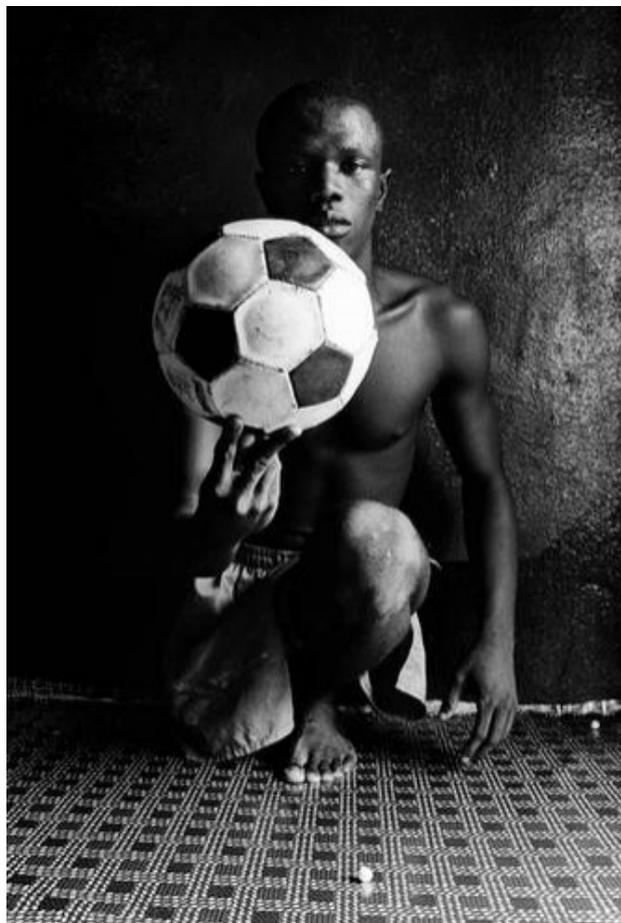


War and social preferences

*A field experiment around the football pitch in
Sierra Leone*



Van der Wal, L.R.

28/11/2011

Supervisor: Dr. Maarten Voors

Second examiner: prof. dr. Erwin Bulte

Wageningen University- Department of Social Sciences

Development Economics Group

Lizzy van der Wal (880210925100)

War and social preferences

A field experiment around the football pitch in Sierra Leone

This thesis is submitted to the Development Economics Group of Wageningen University in partial fulfilment of the requirements for the Master of Science degree in Development Economics

November, 2011

Chair group: Development Economics Group

Supervisor: Dr. Maarten Voors

Second examiner: prof. dr. Erwin Bulte

Cover picture: pep bonet (2003), ***One goal - amputees soccer dreamteam***

“Sierra Leone, Freetown, April 2003. War amputees soccer team. Machete wielding rebels of the Revolutionary United Front (RUF) left unforgettable scars. But these sportsmen kept their faith. They are determined to overcome their trauma and handicap and refuse to be marginalised. Patrick’s foot was amputated by RUF rebels.” (pep bonet / NOOR, 2003)

Abstract

War and social preferences: a field experiment around the football pitch in Sierra Leone

Evolutionary theory predicts that conflict strengthens in-group altruism and parochialism -the differential treatment between in-group and out-group members. We empirically test the consequences of civil war exposure on social preferences and parochialism in a series of artefactual field experiments. Our subjects are 163 youth from Sierra Leone who were participating in two local street football tournaments. We collected data on subjects background, including exposure to conflict in an extensive survey. Econometric analysis reveals that war affects the social preferences. Individuals who were exposed to war during their childhood become less inequality averse and more conflict avoiding; more generous towards their in and out-group and less parochial. The decrease in in-equality aversion and increase in generosity, together with the absence of an increase in parochialism, may cause both within and between group cooperation to increase, and likely lowers the chance on the reoccurrence of conflict. These results may partially explain the pattern of recovery observed in many post conflict settings. Moreover, this provides new evidence for an optimistic view on the potentials of a country which is recuperating from war, and supports a post-war youth policy that focuses on supporting efficient cooperation.

Keywords: civil war, social preferences, parochial altruism.

Acknowledgements

First of all I would like to show my appreciation for the opportunity to spend five months in Sierra Leone. It was an enlightening experience. My thanks go to Maarten Voors for his enthusiasm, critical notes and support. But also, of course, to Francesco Cecchi and Koen Leuvelde with whom we gathered the data for this thesis.

List of Figures

Figures	Page
Figure 1. An overview of the development of social preferences in childhood	1
Figure 2. Map of Sierra Leone	9
Figure 3. Education system of Sierra Leone	21
Figure 4. Distribution participants by war exposure level	22
Figure 5. An overview of when what percentage of the sample was war exposed or displaced. The vertical black lines show when fights took place in Kenema.	23
Figure 6. The distribution of giving in the dictator game in relation to war exposure	24
Figure 7. Percentages of egalitarian choices made in the allocation games in relation to war exposure and in and out-group.	26

List of Tables

Tables	Page
Table 1. Allocation game overview	15
Table 2. Distributional behaviour types	15
Table 3. Trauma typology	19
Table 4. Principal component analysis of war trauma types	20
Table 5. Descriptive results independent variables	22
Table 6. Correlation coefficients	24
Table 7. Descriptive results dictator game and allocation game	25
Table 8. War exposure and allocation games in a series of multivariate probit regressions	29
Table 9. Series of multinomial logistic regression of war exposure and social preferences	30
Table 10. Series of trivariate probit regressions wit war exposure and inequality aversion, generosity and selfishness	32
Table 11. Probit regressions with war exposure and aheadness aversion, behindness aversion and spitefulness	33
Table 12. The relation between age, financial wealth, education and war exposure and displacement	38
Table 13. Alternative models	39
Table A1. The effect of age during war exposure on generosity	48

