio reception	2.421*	2.612**	2.686**	2.569**	2.652**
	(1.260)	(1.267)	(1.219)	(1.201)	(1.227)
Seen US Army last year	0.414				
	(0.378)				
Seen UN last year		-0.0877			
		(0.238)			
Seen AU last year			0.0571		
			(0.164)		
Seen SPLA last year				-0.197	
				(0.219)	
Seen UPDF last year					-0.159
					(0.172)
Observations	414	421	418	421	421

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