INSECURITY, SOCIAL CAPITAL AND COLLECTIVE ACTION

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Short abstract

We explore whether, in violent contexts, personal, communitarian and economic insecurities intervene in the formation of social capital and in developing the ability of communities to solve collective action problems. The effects of three components of social capital (relational, trust and reciprocity, and institutional) on collective action were analyzed. Research was carried out with 1680 rural producers in 56 municipalities in Colombian regions where the rates of violence have been consistently higher than average. We find that insecurity consistently affects collective action. There is no significant direct relationship between relational capital and collective action, but trust and institutional capital have a highly significant positive effect on collective action. There are clear implications for post-conflict "Peace and Development Programmes".

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Abstract

Empirical and theoretical studies have illustrated the close relationship there is between social capital and the formation of collective action. (i. e. Adger, 2003; Ostrom, Gardner and Walker, 1994; Pinto-Ramos, 2006), and have contributed to build a behavioral theory of collective action. Local conditions as well as individual differences affect this relationship (Ostrom, 1994). We extend this view by exploring whether in violent contexts, personal, communitarian and economic insecurities intervene in the formation of social capital and in developing the ability of communities to solve collective action problems. In the paper we present research carried out in 56 municipalities in 2015, in Colombian regions where the rates of violence have been consistently higher than average in the preceding decade. In each municipality, 3 rural districts and 10 productive units per rural district were randomly selected, for a total of 1680 observations. Multilevel models were used to estimate unbiased effects of subjective insecurities and of social capital on collective action.

Based on Diprose (2007) and previous research by the authors (Forero-Pineda et al., 2014), indices of personal, communitarian and economic insecurity were fitted. Collective action was operationalized asking participants about their experience in collective problem-solving, effective collaboration of neighbors, mutual support among members of the community, and caring about the lives and ownership of neighbors.

The effects of three components of social capital (relational, trust and reciprocity, and institutional) on collective action were analyzed. We chose to analyze these three components separately because different studies have questioned the empirical and theoretical validity of conflating them (Glaeser, 1999; Pinto-Ramos, 2006). As an indicator of institutional capital, we use a weighted sum of the awareness of the presence of Government agencies in the rural district, participation in Government-promoted organizations and trust in local authorities.

We find that insecurity consistently affects collective action. There is a very clear negative relationship between personal, communitarian and economic insecurity and collective action. We also find that the components of social capital have distinct effects on collective action. While we find that there is no significant relationship between relational capital and collective action, both trust and institutional capital have a highly significant positive effect on collective action.

There are clear implications for post-conflict "Peace and Development Programmes". In post-conflict situations, as the levels of violence decrease, and proactive policies to improve the perception of security are implemented, the levels of social capital should raise. By facilitating to gather common-pool resources and to establish legitimate rules and monitoring, rural communities in regions where conflict recedes may be more capable to carry out development projects and collectively provide public goods, whether promoted by authorities or generated by the communities.

1. Introduction

Empirical and theoretical studies have illustrated the close relationship there is between social capital and the formation of collective action. (Adger, 2003; Ostrom, Gardner and Walker, 1994; Pinto-Ramos, 2006), and have contributed to build a behavioral theory of collective action.

Local conditions as well as individual differences affect this relationship (Ostrom, 1994).

Recently, both violence and subjective insecurity have been analyzed as related to social capital (Bellows & Miguel, 2006 ,2009; Wood ,2003; McLauchlin, 2015; Gáfaro, Ibáñez & Justino 2014; Schaub,2014; Muller & Vothknecht 2013), to the formation of associative forms of production (Forero-Pineda et al., 2014) and to prosocial behavior (Vélez et al., 2016)

In this paper, we explore whether in violent contexts, personal, communitarian and economic insecurities intervene in the formation of social capital and in developing the ability of communities to solve collective action problems. The relevance of analyzing this relationship is clear. First, as shown by Mosse (2006), institutions are built in a context, where violence may play a role. This observation can be extended to explore whether that relationships among persons, their social capital and the potential of communities for collective action are formed in a context where violence may play a role. Second, it would be interesting to know what are the peculiarities of more violent contexts that modify the relationship between social capital and collective action found in other contexts, and how do the individual subjective perceptions of insecurity affect this relationship. Third, collective action has been identified by Ostrom Ahn (2003) as one efficacious means to obtain public goods, an important component of development. Associative forms may also promote family and small community development. In the context of post-conflict, development programs aiming at improving public goods or increasing the individual incomes might have an important resource in collective action. Fourth, most studies about collective action in Latin America focus their attention on social protest and mobilization of citizens (Alzate 2010). Social protest has proved to be an effective way of obtaining support from Central Government in Colombia to obtain both public goods and subsidies.

In Latin America, collective action has been studied almost exclusively as related to social protest, and political mobilization (Alzate, 2010). Social protest and political mobilization is an important form of collective action. Nonetheless, communities often adopt collaborative forms of obtaining public goods. Our research extends the study of collective action to this broader and until now relatively unexplored space. Part of the relevance of the current work stems from exploring collective action, with or without social protest involved. In Alzate's view, "there are no studies that analyze the unique collective experiences and regional or local situations in which the autonomy of social actors has resisted the control of the armed actors."

Our research was carried out in 56 municipalities in 2015, in Colombian regions where the rates of violence have been consistently higher than average during the preceding decade. In each municipality, 3 rural districts and 10 productive units per rural district were randomly selected, for a total of 1680 observations. Multilevel models were used to estimate unbiased effects of three kinds of subjective insecurity and of social capital on collective action.

The results obtained refer to: (a) the relationship between violence, subjective insecurity and three components of social capital (relational, trust and instituional); (b) the effects of subjective insecurity on the potential of a community for collective action; (c) the relationship between the components of social capital and the potential for collective action of the community.

In section 2, we review the literature on the main relationships dealt with in this research and explain the relationship between this research and the literature. Section 3 presents the methodology. Section 4 describes the main constructs used in the analysis. Section 5 presents, in several subsections, the results related to each of the relationships analyzed; and section 6 concludes and infers policies that could be useful for more effective post-conflict interventions by local, regional and national Governments, and by non-governmental organizations.

2. The relationship between violence, insecurity, social capital and collective action: a review of the literature

a) Social capital and collective action

In early work on social capital or collective action, these concepts were vaguely related. The relationship between the two concepts was barely suggested. Olson (1965) proposed the "zero contribution thesis", referring to a selfish individual whose default option is not to collaborate with the community. Unless the group is small or there is a mechanism that drives common interest, agents will not reach their goals as a group. In his work appear hints of social capital explaining collective action, among them the importance of context, relationships and institutions where colective action occurs.

Ostrom (2000) points out the gap between the proposition of Olson and different empirical results showing evidence of people participating voluntarily in association with others. This empirical gap and conceptual critique led to work emphasizing the fact that individuals are not necessarily selfish, and showing the relevance of prosocial behavior. (McCabe, Rassenti & Smith (1996), Fehr & Schmid (1999), Fehr & Fishbacker (2002), Berg, Dickhout & McCabe (1995), Forshyte et al. (1991)). Ostrom (2000) concludes showing that different laboratories and field experiments favor a vision where people are capable of solving problems of collective action.

Starting from this critique, Ostrom (1997, 2000) develops and incorporates a model of behavior of the individual in collective action situations and deems necessary to incorporate social capital to explain empirical results. Ostrom (1997) articulates the relationship between trust, reputation and reciprocity as an essential element to explain collective action. Persons who reciprocate consistently acquire a reputation and raise trust of others in them. The group becomes capable of carrying out cooperative actions.

Ostrom & Ahn (2003) review different contributions of the literature on social capital and its relationship to collective action (Putnam, 1993; Fukuyama (2000); Coleman (1988). Ostrom & Ahn (2003) establish a basis for such an interaction after an extensive analysis of the literature. They argue for differentiating three forms of social capital: trust and norms of reciprocity, networks or civil participation, and formal or informal rules or institutions. Trust allows the actors to come together in a relation that serves their interests, thus promoting collective action; social networks, as well as institutions, might be a basis to establish trust.

Cuellar & Bolivar (2009) show that Coleman's conception is consistent with a view of modern social capital and aligns with collective action. For Coleman (1988), social capital takes three particular forms: obligations, expectations, and trust; information channels, and rules and effective

sanctions. In short, Coleman states that the expectations about others lead to social capital, but this is also encouraged by communication, standards established and knowledge.

Pinto-Ramos (2006) explicitly studied the relationship between social capital and collective action. He identifies several approaches to the relationship between social capital and collective action. The social trust approach considers the willingness to trust as an element of collective action. The approach of norms and networks considers organizations and institutions as characteristics that allow people to act. The first approach refers to contributions from Fukuyama (2000), Glaeser et al. (1999), Stolle (2001) and Hardin (2002), among others. The second approach draws on Putnam (2000), Coleman (1988), Woolcok (1998), Granovetter (1973) and Lin (2005).

