

DECIDING TO COOPERATE: TESTING EVOLUTIONARY CONSTRAINTS ACROSS CULTURAL DIVERSITY IN NORTHERN GHANA

Cristina Acedo-Carmona & Antoni Gomila

cristina.acedo@uib.es; toni.gomila@uib.cat

Grupo de Cognición y Evolución Humana

Departamento de Psicología

Universidad de las Islas Baleares

Abstract

The upper-east and northern region of Ghana offers a unique opportunity to study the influence of evolutionary social dynamics in making cooperation possible, despite cultural differences. Those regions are occupied by several distinct ethnic groups, in interaction, such as the Kusasi, Mamprusi, Bimoba, Konkomba and Fulani. We will report our fieldwork related to how cooperation takes places there, both within each group, and among the groups. Methods included personal networks of cooperation (ego networks), interviews and analysis of group contexts. The most important result is that, while each ethnic group may differ in terms of family and clan structure, a similar pattern can be found in all of them of cooperation grounded on trust relationships organized around small groups of close relationships. The study allows confirming that habitual decisions about cooperation are not strategic or self-interested, but instead are based on unconscious processes sustained by emotional bonds. These kind of emotional bonds are proposed to be relevant from an evolutionary point of view.

Keywords: cooperative decisions, trust, fieldwork, cultural diversity, human evolution.

1. Introduction

Studies seeking to understand decision-making often distinguish between rational thought processes (Ledyard, 1995; Luce & Raiffa, 1957; Pruitt & Kimmel, 1977; Murnighan & Ross, 1999), in which different options are consciously weighed to choose the one that will provide greater benefits (maximization of economic utility or self-interest), and unconscious, intuitive processes, in which the pros and cons are not explicitly calculated (Epley & Gilovich, 2002; Epstein, 1994; Gilbert, 2002; Gilovich et al., 2002; Griffin & Tversky, 1992; Haidt, 2001; Kahneman et al., 1982; Sloman, 2002; Wilson, 2000; Wilson et al., 2002). In general, a dual concept of decision-making is assumed in humans: Stanovich and West's (2000) *Systems 1 and 2*, or Kahneman's (2011) fast and slow systems. Other studies (March, 1994), however, suggest that decisions arise from the recognition of the subjects' own identity and the application of their rules to the surrounding situations. Some authors emphasize the influence of contexts of uncertainty (Bendor et al., 1991; Kramer et al., 2001; van Dijk et al., 1999; Yamagishi, 1998), social norms (Cialdini et al., 1991; Kallgren et al., 2000), or emotional (affective) settings (Kahneman & Ritov, 1994; Kahneman et al., 1999; Loewenstein et al., 2001; Slovic et al., 2002) as also relevant for decision-making.

Regarding decisions on cooperation, however, it is usually assumed that subjects are rational –in the sense that they choose the option that maximizes their benefit– as the most plausible hypothesis to explain their behavior (Andreoni & Miller, 1993; Andreoni & Samuelson, 2006; Guttman, 1996; Kreps et al., 1982; McMahon, 2005). At first glance, it would be the best choice for the individuals. However, this hypothesis implies that subjects can know and deal with all the existing information about the situation they face, and can calculate the costs and benefits of their alternatives, and choose from all the possible cooperators, selecting the most appropriate: the one who can provide the greatest benefit and who also ensures long-term reciprocity.

Humans are known to have cognitive limitations to handle large amounts of social information (Stiller & Dunbar, 2007; Dunbar, 2009), and it would also be too complex and costly to rationally consider all the possibilities and hazard a guess about people's future behavior. This situation would lead to a state of uncertainty and risk that is difficult to assimilate by beings that are highly dependent on others, as in the case of humans. It is this kind of consideration that has led to recognizing the existence of fast, automatic, and heuristic decision processes, as already mentioned. The search for one's own benefit also contradicts the possibility of maintaining long-term cooperation (Bowles & Gintis, 2011; Rosas, 2013), so it seems that the decision to cooperate should also take place like this type of process. In particular, we propose that these decisions are based on trust, which is a mechanism that combines cognitive and affective aspects, and which facilitates fast decision-making.

Evolutionary considerations reinforce this argument. The evolutionary history of the human species has developed around the need for group efforts to deal with difficult survival environments. The long period of brain maturation in humans has also forced them to rely on others for a long time to meet their basic needs. The development of the ability to trust other individuals has been an adaptive evolutionary mechanism to overcome these dependency situations and ensure efficient cooperation over time.

Trust is a psychological capacity that simplifies the complexity of managing excessive information (Luhmann, 1979). This is done by creating an expectation of repetition of the positive behaviors towards those people with whom one has shared such positive experiences (Authors, 2012) and even towards people who, while not having shared such experiences directly, show greater probability of positive behavior through indirect bonds (Authors, 2014). This psychological and cognitive mechanism of trust not only reduces anxiety and uncertainty, which would lead to interacting with unpredictable subjects, but also to a higher likelihood of successful reciprocity (based on previous behavior). Considering also that humans have interacted within small groups for most of their evolutionary history, one might think that trust has been especially configured to deal with close and familiar relationships (Authors, 2013, 2014).

This work intends to put to the test this double assumption about cooperative decision-making, investigating the role played by trust from an evolutionary perspective. For this purpose, we carried out fieldwork to describe the aspects that influence trust and therefore affect cooperative decisions in a cultural context that is far removed from our own. To

determine also whether such cooperative decisions are more or less limited to close relationships, we chose to conduct the study in a place where there is great variability and ethnic interaction, such as the north and high-east regions of Ghana. This multicultural context allows us to analyze whether trust relationships extend beyond the scope of family relationships, and in this case, the instruments through which people decide to trust and cooperate with broader social networks.

In fact, we believe that this perspective can clarify the reasons for the maintenance of different ethnic groups that interact over time in many African societies (instead of merging into a single group). African history, not always well known, is characterized by a great diversity of small groups that have survived by constantly roaming to take advantage of natural resources (Cleveland, 1991). The difficult conditions of the environment and the scarcity of resources could explain why the specific cultural features of each migrant group have been maintained despite their constant interaction. This situation appears in Ghana, where –despite the emergence of State institutions that seek to create a "national" identity (Benedict, 1983) – there is great ethnic diversity, especially in areas with harsher economic conditions. Such cultural differentiation is also seen in the linguistic differentiation (Bemile, 2000).

Scientists offer very diverse reasons to explain why such cultural diversity is created and maintained (Barth, 1969, 1994; Lentz, 1997; Lentz & Nugent, 2000; Schlee, 2004; Schlottner, 2000). Authors like Lentz (2000), for example, attributed the cultural diversity of Ghana not to its historical past but to artificial creations motivated by colonial or political influences or by the categories that were artificially created by anthropologists. Either way, it is clear that the Ghanaian society is fragmented through lineages, clans, and ethnic groups, whether or not cultural appropriations can be considered to be fully differentiated (Ranger, 1983, 1993; Schildkrout, 1979; Southall, 1970). Such cultural fragmentation is maintained in the common imaginary and in individuals' real affiliation. From our point of view, after recognizing the role of trust relationships in the structuring of social life, it seems reasonable to think that the existence of such cultural variety is effective to adapt not only to an ecological environment but also to an economic, political, and historical environment in more complex societies. This work poses the hypothesis of the potential effectiveness of the creation of small groups with specific cultural traits to enhance trust relations and ensure cooperative decisions, especially in difficult situations.

In short, this work aims to test the following hypotheses: i) cooperative decisions are largely based on trust relationships; (ii) trust and ego networks are established in small groups; (iii) trust bonds need close relationships, familiarity, or identity, as a feature acquired during evolution, despite cultural differentiation; (iii) the higher level of implicit emotionality in relationships of higher levels of trust ensure a greater probability of cooperative decisions in the most demanding situations; and (iv) cultural specificity promotes group cohesion and the decision to cooperate with a greater number of people, enhancing the emotional bonds of group membership and common identity.

Ultimately, this work supports the explanations of cooperative decisions that are strongly based on more intuitive mental processes, conditioned by the individuals' environment, highlighting the important role of affectivity as an evolutionary adaptation to ensure the success of long-term cooperation. The field study in Ghana seeks, therefore, to analyze how cooperative decisions are made, examining in more depth the elements involved in the creation and maintenance of trust relationships. After briefly describing the context that characterizes the studied groups, we shall present the methodology and the results of our study that support our approach.

2. Historical and cultural context

In Ghana (Fig. 1), the wide variety of existing ethnic and linguistic groups offers a suitable framework to deepen the search for the universal elements that appear in cooperative preferences, despite cultural diversity.

Ghana has a population of more than 24 million inhabitants, distributed in 10 administrative regions, including regions in the north and the high-east (Fig. 2) where the study was conducted, specifically in the populations of Bawku and Garu of the Upper-east region, and Bende of the Northern region (Fig. 3).



Figure 1. Geographical location of Ghana (missions.awana.org/site/News2?id=6343)

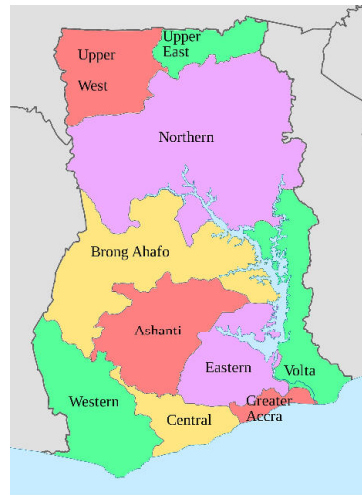


Figure 2. Administrative regions of Ghana (commons.wikimedia.org/wiki/File:Regions_of_Ghana_en.svg)

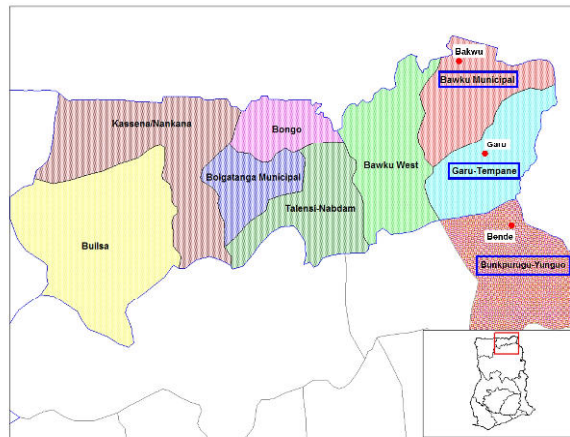


Figure 3. Geographical location of the visited populations. (en.wikipedia.org/wiki/File:Upper_East_Ghana_districts.png). Figure modified by Authors.