Table of Contents

1. Introduction	1
2. Theoretical framework	3
2.1 War exposure and social preferences	3
2.2 Social preferences and economic performance	3
2.3 The development of social preferences	4
3. Research design	9
3.1 Background information	9
3.1.1 Sierra Leone	9
3.1.2 Kenema	12
3.2 Setting and sample	12
3.2.1 Description Tournament 1	12
3.2.2 Description Tournament 2	13
3.2.3 Characteristics sample	13
3.3 Experimental design	13
3.3.1 Artefactual field experiments	14
3.3.2 Survey	15
3.4 Operationalizing variables	16
3.4.1 Operationalizing war exposure	16
3.4.2 Operationalizing other characteristics	20
4. Descriptive results	22
4.1 Descriptive results independent variable	22
4.2 Underlying relations	23
4.4 Descriptive results dependent variable	24
5. Experimental results	27
5.1 Allocation games	28
5.1.1 War exposure and allocation games	28
5.1.2 War exposure and parochialism in allocation games	28
5.2 Social preference types	29
5.2.1 war exposure and social preferences	30
5.2.2 war exposure and parochialism	34
5.3 Interpretation	34
5.4 Robustness	37
5.4.1 Self-reported war-exposure	37
5.4.2 Endogeneity of war exposure and selective migration	37
5.4.3 Gender	38
5.4.4. Robustness of the new model to measure war exposure	38
5.4.5 The effect of NGO programs	39
6. Discussion and Conclusions	40
7. Reference	43
8. Appendix	48

1. Introduction

Football players in the European football leagues whose motherland has been in violent conflict get significantly more yellow and red cards than players whose motherland has not been in violent conflict (Miguel et al., 2008). Miguel et al. (2008) studied the behaviour of football players in European leagues. Football players from a variety of countries play in these leagues, constrained by strictly defined “rules of the game”, with clear rewards and punishments. Remarkably, Miguel et al. (2008) show that the number of years the home country has been in violent conflict before the player reaches the age of eighteen is strongly related to the amount of foul cards received, while years of violent conflict before the player was born do not play a role. Hence, they claim, it is the footballer’s personal war experiences that affect his behaviour, not a change in culture due to war. These results suggest that particular exposure to violent conflict during childhood can generate violent behaviour at an older age.

To conduct an act of violence, which red and yellow card fouls often are, is a symbol of an extreme form of negative *social preferences*. Social preferences may encompass inequality aversion, generosity, spiteful behaviour and selfish behaviour. Social preferences are decisive for the evolution of human cooperation (Boehm, 1997; Sober and Wilson, 1998; Gintis, 2000; Henrich and Boyd, 2001; Sigmund et al., 2001; Boyd et al., 2003; Bernhard, 2006; Choi and Bowles, 2007; Bowles, 2008). If war exposure influences violent behaviour in football, war exposure probably also influences other forms of social preferences and may enforce *parochialism*: favouring people from one’s own group while being hostile towards members from another group.

If the results on violent behaviour also hold for economic behaviour, violent conflict itself has an effect on how a society recovers from violent conflict. The neoclassical growth model predicts a rapid catch-up post-war growth¹ (Peden and Bradley, 1989). Empirical evidence from Germany, Vietnam and Japan suggest that it takes one or two decades for a nation’s capital stock to return to pre-war levels. While rapid post-war growth took place in Rwanda and Uganda, most post-war African countries did not experience such dynamics. This difference can be explained by the way a country emerges from war: if a country is more politically stable or better governed, it has more chance of economic growth (Blattman, 2009). Technology, institutions and social organisation are the parameters that determine how a country emerges from war. The first two factors are explored by an eminent body of development economics literature (Bray, 1986; Fagerberg, 1994; Ebbinghaus and Visser, 1999; Collier, 1999; Gleaser et al., 2004; World Bank, 2008; Voors and Bulte, 2008) while the latter has hardly been investigated (Blattman, 2009; Bellows and Miguel, 2006;2009; Voors et al., 2011). Empirical evidence shows that violence and injustice can activate a taste for peace and good governance and raise participation (Blattman, 2009; Bellows and Miguel, 2009). Social preferences are important for recovery after

¹ This follows from the basic mechanics of the neoclassical growth model. A reduction in the capital stock only temporarily reduces the economic growth rate. A reduction in saving, for example, reduces the capital-output ratio but because capital is subject to diminishing returns, the remaining capital has a higher level of productivity. This causes the economic growth rate to return to its original level (Peden and Bradley, 1989).

war because they determine people's ability to overcome social dilemmas and their level of cooperation (Voors et al., 2011). How these phenomena develop at a micro level, however, is still an unanswered question. The behavioural changes evidenced by Miguel et al. (2008) provide a stimulus to go deeper into the changes of behaviour due to war, disentangle parochialism and thoroughly explore the changes in different types of social preferences separately. It is plausible that effects on children along this dimension are more substantial and longer lasting than direct physical capital investment impacts. This thesis explores the unknowns on a micro level about the relative post-war recovery of human and financial capital, by studying war exposure and changes in social preferences of adolescent football players in post-war Sierra Leone. This will be shown by observing real life behaviour in the football field, doing artefactual experiments and conducting interviews .

This thesis expands on work by Fehr et al (2011) by showing that war exposure influences social preferences and parochialism. Bauer et al. (2011) focus on the effect of warfare on social preferences differences between in and out-group (to measure parochialism) in Georgia and Sierra Leone. They show that participants who were exposed to war become more inequality averse towards their in-group and become more parochial. In this thesis we intend to show more substantiated results than Bauer et al. (2011), by using a different kind of in and out-group and controlling for other variables that might influence social preferences and parochialism. Moreover findings from the artefactual experiments are underpinned with observations from real life football field behaviour. This study forms a new mosaic-stone to explain post war economic growth (or its absence) and will answer the following research questions:

1. *Does war exposure influence social preferences?*
2. *Does war exposure influence parochialism?*

Based on Miguel et al. (2008), Bellows and Miguel (2006;2009), Bauer et al. (2010;2011) and Voors et al. (2011) our hypothesis is that war exposure changes social preferences. To make a hypothesis on the effect of war exposure on parochialism we turn to evolution theory. Evolutionary theory, by Choi and Bowles (2007), predicts that altruistic behaviour could only survive because it coexists with parochial behaviour. The characteristics of both social preferences made small scale societies with more altruistic and parochial individuals to survive intergroup conflicts. This theory is based on change in behaviour by genetic selection, but Choi and Bowles (2007) cautiously leave space for change in behaviour through socialization. Therefore, we hypothesize that war exposure changes social preferences and has an increasing effect on parochialism.

The next section introduces the theoretical framework, followed by the research design, which includes background information on Sierra Leone and the city where the experiment was implemented, insight on the sample used and the setting of the research, and an outline of the experimental design and operationalize the concept of war exposure. The fourth section introduces the descriptive results, followed by the experimental results in section five. Finally there will be a discussion and conclusions.