In this research, the different elements of social capital relating to collective action take the names of trust, institutional capital and relational capital.

b) Violence and insecurity effects on social capital

The conflict or civil war causes, or brings with it, changes within the framework of social construction and social relations of those who inhabit or are involved by this problem. Literature has been concerned with studying dynamic ideas with different motivations. The present text seeks to contribute the study of the connection in order to provide the lessons that help to understand the particularities of this subject.

The relationship between violence and social capital has been studied from different perspectives. Colletta & Cullen (2000) highlight the versatility of social capital, noting that, in the midst of conflict or violence, social capital may react negatively or positively. Social capital can help a community as an input of protection. But it can also be used to increase the conditions of exclusion between groups and increase the prevalence of conflict. Further, violence can destroy social capital, ending ties between individuals, undermining trust towards other individuals, but it can also serve to create new unions between people seeking protection, or be promoted by armed groups wanting to strengthen themselves through alliances.

Bauer et al. (2014) find that experiencing war leads to an enduring increase in people's egalitarian motivations towards their in-group. Bauer et al. (2014) carried out different experiments, designed to distinguish selfishness from altruism and inequality aversion, in Sierra Leone and Georgia. The results indicate that people who have suffered the aftermath of war are less envious and are willing to sacrifice their payments to improve equality, within their own groups.

Voors et al (2011) suggest that exposure to violence affects behavior, mainly by altering preferences of the individuals. Based on experiments done in Burundi, the authors found that communities that have been violently attacked, display more altruistic behavior, are more risk-seeking and less patient. Gilligany, Pasquale & Samii (2011) approach the subject using experimental economics. They find that communities with greater exposure to violence during Nepal's civil war show greater social capital levels, measured by the agent's willingness to invest in trust-based transactions and contribute to a collective good. In short, Gilligany, Pasquale & Samii (2011) have evidence in favor of the institutional hypothesis: in times of difficulty, people construct institutions and norms, and this increases social capital.

In contrast with these writings, Muller & Vothknecht (2013) show evidence of a negative link between violence and social capital in Indonesia. Their results indicate that in addition to the negative relationship, the effects are mediated by belonging to a specific group or ethnicity. This is, the desire to belong to a local group is reduced by the presence of individuals from other ethnic groups. Likewise, individual commitment or decision in community groups is stimulated by the fact that there are members of the same ethnic group. Similarly, De Luca & Verpoorten (2012) show for Uganda that both trust and group membership falls in the face of violence. The level of trust and participation in religious and community associations fall when transiting from relative peace to violence. Despite these findings, they highlight that the process of social capital recovery is fast as a positive element to rescue. Rohnery, Thoenig & Zilibotti (2013) study the effect of war and conflict in Uganda on social capital. They emphasize that trust between individuals falls with the intensity of fights. In post conflict, a great proportion of re-combat is related to the fragmentation of ethnic groups.

Hopfensitz & Florensa (2015) study the behavior of displaced people in Colombia with the public goods game. They find that areas with high in-flows or outflows of displaced population make larger contributions than territories where the population is more stable. In the same way, the authors find that displaced individuals in areas of net out-flow and left-behind families show smaller contributions. Also in Colombia, Velez et al (2016) develop the analysis of the relationship between perceptions of insecurity and cooperative behavior through different games, which yield opposing result for the dictator's game, public goods games and trust game. Findings suggest that individuals who feel threats and danger tend to reduce their contributions. However, when subjective insecurity is high, people show higher trust in peers.

Exploring the inverse relationship, Lindstrom, Merlo & Ostergren (2003) find that social capital reduces subjective perceptions of insecurity. The authors suggest that social capital, measured by them as electoral participation, can to some extent explain the perception of insecurity in their neighborhood. A result also interpreting the inverse relationship between a measure of relational capital and trust, and an aggregated index of insecurity, is found in Orozco, Forero and Wills (2015).

c) Violence and insecurity effects on collective action

Blattman (2009) studies the effects of war on political participation. The evidence from Uganda shows that victims participate or behave as aggressively as non-victims. Individuals who were more related to violence during the conflict are more likely to vote and lead in their communities.

Bellows & Miguel (2009) and Schaub (2014) find evidence of a positive relationship between collective action and violence. Bellows & Miguel (2009) study this relationship in Sierra Leone. Their main result is that they are directly affected by violence and are much more active politically and in civic organizations than non-victims. Victims of war are significantly more likely to register to vote, attend community meetings, and participate in groups of political or community venues. They are also more likely to contribute to local public goods, as measured by whether they serve on primary school committees. Schaub (2014) finds a similar effect in Nigeria, where the relationship between collective action and violence in the urban zone is not significant.

There is some literature showing contradictory results about the relationship between violence and collective action. The need to validate these results in different contexts and variables is clear. Schaub (2014) and Gáfaro, Ibáñez & Justino (2014) study different mechanisms which are useful to explain the relationship between these variables. Schaub (2014) finds evidence about what he calls "mobilization mechanism". In short, cooperation, understood as a greater contribution to the public good, often precedes conflict and is reinforced in a dynamic process and this is why the mechanism takes its name. The mobilization of a group makes it a rational response to a rival group to cooperate and this is a strategy.

Gáfaro, Ibáñez & Justino (2014) study the relationship between the presence of armed groups in Colombia and collective action. The authors highlight the fact that armed groups manipulate social capital to achieve or manage to achieve their objectives. This suggests that a mechanism to explain the relationship between violence and collective action arises from the fact that these groups impose different forms of control over the inhabitants and this encourages cooperation: people in the community do not increase their political participation.

The disparity of results stands out as a result of the review of this literature. Bauer et al (2016) through a meta-analysis of the literature on war and cooperation sheds light on a positive relationship between violence and cooperation. However, we need to go deeper in explaining why these relationships occur, because despite the effects and results, more research needs to be done on people's behavior and on their interactions, in order to draw strong conclusions. Our study extends this literature to study how three components of social capital are related to collective action. It also separates the effects of different forms of violence and types of insecurity that relate to the formation of social capital and collective action.

d) Impersonal vs. kin trust and their relationship with collective action

Putnam (1993) builds a vision where social capital is formed of networks, norms and trust. He argues that the development of trust among the members of a community, either by relationships or norms, helps participation and consolidates the community. Similarly, Ostrom, Gardner, and Walker (1994) argue that continued interactions between individuals and the ability to develop dialogue form expectations of trust will serve to solve collective dilemmas. Fukuyama (2000) coined the concept "radius of trust". The above idea refers to the fact that agents have a certain radius of trust, in a circle of people, a group, in which rules and cooperation are effective.

Ostrom (1998) constructs a model of collective action where trust is a main factor. Actually, reciprocity, reputation and trust jointly favour collective action. Repeated reciprocity, for instance, leads to the generation of reputation. These interactions lead to cooperation and further to collective action. Ostrom & Ahn (2003) view trust as the most inclusive factor in facilitating voluntary cooperation.

Putnam (1993) emphasizes the need to make a distinction between bridging and bonding, and emphasizes that certain forms of social capital serve groups internally, favoring exclusion and others are more inclusive. Bridging social capital contributes to better outward access and dissemination of information. (Putnam, 2000, pp. 24-26).

Stolle (2001) draws a distinction between generalized trust and interpersonal or private trust, trust in known people. The assumption is that bridging social capital allows the development of generalized trust. In this article, we make an attempt to differentiate between these two kinds of trust.

Empirical research on social capital and collective action has further led to debates and to open issues that are still under scrutiny (Aghajanian, 2012; Bauer et al., 2016). Specifically, contradictory results have been found about trust in contexts of conflict. Velez et al. (2016) develop different economic experiments where prosocial behaviors are measured against the dimensions of violence and subjective insecurity in Colombia. The authors find that the effect of subjective insecurity and victimization on trust was positive while it was negative on cooperation. Also using games, Gilligan, Pasquale, & Samii (2014) find that individuals in Nepal exposed to greater violence during the civil war between 1996 and 2006 were more reliable and cooperated more. Cassar, Grosjean and Whitt (2011), who conduct similar experiments and who compare their results with survey information, find that combatants during the 1992-1997 civil war in Tajikistan show lower levels of trust. The authors emphasize that trust is lower among combatants, except for trust in family members. Bechetti, Conzo & Romeo (2011) applied trust and common resources games to show a decline in being trustworthy after electoral violence in Nairobi, Kenya. The main finding of this work is that direct or indirect violence, the forced relocation of individuals, reduces learning of trust in games.