In these arid regions of the northeast of the country, located in the White Volta basin, savanna, with areas of pasture, baobabs, and acacia trees are predominant. The people live mostly from slash-and-burn farming and livestock.

Bawku is the largest population, capital of the Bawku Municipal District (Fig. 3), with a population of about 56,000 inhabitants. It is a city that is home to various ethnic groups. Our study involved groups settled in the area, like the Kusasis (Awedoba, 1989, 2001; Hilton, 1962; Syme, 1932), Frafras (Hart, 1971), Bissas and Mossis (Zahan, 1967); and others from other regions of the country like the Asante (Rattray, 1931, 1932), established in the Ashanti

region, and the Sissala and the Waala (Wilks, 1989) established in the Upper-west region (Fig. 2).

In the region of Garu, capital of the district Garu-Tempene (Fig. 3), we mainly visited the Kusasis, who live scattered in rural areas.

In Bende, a small town located in the district of Bunkpurugu-Yunguo (Fig. 3), we visited several ethnic groups that live in the area, such as the Mamprusis (Drucker-Brown, 1975, 1992; Schlottner, 2000), Bimobas (Assimeng, 1990; Fussy, 1979; Laari, 1987), Konkombas (Tait, 1961) and Fulanis (Oppong, 2002; Tonah, 2005).

The participants of Bawku live in an urban environment and the participants of the areas of Garu and Bende live in rural areas.

The different languages of all these ethnic groups are part of the set of Nigerien-Congolese languages, among which are included the Kwa (Asantes), Gur (Bimobas, Mamprusis, Mossis, Kusasis, Sissalas, Waalas, Frafras, Konkombas), Mande (Bissas), and Fulbe (Fulanis) languages (Fig. 5). However, each of these branches has derived in different languages and dialects for each of these groups.

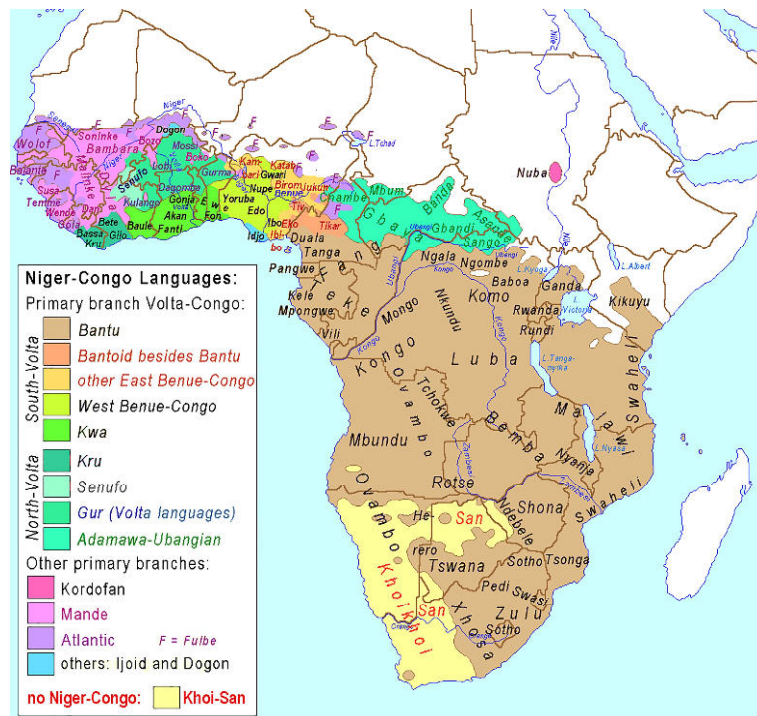


Figure 4. Classification and location of the various branches of Nigerien-Congolese languages.

The origin of these ethnic groups and their history are not very clear. Sub-Saharan migrations due to trade in gold and salt and the slave trade led to frequent movements of various groups in the area. Already in the 10th century, the south of Ghana was part of the Asante Empire. The Mole-Dagbane kingdoms (Mamprusis, Dagombas, and Mossis), from the northeast and strongly hierarchical, settled in the northern area of Ghana between the 13th-15th centuries, and dominated the acephalous groups installed there. The Kusasi, Frafra, and Sissala seem to have originally come from the west of Sudan, migrating to the area in the 17th century, although other Sissala seem to be descendants of the Mole-Dagbane groups. The Asantes are part of the Akan groups that moved from West Africa between the 10th-12th centuries, whereas the Fulani came from Niger and Senegal in the 16th century, they but emigrated to northern Ghana practically at the beginning of 20th century. The Bissa or Busanga settled in the White Volta in the 14th century. With regard to the Bimoba, they came from the mixture of the Moba, who emigrated from Burkina Faso in the 17th century with Mamprusis and Konkombas, after being driven to the north by the Mamprusi and the Dagomba. The Konkomba seem to be one of the few original groups in these lands, and the Waala, originating in the city of Wa, capital of the region of the high-west, came from the conjunction in the 17th century of the warrior traditions of the Dagomba and Mamprusi and Islamic traditions transmitted through small groups of immigrant Mandé from Niger. Both the Mamprusi and the Mossi in the north of the country and the Asante in the center formed centralized and hierarchical groups that gained more power compared to rest of the mentioned groups, which were acephalous.

In the 15th century, the Portuguese took advantage of the mineral resources of the area, and later, the British, French and Dutch arrived (XVI century). In the 17th century, the Confederation of the Asante unified the diverse groups. Solidarity among the groups was very convenient due to the competition to acquire farming land, control trade routes, and for protection. In 1901, the areas of northern Ghana became an English protectorate. The rivalries that existed among certain ethnic groups because of fights for territory or the slave trade increased with English colonization, which promoted power inequality among them and granted certain social and economic privileges to certain groups, to the detriment of others. In 1957, the country became independent of the English Crown but the differences before and during the colonial era are still the causes of the current inter-ethnic tensions.

Such diversity in the groups in terms of origin and language extends not only to merely cultural aspects, such as beliefs, customs, festivals, etc....., but also in some groups to the economic activities they engage in. Thus, whereas the Kusasi and Frafra are sedentary farmers, and the Konkomba and Bimoba are slash-and-burn farmers, the Fulani are mainly semi-nomadic cattle breeders, and the Busanga are dedicated to metallurgy. The Mamprusi and Mossi practice agriculture, although some Mamprusis also have livestock and many of them are also traders. The Sissala and Waala are devoted to agriculture in the rainy season (from May to September) but they also hunt and fish in the dry season (November to April). The Waala women also harvest crops and sell in the markets. The Asante live on cocoa farming, hunting, and trading wood and gold.

Currently, 90% of Ghana's population lives in urban areas, and economy has grown mainly due to improvements in agriculture, but also due to the development of the extractive industries of the natural resources of the country (oil, gas, and minerals), services sector, and manufacturing. However, in the north of the country, there are still conflicts over the distribution of farmland and the small-scale, rudimentary farming techniques, forcing its inhabitants to live in a subsistence economy.

3. Social and economic structures

In northern Ghana, family plays an important social role. In general, for many of these ethnic groups, the concept of family has a more extensive meaning than the nuclear family, which is seen in their language through the use of the same term for different individuals within the family environment. Apart from the family that coexists, there are lineages and clans, which are cultural forms that are very important to the way trust and cooperative relationships are structured. These cultural groups influence the distribution of land, properties, and titles, and create identity signs in the individual, by including him or her in a reference group that serves both to receive help and to decide about alliances or marriages.

Social researchers have tried to define concepts such as lineage (Kuper, 1982), clan, tribe (Ekeh, 1990; Mafeje, 1971) or ethnic group (Cohen, 1978; Heusch, 1997), although each culture may attribute different meanings to these concepts. Even the concept of the family can adopt different meanings in different cultural groups. In the case of Ghana, all these concepts become complex from the very moment when so much ethnic diversity is found. Thus, each

ethnic group has its own cultural way of creating bonds. In general, lineage defines the way of family social organization and is relevant to designate the identity-group to which the individual belongs, with the above-mentioned social and economic implications. In the ethnic groups that are present in this work, some lineages are matrilineal and others are patrilineal. Lineages, which are inbred, range from nuclear bonds to the inbred lines extended over time. This means that the larger lineages, corresponding to the most distant ancestors, are subdivided into other smaller lineages until reaching the nuclear family unit.

The clans in these areas can link different lineages within a particular territory, because the clan also assimilates a territorial aspect which, in some cases, can be considered as the minimum unit at the political level (district). In general, the tribe consists of a set of districts or clans of the same ethnic group in a larger territory. Thus, an ethnic group can be composed of several tribes. However, the concept of tribe does not appear as clearly in all cases, nor is it used as much as the rest of the terms in these regions.

The most important example of matrilineal ethnic groups is the Akan groups, among which are the Asante. The Asante, like other Akan groups, consider that the individual receives the blood inheritance (*Abusua*) from the maternal family and the spirit (*Nton*) from the paternal line. Thus, although group inclusion of the individual comes down from the maternal line, and with it, the succession of land rights, properties and titles, character or personality traits are received from the paternal line.

The rest of the ethnic groups analyzed have a patrilineal social organization. Such is the case of the Mossi, which are a part of the Mole-Dagbane groups, whose individuals do not exist by themselves but as members of the collective family. For them, the family constitutes the smallest entity of society. Everything an individual does is attributed to the characteristics of his family.

There are similarities in the household composition among different ethnic groups in rural areas of northern Ghana. The family group that coexists is based on a set of cabins oriented in a circle. Each cabin is assigned to different members of the family. The features of the set regarding shape, composition, and location vary according to group ethnicity. This family set tends to be led by a man with one or more wives. Polygamy depends on religious, economic, and educational factors. Also included in the household are the children and their spouses, depending on the type of culturally acquired lineage, and the grandchildren, as well as the possibility of including other relatives. A family group can range from 4 or 5 people to

more than 50. The number of people who coexist in urban households is decreasing, although the number of family members coexisting in rural areas is greater.