2. Theoretical framework

In the theoretical framework the important literature for this thesis is introduced in three sub-chapters. First the relationship between war exposure and social preferences and parochialism is explained. Secondly, the different social preferences and parochialism are further explained, and how they affect economic behaviour is described. Thirdly it is explained how humans develop social preferences and parochialism, on what age this development takes place, and how this development can be disturbed.

2.1 War exposure and social preferences

Evolutionary theory predicts that altruistic behaviour (benefiting group members at the cost of oneself) could only survive time because it coexists with parochial behaviour. Choi and Bowles (2007) distinguish four types with different combinations of social preferences: parochial altruists (PA), tolerant (non- parochial) altruists (TA), parochial non-altruists (PN), and tolerant non-altruists (TN). Altruism strengthens in-group cooperation and weakens competitive behaviour towards fellow group members. Parochial behaviour strengthens intergroup hostilities, which on its own is harmful, because it forgoes beneficial opportunities for coalitions, co-insurance and exchange (Choi and Bowles, 2007; Bowles, 2008). The characteristics of both behaviours made small scale societies with more altruistic and parochial behaving individuals (PA) that survive intergroup conflicts. This theory is based on change in behaviour by genetic selection. Economists recently tried to prove the non-genetic development of preferences (Henrich et al., 2005; Bauer et al., 2011)². For example Henrich et al. (2005) show that social preferences depend on the pay-offs of cooperation in everyday life. The body of literature on the effect of shock, like war, on social preferences is minor (Voors et al., 2011; Bauer et al., 2010;2011; Gneezy and Fessler, 2011). Voors et al. (2011) show that people in communities in Burundi who were more exposed to war violence are more altruistic towards their neighbours. Bauer et al. (2011) focus on the effect of warfare on social preferences differences between in and out-group (to measure parochialism) in Georgia and Sierra Leone. They show that participants who were exposed to war when they were older than seven (based on experiments in Georgia) and younger than 20 (based on experiments in Sierra Leone) become more inequality averse towards their in-group and become more parochial.

2.2 Social preferences and economic performance

This subchapter summarizes the meaning of the social preferences inequality aversion, altruism, spitefulness, selfishness and parochialism and how they relate to economic performance. A change in social preferences may erode social capital, decrease collaboration, and make communities less resilient against future shocks (it might withhold individuals to participate in joint insurance) or hamper the provision of growth-enhancing public goods. If so, this has implications for trajectories of development, particularly, the scope for vicious and virtuous development cycles will need to be altered. If adverse shocks invite anti-social preferences, then temporary shocks can condemn communities to trajectories into poverty trap type of outcomes (Voors et al., 2011). In the next paragraphs the impact of each social preference is discussed.

² To reject the assumption of the canonical model of utility maximization in economics that behaviour is fixed.

If one shows inequality averse behaviour one does not want that anybody has more (behindness aversion) or less than he has (aheadness aversion), one wants everybody to have the same endowment³. Inequality aversion can influence economic performance in three ways. Firstly, inequality averse individuals are willing to cooperate if they can be sure that others cooperate, they are conditional co-operators (Fehr and Schmidt, 2005). Cooperation has a positive effect on economic growth (Knack and Keefer, 1996). Secondly, Inequality aversion is likely to be important for employer-employee relationships in labour markets (Bewley, 1998). Thirdly, inequality averse individuals are willing to punish because free-riders exploit co-operators, therefore inequality averse individuals can be good for governing towards a common good (Fehr and Schmidt, 2005).

If one shows altruistic behaviour one is willing to pay so that another receives more⁴. In this thesis the term altruism and generosity are used as if they have the same definition. Altruism increases cooperative institutions and raises efficiency, both contribute to economic growth (Fehr and Schmidt, 1999;2006; Fehr et al., 2008;2011; Bowles, 2008). If one behaves spitefully one is willing to pay so that someone else gets less⁵. This is anti-social behaviour and logically decreases cooperation and efficiency, moreover it increases the change on sabotages (Harbring and Irlenbusch, 2011). When one behaves selfishly one does not consider any other endowment than one's own⁶. Because the inequality averse people are conditional co-operators, they will only participate in cooperation if they know that the others are not going to behave selfishly. Therefore, it is crucial when inequality averse individuals and selfish individuals co-exist that there are good institutions to make sure that it is costly to be completely selfish in cooperation. When there are effective institutions selfish individuals decreases cooperation in two ways. One, they back out of cooperation themselves, and two, they make inequality averse individuals back out of cooperation (Fehr and Schmidt, 2005).

Parochialism is shown by Chen and Li (2009) by participants who did not experience a shock (like war exposure). They show that altruism increases by 47% and envy decreases by 92% when participants are matched with an in-group member. Parochialism decreases coalitions, cooperation and diminishes inter-group exchange (Choi and Bowles, 2007).

2.3 The development of social preferences

The development of social preferences happens throughout life, but mostly during childhood (Fehr et al., 2011). The development of an individual is driven by genetics and environment. The relation between genetics and environment is not as dichotomous as once believed. For instance, environmental events such as stressors (like war exposure is) can modify the way in which a genome is transcribed (Bremner and Vermetten, 2001). The development of social behaviour is a rich tradition in developmental psychology, but there is a surprising lack of studies that isolate the development of social preferences from the development of other forms of social behaviour. Therefore, to create a clear overview of how war exposure can influence social preferences

³With inequality aversion the payoffs of those who have less income enter positively in the utility function while the payoffs of those who have more enter negatively.

⁴ When one acts altruistic the material payoffs of others enter positively in the decision-makers utility function.

⁵ With spiteful behaviour payoffs of others enter negatively in the decision-makers utility function.

⁶ With selfish behaviour the payoffs of others do not enter the decision-makers utility function.

the following subjects are discussed. First, the neurological background of the development of social behaviour is discussed. Secondly, the neurological background is combined with empirical data of when which type of social preferences develops. Finally is discussed, how a trauma can influence the development of social preferences.