Rohner, Thoenig & Zilibotti (2013) find that violent combat has a negative impact on "confidence towards other people in Uganda", but the effect is low for trust towards acquaintances and there is hardly an effect on trust in relatives. This is relevant in the light of the findings of Cassar, Grosjean and Whitt (2011), who highlight the difference between groups close and far from the individual. In this case, combatants revealed lower levels of trust, but a subsequent survey led the authors to the conclusion that this occurs towards members who are not part of their close circle. This is consistent with the learning of combatants, who value their clan but reject the enemy. This is also consistent with the findings of Whitt & Wilson (2007) and Gneezy & Fessler (2012) who find marked differences in trust in close or distant persons. Whitt & Wilson (2007) also point out that in Bosnia under the scheme of the dictator's game people are much more just with people of the same ethnic group. Gneezy & Fessler (2012) find in the study of the conflict between Israel and Hezbollah, using the ultimatum and trust games, that people often punish those who do not cooperate more and reward more those who cooperate within a community. Gneezy & Fessler (2012) conclude that beyond the simple increase of solidarity within the group, violent conflicts induce behaviors that increase cooperation within the group, which makes victory more likely. Orozco, Forero and Wills (2015) explain insecurity by short range and long range trust, and find a negative relationship, stronger for short range trust. They also find a positive relationship between long range trust and the formation of organizational hybrids.

e) The literature and our research

This article may be viewed as a response to some of the issues identified in this review of the literature. It is specifically concerned with investigating how diverse forms of violence, individual perceptions of insecurity and social capital are related to collective action. By including different forms of violence, three types of subjective insecurity, and distinguishing between three components of social capital, what is sought is to unmask some channels of these relationships. The interactions between insecurity, the three components of social capital and collective action are explicitly considered.

3. Methodology

a) Multilevel models

As hypothesized by Putnam (quote in footnote) collective action depends on individual behavior but also on the social context. The context we analyze in this paper is marked by a long history of violence, which has declined in recent years. The research was precisely carried out in 56 municipalities of 8 regions, where the average rate of violence of the previous decade, as measured by different objective indicators, was above the average of Colombia. We hypothesize that differences in the levels of violence among the studied municipalities have an influence individual perceptions of insecurity, and directly or indirectly affect the formation of social capital and of the potential of collective action.

For this reason, the research combines variables of two different levels: the level of the individual and the level of the municipality. All production units in a municipality share the same value of the variables assigned to the municipality. Due to the clustering of individuals within municipalities and the inclusion of municipality-level variables, the standard lineal regression model violates the assumption of independent errors (Snijders and Bosker, 1999). The most appropriate method for dealing with the biases introduced by the nested structure of data is multilevel mixed-effects regression analysis. An important additional advantage of this method is that it is possible to estimate the coefficients of the relationship for each municipality.

More specifically, multilevel models are an extension of linear regression that can be used to account for clustered sampling designs and to explicitly model contextual effects (Bryk and Raudenbush, 1992). These models are highly appropriate to model "cross-level" effects between variables from different levels of analysis. The multilevel models that are used to estimate the effects of subjective insecurities and of social capital on collective action are:

$$\boldsymbol{Relational\ capital} = \beta_0 + \beta_1 * Insecurity + \gamma_1 * Violenc + Controls\ levels\ 1\&2$$

$$\boldsymbol{Trust} = \beta_0 + \beta_1 * Insecurity + \gamma_1 * Violence + Controls\ levels\ 1\&2$$

$$\boldsymbol{Institutional\ capital} = \beta_0 + \beta_1 * Insecurity + \gamma_1 * Violence + Controls\ levels\ 1\&2$$

$$\textbf{\textit{Collective Action}} = \beta_0 + \beta_1 * Insecurity + \beta_2 * Trust + \beta_3 * Institutional\ capital + \beta_4 * Relational\ Capital + \gamma_1 * Violence + Controls\ levels\ 1\&2$$

4. Variables

For the construction of the indices we use two different methods, principal component analysis and common factor analysis. Principal component analysis (PCA) is characterized by analyzing the total variance of the set of observed variables. It seeks to determine the basic dimensions that define them. In common factor analysis (CFA), the study of the interrelationships between variables is restricted to the common variance (or covariance) that is the search for some factors that express what is common to the set of observed variables (DeCoster, 1998).

a. Insecurity

To measure subjective insecurity we use different questions that capture affective and cognitive perceptions of insecurity independently of their causes (e.g. crime, violence, etc.). We select 14 items that are highly correlated. Principal component analysis yields three factors with eigenvalues greater than one. Scoring coefficients are presented in table1. The scoring coefficients for the first factor are relatively high for variables related to threats against life, family, beliefs and personal property; and neighborhood customs related to carrying weapons. The first factor, therefore, is considered to capture the personal insecurity. The index includes six question items (Cronbach's alpha: 0.7335). The second factor receives most of its loading from items that refer to threats to the freedom of assembly, association, political participation, and the enforcement of these freedoms by the community. Accordingly, we define this factor as reflecting communitarian insecurity. It includes five question items and its Cronbach's alpha is 0.45. The relative low value reflects that communitarian insecurity is more diverse and multidimensional than the other factors. The third factor is loaded by items related with economic matters, such as an adequate income level and the climate for operating businesses. We define this factor as economic insecurity.

Table 1
Principal-component factor analysis for subjective insecurity

Constructs	Personal insecurity	Communitarian insecurity	Economic insecurity	Questions
Loads	0.04251	-0.09094	0.42609	I can obtain an adequate level of income in this rural district, which allows acceptable standard of living. (R)[1]
	-0.04151	0.00619	0.52419	In this rural district, there is a good climate to start businesses (R)
	-0.06634	0.03735	0.30576	People can freely associate to develop productive projects (R)
	-0.11832	0.37684	-0.01438	People can participate in any type of meeting (R)

[1]The question was originally built in sense of security and was rescaled in the sense of insecurity, using the

	-0.02472	0.28228	0.02345	In this rural district I feel safe to go out at night (R)
	-0.07931	0.52774	-0.00265	In this rural district my children can play in the neighborhood (R)
	0.39337	-0.09917	-0.03069	In this rural district, people fear for their life
	0.38965	-0.08569	-0.00707	I fear robberies or physical aggression at home
	0.16065	0.22393	-0.07936	Your family and neighbors make you feel safe (R)
	0.27116	-0.06094	-0.00111	It is necessary to carry a weapon in this municipality
	-0.0284	0.13015	-0.0323	I belong to social or religious groups which make me feel safe (R)
	0.14012	-0.07821	0.01115	I have felt persecuted for my political or religious beliefs
	0.16834	0.05493	-0.00922	I feel afraid when going out because of insecurity in this rural district
Alpha	0.733	0.4509	0.6741	

b. Collective action

An overall Collective Action index was constructed with four items. As a previous validation step we conducted a pairwise test among this 4 elements. All items are highly and positive correlated with one another. As a result of this strong correlation all items were loading into a single factor with eigenvalues greater than one, when using factor analysis. Collective action was operationalized asking about experience in collective problem-solving, effective collaboration of neighbors, mutual support among members of the community, and caring about the lives and ownership of neighbors. The scoring coefficients for this factor are presented in table 2.

Table 2
Factor analysis for collective action

Construct	Questions	Loads	Alpha
Collective action	Most people in this municipality[2] are willing to help when needed	0.14643	0.7611
	In this rural district we are supportive of each other	0.31560	
	In this rural district we take care of each other's lives and property	0.37116	
	When there is a problem in the rural district, neighbors act together to solve it	0.25403	

Following Ostrom, Ahn, Olivares (2003), the effects of three components of social capital (relational, trust and reciprocity, and institutional) on collective action were analyzed. We chose to analyze these three components separately because different studies have questioned the empirical and theoretical validity of conflating them (Glaeser, 1999; Claiburn and Martin, 2000; Pinto-Ramos, 2006).

c. Trust

[2] The municipality refers to the space and population within a local administrative unit. It comprises an urban zone and several rural districts.

Trust is conceptualized and measured asking about trust in both close and distant groups (i.e. trust in 'others', in family, neighbors). These four items have a high and positive correlation and loaded into one factor (Cronbach's alpha: 0.5936).

Table 3
Factor analysis for trust

Construct	Questions	Loads	Alpha
Trust	I can trust members of my family	0.06694	0.5926
	I can trust neighbors in my rural district	0.25265	
	I can trust people living in the town	0.45502	
	I can trust people from other towns	0.30469	

d. Relational capital

To operationalize relational capital, we took 13 items that measure the participation in different types of organization (Crombach alpha: 0.4957). These separate measures are then aggregated into a composite index by a simple sum, reflecting the width of relational capital.

Table 4
Relational Capital Items
(Items refer to participation in different types of organizations).

	Type of organization	Alpha
Relational Capital Items	Neighbors association	0.4957
	Parent association	
	Sports team	
	Public interest association	
	Chorus, music or theater group etc.	
	Trade union	
	Women association	
	Peasant association[3] *	
	Alumni association	
	Peasant association	
	Consumer association	
	Social club	
	Religious community	

e. Institutional capital

[3] "Asociación de usuarios campesinos" is an organization of peasants with local, regional and national levels and legal recognition.

An index of institutional capital was built considering three dimensions: participation in Government led organizations; awareness of the presence of State agencies, and trust in the mayor of the municipality.

To operationalize the participation in government related organizations, six organizations that were promoted or are led by government and are of relevance for rural dwellers were considered. For example, community action boards were created by Government to give legal recognition to communities and to facilitate their participation in policy decision-making. This and other five items indicating participation in these organizations were aggregated by a simple sum (Table 5).