These aggregates are led by the oldest male, who creates the family unit and is the one who makes decisions about domestic issues like the distribution of tasks, properties, and the allocation of farming space among the remaining members of the family group, among other issues.

Not all ethnic groups in the area have historically shown the hierarchical form of social organization. Whereas the Asante, Mossi and Mamprusi are heirs of empires with a marked hierarchical and centralized social structure, the other groups did not have chiefs. After the colonial era, some of the acephalous groups have created new leadership systems in an attempt to regain power over the territory. Despite these differences, most groups grant high respect to the decisions of all the elders (heads of the clan or lineage) concerning their internal affairs. They also tend to have religious authority for spiritual matters, which are closely related to the land (the so-called "priests of the Land"; "Tindemba" for the Mamprusi; "Tengabisi" for the Mossi; "Tindana" for the Konkomba, the Kusasi, and the Frafra; "Tinteen-tiina", for the Sissala). There are also leaders who usually mediate in matters related to the government of the country (such as judicial affairs). These individuals are professionally engaged in this work and receive a salary from the government for this. Some groups with a more hierarchical tradition, like the Asante or the Mamprusi, maintain another set of local and regional authorities that form a chain of power within the clans and tribes of the group. More than real power, these posts tend to have a great symbolic power of which the group feels very proud.

Agriculture (Benneh, 1973; Der, 2001; Panin, 1987) it is the most frequent way of life in these areas, as well as livestock, hunting, fishing, and gathering fruits. The different authorities play a role in managing the agricultural resources. Land tenure is customary in northern Ghana. This is a traditional system based on the community's control of the use of the land and its resources. This means that the community assigns to individuals the rights of use or usufruct of certain plots of land, which they may exploit and transmit by inheritance to their descendants, but they may not sell it. The community can sometimes reserve the right to reassign such uses. This system usually also entails the right of use by all community members of all the resources provided by the communal property, beyond the cultivation areas.

Although with some differences concerning the right over land among the more hierarchical ethnic groups (northern region) and those who are not so hierarchical (the upper-east and western region), decisions about land are made by the head of the household (Kotey, 1995), the so-called "Lord of the land". In the case of the more hierarchical groups, such rights were assigned by their leaders, although, in theory, the allodial title (the owner has full dominion over the lands, i.e., the property is free from all state levy), reverted to the supreme chief of the group. In the case of historically acephalous groups, the allocation of land is made by the community (Agbosu et al., 2007), and the management of communal resources devolves on the priest of land and on the lineage and clan heads (Kotey, 1995). These authorities maintain the power to decide on the correct use of the resources of the communal property that are not cultivated areas (such as the rights over water, wood, medicinal plants, grazing, etc...) and to decide on penalties for their misuse (Songsore et al., 2001). The priests of the land have the ritual property of the land to carry out rituals that ensure productivity. To achieve all these rights on arable land and other resources, individuals must belong to the community. People from outside the community have to ask permission for them. The head of the household transmits his cultivation areas hereditarily to his descendants, but in order to sell the land, he must inform the community or the leader. However, cases of land sales are unusual.

It seems clear that social structures play an important role in the economic management of the agricultural areas in northern Ghana (Woodman, 1963). However, in this paper, we try to show that the culturally created social groups also have an enormous influence on the cooperative decisions of individuals toward certain groups, to the detriment of others. All of this is based on the attribution of trust assigned to these groups. But it is necessary to understand how trust functions among such groups.

4. Method

4.1. Procedure

The field work was carried out in January-February 2013, with participants from different ethnic groups settled in Bawku, Garu, and Bende. The data were obtained through ego networks and interviews of people chosen at random. Given the temporal limitation of the

fieldwork, besides these data and the observations conducted during this time, we used information from the literature about such groups to elaborate our conclusions.

The study aims to describe participants' ego and trust networks and unravel the motivations that drive them to decide to trust and cooperate with the individuals from their networks compared to the rest. The objective is to understand which elements influence decisions concerning cooperation.

4.2. Measures

Below are the different measures used for data collection. The materials used for this purpose (templates to register the ego networks and the interview questions) were presented in English to those who spoke that language. For participants who did not speak English, we used collaborators who helped to translate the ego network templates to the participants' native language and served as intermediaries in the interviews. The terms used were translated as accurately as possible in the different languages.

Ego networks

To obtain the ego networks, we asked to the participants to make a list with the names of the persons with whom they habitually cooperated, the ethnic group to which these cooperators belonged, the kind of relationship that linked them, whether the cooperation was unilateral or mutual, the type of cooperation, and the level of trust they felt towards them (supplementary material 1).

Interviews

We also conducted a recorded interview with 21 questions with each of the participants (supplementary material 2). Through this means, we sought to inquire about the factors involved in the creation, maintenance, and breakdown of trust decisions: questions about what to take into account when deciding to trust for the first time and to maintain the acquired trust; whom they trust more and with whom do they trust their secrets; whether it is possible to always trust the family, the meaning of the family for them and what family relationships are like; exchanges that require higher levels of trust; when they consider that their trust was betrayed, whether they could forget this betrayal and how they would punish it; what the relationships are like within the clan; whether they trust other ethnic groups and what their relationships with them are like; whether activities are carried out in the

community to promote trust and integrate new members; whether reputation is important in the community and in what way; whether they believe that religion or the government's attitude can influence cooperation among individuals; the level of safety of the interviewees and their values as a group.

4.3. Participants

Ego networks

In this study, a total of 46 people participated: 33 (71.7%) males and 13 females (28.3%). The ethnic groups of the participants are: 9 Bimobas (19.6%), 1 Frafra (2.2%), 9 Konkombas (19.5%), 11 Kusasis (23.9%) and 16 Mamprusis (34.8%). The distribution of these ethnic groups by gender is shown in Fig.5.

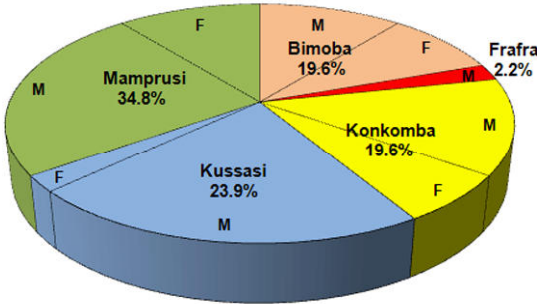


Figure 5. Distribution of ego networks by ethnic groups and gender.

Interviews

For the interviews, we collected a sample of 29 people: 19 males (65.5%) and 10 females (34.5%). The ethnic groups of the participants are: 1 Akan (3.4%), 1 Asante (3.4%), 4 Bimobas (13.8%), 1 Bissa (3.4%), 2 Frafras (6.8%), 3 Fulanis (10.3%), 4 Konkombas (13.8%), 5 Kusasis (17.2%), 4 Mamprusis (13.8%), 1 Mossi (3.4%), 1 Sisala (3.4%), and 2 Waalas (6.9%). The distribution of these ethnic groups by gender is shown in Fig.6.

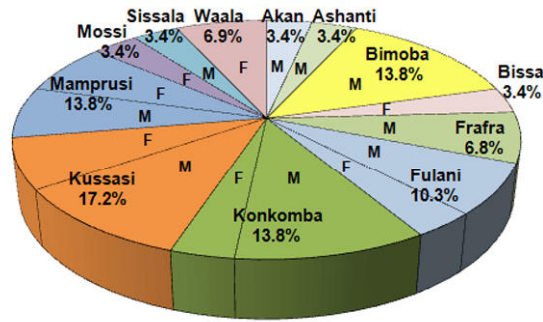


Figure 6. Distribution of the interviewed ethnic groups by gender.

4.4. Data analysis

The results of the ego networks and the interviews were computed in percentages, except for the statistical measures used to explain the sizes of the trust and cooperation groups. In the case of interviews, the responses were grouped in mutually exclusive categories before computing them.

5. Results

Results are presented firstly describing the data obtained from the ego networks concerning decisions on cooperation that participants make habitually, and subsequently studying in more depth the factors that affect trust decisions (interviews) and that can ultimately explain such cooperation decisions.

5.1. Cooperation decisions

We will explain the essential points to highlight the cooperation decisions reflected in the ego networks:

Cooperation groups

The habitual cooperator group is not very large: it contains an average of about 14 people, without much difference between men (15.18) and women (12.38) (Tab.1), but with a slight difference regarding the ethnic groups (Tab.2). Noteworthy are the Kusasi (25.09) and the Frafra (44.00) with a larger average of habitual cooperators than the rest.

Mean of usual cooperators by gender					
Gender	Mean	N	Std. Deviation	Variance	Median
Female	12,38	13	7,943	63,090	10,00
Male	15,18	33	12,019	144,466	12,00
Total	14,39	46	11,008	121,177	10,50

Table 1. Average number of cooperation relations by gender.

Mean of usual cooperators by ethnic group					
Ethnic group	Mean	N	Std. Deviation	Variance	Median
Bimoba	8,67	9	4,123	17,000	10,00
Frafra	44,00	1	.	.	44,00
Konkomba	10,67	9	6,874	47,250	8,00
Kussasi	25,09	11	11,657	135,891	22,00
Mamprusi	10,50	16	7,220	52,133	7,00
Total	14,39	46	11,008	121,177	10,50

Table 2. Average number of cooperation relations by ethnic group.

The composition of the cooperation groups consists, firstly, of friends (49.24%), then, relatives (28.33%), to a lesser extent, neighbors (11.67%), some coworkers (6.36%), and very few acquaintances (3.18%) or strangers (0.76%). The vast majority of them are people they trust (very high: 35.48%; high: 45.95%). The group of relatives is that has a higher percentage of very high trust (16.36%), followed by friends (14.00%) and neighbors (3.33%) (Tab.3).

% Usual cooperators by type of relationship & trust level						
Type of relationship	%	Trust level				
		Very high	High	In between	Low level	No trust
Relative	28,33%	16,36%	9,09%	1,36%	0,76%	0,76%
Friend	49,24%	14,09%	25,00%	7,12%	2,12%	0,91%
Neighbor	11,67%	3,33%	6,06%	1,21%	0,61%	0,46%
Co-worker	6,36%	1,09%	3,97%	0,79%	0,33%	0,18%
Acquaintance	3,18%	0,15%	1,67%	0,76%	0,15%	0,45%
Guardian	0,46%	0,46%	0,00%	0,00%	0,00%	0,00%
Stranger	0,76%	0,00%	0,16%	0,30%	0,00%	0,30%

Table 3. Proportion of habitual cooperators distributed according to type of relationship and trust level maintained with the participant.