2.3.1 The neurological background of the development of social preferences

Advances in neuroscience are revealing, because they demonstrate the extent to which early experience influences the development of neural circuits that mediate cognitive, linguistic, emotional, and social capacities in the pre-frontal cortex (Katz and Shatz, 1996; Knudsen, 2004; Yang and Raine, 2009). Knudsen et al. (2006, p. 10155) describe four core concepts that have merged from decades of mutually independent research in economics, neuroscience and developmental psychology:

*“First, the architecture of the brain and the process of skill formation are both influenced by an inextricable **interaction between genetics and individual experience**.*

*Second, both the mastery of skills that are essential for economic success and the development of their underlying neural pathways follow hierarchical rules in a bottom-up sequence such that **later attainments build on foundations that are laid down earlier**⁷.*

*Third, cognitive, linguistic, social, and emotional competencies are interdependent, all are **shaped powerfully by the experiences of the developing child**, and all contribute to success in the workplace.*

*Fourth, although adaptation continues throughout life, **human abilities are formed in a predictable sequence of sensitive periods**, during which the development of specific neural circuits and the behaviors they mediate are most plastic⁸, and therefore optimally receptive to environmental influences.”*

The first core concept is based on the experiences influence neural circuits. Neural circuits are most probable to change in the period the neural circuits are maturing. This is simultaneously the period when the neural circuits are most sensitive for experiences of the individual. Therefore, this period is also referred to as the sensitive period.

The second core concept might need clarification. Neural circuits are sensitive in a hierarchical order. First the neural circuits at lower levels are sensitive. These are the circuits which perform more fundamental computations. The sensitive period of the lower level neural circuit close before the sensitive period for circuits at a higher level close (Pascalis et al. 2005; Linkenhoker et al., 2005; DeBello and Knudsen, 2004). This sequencing of sensitive periods is logical, because higher levels in a hierarchy depend on precise and reliable information from lower levels to accomplish their functions the sensitive periods for most lower-level circuits

⁷ This principle stems from two characteristics that are intrinsic to the nature of : (1) early learning confers value on acquired skills, which leads to self-reinforcing motivation to learn more; and (2) early mastery of a range of cognitive, social, and emotional competencies makes learning at later ages more efficient and therefore easier and more likely to continue.

⁸ When a neural circuit is plastic, it is changeable.

end relatively early in life. In contrast, sensitive periods for most higher-level circuits remain open until the individual reaches adulthood (Knudsen, 2004).

The third core concept is the implication of the second and fourth concept. During childhood neural circuits are maturing, and most sensitive for external experiences. The first build, lower level, circuits are essential for the functioning of higher level circuits. The fourth concept elaborates on why early developments are difficult to reverse. The importance of experiences in early life are in line with psychosocial theory that states that the social surrounding of a child are crucial for the development of social preferences by a child (Eisenberg and Mussen, 1989).

Though some neural circuits change throughout human lifetime, many neural circuits have sensitive period when it is particularly prone to the influence of experiences when the circuit is maturing while an individual is a child (Knudsen, 2004). Changes that are made in the neural circuit during the sensitive period are difficult or impossible to change after the sensitive period is closed (Knudsen et al., 2006;Debello et al., 2001)⁹.

2.3.2 A chronological overview of the development of social preferences

Just like most personal characteristics, different social preferences and parochialism are mostly developing in different stages of childhood (Fehr et al., 2008;Almas et al., 2010;Fehr et al., 2011). An overview of the different stages of developing social preferences is given in figure 1. Figure 1 shows that individuals first develop the lower level preferences (spitefulness, selfishness, inequality aversion and altruism) before they develop higher level preferences (parochialism, where one starts to make a difference in social preferences towards in and out-group). This is in line with the second core concept by Knudsen et al. (2006), which implies that the higher level preferences like parochialism, can only optimal develop if the lower level preferences are optimal developed.

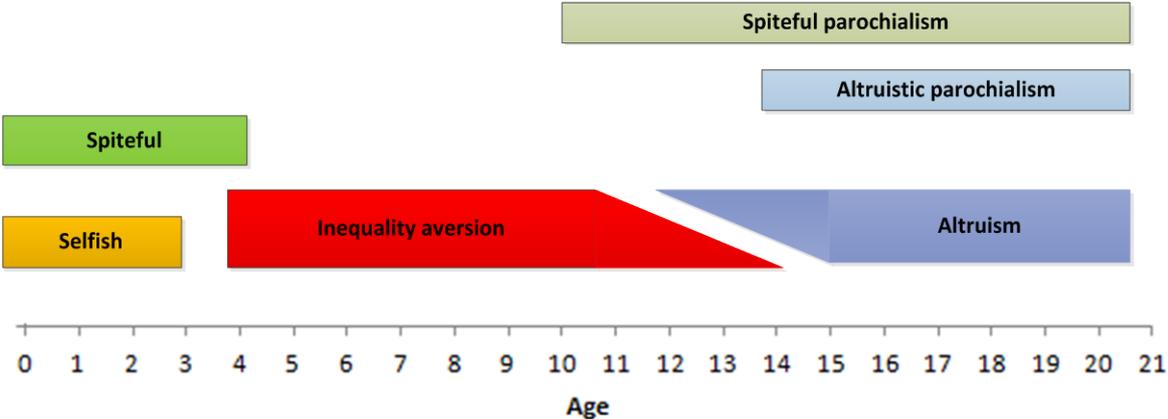


Figure 1. an overview of the development of social preferences in childhood based on empirical research by Fehr et al. (2008), Almas et al.(2010) and Fehr et al. (2011).

First humans develop spitefulness and selfishness. Spitefulness decreases strongly with age (Fehr et al., 2008;2009). Around the age of three humans start to develop inequality aversion (counting both aheadness

⁹ For example, the treatment for a lazy eye or the ability to learn a new language.

and behindness aversion) that peaks at the age of 10 or 11 (Fehr et al., 2008; Almas et al., 2010). When inequality aversion decreases (especially due to the decrease in behindness aversion) altruism gains room to develop during adolescence. In adolescence altruistic behaviour becomes dominant, which contributes to an increase in overall efficiency (Fehr et al., 2011; Almas et al. 2010). Empirically parochial behaviour is shown by Goette et al. (2006), Fehr et al. (2008), Almas et al. (2010) and Fehr et al. (2011). The most recent research by Fehr et al. (2011) focuses on the development of parochial behaviour in childhood and adolescence. Fehr et al. (2011) indicate a less clear trend in development of parochialism in childhood and adolescence than they can indicate for social preferences. When parochialism starts to influence one's social preferences depends on what type of social preferences one considers. Individuals who show spiteful behaviour become hostile parochial towards out-group at the age of 10 and individuals who show altruistic behaviour become favouring parochial towards in-group at the age of 14. Almas et al. (2010) find similar results. Parochial behaviour might show at a later age than other social behaviour because parochialism only shows when one comes in contact with new social groups (Fehr et al., 2011).