Table 5
Participation in government related organizations

	Questions
	Community action Board[4]*
	Political movement *
	Communitarian mothers association *
	Local planning council
	Citizen vigilance organization *
	Rural development council *

The third component of the index of institutional capital is the awareness of the presence in the rural district of different Government agencies. These government agencies (Table 6) are related to maintenance of national order. We aggregated nine items measuring awareness of the presence of each of these organizations.

Table 6
Presence of Government´s organization
(Items refer to awareness of the presence of different government agencies).

	Agencies
	National police
	Army
	Police inspector
	Municipal attorney
	Peace judge
	Prosecutor
	National ombudsman
	Commissioner
	Civil Defense Agency

[4] "Junta de Acción Comunal" is a local organization of the community with legal recognition.

The third dimension of institutional capital is trust in the mayor of the municipality. This single scale captures the person's trust in the mayor of the municipality. Finally we conduct a factor analysis where the three dimensions are fitted in one index. The scoring coefficients are presented in table 7.

Table 7
Factor analysis for Institutional capital

Construct	Questions	Loads
Institutional capital	Participation in government related organizations	0.14137
	Presence of Government´s organization	0.13103
	Trust in the mayor of the municipality	0.13607

Violence

Different kinds of violence are used in this study to identify the effect of these kinds of violence on collective action and social capital. We include homicides, theft and a common crime rate. These are related to the new forms of violence that are emerging in Colombia. On the other hand, displaced population and terrorism were included as forms of violence more associated with armed groups.

Control variables

Two kinds of control variables were considered relevant to include in this study. The first refers to the personal level (variables referring to the person that answered the poll). The following variables are taken into consideration for: age, gender, income, number of children, educational level, price instability and the level of formalization of the ownership of land. The second kind of control are the municipal level controls and is collected from other sources. The variables included in this level are: GDP per capita of the municipality and mean of study years for the municipality.

Descriptive statistics and alternate models

Tables 8 and 9 respectively show correlations and the descriptive statistics of all the variables these used in the study.

Table 8
Correlations among variables

	Personal insecurity	Communitarian insecurity	Economic insecurity	Trust	Relational capital	Institutional capital	Formalization of ownership	Woman	Number of children	Income	Level of education	Price instability	Average of education in the municipality	GDP of the municipality	Terrorism	Common Crime	Homicides	Displaced population
Personal insecurity	1																	
Communitarian insecurity	-0.01	1																
Economic insecurity	0	0	1															
Trust	-0.12***	-0.07***	-0.25***	1														
Relational capital	0.13***	-0.01	-0.07***	0.03	1													
Institutional capital	0.03	-0.02	-0.15***	0.29***	0.34***	1												
Formalization of ownership	-0.04	-0.04	0.03	-0.04	-0.04	-0.02	1											
Woman	0.07	0.04	0.12***	-0.12***	0.04	-0.04*	0.01	1										
Number of children	-0.01	-0.02	0.06	0	-0.03	0.01	-0.01	0.11***	1									
Income	-0.02	0.05	-0.17***	0.04	0.06	0.06	-0.01	-0.18***	-0.09***	1								
Level of education	-0.06	0.07	-0.05	-0.04	0.03	0.01	0.03	0	-0.33***	0.33***	1							
Price instability	-0.06	0.05	0.02	-0.05	-0.02	-0.06	-0.02	0.02	0.01	-0.01	0.01	1						
Average of education in the municipality	0	0.12	-0.06	0.01	-0.06	0	0.05	-0.04	-0.02	0.17***	0.1***	-0.03	1					
GDP of the municipality	-0.2***	-0.02	-0.17***	0.11***	-0.06	-0.01	0.06	-0.11	0.03	0.16	0.05	-0.02	0.138***	1				
Terrorism	0.08***	0.11***	-0.03	0.05	0.09***	0.06	-0.04	-0.01	-0.02	0.02	0.01	-0.05	-0.07	-0.03	1			
Common Crime	-0.03	-0.01	-0.04	-0.04	-0.07***	-0.08***	0.02	-0.05	0.01	0.02	-0.04	-0.08***	0.141***	0.231***	0.09***	1		
Homicides	0.09	0.14***	-0.08	0	0.14***	0.1***	-0.05	-0.05	0.01	0.01	-0.03	0.04	0.02	-0.04	0.235***	0.13***	1	
Displaced population	0.02	0.02	0.09***	0.02	0.14***	0.12***	0.02	0	0.06	0.14	0.06	0.24***	0.12	0.12***	0.09	0.23***	0.05	1

Table 9
Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Collective action	1680	10.67755	1.996837	2.627	13.135
Personal insecurity	1680	1.71E-10	1.004678	-1.678743	3.923006
Communitarian insecurity	1680	-8.31E-10	1.005822	-2.102736	4.425657
Economic insecurity	1680	6.02E-10	1.004658	-2.234493	2.3446
Trust	1680	3.455434	0.9364108	1.079296	5.396479
Relational capital	1680	1.241071	1.305453	0	10
Institutional capital	1680	-7.47E-10	0.2430093	-0.3998669	1.63326
Formalization of ownership	1680	1.135714	0.8666466	0	3
Woman	1680	0.3577381	0.4794772	0	1
Number of children	1680	3.215476	2.375174	0	13
Income	1680	624690.3	370911.7	429566.7	4500000
Level of education	1680	5.25	3.310693	0	16
Price instability	1680	0.3488095	0.4767355	0	1
Average of education in the municipality	1680	6.739954	0.7657371	4.742678	8.632066
GDP of the municipality	1680	-2.10E-08	1	-1.4543	3.299217
Terrorism	1680	-2.76E-09	1	-0.4978876	4.006515
Common Crime	1680	2.61E-09	1	-1.098527	4.693051
Homicides	1680	4.19E-09	1	-1.211921	3.664552
Displaced population	1680	-1.08E-09	1	-0.9420245	4.270748

We calculated t models alternating insecurities (one at a time) and models simultaneously including all insecurities. We calculate the variance inflation factors for the independent variables (VIF) to determine if we have multicollinearity in the models. Although we have VIFs greater than 10 in one variable. A commonly given rule of thumb is that VIFs of 10 or higher may be reason for concern. This is, however, just a rule of thumb (Williams, 2015). In this case, this high vif value may be explained by the different relationships between trust and the other components of social capital used in the model. This relationship is explicitly analyzed in this study.

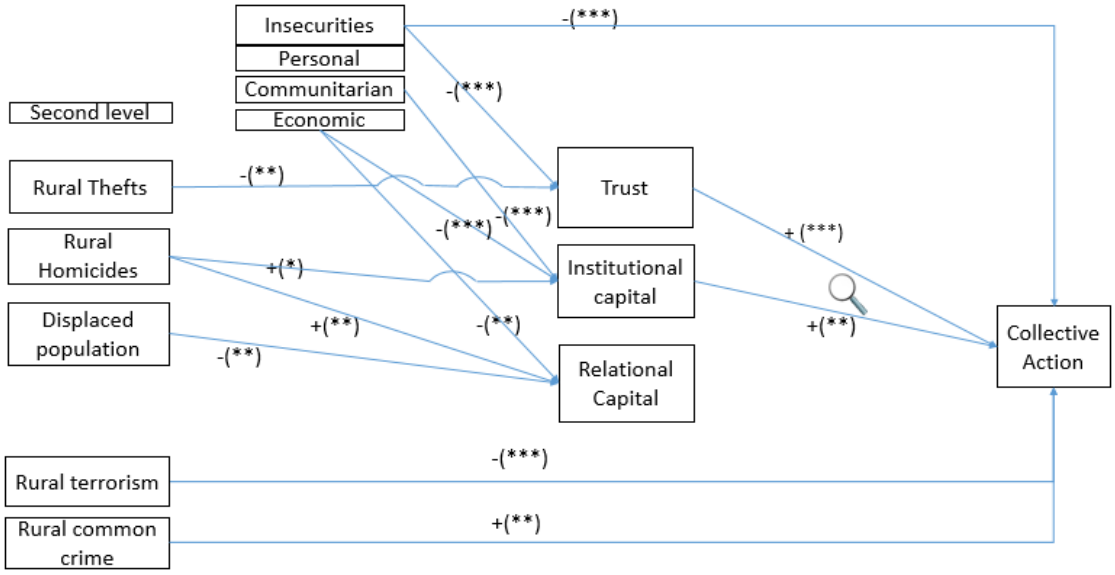
Table 10
Variance inflation factors

Variable	VIF	1/VIF
Trust	15.3	0.065371
Average of education	6.62	0.17572
Income	4.71	0.212311
Level of Education	4.44	0.22501
Number of children	3.15	0.317505
Formalization of ownership	2.73	0.36574
Relational capital	2.19	0.45603
Woman	1.68	0.594326
Price instability	1.56	0.641548
Common crime	1.23	0.815767
Institutional capital	1.22	0.817613
GDP of the municipality	1.22	0.820352
Economic insecurity	1.13	0.881122
Personal insecurity	1.1	0.91068
Terrorism	1.05	0.948549
Communitarian insecurity	1.04	0.960906
Mean VIF	**3.14**	

5. Results

Multi-level hierarchical regression models are estimated. Four main models are reported, one for each component of social capital and one for collective action. The effect of each type of subjective insecurity is analyzed separately. Additionally, indicators of objective violence in the municipality are included as second level variables. Aggregate results are presented in figure 1. Further analysis is presented below.