Types of exchanges

Both family and friends stand out in most of the exchanges, especially advice (10.55% and 14.18%), information (6.70% and 8.33%), secrets (7.30% and 6.61%), and learning (4.04% and 6.02%). Family members cooperate to a greater extent than friends in activities such as loaning money (4.12% and 2.92%), exchanging services (3.86% and 1.38%) and secrets. Friends outnumber family members in the exchange of advice, information, learning, and work (3.57% and 1.44%), thus extending the possibilities of getting help to a greater number of people (Tab.4).

What is mostly exchanged with neighbors is advice (2.67%) and work (1.28%), although in low proportions. Coworkers do not play a large role as cooperators. Their most important role is in the transmission of advice (1.56%), information (1.21%), and learning (0.95%). To improve one's reputation and obtain contacts, acquaintances (0.34% and 0.26%), friends (0.34% and 0.86%), and neighbors (0.34% and 0.26%) are appointed. Family members also contribute to obtaining new contacts (0.68%) (Tab.4).

% Type of cooperation by type of relationships							
Type of cooperation	Relative	Guardian	Friend	Co-worker	Neighbor	Acquaintance	Unknown
Job	1,44%	0,00%	3,57%	0,51%	1,28%	0,17%	0,00%
Lending money	4,12%	0,00%	2,92%	0,25%	0,17%	0,00%	0,00%
Secrets	7,30%	0,09%	6,61%	0,26%	0,69%	0,08%	0,00%
Services	3,86%	0,00%	1,38%	0,51%	0,95%	0,26%	0,17%
Information	6,70%	0,00%	8,33%	1,21%	0,86%	0,44%	0,00%
Advice	10,55%	0,18%	14,18%	1,56%	2,67%	0,75%	0,09%
Learning	4,04%	0,00%	6,02%	0,95%	0,86%	0,42%	0,17%
Reputation	0,17%	0,00%	0,34%	0,09%	0,34%	0,34%	0,00%
Contacts	0,68%	0,00%	0,86%	0,09%	0,26%	0,26%	0,00%
Total	38,86%	0,27%	44,20%	5,42%	8,08%	2,72%	0,44%

Table 4. Proportion of types of cooperation that habitual cooperators maintain with the participants, distributed according to the type of relationship.

Reciprocity

A high percentage of cooperation is reciprocal (73.61%), especially among cooperators with very high (27.32%) and high (34.46%) trust levels (Tab.5).

% Cooperation by reciprocity and trust level			
Trust level	Reciprocity	P. receives	P. gives
Very high	27,32%	4,86%	3,34%
High	34,46%	7,28%	4,25%
Medium	8,04%	2,58%	0,91%
Low level	2,12%	1,36%	0,45%
No trust	1,67%	0,76%	0,60%
Total	73,61%	16,84%	9,55%

Table 5. Distribution of cooperation by levels of trust and reciprocity. P. receives or P. gives means that the participant is who receives or gives the cooperation respectively.

Cooperators with the highest level of trust have a greater proportion of reciprocity (very highly trusted cooperators: 76.92%; highly trusted: 74.92%; medium trust 69.74%). The percentages of non-reciprocity increase among cooperators with lower levels of trust (medium trusted: 22.37% and 7.89%; low trusted: 34.62% and 11.54%; not trusted: 25% and 20%) (Tab.6).

% Distribution of reciprocity by trust level			
Trust level	Reciprocity	P. receives	P. gives
Very high	76,92%	13,68%	9,40%
High	74,92%	15,84%	9,24%
Medium	69,74%	22,37%	7,89%
Low level	53,85%	34,62%	11,54%
No trust	55,00%	25,00%	20,00%

Table 6. Composition of the proportions of reciprocity at each trust level. P. receives or P. gives means that the participant is who receives or gives the cooperation respectively.

However, with family members, in whom higher levels of trust are placed, there is a lower level of reciprocity in their exchanges as a whole, compared to friends or coworkers (66.8%, 83.4%, and 73.8%, respectively). This suggests that affective family ties are a good mechanism to ensure cooperation despite the lower reciprocity (perhaps due to the education received about the role of the family). In contrast, cooperators who are only acquaintances (52.4%) or strangers (60%), and neighbors (36.4%) show high percentages of donations to the participants, surpassing the proportions of reciprocity (acquaintances: 42.9% and strangers: 40%). This seems to indicate that less trusted cooperators are maintained, although perhaps

not in the long term, because they provide a clear benefit to the individual and are used for less risky issues (Tab.7).

% Reciprocity by type of relationship			
	Reciprocity	P. gives	P. receives
Relative	66,8%	8,0%	25,1%
Friend	83,4%	13,2%	3,4%
Neighbor	58,4%	36,4%	5,2%
Coworker	73,8%	26,2%	0,0%
Guardian	66,7%	33,3%	0,0%
Acquaintance	42,9%	52,4%	4,8%
Stranger	40,0%	60,0%	0,0%

Table 7. Composition of the proportions of reciprocity in each type of relationship. P. receives or P. gives means that the participant is who receives or gives the cooperation respectively.

The ethnic groups with a higher number of cooperators –Kusasis and Frafras– are those that, in turn, display greater ethnic diversity among their habitual cooperators. However, even in this case, about one half of their cooperators are from their ethnic group (51.4% and 47.7%). The Mamprusi also show great ethnic diversity among their habitual cooperators (67.1%). However, the Komkombas and Bimobas have a high percentage of ethnic endogamy in their networks of habitual cooperators (95.8% and 83.3%) (Tab.8).

% Composition of cooperators by ethnic group									
Konkomba		Bimoba		Mamprusi		Kusasi		Frafra	
Bimoba	1,1%	American	1,3%	Bimoba	17,4%	Bimoba	6,2%	Bulsa	2,3%
Mamprusi	3,2%	Bimoba	83,3%	Bissa	1,2%	Bissa	2,5%	Dagomba	4,5%
Konkomba	95,8%	Bulsa	1,3%	Kusasi	1,8%	Ewe	1,1%	Ewe	4,5%
		Dagomba	1,3%	Mamprusi	67,1%	Ga-Adangbe	,7%	Ga-Adangbe	4,5%
		Ewe	1,3%	Frafra	1,2%	Kusasi	51,4%	Kusasi	13,6%
		Ga-Adangbe	1,3%	Ashanti	1,8%	Mamprusi	2,2%	Mamprusi	2,3%
		Kusasi	1,3%	Konkomba	7,8%	Gonja	,7%	Gonja	2,3%
		Mamprusi	9,0%	Mossi	1,2%	Kassena	,7%	Kassena	6,8%
				Tallensi	,6%	Akyem	14,5%	Akyem	2,3%
						Frafra	7,2%	Frafra	47,7%
						Ashanti	2,2%	Ashanti	6,8%
						Fante	4,0%	Fante	2,3%
						Hausa	,4%		
						Mossi	1,8%		
						Nzuma	1,4%		
						Portagee	,4%		
						Yoruba	,4%		
						Brongnu	,7%		
						Dagaati	1,1%		
						Bulsa	,4%		
Total	100,0%	Total	100,0%	Total	100,0%	Total	100,0%	Total	100,0%

Table 8. Composition of habitual cooperators by ethnic group.

5.2. Trust decisions

In this section, we describe the composition of trusted groups and the main factors considered by the interviewees when deciding to trust others, and that affect the creation, maintenance, and breakdown of trust.

Trust groups

According to the interviewees, the average number of trusted people (trustees) is slightly larger than the cooperation group, about 23 people (Tab.9).

Number of trusted persons by gender					
Gender	Mean	N	Std. Deviation	Variance	Median
Female	15,11	9	14,777	218,361	10,00
Male	27,94	18	39,508	1560,879	13,00
Total	23,67	27	33,552	1125,769	10,00

Table 9. Statistical measures of the number of trusted people.

However, most of the interviewees trust fewer than 15 people (70.4%) (Tab.10).

Number of trusted persons				
Nr. Trusted	Frequency	Percent	Valid Percent	Cumulative Percent
0	1	3,4	3,7	3,7
3	2	6,9	7,4	11,1
4	1	3,4	3,7	14,8
5	2	6,9	7,4	22,2
6	2	6,9	7,4	29,6
7	1	3,4	3,7	33,3
10	5	17,2	18,5	51,9
11	2	6,9	7,4	59,3
15	3	10,3	11,1	70,4
19	1	3,4	3,7	74,1
20	1	3,4	3,7	77,8
28	1	3,4	3,7	81,5
50	1	3,4	3,7	85,2
60	2	6,9	7,4	92,6
95	1	3,4	3,7	96,3
150	1	3,4	3,7	100,0
Total	27	93,1	100,0	
Missing	2	6,9		
Total	29	100,0		

Table 10. Number of interviewees' trusted people.

The mean increases in the Konkomba participants, who have higher average of trusted people (80). This is not so surprising if we consider that in the family settlements of the Konkomba, a large number of members coexist, which leads to their mentioning practically the whole family as trusted persons. Also notable are the Mamprusi, with an average of 30.25 trusted people. However, the samples are small and the variances are high in both cases. The Bimoba and Kusasi show lower means of trusted people (9.75 and 8). Therefore, both the groups of habitual cooperators and the trusted circle are small (Tab.11).

Number of trusted persons					
Ethnic group	Mean	N	Std. Dev.	Variance	Median
Akan	4,00	1			4,00
Asante	10,00	1			10,00
Bimoba	9,75	4	7,974	63,583	9,00
Bissa	10,00	1			10,00
Frafra	3,00	1			3,00
Fulani	15,00	1			15,00
Gruni	15,00	1			15,00
Konkomba	80,00	4	46,904	2200,000	60,00
Kusasi	8,00	5	4,899	24,000	6,00
Mamprusi	30,25	4	43,208	1866,917	10,00
Mossi	5,00	1			5,00
Sisala	19,00	1			19,00
Waala	19,00	2	12,728	162,000	19,00
Total	23,67	27	33,552	1125,769	10,00

Table 11. Statistical measures of the number of trusted people by ethnic groups.