2.3.3 Changes in social preferences

When an individual experiences a trauma, like war, the individual attempts to adjust after the trauma. At this point it is appropriate to cite a group of influential scientists in psychiatry and bio-behavioural science: Pynoos, Steinberg and Piacentini (1999, p. 1547):

“Adjustment refers to the child’s ability to tolerate, manage or alleviate on-going psychological, physiological, behavioural and developmental disturbances. Effective adjustment includes the achievement of adequate understanding of the experience and subsequent reactions with as two outcome measures, resumption of age-related developmental progression and acquisition of developmental competencies as well as recovery from traumatic-stress-related symptoms”

Hence a trauma, like war exposure, can disturb the child's on-going developmental processes. When a child is at the age of developing a certain social preference, experiences a trauma and is not able to adjust effectively, the developmental progress of the social preference can be disturbed. Behaviour research confirms that the early years are fundamental for full range of human competencies and are period of heightened sensitivity to the effects both positive and negative experiences (Shonkoff and Philips, 2000). This developmental physiological theory is also in line with empirical relation between age and behaviour found by Miguel et al. (2008). Who found that the younger men are exposed to war the more violent they behave in the football field.

If one goes back to the neurological level, one finds that experiences have the strongest impact on neural circuits during the maturation of the neural circuit (sensitive part) (Bremner and Vermetten, 2001). Two mechanisms are core to this reinforced impact. First, the molecular and cellular mechanisms that intercede neural plasticity during a sensitive period are highly active, enabling circuits to undergo substantial changes in architecture, chemistry and gene expression in response to experiential influences (Hubel et al. 1977; Daw, 1994; Berardi et al., 2000; Knudsen, 2004; Horn, 2004). After a sensitive period has passed, one or more of these critical mechanisms no longer operate or operate less effectively (Knudsen et al., 2006). Secondly the

earliest experience is particularly influential because it has the unique advantage of instructing a pattern of connectivity in a circuit without interference from an already-established pattern. Later experience requires relatively more intensity and tends to be less efficacious (Zheng and Knudsen, 2001; Knudsen, 2004; Hensch, 2005)¹⁰. So, Repeated exposure to stressors early in life has effects on stress responsive neurobiological that persist throughout life (Bremner and Vermetten, 2001). Therefore it is important to consider what is developing and in which stage of development is it at the point the stressor takes place (Nelson and Carver, 1988; Toth and Cicchetti, 1988).

Voors et al. (2011) makes a distinction between a shift in preferences through experience of an individual and that an individual discovers his own true preference through experience. If one combines this with 2.3.1 one can conclude that this study is not discussing a preference shift or discovery of the true social preference, rather this thesis discusses the effect of war exposure on the development of social preferences. The impact of war exposure on social preferences of an individual, depends on how far the social preferences of the individual are already developed.

¹⁰ In parallel fashion, developmental research in humans indicates that there may be sensitive periods in early childhood when greater responsiveness to therapeutic interventions might enhance life-long outcomes and decrease the probability of later mental health problems, such as anxiety or depression (Luby, 2000; Shankoff and Meisels, 2000; Mifsud and Rapee, 2005; Ramey and Ramey, 1999; Belsky, 2006)

3. Research design

This section gives a brief overview of background information, setting, sample, experimental design of this research and concludes with the operationalization of the variable war exposure.

3.1 Background information

This sub-chapter goes into the background of Sierra Leone. Firstly the war history of the entire country of Sierra Leone is outlined, to give insight in the complexity and impact of the civil war¹¹, followed by an outline of the current situation. Secondly, a summary of the war history of the city where the data is collected, Kenema, is presented followed by the current situation in Kenema.

3.1.1 Sierra Leone

Sierra Leone is a West-African country (as one can see in figure 2), recovering from war. Firstly, the war history of Sierra Leone is introduced, followed by insights on the current situation in the country. In conflict studies there are two lines that explain the motivation for civil war in a country, greed and grievance. Though it seems hard to conclude what the motivation was of thousands of individuals, Collier (2002) labels Sierra Leone as a leading example of civil war that was based on greed. Collier underlines this with two arguments. One, the argument that later in the war, the war was financed with diamonds from the country. Two, when the rebel leader (Foday Sankoh) came in power he did not do anything that could take away the grievance. Other scholars see grievance as the cause of the civil war in Sierra Leone (Richards, 1998; Peters, 2011). Probably, both points of view are correct. Only grievance could not have started a war without any financial means to purchase weapons. Greed alone is not enough to mobilize so many people, unless the opportunity cost of rebellion is very low (which will also induces grievance). The presence of natural minerals has a positive impact on the duration of war (Collier and Hoeffler 2004). In the following historical overview an attempt is made to provide a neutral overview of the civil war, without explaining the motivation.



Figure 2. Map of Sierra Leone

Sierra Leone has a history of slavery and a culture of “big men”. Local power is distributed to traditional chiefly authorities which places civilians in a powerless position, depending for land, income and law enforcement on the ruling of men with a high status. Over a period of twenty years before the war started, the central government gradually detached from society, especially from the rural areas (Richards, 1998). Even before the

¹¹In the setting of this thesis it fits best to give a summary of the history of Sierra Leone. For more detailed information on the impact of slavery on pre-war Sierra Leone you can look into Glennerster et al. (2010). For a more detailed on the civil war you can take a look at several papers by Paul Richards.

onset of war, Sierra Leone had the second lowest human development index¹² in the world (UNDP, 1993). Citizens started to distrust the government, and the amount of marginalized young people who had no job opportunity nor access to land increased considerably. This made the country vulnerable to a rebel movement the Revolutionary United Front (RUF), to gather marginalized young people. Until now it has remained unclear whether the RUF was purely a Sierra Leone initiative inspired by the Liberian war, or if Liberians physically crossed the border and kindled the rebellion in Sierra Leone (Glennester et al., 2010).

The civil war began in March 1991. The RUF was gathering armed forces to overthrow the All-party Congress government of President Joseph Momoh. The RUF appeared to be inspired by the *Green Book* by Gaddafi and tried to isolate themselves in the border region in the east next to Liberia, and this would continue to remain their safe heaven. The RUF hired paramilitary forces from Liberia (Glennester et al., 2010). The brutal actions of these Liberian special forces created a gap between RUF and local communities. The RUF abducted members of the socially excluded youth underclass from the isolated east of Sierra Leone. Some of them cooperated to save their own lives, while others agreed with the ideals of the RUF (Richards 1998).