Figure 1. The relationship between violence, insecurity, social capital and collective action



5.1 Determinants of Relational capital

Table 11

Multiple regression model: Relational capital explained by insecurity and violence

	Relational capital			
First level				
Personal insecurity	0.0623			0.0636
	(0.0441)			(0.0431)
Communitarian insecurity		-0.0180		-0.0121
		(0.0318)		(0.0318)
Economic insecurity			-0.0632**	-0.0587*
			(0.0319)	(0.0320)
	Second level			
Homicides	0.161***	0.168***	0.161**	0.158***
	(0.0616)	(0.0614)	(0.0649)	(0.0573)
Displaced population	-0.201***	-0.195***	-0.189***	-0.194***
	(0.0644)	(0.0642)	(0.0678)	(0.0600)
(Controls of levels 1&2) …	*(See Appendix A for full regression)*			
Constant	***2.070******	***1.984******	***1.978******	***2.027******
	(0.618)	***(0.617)***	***(0.649)***	***(0.577)***
R^2 within	***0.0218***	***0.0219***	***0.0239***	***0.0226***
R^2 between	***0.339***	***0.296***	***0.302***	***0.360***
R^2 overall	***0.0892***	***0.0807***	***0.0834***	***0.0936***
Observations	***1,680***	***1,680***	***1,680***	***1,680***
Number of municipalities	***56***	***56***	***56***	***56***

As presented in table 11, we find that insecurities have different effects on relational capital. While we find that economic insecurity is negatively related with relational capital. Both communitarian and personal insecurity are not significantly related to relational capital.

We also find distinct effects between the different types of violence and relational capital. Rural terrorism and rural homicides have a positive relationship with relational capital, reflecting perhaps that fear caused by these forms of violence leads rural dwellers to join organizations. Displaced population has a negative relation with relational capital, perhaps because those who go away were leaders of some of these organizations, and were the main targets of armed illegal groups.

5.2 Determinants of Trust

Different authors understand trust as the development of expectations about other individuals, and consider that both personal and contextual variables and experiences determine those expectations (Castaldo et al., 2010; Welch et.al. 2005, among others).

As shown in a previous section, types of trust may be defined according to different criteria. A common distinction is made between trust in known and unknown persons. In the literature related to violence, it is found that trust varies by ethnicity, kinship and neighborhood. Criado et.al (2014) emphasizes disparity of criteria on the matter. Although these authors focus on ethnic heterogeneity and find that there is no evidence for this in their study, it is clear that there is a division about the effects on trust between individuals who resemble each other or not. Burbidge & Cheeseman (2017) find different findings. Trust is also measured differently in different studies. Some authors measure it through games. Others measures trust by surveys where people self report their confidence levels in relation to a certain question or item that they resolved to respond. On this, Glaeser et.al (2000) find that the differences between experiments and surveys vary. He argues that attitudinal survey questions about trust predict trustworthy behavior much better than they predict trusting behavior in experiments.

The expected effects on trust are similar to those found by Alesina & La Ferrara (2000); Bechetti, Conzo & Romeo (2011); Rohner, Thoenig & Zilibotti (2013); Cassar, Grosjean and Whitt (2011), for whom trust is diminished by insecurity and violence. Following the literature, it is considered that expectations, mainly those related to generalized trust, are affected by the negative experiences of the person.

Table 12
Multiple regression model: Trust as explained by types of insecurity

	Trust		
First level			
Personal insecurity	-0.103***		-0.122***
	(0.0240)		(0.0236)
Communitarian insecurity		-0.153***	-0.130***
		(0.0231)	(0.0224)

Economic insecurity			-0.188***	-0.192***
			(0.0228)	(0.0225)
Second level				
Rural Thefts	-0.120**	-0.139**	-0.101*	-0.119***
	(0.0572)	(0.0619)	(0.0532)	(0.0438)
		See Appendix B for full regression		
(Controls levels 1&2) …				
Constant	***3.671******	***3.605******	***3.859******	***3.225******
	(0.642)	***(0.692)***	***(0.596)***	***(0.443)***
R^2 within	0.0207	0.0404	0.0447	0.0866
R^2 between	0.190	0.0672	0.302	0.191
R^2 overall	0.0536	0.0429	0.0932	0.107
Observations	***1,680***	***1,680***	***1,680***	***1,680***
Number of municipalities	***56***	***56***	***56***	***56***

Table 12 shows the results of the different levels of insecurity and social capital. The findings are consistent in relation to expected effects and directions. Personal, communitarian and economic insecurity diminish trust in a significant way. The effect of economic insecurity on trust is the strongest. The conditions for income and business development have an impact on the expectations of individuals. This is consistent with what Alesina & Ferrara (2000), Elgar (2010), and Bahry (2016) found: negative effects of different economic variables on trust.

Further, the effect of personal and communitarian insecurity leads us to consider that it is not enough to keep an individual safe, but it is also necessary to protect the context where he lives. This effect supports the work previously mentioned, where trust decreases when there is exposure to violence.

Finally, it is found that there is a negative and significant effect of rural robberies on trust. When thefts occur, trust among people is eroded.

In-group and out-group trust

We explore the relationship between relational and institutional capital and trust. These two forms of social capital are perhaps direct determinants of collective action, but they also act on collective action through their contribution to trust, which Ostrom & Anh (2003) consider as the most inclusive factor facilitating cooperation.

We run three models to show the effects of relational and institutional capital on trust. In the first model, the dependent variable is an aggregated index of trust (two items of in-group trust and two items of out-group trust). Two other models are run, one with in-group trust and one with out-group trust. Table 13 shows that relational capital has a negative relationship with the aggregated measure of trust, which is due to out-group trust.

Institutional capital has a positive and highly significant relation both with the aggregated index and with the disaggregated indices. The effect of institutional capital is stronger on out-group trust than on in-group trust. This result can be explained by the wider range of action of the organizations considered as institutional capital.

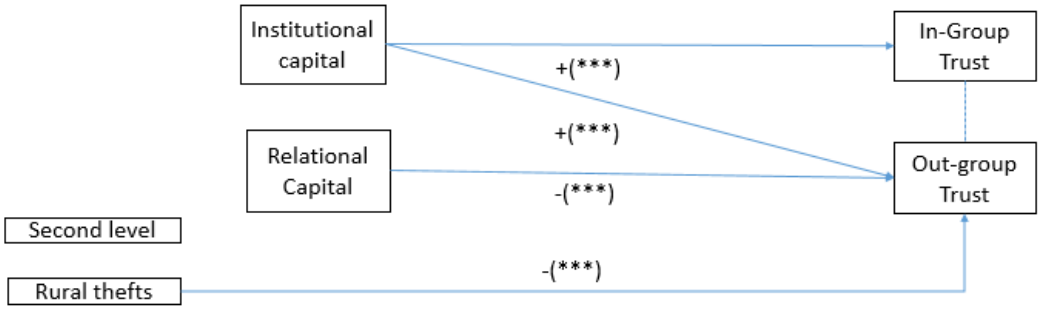


Table 13
Multiple regression model: Trust as explained by types of social capital

	Aggregated trust	*In-Group trust*	*Out-group trust*
First level			
Relational capital	-0.0568***	-0.0171	-0.0572***
	(0.0179)	(0.0137)	(0.0199)
Institutional capital	1.127***	0.422***	1.212***
	(0.0936)	(0.0716)	(0.104)
Second level			
Rural Thefts	-0.0910*	0.0178	-0.134**
	(0.0501)	(0.0286)	(0.0633)
(Controls levels 1&2)	*See Appendix C for full regression*		
Constant	***2.070******	***5.120******	***2.396******
	(0.618)	***(0.270)***	***(0.590)***
R^2 within	***0.0218***	***0.0278***	***0.0852***
R^2 between	***0.339***	***0.149***	***0.268***
R^2 overall	***0.0892***	***0.0425***	***0.126***
Observations	***1,680***	***1,680***	***1,680***
Number of municipalities	***56***	***56***	***56***

The negative sign of relational capital on out-group trust could be explained as the result of the excluding character of at least part of the voluntary organizations where rural dwellers participate.

5.3 Determinants of Institutional capital

In a relational scheme, institutions facilitate trust and relationships among people. Violence and insecurity may lead to the destruction, modification, imposition or creation of different institutions. Then, as in the case of trust, contextual variables play an important role in the formation of institutions.

Gáfaro, Ibáñez & Justino (2014) propose a particular mechanism by which there is a connection between collective action and violence. They conclude that armed groups manipulate social capital to achieve goals and objectives. Explaining that the mechanisms beyond pro-social behaviors such as altruism, confidence, which lead to collective action, are given by a control exercised by the war group.