Family

Relatives are, again, the people most frequently mentioned as being more highly trusted (66.22%), and secondly, friends (13.52%), although number of cooperative friends is greater than that of relatives. We therefore note that, to meet the needs of cooperation, the network of people extends beyond the family, although the level of trust decreases somewhat (Tab.12).

% Most trusted people	
Relatives	66,22%
Friends	13,52%
People you live with	4,06%
Coworkers	1,35%
People with same language	1,35%
Same group or clan	1,35%
People who believe in you	1,35%
People who help you	1,35%
Men more than women	1,35%
Chief	2,70%
Assembly/Committee	1,35%
Children in the community	1,35%
For travel, Mamprusis	1,35%
Women	1,35%
Total	100,00%

Table 12. People with a higher level of trust according to the interviewees.

However, having a family relationship does not ensure the existence of trust. Although the role of kinship ties is very important in the Ghanaian society, the decision to trust depends, ultimately, on individuals' behavior, among the reasons to decide to trust for the first time (behavior, 48%) and to maintain trust (behavior, 47.06%, and help, 29.42%) (Tab.13).

% Reasons for deciding to trust				% Reasons for maintaining trust							
Other's behavior*		Other's behavior*		Help		Communication		Other's behavior		Other reasons	
Trust first time	18,00%	Other's behavior	22,00%	Takes care	3,92%	Not suspecting the other	1,96%	Trusted person's behavior	13,74%	Faith	3,92%
Appearance	14,00%	Is communicative	2,00%	Advice	5,88%	Not having secrets	1,96%	Is happy	1,96%	Unity	1,96%
References	12,00%	Is friendly	4,00%	Help	19,62%	Telling the truth	1,96%	Keeps friendship	1,96%		
Social Capital	6,00%	The person's approach	2,00%			Not gossiping	1,96%	Experience with trusted person	9,80%		
Visit home	2,00%	Way of talking	4,00%			Listening	1,96%	Is not angry or sad	1,96%		
		Greetings	4,00%			Keeping secrets	3,92%	Respect	7,84%		
		Conversation	4,00%			Greetings	1,96%	Person's character	3,92%		
		Like the person	2,00%			Conversation	1,96%	Does not steal	1,96%		
		Is humble	2,00%					Keeps promises	3,92%		
		Tells the truth	2,00%								
Total	100,00%		48,00%	Total	29,42%		17,64%		47,06%		5,88%

Table 13. Detail of the reasons mentioned by interviewees to decide to trust for the first time and to maintain trust over time.

The interviewees are divided practically equally among those who say they always trust the family and those who do not (both answers: 44.83%). Although a large percentage declares having a good relationship with their relatives (68.97%), 31.03% admits having problems with the family. However, with regard to the meaning of family among the interviewees, a large percentage defines it as the support or help group (29.70%), or the people with whom they live (26.57%) or identify with (14.05%) (Tab.14). Therefore, needs met by the family entity are the same that could be met by relationships of friendship or by any other type of social relationship.

Information about family					
% Always trust family	% Family relationships	% Meaning of Family			
Yes	44,83%	Good	68,97%	Being together	26,57%
No	44,83%	Some problems	20,69%	Identity and origins	14,05%
Close family	6,89%	Not very good	10,34%	The best unit of society	1,56%
It depends	3,45%			Big influence on the person	1,56%
	100,00%		100,00%	Help	29,70%
				Trustful people	4,69%
				Comfortable people	3,12%
				They listen to you	1,56%
				Give love	1,56%
				Children, being alive and happy	4,69%
				Not being alone	1,56%
				Something valuable	9,38%
					100,00%

Table 14. Proportion of interviewees who always trust the family and who have good relations with the family. Proportion of the different meanings of family for the interviewees.

The clan against other ethnic groups

Although there is a high level of interaction between the ethnic groups created by marriage ties, cohabitation, and high tolerance of religious beliefs, there are still important divisions in the relations among them, as well as language differences. Despite authors arguing that the clans, including the same ethnic groups, are not always the result of a clear cultural and historical differentiation, but are shaped by the groups' needs, and are not static (it even seems that the ethnic groups are sometimes modified by migratory movements), this cultural division is very present in individuals' feelings and daily behavior.

Proof of this is that many of the interviewees declared having good relations with the members of their clan (78.13%), whereas only a very low percentage said the same thing about other ethnic groups (14.92%). Among the few participants who mention having conflicts with members of the same clan (21.87%), practically mostly refer to a problem with the land (6.25%), whereas in the case of other groups, there is a mixture of problems due to the distribution of the land (4.26% of responses), political problems (2.12%), power (4.26%), misunderstanding (4.26%), lack of unity (2.12%) and trust (2.12%), language differences (2.12%), etc... Moreover, a little less than half of the interviewees (44.44%) states that they trust other ethnic groups. Affinity with the clan is understood, moreover, if it is taken into account that 28.58% of the responses refer to the help or support received as an advantage of belonging to a clan, and another 28.57% refer to the feeling of unity that the clan provides

(Tab.15). This shows the cultural role of support that is attributed to the clan in Ghanaian societies, as is the case with the family.

Same clan				Other ethnic groups	
% Relationships		% Same-clan benefits		% Relationships	
Good	78,13%	Accommodation in travels	4,76%	Positive	14,92%
Some problems*	18,75%	Many benefits	4,76%	Negatives*	23,38%
Not very good	3,12%	Acceptance	4,76%	Neutral	27,66%
		Enjoyment	4,76%	It depends on heads' relationship	2,12%
Total	100,00%	Unity	28,57%	Negative with some of them	31,92%
% Problems*		Help	28,58%	Total	100,00%
Land	6,25%	No betrayal	4,76%	% Negatives* (Conflict reasons)	
Financial issues	3,13%	Respect	4,76%	Problems for feeling superior	2,12%
Properties	3,13%	Friendship	4,76%	Problems due to language and origins	2,12%
Thefts	3,13%	Advice	9,53%	Land problems	4,26%
Different characters	3,13%			Chieftancy problems	4,26%
				Misunderstanding between tribes	4,26%
				No trust	2,12%
				No unity	2,12%
				Political conflicts	2,12%
Total	18,75%	Total	100,00%	Total	23,38%
				% Trust	
				Yes	44,44%
				No	22,22%
				Do not trust people with power, traditional people	2,78%
				It depends	30,56%
				Total	100,00%

Table 15. Detail of the relations maintained with the same clan, the kind of problems that can exist with them and the benefits of belonging to a clan. Detail also of the relationships with other ethnic groups, the conflicts that may exist with them, and the percentages of interviewees who trust them.

There is a long history of relationships underlying the various ethnic groups. In addition to cultural differences and origins, there have been confrontations between different ethnic groups, mainly because of the appropriation of territory and resources, the attempt to gain power and supremacy over others, and even to try to make a profit from the slave trade. This has been the case of the struggles that have existed in the 20th century between Konkombas and Bimobas, in the upper-east area, to gain leadership; between Konkombas and Dagombas (Hippolyt, 2003); or Konkombas and Mossis. The Konkomba were invaded in the 16th century by the Nanumba, the Gonja, and the Dagomba (who have fraternal relations with the Mossi). They were their vassals and forced to pay taxes for the use of the land. In the 18th century, the Asante conquered the Dagomba and demanded tributes. Among these tributes

were the Konkomba who were captured and handed over to the Asante as slaves. Currently, Dagombas and Konkombas continue to fight for the right to land, and there are still some religious tensions among them (the Dagomba are Muslims and the Konkomba are traditionalists). There are also tensions between the Kusasi and the Mamprusi for supremacy in Bawku and due to the appropriation of land: the Kusasi allege their authority on the basis of their original settlement in this city, whereas the Mamprusi, accustomed to being the leaders, received greater powers from the British government during the protectorate in this area. The rivalry between ethnic groups is also observed in the data of this study with the problems in Bende between the Bimoba, who are the majority, and practically all the other ethnic groups in the area. Moreover, in Bende, the Fulani do not relate much with other groups, except for work-related reasons (care of livestock). The interviewees also commented on the confrontations of other groups that have a strong hierarchical tradition, like the Asante, with ethnic groups like the Konkomba or Kusasi, although in the Northern region there are not very many Asante.

We observe a twinning with certain support groups, in this case lineages and clans, in contrast to a distancing and sometimes confrontation with other ethnic groups due to the appropriation of resources and privileges.

Factors that affect trust decisions

Creation and maintenance of trust

When deciding to trust for the first time, nearly half of the interviewees take any evidence of the person's behavior into account (48%). Very few people choose to trust in advance (18%), notice others' appearance (14%), or use others' references (12%). Few of them only consider what they can achieve with the bond (social capital, 6%). Some ethnic groups, like the Asante, the Mamprusi, or the Sissala, the way of greeting is very important to create a first link towards trust (Tab.13).

According to the interviewees, economic exchanges (22.85%) –financial affairs (4.15%), trading animals (4.15%), business (4.15%), work plans (4.15%), and agricultural affairs (6.25%) – are the ones that most frequently require a higher level of trust. Help in general (20.85%) and exchange of secrets (14.58%) also require high doses of trust. However,

in absolute terms, exchanging secrets is the most frequently mentioned response among exchanges that requires higher levels of trust (Tab.16).

% Trustful exchanges			
Secrets	14,58%		
Economic exchanges*	22,85%	Economic exchanges*	Help*
Marriage	4,15%	Animals	4,15%
Travel exchanges	2,09%	Farm exchanges	6,25%
Help*	20,85%	Work plan activities	4,15%
Feelings and concerns	8,34%	Business exchanges	4,15%
Education	2,09%	Finances	4,15%
Visits, funerals and festivals	6,27%		
Introducing to people	2,09%		
Respect and coexistence	6,24%		
Family activities	2,09%		
Way of interactions	2,09%		
Donations	4,18%		
Faith	2,09%		
Total	100,00%		

Table 16. Details of the types of exchange that require higher levels of trust according to interviewees.

The activities that are carried out jointly stimulate an approach to trust, according to the interviewees. Among them, the most frequently mentioned are the different types of meetings (43.65%): the festivals of each ethnic group (8.45%), parties (7.03%), funerals (2.82%), sacrifices that are carried out in the traditionalist religion to satisfy the ancestors (2.82%) – intermediaries with the spirits of the land–, religious meetings (5.63%), marriages (1.41%), etc... (Tab.17). Funerals are very important in these areas because they are done in two parts: the Kumian (burial) and Kukoan (the party held one year after the death). During the Kukoan, all the guests share a feast in honor of the deceased until the early hours of the morning, with music, food, drink, and dance.