Not long after the start of the war the government turned out to be incapable to handle the RUF. An internal coup took place early in the war, which brought the RUF very close to join the government. The cooperation between the new government and RUF disintegrated, and a new phase of violence started. Due to animosity among troops, payrolls that did not reach the war-front, and because of soldiers and officials unable to resist the attraction of diamonds, the new government lost control over their troops. Still the RUF and government alternately won territory. In the meanwhile Civilian Defence Forces (CDF but, also locally named Tamaboro or Kamajors) began to mobilize themselves to protect rural areas against RUF and corrupt government troops (Richards 1998). CDF were generally civilians and relied primarily on local fundraising for supply. Command and organization was often linked to traditional chiefly authorities and secret religious activities (Ferme, 2001).

In 1995 restlessness inside the government started to take serious forms once again. Mid 1997 the RUF was invited by a new government (based on the original government army before 1992) in Freetown, and the RUF marched into the capital. From there the RUF started to recruit a new RUF/government army named the AFRC. The CDF took over the diamond rich forested parts of the country, pledging to fight to restore the previous government (Richards 1998). Then the Economic Organization of West African States (ECOMOG) led by the armed forces of Nigeria stepped in. The AFRC and RUF junta forces were defeated and driven out of Freetown. In February and March 1998 there was fierce fighting throughout the country as ECOMOG and members of the CDF continued to fight fragments of the AFRC and RUF, particularly in the larger cities outside the capital. However, government and ECOMOG forces failed to gain control of the whole country, and the civil conflict continued throughout 1998. In December 1998 AFRC and RUF rebels infiltrated Freetown and, at year's end, controlled areas close to the capital. Clashes continued to occur between ECOMOG, rebel forces of the RUF,

¹² Measures development by combining indicators of life expectancy, educational attainment and income into a composite human development index, the HDI. The HDI serves as a frame of reference for both social and economic development.

and the AFRC, who attacked and re-entered Freetown in January, 1999. It was to be the saddest period of the ten year old conflict with reprisals and worst human suffering. Following a brutal 1999 rebel attack on Freetown, a large force of United Kingdom and United Nations troops finally brought an end to the war. These foreign troops conducted a disarmament campaign and secured a peace treaty in January 2002 (Bellows and Miguel, 2006).

Sierra Leone's civil war started in 1991 and lasted until early 2002. An estimated 50,000 Sierra Leoneans were killed, over half of the population was displaced from their homes, and thousands were victims of amputations, rapes, and assaults (Human Rights Watch, 1999). During the entire war the troops of many parties were uncontrollable and committed acts of violence against people and their possessions. All parties were attracted by the presence of diamond rich areas, and were distracted from their original goal. For civilians it became unclear where the danger was coming from. In east Sierra Leone there are villages that testify they have been attacked by three different parties¹³ (Sierra Leone data base Voors, 2010).

Current situation in Sierra Leone

While it is still too soon to know if stability has returned to Sierra Leone for good, democratic consolidation appears to be occurring through the peaceful democratic alternation of power (Glennerster et al., 2010) and the majority of the citizens does not expect the war to return¹⁴. In literature a few positive effects of the war on the society are shown. Bellows and Miguel (2006) show that individuals with more war exposure are more likely to vote in Sierra Leone. Bellows and Miguel (2009) show that civil war experiences lead to an increase in individual political participation, community activism and local public good provision. Moreover conflict victims' households are more likely to attend community meetings and join social and political groups, more likely to register to vote, and to sometimes participate in school committees and road maintenance. These individual contributions appear to reflect changes in individual preferences and values (Bellows and Miguel, 2009). Other scholars argue, for example Keen (2005), that civil war transformed society and culture in Sierra Leone in a more negative way. He states that the experience of displacement and partly the exposure to aid organizations seems to have produced, especially among youths, a heightened suspicion among many Sierra Leoneans (Keen, 2005).

Viewed from numerous angles, Sierra Leone is still one of the world's poorest countries. According to the United National Development Program's 2007-2008 Human Development Report, Sierra Leone's human development index in 2005 was 0.336, the lowest score in the world. Per capita GDP (adjusted for purchasing power parity) is US\$806. Life expectancy at birth is 41.8 years, ranking Sierra Leone 173rd out of 177 countries. Child mortality in Sierra Leone is among the highest in the world. More than 17% of the children die before they reaches the age of 5 (UN, 2011). Adult literacy is 34.8%, and while there has been some progress in school enrolment after the civil war, gross secondary school enrolment was only 32 per cent in 2007. Nearly half of

¹³ One of the villages was attacked by the RUF, Liberians and government troops.

¹⁴ Throughout multiple personal conversations citizens of Sierra Leone expressed themselves to be "tired of war", and convinced that the people of Sierra Leone would not let a reoccurrence of war happen.

the population had no access to an improved water source (such as a borehole well, protected spring, or piping) in 2004 (Glennester et al., 2010).

3.1.2 Kenema

Kenema is the third largest city in Sierra Leone, located relatively close to where the civil war in 1991 have flamed up. Around Kenema the first attacks by the RUF started in June 1991, in that year 11 per cent of the participants in our sample left their homes to go to a safer place. In January 1994 the government army (government army after the first coup 1992-1996) gained territory again. For a year the government army and the RUF fought each other around Kenema. In the last registered fight in December 1994 the RUF gained territory, after which there was no fighting for two years. In February 1997 the situation became tense once more, the government army that was formed after the coup in the beginning of the war, was fighting the new “government/RUF army” the AFRC. After the ECOMOG expelled the AFRC from Freetown the ECOMOG fought in July 1997 together with the CDF against the AFRC and RUF troops around Kenema. Almost two years of frequent fights between multiple parties¹⁵ in and around kenema followed. In the years 1996 to 1998 over 38 per cent of the participants in our sample fled their homes. Meanwhile extreme violence occurred against supposed RUF/AFRC supporters among the civilians of Kenema. In the days following the removal of the AFRC and RUF, there were cases of torture and executions. At least 50 people were executed because one had accused them of having supported the AFRC or RUF. Some of them were burned alive (Leboef, 2008). In April 2000 the last fight was registered (Raleigh and Herve, 2005).