Voors & Bulte (2014) show evidence of how the exposure to violence affects institutions in Burundi. In this way, the authors refer to an institutional legacy, violence outside the group leads to the stimulation of social capital, leading people to develop institutions that facilitate group security. In the case of Burundi, violence was perpetuated by rebels and the army, so it was isolated that the inhabitants were participants in the generation of violence, as a consequence of this type of dynamics. These works make it clear that the effect of violence on institutions can be either positive or negative. Then, it is important to study in greater detail the effect of this phenomenon on institutions.

Table 14

Multiple regression model: Institutional capital as explained by types of insecurity, types of social capital and collective action.

	Institutional capital			
First level				
Personal insecurity	0.000689			-0.00217
	(0.00638)			(0.00636)
Communitarian insecurity		-0.0150**		-0.0134**
		(0.00611)		(0.00609)
Economic insecurity			-0.0278***	-0.0271***
			(0.00611)	(0.00613)
Second level				
Homicides	0.0213*	0.0234**	0.0187*	0.0208*
	(0.0117)	(0.0117)	(0.0113)	(0.0117)
Displaced population	-0.0346***	-0.0336***	-0.0308**	-0.0298**
	(0.0129)	(0.0129)	(0.0126)	(0.0129)
(Controls levels 1&2) …	*See Appendix D for full regression*			
Constant	***0.0637***	***0.0427***	***0.0331***	***0.0114***
	(0.156)	***(0.156)***	***(0.151)***	***(0.156)***
R^2 within	***0.00842***	***0.0138***	***0.0189***	***0.0233***
R^2 between	***0.190***	***0.150***	***0.240***	***0.202***
R^2 overall	***0.0383***	***0.0364***	***0.0549***	***0.0528***
Observations	***1,680***	***1,680***	***1,680***	***1,680***
Number of municipalities	***56***	***56***	***56***	***56***

Table 14 shows the relationship of violence and insecurity with institutional capital. A significant negative effect of economic and communitarian insecurity on institutional capital is found. There was no evidence that personal insecurity affects this type of capital. Homicides has a positive effect on institutional capital and displacement of persons has a negative effects on institutional capital.,

Gafaro, Ibañez & Justino (2014), using a different measure of violence including homicides, find that direct exposure to violence does not have statistically significant impact on collective action, this without taking into account the mediation of armed groups in the conflict.

5.4 Insecurity and Social Capital as determinants of Collective Action

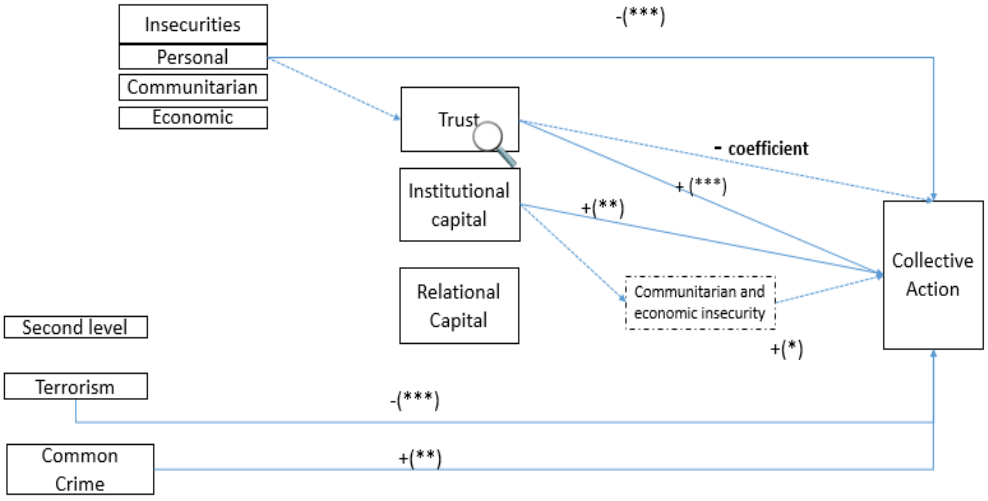


Table 15

Multiple regression model: Collective action as explained by types of insecurity and types of social capital

	Collective Action			
First level				
Personal insecurity	-0.165***			-0.209***
	(0.0476)			(0.0471)
Communitarian insecurity		-0.378***		-0.373***
		(0.0448)		(0.0454)
Economic insecurity			-0.207***	-0.215***
			(0.0472)	(0.0462)
Trust	0.835***	0.814***	0.812***	0.833***
	(0.0509)	(0.0497)	(0.0515)	(0.0509)
Institutional capital	0.421**	0.382*	0.365*	0.429**
	(0.203)	(0.199)	(0.203)	(0.202)
Relational capital	0.0564	0.0533	0.0398	0.0472
	(0.0372)	(0.0363)	(0.0372)	(0.0375)
	Second level			
Rural Terrorism	-0.170***	-0.133**	-0.186***	-0.112
	(0.0655)	(0.0561)	(0.0694)	(0.0694)

Rural Common Crime	0.153**	0.122*	0.155**	0.122
	(0.0735)	(0.0629)	(0.0778)	(0.0780)
(Controls levels 1&2) ...	See Appendix F for full regression			
Constant	***10.11****	***9.750****	***10.33****	***10.11****
	(0.807)	***(0.704)***	***(0.812)***	***(0.903)***
R^2 within	***0.169***	***0.186***	***0.173***	***0.206***
R^2 between	***0.461***	***0.663***	***0.442***	***0.615***
R^2 overall	***0.210***	***0.245***	***0.211***	***0.259***
Observations	***1,680***	***1,680***	***1,680***	***1,680***
Number of municipalities	***56***	***56***	***56***	***56***

The main result is that insecurity consistently affects collective action. There is a very clear negative relationship between personal, communitarian and economic insecurity, and collective action. These findings coincide with the results found by Velez et al (2016) in the sense that individuals who feel in threat and danger are less willing to collaborate.

We also find that the components of social capital have distinct effects on collective action. Ostrom & Ahn (2003) say that trust, networks and institutions are the basis of collective action. However, we find that there is no significant direct relationship between relational capital and collective action. In contrast, both trust and institutional capital have a highly significant positive effect on collective action. As shown in a table 10, this result may be explained by the negative relationship between relational capital and trust.

As shown in appendix G, we find that social capital is mediating the effect of insecurity on collective action. When we include social capital components in the regression of collective action, the coefficient of insecurity is smaller.

A negative relationship is also found between average education of the municipality and collective action. This result could be explained by two channels. First, it has been argued that not all education promotes social virtues in an individual. Hyllygus (2006) finds that the curriculum matters for political participation of an individual. Colombia has low levels of civic education,, as shown by the PISA tests (Jiménez, & Useche, (2001)).

Another explanation is that education may be a space where exclusion is promoted. Hochschild (2003), emphasizes how education in the case of the United States, ends up designing a scheme where individuals are socially divided. In Colombia, there are differences in education between people with different incomes, highlighting the role of inequality through education. Nie, Junn & Barry (1996) conclude that education is an instrument that reflects social divisions within networks of individuals. Education would entail a separation in such networks.

6. Summary of main results and conclusion

The main results of this research are:

First, individual perceptions of personal, communitarian and economic insecurity have a negative effect on the three components of social capital and on collective action. The negative effect on collective action diminishes when the components of social capital are included as determinants of collective action. All insecurities have a negative relationship with collective action and with the three components of social capital. Economic insecurity maintains a particularly stable relationship throughout the statistical analysis.

Second, the direct effects of the different components of social capital on collective action are varied. Trust and institutional capital have a direct positive effect on collective action. Relational capital does not have a significant direct effect on collective action. Relational capital in general does not show, under conditions of violence and insecurity, a direct relationship with collective action, in contrast wit both trust and institutional capital, though it has a negative indirect effect through its effect on trust. One explanation could be that the kinds of civil organizations in these regions do not always foster the potential of rural inhabitants for collective action. The motivation to participate in groups is not the same as the motivation for collective action. Contextual variables, such as acts of terrorism, have more important effects on collective action than relational capital.

This result is surprising. For this reason, we explored the effect of relational capital on trust. First we used an aggregate measure of trust, with items reflecting in-group and items reflecting out-group trust. The relationship between relational capital and this aggregate is negative and highly significant. When separating the in-group and out-group items of trust, the relationship of relational capital with in-group trust is not significant but it is negative and significant with out-group trust. Both in-group (bonding) and out-group (bridging) trust have positive effects on collective action.

Third, while the relationship between institutional capital and collective action is positive, it is observed that subjective personal insecurity increases the significance of this relationship. This could support the hypothesis that when personal insecurity (threats to life,...) are present, institutional capital has a closer relationship to collective action.

Many different forms of objectively observed violence affect social capital. Homicides have a positive effect on institutional and on relational capital: rural dwellers may be affiliating to organizations, both Governmental and civil society, as a form of defending against violence (see Forero et al 2014).