In these societies of northern Ghana, sharing tasks (29.58% of the responses), working together in the field (5.63%) or in the forestation tasks (1.41%), help to create bonds of trust, as do chatting (9.85%), games (1.41%), songs (1.41%), religious activities (2.82%), etc... Showing an attitude of respect toward others (1.41%) and making the other feel accepted and at home (1.41%) are equally important to promote trust (Tab.17).

% Trust activities					
Meetings*	43,65%	Meetings*		Shared activities*	
Physical contact	1,41%	Meetings	12,67%	Sharing personal issues	2,82%
Shared activities*	29,58%	Festivals	15,48%	Advice	1,41%
Some behaviors*	8,46%	Ritual	5,64%	Sharing religion	1,41%
Sharing material things	1,41%	Religious	8,45%	Singing	1,41%
Help	4,22%	Visits	1,41%	Praying to God	1,41%
Don't know	2,82%		43,65%	Chatting	9,85%
Donations	2,82%	Detail of meetings		Eating together	1,41%
Don't do anything	4,22%	Meetings	11,26%	Working together	1,41%
Know each other	1,41%	Chief meetings	1,41%	School games	1,41%
			12,67%	Farming together	5,63%
		Parties	7,03%	Forestation	1,41%
		Festivals	8,45%	Total	29,58%
			15,48%	Some behaviors*	
		Sacrifices	2,82%	Feeling at home	1,41%
		Funerals	2,82%	Being truthful	1,41%
			5,64%	Respecting each other	1,41%
		Ceremonies	1,41%	Doing the right thing	1,41%
		Christian meetings	5,63%	Welcoming new people	1,41%
		Marriages	1,41%	Being together	1,41%
			8,45%		
		Invitations	1,41%		
Total	100,00%	Total	43,65%	Total	8,46%

Table 17. Detail of activities that promote trust according to the interviewees.

As when creating trust, the basic indicator to maintain trust is the individual's behavior (47.06%), although the help received (29.42%) and good communication (17.64%), through greetings, conversations, sharing secrets, etc., are also mentioned (Tab.13). Exchanging advice is very important in these societies.

Reputation is a surrogate of trust in people not directly known. For the interviewees, it is very important (93.10%), and it mainly serves to be respected (29.17% responses), to obtain help if necessary (27.10%), to have people nearby (10.42%); compared to the ostracism, lack of respect and support received by people of ill-repute (Tab.18). Reputation serves to expand social networks, especially in those cases where it is necessary, whereas direct behavior is what is taken into account in the habitual small lineage and clan networks.

% Importance of reputation	
Yes	93,10%
No response	6,90%
Total	100,00%
% Consequences of having a good reputation	
Being respected	29,17%
Being inside	2,08%
Getting help	27,10%
Getting protection	4,16%
Having a future	4,17%
Maintaining yourself	2,08%
Being trusted by others	4,17%
Having people close by	10,42%
Being an important person	4,16%
People know you	6,25%
People give you responsibilities	2,08%
It's good for you	2,08%
People pray for you, bless you	2,08%
Total	100,00%

Table 18. Importance of reputation in these areas and detail of the consequences of having a good reputation, according to the interviewees.

The values system within the ethnic groups promotes approach and trust among its members in different ways. This is reflected in the results of our study. For example, the Kusasi mentioned promoting the maintenance of their culture and traditions as group values; the Bimoba mentioned among their values, apart from the above, the need to maintain their rights as members of their community and build a better community; the Frafra emphasized the value of helping other Frafra; the Asante stressed maintaining their language and heritage; for the Gruni, speaking their language and using their traditional clothing is highly valued, similar to the Waala and the Mamprusis; for the Konkomba, their group unity is very important; and for the Fulani sharing what they have, especially milk, with their relatives and ancestors is very important.

Although many interviewees stated that religion influences people's cooperative attitude (89.65%) (Tab.19), there is a lack of coherence between this claim and their behavior, as will be seen, when it comes to forgetting or forgiving the betrayal of trust, or forgetting the existing conflicts with individuals from different clans or ethnic groups.

% Influence of religion in cooperation	
Yes	89,65%
No	10,35%
Total	100,00%

Table 19. Influence of religion in general attitudes towards cooperation according to the interviewees.

Religion does not seem to have more influence on trust and cooperation than the values inculcated in the individuals, as many interviewees mentioned help and respect for others in their values system. Even for some Muslims, their religion is a cause for separation from people who do not share their faith, although other Muslims think otherwise. Religious values may somehow affect a general attitude of openness and cooperation towards strangers, as well as the values inculcated outside of religion, but this only involves certain cooperative attitudes, which are not the most common among the subjects (as shown in the ego networks), nor are they the ones that resist the most in times of difficulties. As has been shown, cooperative attitude depends on many other factors such as direct experience with individuals, their ongoing relationship with them, and their level of trust.

This is a society that has a notable percentage of insecurity among its citizens (43.33% of the interviewees feel unsafe in their environment). The most frequently mentioned reasons are economic (12.74%), security (17.84%), or health (12.75%), which could influence the attitude of trust towards strangers (Tab.20). However, as mentioned, this is not so much directed towards people of the lineage or clan, who are the people with whom they cooperate habitually.

According to almost all of the interviewees, the above deficiencies and problems are the reasons given by the participants to declare why the government has a positive influence on the trusting and cooperative attitudes among its citizens (91.67% of the interviewees). The alleged reasons are the creation of security policies (23.38%), the arrangements made (19.77%), the laws or rules established (14.37%), the economic policies (10.78%), the policies that promote unity among the citizens (12.59%), and the educational policies (3.59%). Those who believe otherwise (8.33%), point to the negative influence of bad government policies (1.28%), the need for greater promotion of education among individuals (1.28%), and the predominance of the politicians' private interests over the general interest (1.28%), among other reasons (Tab.20).

% Feeling of security		% Government's influence in cooperation	
Yes	53,33%	Yes	91,67%
No	43,33%	No	8,33%
It depends	3,34%	Total	100,00%
Total	100,00%	% Reasons "Yes"	
% Economic reasons		Economic policies	10,78%
Problems with animals	2,55%	Security	23,38%
Problems with housing	2,55%	Law and rules	14,37%
Problems with farm	2,55%	Management	19,77%
Poverty	2,55%	Education	3,59%
Not having food	2,55%	People in Government	7,19%
Total	12,74%	Unity policies	12,59%
% Security reasons		Total	91,67%
Thieves at night	5,10%	% Reasons "No"	
Conflicts	5,10%	Bad local officers	0,64%
Bimobas and chieftancy	2,55%	Broken promises	0,64%
Being harmed by strangers	5,10%	Partial help	0,64%
Total	17,84%	Own interests	1,28%
% Health reasons		Authority secrets	0,64%
Accidents	2,55%	Little involvement	0,64%
To live and die	2,55%	Bad policies	1,28%
Pain when sun is hot	2,55%	Not enough education	1,28%
Mosquitos, snakes, scorpions	5,10%	Not condemning	0,64%
Total	12,75%	Not reacting quickly	0,64%
		Total	8,33%

Table 20. Sense of security of the interviewees, detail of their reasons for insecurity, influence of the Government's attitude in the cooperative attitude of the people and the reasons thereof.

Government activities could be considered a substitute for the personal touch, group values and reputation when attempting to expand the scope of bonds among strangers, in this case, the citizens of a country. The results of our study show that trust and cooperation depend more on personal interaction than on other types of measures. Hence, these measures may affect the overall level and under certain circumstances, but they are not usually the most usual reasons of individuals when deciding to grant their trust or to cooperate.

Breach of trust

The most frequently mentioned cause of breach of trust is the failure to keep secrets (21.28%), more so than not receiving help when needed (19.14%). They also mentioned not respecting agreements (8.51%), bad behavior (8.51%), lying (6.38%) and non-reciprocity of trust (6.38%) (Tab.21).

% Betrayal		% Punishment			
Lying to you	6,38%	% Punishment			
Not liking their behavior	8,51%	Yes	52,73%		
Not helping	19,14%	No	47,27%		
Breaking agreements	8,51%	Total	100,00%		
Jealousy	2,13%	% Types of punishment			
Gossiping	4,25%	Avoidance*	43,63%	Approach measures*	
Hypocrisy	2,13%	Approach measures*	21,81%	Advise	7,27%
Not keeping secrets	21,28%	Sending to authorities	7,28%	Talking about it	10,90%
Not trusting you	6,38%	No punishment*	25,46%	Giving them time	3,64%
Taking something without permissi	2,13%	Paying back	1,82%		
Taking family's properties	2,13%	Total	100,00%	Total	21,81%
Not respecting you	4,25%	Avoidance*		No punishment*	
Insulting you	2,13%	Not sharing secrets	1,82%	Forgetting	3,64%
Not forgiving you	2,13%	Avoiding them	18,18%	Forgiving them	3,64%
Harming you	2,13%	Not trusting them	7,27%	God will punish them	5,45%
Not greeting you	2,13%	Not talking to them	12,72%	No punishment	9,09%
Ceasing to interact with you	2,13%	Ceasing the relationship	1,82%	Patience	1,82%
Betraying you for influence	2,13%	Not greeting them	1,82%	Praying to God	1,82%
Total	100,00%	Total	43,63%	Total	25,46%

Table 21. Interviewees' reasons to consider that their trust has been betrayed, proportion of interviewees who would punish breach of trust and types of punishment used for betrayers.

Although 48.28% of the interviewees claim they can forget the betrayal of trust (Tab.22), it will depend on type of betrayal, the strength of the emotional bond maintained, the amount of help received previously and, sometimes, whether or not the person acknowledges his error. However, 34.48% of the interviewees declare they cannot forget the breach of trust (Tab.22); some of the interviewees say they have more difficulty forgetting the betrayal than forgiving the betrayer, perhaps as a protection against the possible risk of continuing to interact with someone who has already betrayed them previously. Religion does not seem to have much influence on forgiving and still less on forgetting the breach of trust.