Current situation in Kenema

The city houses over 128,402 inhabitants (Republic of Sierra Leone census, 2004). The inhabitants are ethnically diverse, though the Mende make up the largest ethnic group. Also a relatively amount of Lebanese are living in Kenema. Kenema is the major trade and commercial centre of eastern Sierra Leone and the heart of the diamond and timber industry of Sierra Leone. Due to the presence of various colleges, Kenema also gives home to a student population.

3.2 Setting and sample

For our study we invited adolescent football players participating in two different tournaments (in which sixteen teams participated). For both tournaments participating teams had to pay a contribution to be allowed to play. The teams that won the tournaments earned a significant amount of money, so the stakes were high. In both tournaments neutral referees were assigned to ensure that official football rules were followed.

3.2.1 Description Tournament 1

The first tournament took place on a football field in the neighbourhood ‘Reservation area’ in Kenema. Three adolescent ladies organized the football tournament including a closing party event with a beauty contest, weightlifting contest and dance shows.

¹⁵ In chronological order; the Kamajors fighting the RUF, the AFRC fighting ECOMOG, the AFRC fighting the Kamajors, The Kamajors fighting the AFRC and RUF, The AFRC fighting the ECOMOG, the ECOMOG fighting the AFRC, the AFRC fighting the ECOMOG again. Mid 1998 the new government (formed in 1998) army took over the fights against the RUF(Raleigh and Herve, 2005).

The 'football pitch' was a sandy field without lines and with gravel and stones and two goals on it. Within the tournament teams were based on streets in 'Reservation area', i.e. one plays in the team of the street one lives in. A few evenings a week two different streets played a match together. Although all participants knew each other slightly, because they were all from the same neighbourhood, the teams were surprisingly competitive towards their opponents. Of the four matches observed two ended up in loud and aggressive verbal arguments. One of those arguments turned into a physical fight involving sticks.

3.2.2 Description Tournament 2

The second tournament took place at the KDEC-field at a school in Kenema. This tournament was better organized than the previous one. Matches started on time and there were clear lines in and around the field. Just as in the other tournament, not everybody was financially wealthy enough to own their own football shoes. When a player was substituted he had to take off his shoes to hand them over to the player who was going in.

In the KDEC tournament the entrance fee per team and the prize money were considerably higher than in the other tournament. Not only that, also the quality of the game was higher, nevertheless, one out of three matches turned into a bloody fist fight involving more than forty people.

3.2.3 Characteristics sample

This study is based on a dataset gathered by observing field behaviour, doing artefactual experiments and conducting surveys in December 2010. The sample consists of 163 football players between 14- 31 years old, living in Kenema. After seven quarter finals the two playing teams were asked to participate in a survey and artefactual experiments, with the opportunity to earn some money.

Members of a participant's own football team are considered the participants in-group. All the members of the opposing team are considered the participant's out-group. This is a good classification of in out-group form two main reasons. Firstly it are really two groups. Because the experiments were done after the quarter finals each team already played multiple matches as a team. Moreover, the two groups just competed against each other for a big amount of prize money, and therefore likely to be still in a we/ them mind-set. Secondly, the groups are not based on roles during the war. Therefore, social preference we measure will not be the preference towards the in and out-group during the war, but the social preference towards in and out-group in general.

3.3 Experimental design

The participants started with the first part of the survey on personal characteristics, then played the artefactual field experiments¹⁶ and finished with the second part of the survey on war experience. Conducting the survey and games and waiting for the payment all together took one and a half hour. The surveys and game

¹⁶ Besides the dictator game and allocation game we also implemented a risk game and a competitiveness game. Data on these games are not used in this thesis.

instructions were translated to Mende or Krio (depending on the language preferred by the participant) by the research assistants conducting the surveys and games. The order of playing with an in-group or out-group opponent was randomized, so that we do not measure the effect of playing the games twice as difference in treatment towards in and out-group. It was clear for the participants that the experiments were played with real money.

3.3.1 Artefactual field experiments

Dictator game

In the dictator game (Bolton et al., 1998) we asked each participant twice to divide 1000 Le (equal to \$ 0.25 American dollar) among himself and another anonymous football player. There were no options given to choose how to divide the money, the participant was completely free to divide the money in the way he wanted. Once the other person was an anonymous team mate (in-group), and once the other was an anonymous member of the opponent team (out-group).

Allocation games

The allocation games consisted of 4 allocations, the costless sharing game, costly sharing game, costless envy game and costly envy game (based on Fehr et al., 2008). An overview is shown in table 1. All the allocations consisted of an egalitarian allocation and one other not egalitarian allocation. In the costless sharing game the participant chose between the allocation A (1000, 1000) and B (1000, 0). Allocation A is the egalitarian allocation in which the participant himself and the anonymous player the participant was linked to, would receive 1000 Le. Allocation B means that the participant himself received 1000 Le and the anonymous player the participant was linked to would receive nothing. In the costly sharing game the participant had to choose between allocation A (1000, 1000) and allocation B (2000, 0). This game measures motives to reduce advantageous inequalities. Allocation A was here the egalitarian option, and provides a benefit to an anonymous partner at the cost of the participant himself, a selfish person would never choose this allocation.

In the costless envy game the participant could choose between allocation A (1000, 1000) and allocation B (1000, 2000). In the costly envy game the participant could choose between (1000, 1000) and allocation B (2000, 3000). If a participant would be completely homo economicus he would choose allocation B where he will get the highest benefits, but it leads to a disadvantageous inequality for the decision-making participant. Choosing the egalitarian option shows that one is willing to pay reduce disadvantageous inequality.

Table 1. Allocation game overview

	Game	Allocation A		Allocation B	
		SELF	OTHER	SELF	OTHER
1	Costless sharing	1000	1000	1000	0
2	Costly sharing	1000	1000	2000	0
3	Costless envy	1000	1000	1000	2000
4	Costly envy	1000	1000	2000	3000

Each participant made these choices twice. Once he knew he was linked to an anonymous player of his own team (in-group), and once he knew that he was linked to an anonymous player from the opponent team (out-group). In what order a participant was playing with in- or out-

group was randomly divided among the participants. The distribution type of a participant can differ among the two allocation games. One individual can be selfish toward his in-group, while the same individual can be egalitarian towards his out-group. Before the participants started with the game they were notified that they would only get paid from one of the choices they make, when they finished the surveys and games there was a transparent lottery to determine what choice would be paid to them.