However, only terrorist actions and common crime affect CA, and they do so in different directions. As expected, acts of terrorism have a positive relationship with communitarian insecurity. Both these variables affect collective action significantly. This effect is mediated by

subjective communitarian insecurity, discouraging the community to undertake collective action either through mobilizations to gain attention from Government or to collectively provide public goods. Communities in some the regions analyzed mobilize against common crime, and this explains the positive relationship between the indexes of common crime and collective action.

Some general conclusions may be extracted from these results.

The research has shown the importance of considering the specificities of the context, as sought by Putnam (2000), in the analysis of collective action. Violence and postconflict conditions, as observed in the regions under study, have a strong influence on the formation of social capital and on the relationships between its components and collective action.

Different types of violence have contradictory effects on social capital and on collective action. Aggregate indices of violence are thus not suitable to analyze the relationship with social phenomena. A general conclusion about the effects of violence on social capital or collective action cannot be drawn. Some of the objective violence indices, such as those related to common crime show a positive effect on collective action; these forms of violence are closely related to the dynamics of violence in post conflict, when conflict has dropped and in some regions it is being replaced by structures of common crime. The reaction of some communities has been to organize against these forms of common crime, and there is a risk that this reaction might be fostering the resurgence of paramilitary groups. A negative effect of violence on collective action is simultaneously observed, when the form of violence is related to political conflict. Terrorism and displacement are among the violence variables that affect negatively collective action.

Finally, some consequences may be derived for the management of post-conflict. In post-conflict, neither local nor national Governments are able to provide public goods and development support to all the communities in regions where violence was high during conflict years. Collective action of the communities becomes necessary to independently provide part of those public goods or assume the management of its provision when there are Government grants or subsidies.

In post-conflict situations, as the levels of violence decrease, and proactive policies to improve the perception of security are implemented, the levels of social capital should raise. By facilitating to gather common-pool resources and to establish legitimate rules and monitoring, rural communities in regions where conflict recedes may be more capable to carry out development projects or collectively provide public goods, whether promoted by authorities or generated by the communities.

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Appendix A

	Relational capital			
First level				
Personal insecurity	0.0623			0.0636
	(0.0441)			(0.0431)
Communitarian insecurity		-0.0180		-0.0121
		(0.0318)		(0.0318)
Economic insecurity			-0.0632**	-0.0587*

			(0.0319)	(0.0320)
Woman	0.0566	0.0579	0.0576	0.0609
	(0.0652)	(0.0653)	(0.0651)	(0.0653)
Number of children	-0.00231	-0.00238	-0.00107	-0.00160
	(0.0131)	(0.0131)	(0.0131)	(0.0132)
Income	1.86e-07**	1.91e-07**	1.75e-07*	1.66e-07*
	(9.01e-08)	(9.02e-08)	(9.02e-08)	(8.93e-08)
Level of education	0.0193*	0.0188*	0.0195*	0.0190*
	(0.0101)	(0.0101)	(0.0101)	(0.0101)
Price instability	-0.108	-0.107	-0.101	-0.108
	(0.0683)	(0.0684)	(0.0683)	(0.0683)
Formal ownership	-0.310***	-0.311***	-0.310***	-0.324***
	(0.0789)	(0.0790)	(0.0789)	(0.0789)
Informal land possession	-0.118	-0.126	-0.123	-0.126
	(0.103)	(0.103)	(0.103)	(0.103)
Rented land	-0.0578	-0.0605	-0.0504	-0.0613
	(0.114)	(0.114)	(0.113)	(0.114)
Second level				
Average education in municipality	-0.157*	-0.144	-0.143	-0.148*
	(0.0893)	(0.0891)	(0.0940)	(0.0832)
Municipal GDP per capita	0.0274	0.0109	0.000238	0.0274
	(0.0688)	(0.0681)	(0.0722)	(0.0688)
Homicides	0.161***	0.168***	0.161**	0.158***
	(0.0616)	(0.0614)	(0.0649)	(0.0573)
Displaced population	-0.201***	-0.195***	-0.189***	-0.194***
	(0.0644)	(0.0642)	(0.0678)	(0.0600)
Constant	***2.070******	***1.984******	***1.978******	***2.027******
	(0.618)	***(0.617)***	***(0.649)***	***(0.577)***
R^2 within	***0.0218***	***0.0219***	***0.0239***	***0.0226***
R^2 between	***0.339***	***0.296***	***0.302***	***0.360***
R^2 overall	***0.0892***	***0.0807***	***0.0834***	***0.0936***
Observations	***1,680***	***1,680***	***1,680***	***1,680***
Number of municipalities	***56***	***56***	***56***	***56***

Appendix B

Trust				
First level				
Personal insecurity	-0.103***			-0.122***
	(0.0240)			(0.0236)
Communitarian insecurity		-0.153***		-0.130***
		(0.0231)		(0.0224)
Economic insecurity			-0.188***	-0.192***
			(0.0228)	(0.0225)
Woman	-0.164***	-0.152***	-0.156***	-0.147***

	(0.0472)	(0.0469)	(0.0465)	(0.0458)
Number of children	0.00281	0.00274	0.00608	0.00551
	(0.00954)	(0.00948)	(0.00940)	(0.00928)
Income	5.53e-08	4.88e-08	5.60e-09	1.57e-08
	(6.45e-08)	(6.41e-08)	(6.37e-08)	(6.28e-08)
Level of education	-0.0131*	-0.0116	-0.0110	-0.0118*
	(0.00735)	(0.00731)	(0.00724)	(0.00714)
Price instability	-0.0688	-0.0609	-0.0578	-0.0560
	(0.0482)	(0.0480)	(0.0476)	(0.0467)
Formal ownership of land	-0.0349	-0.0278	-0.0419	-0.0591
	(0.0571)	(0.0568)	(0.0563)	(0.0554)
Informal land possession	0.000796	0.00727	0.00830	-0.0227
	(0.0746)	(0.0741)	(0.0734)	(0.0723)
Rented land	-0.0863	-0.0922	-0.0687	-0.0892
	(0.0824)	(0.0820)	(0.0812)	-0.0591
	Second level			
Average education in municipality	0.0315	0.0568	0.0134	0.0593
	(0.0673)	(0.0680)	(0.0681)	(0.0629)
Municipal GDP per capita	0.0943**	0.110**	0.0854*	0.0443
	(0.0472)	(0.0473)	(0.0476)	(0.0430)
Rural Thefts	-0.115**	-0.131***	-0.0963*	-0.119***
	(0.0492)	(0.0497)	(0.0498)	(0.0438)
Constant	***3.671******	***3.605*****	***3.859*****	***3.225*****
	(0.642)	***(0.692)***	***(0.596)***	***(0.443)***
R^2 within	***0.0207***	***0.0404***	***0.0447***	***0.0866***
R^2 between	***0.190***	***0.0672***	***0.302***	***0.191***
R^2 overall	***0.0536***	***0.0429***	***0.0932***	***0.107***
Observations	***1,680***	***1,680***	***1,680***	***1,680***
Number of municipalities	***56***	***56***	***56***	***56***

Appendix C

Other components of social capital as determinants of trust

	Aggregated trust	***In-Group trust***	***Out-group trust***
First level			
Relational capital	-0.0568***	-0.0171	-0.0572***
	(0.0179)	(0.0137)	(0.0199)
Institutional capital	1.127***	0.422***	1.212***
	(0.0936)	(0.0716)	(0.104)
Woman	-0.124***	-0.0523	-0.126**
	(0.0456)	(0.0350)	(0.0505)
Number of children	-0.000387	0.0145**	-0.0101

	(0.00919)	(0.00710)	(0.0101)
Income	5.01e-08	8.95e-09	7.13e-08
	(6.22e-08)	(4.78e-08)	(6.88e-08)
Level of education	-0.0116	-0.00655	-0.0115
	(0.00709)	(0.00544)	(0.00784)
Price instability	-0.0318	0.00800	-0.0551
	(0.0467)	(0.0354)	(0.0518)
Formal ownership of land	-0.0287	-0.0308	-0.0180
	(0.0554)	(0.0424)	(0.0612)
Informal land possession	0.0107	-0.0603	0.0761
	(0.0719)	(0.0550)	(0.0796)
Rented land	-0.0818	-0.0482	-0.0814
	(0.0794)	(0.0611)	(0.0878)
Second level			
Average education in municipality	-0.00238	-0.115***	0.0813
	(0.0685)	(0.0391)	(0.0865)
Municipal GDP per capita	0.120**	0.0456*	0.128**
	(0.0477)	(0.0273)	(0.0603)
Rural Thefts	-0.0910*	0.0178	-0.134**
	(0.0501)	(0.0286)	(0.0633)
Constant	***2.070******	***5.120******	***2.396*****
	(0.618)	***(0.270)***	***(0.590)***
R^2 within	***0.0218***	***0.0278***	***0.0852***
R^2 between	***0.339***	***0.149***	***0.268***
R^2 overall	***0.0892***	***0.0425***	***0.126***
Observations	***1,680***	***1,680***	***1,680***
Number of municipalities	***56***	***56***	***56***