% Forgive & forget by type of religion									
Religion	Total	Forget (Fg)	% Fg	Forgive(Fv)	% Fv	It depends	% It depends	Not forget	% Not forget
Muslim	11	5	45,45%	2	18,18%	1	9,09%	5	45,45%
Christian	9	5	55,56%	2	22,22%	0	0,00%	3	33,33%
Christian Pentecostal	2	0	0,00%	1	50,00%	2	100,00%	1	50,00%
Christian Protestant	3	0	0,00%	1	33,33%	2	66,67%	1	33,33%
Traditionalist	4	4	100,00%	1	25,00%	0	0,00%	0	0,00%
Total	29	14	48,28%	7	24,14%	5	17,24%	10	34,48%

Table 22. Number and proportion of interviewees who claim they can forget or forgive the breach of trust, distributed by the kind of religion practiced.

Concerning breach of trust, 52.73% of the interviewees would punish the betrayal, especially with different forms of avoidance (43.63% of the mentioned forms of punishment). Few would approach the person (21.81%), talk about it (10.90%), give them time (3.64%), or advise the individual (7.27%); and 25.46% of the responses about punishment of betrayal of trust is negative (Tab.21).

According to the interviewees, in the event of conflict, the most widely used form of approach is some kind of communication (48.10%), and some interviewees mention the importance of mediators (15.19%). Participants point to relatives (2.53%), heads or traditional leaders (6.32%), religious leaders (1.27%) or the government (2.53%) as mediators. Other interviewees mention the option of forgetting and forgiving as a way of resolving disputes (10.12%), as well as rectifying the behavior (8.86%), good manners (7.60%), understanding the problem (8.86%) and praying to God (1.27%) (Tab.23).

% Ways to resolve conflicts			
% Communication		% Forgive and forget	
Negotiation	1,27%	Forgive and forget	1,27%
Talking	20,26%	Forget	5,06%
Advice	15,18%	Forgive	3,79%
Listening	3,79%	Total	10,12%
Telling the truth	1,27%	% Rectify	
Meeting individually	1,27%	Don't do again	1,27%
Praying for peace	1,27%	Stop doing it	7,59%
Explaining the meaning of unity	3,79%	Total	8,86%
Total	48,10%	Total	8,86%
% Mediations		% Good manners	
Family	2,53%	Being polite	1,27%
Religious leader	1,27%	Calming down	1,27%
Police	1,27%	Patience	5,06%
Traditional leaders/Chiefs	6,32%		
Government	2,53%		
Being a leader to stop it	1,27%		
Total	15,19%	Total	7,60%
Understanding the problem	8,86%	Blessing	1,27%

Table 23. Ways to resolve conflicts according to the interviewees.

6. Discussion and conclusion

The above-mentioned fieldwork in different parts of northern Ghana serves as example to verify the predominant elements in the cooperative decisions of individuals living in environments where survival is difficult.

It was mainly observed that the decision to cooperate depends, above all, on those individuals with whom one maintains trust relationships (hypothesis i), which was particularly confirmed in the ego networks.

We also observed that the decision to cooperate normally depends on a small group of people, which largely corresponds to the trust circles, which are also small groups (hypothesis ii). This size limitation is very much in keeping with the evolutionary hypothesis of the psychology of personal trust, which argues that this psychology emerged in the setting of close relationships, and was maintained through coexistence in small groups during the greater part of human history (Authors, 2013). This explains the need for familiarity or proximity to create bonds of trust and cooperation (family, friends), even creating concepts of cultural affiliation like lineage and clan, extending cooperation networks to more people, as is necessary in these environments where survival is so difficult (hypothesis iii). This also explains the maintenance of groups with their own cultural signs (ethnic groups) in particularly difficult political and historical situations, as in the case of northern Ghana. These cultural brands ensure a more emotional approach (group values), which is needed to create group cohesion and enhance cooperation (hypothesis iv). However, the level of trust changes according to the proximity of the groups: first come lineages and clans; then, one's own ethnic group; and lastly, other ethnic groups.

In a hostile environment with adverse weather conditions, in which predominate a semi-arid savannah landscape and precarious agriculture, individuals need more support from others to survive. In northern Ghana, the amount of rainfall is lower than in other regions of the country, and the effects of the Harmattan –dry desert wind– which decreases the moisture and brings hot days, last longer than in the southern region (about four months of the year). Under these difficult conditions, besides the basic unit of kinship and lineage, the clan offers an extension of the support group, as does the ethnic group. Thus, bonds based on values that particularly promote membership and help for members of the same group (strong ethnic endogamy in cooperation) are created.

In places with scarce resources, confrontation due to the distribution of power and land was also expected. Under these circumstances, the differences between the ethnic groups and their conflicts have been maintained. Not even the existence of a central Government has been able to unify such cultural diversity, although regulatory structures and political efforts may lead to a general improvement to maintain citizen cohesion. However, such "state" cohesion is

weaker and the bonds provided are not the most frequently used in cooperation, which mostly operates in the sphere of small groups of personal trust.

Therefore, cooperative decisions and bonds of trust influence subjects' environment, but in any case, it is clear that more intuitive mental processes, influenced by affective emotions rather than by objective reasoning, are applied on a daily basis. However, emotional bonds based on trust are adaptive in evolutionary terms because they increase the chances of reciprocal cooperation. As has been shown, the ego networks, which include the bonds of higher trust, are also those with a higher percentage of reciprocity. Only a few cultural figures (e.g., families) do not demand such level of reciprocity, which reinforces the strength of the bond to ensure cooperation in the most costly situations (riskier exchanges, which require higher doses of trust).

In addition, trust is primarily and ultimately acquired based on the person's prior behavior, which also guarantees greater possibilities of success in reciprocity, even when referred to family, one's lineage, or clan. Therefore, interaction, communication, and shared activities increase the chances of creating bonds of trust. Reluctance to forget the breach of trust also helps to reduce the risk of repeating negative situations.

Aside from a few exceptions, there is a very high level of religious tolerance in the societies of northern Ghana. The coexistence of different religions is present within the same ethnic group, even within the same family. However, it has been observed that spiritual beliefs do not have more influence on the cooperative behavior or trust bonds than the cultural values of the ethnic group. They have even less influence on personal trust, which, as mentioned, depends mainly on mutual commitment and the support received.

Thus, reflected here are the main principles that drive the decision to cooperate. In contrast to the individualistic tendencies which have been mobilized in large societies as a result of the application of capitalist, neo-liberal economies, which are strongly influenced by the idea of rational and benefit-maximizing decisions, individuals continue to decide to cooperate with small affective groups in any sphere of social life. Above all in times of crisis, such small groups are reinforced to a greater extent, even extending stronger bonds to more people. These bonds, supported by the psychology of personal trust, especially adapted to deal with the most difficult environments, are those that our ancestors have used during the greater part of human evolutionary history.

ACKNOWLEDGMENTS

The acknowledgments are included here if the manuscript is accepted.

References

- Agbosu, L., Awumbila, M., Dowuona-Hammond, C., & Tsikata, D. (2007). Customary and statutory land tenure and land policy in Ghana. *ISSER Technical Publication*, 70.
- Andreoni, J., & Miller, J.H. (1993). Rational cooperation in the finitely repeated prisoner's dilemma: Experimental evidence. *The Economic Journal*, 103, 570-585.
- Andreoni, J., & Samuelson, L. (2006). Building rational cooperation. *Journal of Economic Theory*, 127(1), 117-154.
- Assimeng, M. (1990). *Bimoba Sociological Study*. Legon, Accra: University of Ghana.
- Awedoba, A. K. (1989). Matrimonial goods among the Atoende Kusasi. Contingent prestations: part II. *Research Review*, 5, 2.
- Awedoba, A. (2001). Kusasi matrimonial prestations and exploitation: The major Moreton legacy. In Y. Saaka (Ed.), *Regionalism and public policy in Northern Ghana* (pp. 118-144). New York: Peter Lang.
- Barth, F. (1969). *Ethnic groups and boundaries*. Oslo: Oslo University Press.
- Barth, F. (1994). Enduring and emerging issues in the analysis of ethnicity. In H. Vermeulen & C. Govers (Eds.), *The anthropology of ethnicity. Beyond ethnic groups and boundaries* (pp. 11-32). Amsterdam: Het Spinhuis Publishers.
- Bemile, S. (2000). Promotion of Ghanaian languages and its impact on national unity: The Dagara language case. In C. Lentz & P. Nugent (Eds.), *Ethnicity in Ghana: The limits of invention* (pp. 204-225). London: Macmillan.
- Bendor, J., Kramer, R. M., & Stout, S. (1991). When in doubt ...: Cooperation in a noisy prisoner's dilemma. *Journal of Conflict Resolution*, 35(4), 691-719.
- Benedict, A. (1983). *Imagined communities: Reflections on the origin and spread of nationalism*. London: Verso.
- Benneh, G. (1973). Small scale farming systems in Ghana. *Africa*, 43(2), 134-145.
- Bowles, S., & Gintis, H. (2011). *A cooperative species. Human reciprocity and its evolution*. Princeton and Oxford: Princeton University Press.

- Cialdini, R. B., Kallgren, C. A., & Reno, R. R. (1991). A focus theory of normative conduct: A theoretical refinement and reevaluation of the role of norms in human behavior. *Advances in Experimental Social Psychology*, 24, 201-234.
- Cleveland, D.A. (1991). Migration in West Africa: A savanna village perspective. *Africa*, 61, 222-246.
- Cohen, R. (1978). Ethnicity: Problem and focus in Anthropology. *Annual Review of Anthropology*, 7, 379-403.
- Der, G. B. (2001). The traditional political systems of Northern Ghana reconsidered. In Y. Saaka (Ed.), *Regionalism and public policy in Northern Ghana* (pp. 35-66). New York: Peter Lang.
- Drucker-Brown, S. (1975). *Ritual aspects of the Mamprusi kingship*. African Studies Social Research Documents, 8. Cambridge: African Studies Centre.
- Drucker-Brown, S. (1992). Horse, dog, and donkey: The making of a Mamprusi king. *Man*, 27, 71-90.
- Dunbar, R.I.M. (2009). The social brain hypothesis and its implications for social evolution. *Annals of Human Biology*, 36(5), 562-572.
- Ekeh, P. (1990). Social Anthropology and two contrasting uses of tribalism in Africa. *Comparative Studies in Society and History*, 32, 660-700.
- Epley, N., & Gilovich, T. (2002). Putting adjustment back in the anchoring and adjustment heuristic. In T. Gilovich, D. Griffin & D. Kahneman (Eds.), *Heuristics and biases: the psychology of intuitive judgment* (pp. 391-396). New York: Cambridge University Press.
- Epstein, S. (1994). Integration of the cognitive and psychodynamic unconscious. *American Psychologist*, 49, 709-724.
- Fussy, K.N. (1979). *Kont: initiation rites of the Bimoba of Northern Ghana*. Legon, Accra: University of Ghana.

- Gilbert, D. T. (2002). Inferential correction. In T. Gilovich, D. Griffin & D. Kahneman (Eds.), *Heuristics and biases: the psychology of intuitive judgment* (pp. 167-184). New York: Cambridge University Press.
- Gilovich, T., Griffin, D., & Kahneman, D. (2002). *Heuristics and biases*. New York: Cambridge University Press.
- Griffin, D. W., & Tversky, A. (1992). The weighing of evidence and the determinants of confidence. *Cognitive Psychology*, 24, 411-435.
- Guttman, J.M. (1996). Rational actors, tit-for-tat types, and the evolution of cooperation. *Journal of Economic Behavior & Organization*, 29(1), 27-56.
- Haidt, J. (2001). The emotional dog and its rational tail: A social intuitionist approach to moral judgment. *Psychological Review*, 108, 814-834.
- Hart, K. (1971). Migration and tribal identity among the Frafras of Ghana. *Journal of Asian and African Studies*, 4, 21-36.
- Heusch, L. (1997). L'ethnie: les vicissitudes d'un concept. *Archives Européennes de Sociologie*, 38, 185-205.
- Hilton, T. E. (1962). Notes on the history of Kusasi. *Transactions of the Historical Society of Ghana*, 6, 79-86.
- Hippolyt, A. S. (2003). Exclusion, association and violence: Trends and triggers in Northern Ghana's Konkomba-Dagomba wars. *The African Anthropologist*, 10(1), 39-82.
- Kahneman, D., & Ritov, I. (1994). Determinants of stated willingness to pay for public goods: A study in the headline method. *Journal of Risk and Uncertainty*, 9, 5-38.
- Kahneman, D., Ritov, I., & Schkade, D. (1999). Economic preferences or attitude expressions? An analysis of dollar responses to public issues. *Journal of Risk and Uncertainty*, 19, 220-242.
- Kahneman, D., Slovic, P., & Tversky, A. (1982). *Judgment under uncertainty: Heuristics and biases*. New York: Cambridge University Press.

- Kallgren, C. A., Reno, R. R., & Cialdini, R. B. (2000). A focus theory of normative conduct: When norms do and do not affect behavior. *Personality and Social Psychology Bulletin*, 26(8), 1002-1012.
- Kotey, N. A. (1995). Land and tree tenure and rural development forestry in northern Ghana. *University of Ghana Law Journal*, 102-132.
- Kramer, R. M., Wei, J., & Bendor, J. (2001). Golden rules and leaden worlds: Exploring the limitations of tit-for-tat as a social decision rule. In J. M. Darley, D. M. Messick, & T. R. Tyler (Eds.), *Social influences on ethical behavior in organizations* (pp. 177-200). Mahwah, NJ: Erlbaum.
- Kreps, D. M., Milgrom, P., Roberts, J., & Wilson, R. (1982). Rational cooperation in the finitely repeated prisoners' dilemma. *Journal of Economic Theory*, 27(2), 245-252.
- Kuper, A. (1982). Lineage theory: A critical retrospect. *Annual Review of Anthropology*, 11, 71-95.
- Laari, P. (1987). *Problems of traditional marriage systems among Bimoba of Northern Ghana*. Social Administration Unit, Legon, Accra: University of Ghana.
- Lentz, C. (1997). Creating ethnic identities in North-Western Ghana. In C. Govers & H. Vermeulen (Eds.), *The politics of ethnic consciousness* (pp. 31-89). London: Macmillan.
- Lentz, C. (2000). Colonial constructions and African initiatives: The history of ethnicity in Northwestern Ghana. *Ethnos*, 65(1), 107-136.
- Lentz, C., & Nugent, P. (2000). *Ethnicity in Ghana: the limits of invention*. London: Macmillan.
- Ledyard, J. O. (1995). Public goods: A survey of experimental research. In J. H. Kagel & A. E. Roth (Eds.), *The handbook of experimental economics* (pp. 111-194). Princeton, NJ: Princeton University Press.
- Loewenstein, G., Weber, E. U., Hsee, C. K., & Welch, N. (2001). Risk as feelings. *Psychological Bulletin*, 127, 267-286.

- Luce, R. D., & Raiffa, H. (1957). *Games and decisions: Introduction and critical survey*. New York: Wiley.
- Luhmann, N. (1979). *Trust and power*. Chichester, UK: Wiley.
- McMahon, C. (2005). Shared agency and rational cooperation. *NOÛS*, 39(2), 284-308.
- Mafeje, A. (1971). The ideology of 'Tribalism'. *Journal of Modern African Studies*, 9, 253-261.
- March, J. (1994). *A primer on decision-making: How decisions happen*. New York: Free Press.
- Murnighan, J. K., & Ross, T. (1999). On the collaborative potential of psychology and economics. *Journal of Economic Behavior and Organization*, 39, 1-10.
- Oppong, Y. (2002). *Moving through and passing on. Fulani mobility, survival and identity in Ghana*. New Brunswick, NJ: Transaction Publishers.
- Panin, A. (1987). *Hoe and bullock farming systems in Northern Ghana: A comparative socio-economic analysis*. Langen, Germany: Triops GmbH.
- Pruitt, D. G., & Kimmel, M. J. (1977). Twenty years of experimental gaming: Critique, synthesis, and suggestions for the future. *Annual Review of Psychology*, 28, 363-392.
- Ranger, T. (1983). The invention of tradition in colonial Africa. In E. Hobsbawm & T. Ranger (Eds.), *The invention of tradition* (pp. 211-262). Cambridge: Cambridge University Press.
- Ranger, T. (1993). The invention of tradition revisited: The case of colonial Africa. In T. Ranger & O. Vaughan (Eds.), *Legitimacy and the State in twentieth-century Africa* (pp. 62-111). London: Macmillan.
- Rattray, R.S. (1931). The tribes of the Ashanti Hinterland: Some results of a two-years anthropological survey of the Northern territories of the Gold Coast. *Journal of the Royal African Society*, 30, 118, 40-57.
- Rattray, R. (1932). *The tribes of the Ashanti Hinterland, Vol. 2*. Oxford, UK: Clarendon Press.

- Rosas, A. (2013). Social preferences and rational egoism. *Contrastes. Revista Internacional de Filosofía*, 18, 255-267.
- Schildkrout, E. (1979). The ideology of regionalism in Ghana. In W. Shack & E. Skinner (Eds.), *Strangers in African societies* (pp.183-207). Berkeley: University of California Press.
- Schlee, G. (2004). Taking sides and constructing identities: Reflections on conflict theory. *The Journal of the Royal Anthropological Institute*, 10(1), 135-156.
- Schlottner, M. (2000). We stay, others come and go: Identity among the Mamprusi in Northern Ghana. In C. Lentz & P. Nugent (Eds.), *Ethnicity in Ghana. The limits of invention* (pp. 49-67). London: Macmillan.
- Slooman, S. A. (2002). Two systems of reasoning. In T. Gilovich, D. Griffin & D. Kahneman (Eds.), *Heuristics and biases: the psychology of intuitive judgment* (pp. 379-396). New York: Cambridge University Press.
- Slovic, P., Finucane, M., Peters, E., & MacGregor, D. G. (2002). The affect heuristic. In T. Gilovich, D. Griffin & D. Kahneman (Eds.), *Heuristics and biases: the psychology of intuitive judgment* (pp. 397-420). New York: Cambridge University Press.
- Songsore, J., Denkabe, A., Jebuni, C.D., & Ayidia, S. (2001). Challenges of education in Northern Ghana: A case for Northern Ghana Education Trust Fund (NETFUND). In Y. Saaka (Ed.), *Regionalism and public policy in Northern Ghana, Yakubu* (pp. 223-239). New York: Peter Lang.
- Southall, A. (1970). The illusion of tribe. In P.W. Gutkind (Ed.), *The passing of tribal man in Africa* (pp. 31-46). Leiden, Holland: Brill.
- Stanovich, K. E., & West, R. F. (2000). Individual differences in reasoning: Implications for the rationality debate. *Behavioral and Brain Sciences*, 23, 645-665.
- Stiller, J., & Dunbar, R.I.M. (2007). Perspective-taking and memory capacity predict social network size. *Social Networks*, 29, 93-104.
- Syme, J.G.G. (1932). *The Kusasis. A short history*. Unpublished mimeograph.

- Tait, D. (1961). *The Konkomba of Northern Ghana*. International African Institute, London: Oxford University Press.
- Tonah, S. (2005). *Fulani in Ghana. Migration history, integration and resistance*. The Research and Publication Unit Department of Sociology, Legon, Accra: University of Ghana.
- van Dijk, E., Wilke, H., Wilke, M., & Metman, L. (1999). What information do we use in social dilemmas? Environmental uncertainty and the employment of coordination rules. *Journal of Experimental Social Psychology*, 35(2), 109-135.
- Wilks, I. (1989). *Wa and the Waala: Islam and polity in Northwestern Ghana*. Cambridge, UK: Cambridge University Press.
- Wilson, T. D. (2000). *Strangers to ourselves: Discovering the adaptive unconscious*. Cambridge, MA: Harvard University Press.
- Wilson, T. D., Centerbar, D. B., & Brekke, N. (2002). Mental contamination and the debiasing problem. In T. Gilovich, D. Griffin & D. Kahneman (Eds.), *Heuristics and biases: the psychology of intuitive judgment* (pp.185-200). New York: Cambridge University Press.
- Woodman, G.R. (1963). The acquisition of family land in Ghana. *Journal of African Law*, 7(3), 136-151.
- Yamagishi, T. (1988). The provision of a sanctioning system in the United States and Japan. *Social Psychology Quarterly*, 51(3), 265-271.
- Zahan, D. (1967). The Mossi kingdoms. In D. Forde & P. M. Kaberry (Eds.), *West African kingdoms in the 19th century* (pp. 152-178). International African Institute. London: Oxford University Press.