Appendix D

	Institutional capital			
First level				
Personal insecurity	0.000689			-0.00217
	(0.00638)			(0.00636)
Communitarian insecurity		-0.0150**		-0.0134**
		(0.00611)		(0.00609)
Economic insecurity			-0.0278***	-0.0271***
			(0.00611)	(0.00613)
Woman	-0.0293**	-0.0280**	-0.0283**	-0.0293**
	(0.0126)	(0.0125)	(0.0125)	(0.0126)
Number of children	0.00306	0.00304	0.00352	0.00306
	(0.00253)	(0.00253)	(0.00252)	(0.00253)
Income	3.43e-09	3.47e-09	-2.23e-09	3.43e-09
	(1.71e-08)	(1.71e-08)	(1.71e-08)	(1.71e-08)
Level of education	0.000458	0.000510	0.000613	0.000458
	(0.00195)	(0.00194)	(0.00194)	(0.00195)
Price instability	-0.0381***	-0.0371***	-0.0364***	-0.0381***
	(0.0129)	(0.0129)	(0.0128)	(0.0129)
Formal ownership of land	-0.0152	-0.0148	-0.0175	-0.0152
	(0.0151)	(0.0151)	(0.0151)	(0.0151)
Informal land possession	-0.000221	-0.000909	-0.00141	-0.000221
	(0.0198)	(0.0197)	(0.0196)	(0.0198)
Rented land	-0.000956	-0.00183	0.000739	-0.000956
	(0.0219)	(0.0218)	(0.0217)	(0.0219)
	Second level			
Average education in municipality	-0.00823	-0.00513	-0.00454	-0.00144
	(0.0194)	(0.0194)	(0.0188)	(0.0194)
Municipal GDP per capita	0.00445	0.00300	-0.000508	-0.00200
	(0.0133)	(0.0133)	(0.0129)	(0.0133)
Homicides	0.0213*	0.0234**	0.0187*	0.0208*
	(0.0117)	(0.0117)	(0.0113)	(0.0117)
Displaced population	-0.0346***	-0.0336***	-0.0308**	-0.0298**
	(0.0129)	(0.0129)	(0.0126)	(0.0129)
Constant	***0.0637***	***0.0427***	***0.0331***	***0.0114***
	(0.156)	***(0.156)***	***(0.151)***	***(0.156)***
R^2 within	***0.00842***	***0.0138***	***0.0189***	***0.0233***
R^2 between	***0.190***	***0.150***	***0.240***	***0.202***
R^2 overall	***0.0383***	***0.0364***	***0.0549***	***0.0528***
Observations	***1,680***	***1,680***	***1,680***	***1,680***
Number of municipalities	***56***	***56***	***56***	***56***

Apendix E

Mediation between insecurities and institutional capital

Economic insecurity		***Communitarian insecurity***
First level		
Institutional capital	-0.438***	-0.253***
	(0.0971)	(0.0978)

Woman	0.0212	0.0715
	(0.0497)	(0.0500)
Number of children	0.0176*	-0.000254
	(0.0100)	(0.0101)
Income	-2.11e-07***	-3.68e-09
	(6.79e-08)	(6.82e-08)
Level of education	0.00595	0.00332
	(0.00772)	(0.00776)
Price instability	0.0496	0.0473
	(0.0513)	(0.0517)
Formal ownership of land	-0.0756	0.0206
	(0.0601)	(0.0604)
Informal land possession	-0.0341	-0.0426
	(0.0783)	(0.0788)
Rented land	0.0679	-0.0528
	(0.0866)	(0.0871)
Second level		
Average education in municipality	0.0612	0.213***
	(0.0677)	(0.0748)
Municipal GDP per capita	-0.195***	-0.0790
	(0.0518)	(0.0572)
Homicides	-0.0723	0.144***
	(0.0468)	(0.0517)
Displaced population	0.0883*	0.0628
	(0.0489)	(0.0539)
Constant	-0.355	-1.494***
	(0.463)	(0.511)
R^2 within	***0.0196***	***0.00770***
R^2 between	***0.316***	***0.173***
R^2 overall	***0.0873***	***0.0469***
Observations	***1,680***	***1,680***
Number of municipalities	***56***	***56***

Apendix F

Multilevel regression complete

Collective Action				
First level				
Personal insecurity	-0.165***			-0.209***
	(0.0476)			(0.0471)
Communitarian insecurity		-0.378***		-0.373***
		(0.0448)		(0.0454)
Economic insecurity			-0.207***	-0.215***
			(0.0472)	(0.0462)
Trust	0.835***	0.814***	0.812***	0.833***

	(0.0509)	(0.0497)	(0.0515)	(0.0509)
Institutional capital	0.421**	0.382*	0.365*	0.429**
	(0.203)	(0.199)	(0.203)	(0.202)
Relational capital	0.0564	0.0533	0.0398	0.0472
	(0.0372)	(0.0363)	(0.0372)	(0.0375)
Woman	0.236**	0.242***	0.245***	0.258***
	(0.0952)	(0.0934)	(0.0951)	(0.0926)
Number of children	-0.0120	-0.0133	-0.00726	-0.00994
	(0.0193)	(0.0190)	(0.0193)	(0.0189)
Income	-5.42e-08	-5.36e-08	-1.12e-07	-9.62e-08
	(1.30e-07)	(1.28e-07)	(1.30e-07)	(1.27e-07)
Level of education	-0.0292**	-0.0287**	-0.0243	-0.0307**
	(0.0148)	(0.0146)	(0.0148)	(0.0144)
Price instability	0.116	0.125	0.137	0.122
	(0.0958)	(0.0932)	(0.0960)	(0.0925)
Formal ownership of land	-0.130	-0.151	-0.130	-0.181
	(0.115)	(0.113)	(0.115)	(0.112)
Informal land possession	-0.251*	-0.287**	-0.217	-0.319**
	(0.149)	(0.146)	(0.149)	(0.145)
Rented land	-0.106	-0.164	-0.0839	-0.151
	(0.166)	(0.164)	(0.166)	(0.162)
	Second level			
Average education in municipality	-0.328***	-0.258***	-0.347***	-0.240**
	(0.115)	(0.0990)	(0.115)	(0.112)
Municipal GDP per capita	0.0384	0.0570	0.0433	-0.0154
	(0.0724)	(0.0613)	(0.0763)	(0.0634)
Rural Terrorism	-0.170***	-0.133**	-0.186***	-0.112
	(0.0655)	(0.0561)	(0.0694)	(0.0694)
Rural Common Crime	0.153**	0.122*	0.155**	0.122
	(0.0735)	(0.0629)	(0.0778)	(0.0780)
Constant	***10.12***	***9.732***	***10.34***	***10.11***
	(0.701)	***(0.612)***	***(0.739)***	***(0.903)***
R^2 within	***0.169***	***0.186***	***0.173***	***0.206***
R^2 between	***0.461***	***0.663***	***0.442***	***0.615***
R^2 overall	***0.210***	***0.245***	***0.211***	***0.259***
Observations	***1,680***	***1,680***	***1,680***	***1,680***
Number of municipalities	***56***	***56***	***56***	***56***

Apendix G

Mediation of social capital on insecurities

	Collective Action				
First level					
Personal insecurity	-0.165***			-0.209***	-0.289***
	(0.0476)			(0.0471)	(0.0492)
Communitarian insecurity		-0.378***		-0.373***	-0.468***
		(0.0448)		(0.0454)	(0.0478)
Economic insecurity			-0.207***	-0.215***	-0.377***

			(0.0472)	(0.0462)	(0.0480)
Trust	0.835***	0.814***	0.812***	0.833***	
	(0.0509)	(0.0497)	(0.0515)	(0.0509)	
Institutional capital	0.421**	0.382*	0.365*	0.429**	
	(0.203)	(0.199)	(0.203)	(0.202)	
Relational capital	0.0564	0.0533	0.0398	0.0472	
	(0.0372)	(0.0363)	(0.0372)	(0.0375)	
	Second level				
Average education in municipality	-0.328***	-0.258***	-0.347***	-0.240**	-0.185*
	(0.115)	(0.0990)	(0.115)	(0.112)	(0.101)
Rural Terrorism	-0.170***	-0.133**	-0.186***	-0.112	0.0205
	(0.0655)	(0.0561)	(0.0694)	(0.0694)	(0.0743)
Rural Common Crime	0.153**	0.122*	0.155**	0.122	-0.0576
	(0.0735)	(0.0629)	(0.0778)	(0.0780)	(0.0670)
(Controls levels 1&2) …					
Constant	***10.11***	***9.750***	***10.33***	***10.11***	***12.32***
	(0.807)	***(0.704)***	***(0.812)***	***(0.903)***	***(0.690)***
R^2 within	***0.169***	***0.186***	***0.173***	***0.206***	***0.102***
R^2 between	***0.461***	***0.663***	***0.442***	***0.615***	***0.312***
R^2 overall	***0.210***	***0.245***	***0.211***	***0.259***	***0.131***
Observations	***1,680***	***1,680***	***1,680***	***1,680***	***1,680***
Number of municipalities	***56***	***56***	***56***	***56***	***56***