With the combination of the different allocation games we categorize the participants into one or more types. In table 2 is shows how we categorize them. Aheadness averse individuals choose the egalitarian option in the costly sharing game and the costless sharing game, that is in games in which they can reduce advantageous inequality. Behindness averse types choose the egalitarian option in the costly envy game and the costless envy game, that is in games in which they can reduce disadvantageous inequality. Inequality averse types choose the egalitarian option in all four games. Generous subjects always choose the allocation that maximize payoff of their partner, even at their own costs. Spiteful subjects choose the allocations that minimize payoff of their partner. Selfish subjects maximize their own payoff (Bauer et al. 2010).

Table 2. Distributional behaviour types

Types	Costly sharing game	Costless sharing game	Costly envy game	Costless envy game
	<i>(1000, 1000)</i> vs. <i>(2000, 0)</i>	<i>(1000, 1000)</i> vs. <i>(1000, 0)</i>	<i>(1000, 1000)</i> vs. <i>(2000, 3000)</i>	<i>(1000, 1000)</i> vs. <i>(1000, 2000)</i>
Aheadness averse	(1000, 1000)	(1000, 1000)	Any	Any
Behindness averse	Any	Any	(1000, 1000)	(1000, 1000)
Inequality averse	(1000, 1000)	(1000, 1000)	(1000, 1000)	(1000, 1000)
Generous	(1000, 1000)	(1000, 1000)	(2000, 3000)	(1000, 2000)
Spiteful	(2000, 0)	(1000, 0)	(1000, 1000)	(1000, 1000)
Selfish	(2000, 0)	Any	(2000, 3000)	Any

3.3.2 Survey

The first part of the survey focused on demographics and how the participants relates to his football team. The demographics part contains questions on age, height, education, religion, ethnic group, indications of financial

wealth (like amount of phone use, how many meals they have a day and whether or not they have a job, the complete survey questions are located in appendix B). With this data we control for variables, besides war exposure, that could possibly explain participants their social preferences. Questions about their football team tell us how many times they played with their team, if they scored, position in the field, how many fault cards they had, if they consider themselves competitive and how good football players they are in comparison with their team mates. These indicators will give an insight how bound the participants are to their football team, how euphoric they are during the survey, if the position one plays says something about one's preferences, if self-image or competitiveness is in line with the results and how confident they are. This gives us the chance to link the experiment results with real life characteristics.

The second part of the survey focuses on witchcraft and warfare exposure, and contains questions on violent movies, witchcraft, displacement, hearing fighting, seeing fighting, seeing an injured person, being injured during the war, injuries and losses. The first questions serve to measure whether war exposure has influence on belief in witchcraft, and the amount of violent movies someone watches. The latter questions give us an indication to what extent a person was exposed to war.

3.4 Operationalizing variables

In this section the use of the independent variables war exposure, age, education, financial wealth, and winning or losing of the football match is explained.

3.4.1 Operationalizing war exposure

This subchapter introduces the measurement of war exposure. First, other literature is discussed that tries to measure the effects of war exposure on behaviour of an individual. Because methods used in the discussed literature have shortcomings and/or are not applicable to our study, we introduce a new model to measure war exposure.

Attempts to measure the effect of war on social behaviour

There are several ways to define war exposure. Bauer et al. (2010), for example, define subjects a victim if they have heard fighting. If we follow this example all participants in our sample (in fact all the inhabitants of Sierra Leone) would be indicated as victim. Considering this, a more specific definition seems appropriate. For an accurate measurement effect of being war-exposed it would be more appropriate if the variable showing victimization is not just a dummy variable, but can show nominal levels of war exposure. Bauer et al. (2011) in a later article and Bellows an Miguel (2009), focussing on Sierra Leone, improve on the measurement of war exposure. They measure three levels of war exposure. If participants have not lost any household members during the war, and none was injured, the participant is considered 'least-affected'. If a household member of the participant was injured or killed the participant is considered 'mid-affected' and if the participant has both, lost any household member and any household member of the participant was injured, the participant is considered 'most affected'. So how much a subject is considered war exposed depends strongly on the experience of household members. Though the nominal measurement is an improvement this approach still has severe shortcomings. Psychological literature shows that different types of war exposure differ in intensity

of effect on the individual who has been war-exposed (Macksoud and Aber, 1996; Allwood et al., 2002; Harel Fisch et al., 2010). The models used by Bauer et al. (2010;2011) and Bellows an Miguel (2009) miss out on the effect of personal direct war exposure and the different effects several types of war exposure have, e.g. the effect of witnessing violence, being injured yourself, whether your parents fought and whether you were displaced.

Because of the non-existence of an appropriate model to measure the effect of war exposure on behaviour on the individual level in social economic literature, the following sub-chapter explores the body of psychological literature on this subject before we create a model that can measure war exposure in a more appropriate manner.

Psychological literature on the effects of different types of war exposure

As described above, we set out to make a model to measure war exposure that takes into account the fact that different traumas differ in the intensity of their effect on social preferences. Therefore we focus first on what type of war exposure has an intense effect on social preferences.

This subchapter first introduces an article by Macksoud and Aber (1996) on the effect of different types of war exposure on social preferences. Because there is no other literature that focuses particularly on the effect of different types of war exposure on social preferences, the rest of this sub-chapter will focus on the effect of different types of war exposure on mental health and behaviour in general.

Macksoud and Aber (1996) use the Childhood War Trauma Questionnaire (CWTQ)¹⁷ (by Macksoud, 1992) to assess children's exposure to war traumas. They divide types of war exposure into four different types¹⁸; active involvement, experience of loss, passive involvement and limited involvement. Results show *active involvement* -this involves: separation from parents, victim of violence and involvement in hostilities- has most influence on pro-social behaviour¹⁹, although only separation is a war exposure type in *active involvement* that is significantly associated with pro-social behaviour. Witnessing violent acts by itself (in the passive involvement factor) is also significantly related to pro-social behaviour. Bauer et al (2010;2011) and Bellows an Miguel (2009) miss the effect of the just mentioned types of war exposure on social preferences. Unfortunately there

¹⁷The CWTQ is constructed as a semi structured interview on demographic variables and the occurrence of 45 traumas during the lifetime of a child.

¹⁸The 45 traumas indicated by the CWTQ can be grouped under 10 different trauma categories. A principal component analysis with varimax rotation was performed on a sample in order to explore empirically the factor structure underlying the 45 traumas. This conducted eleven factors that were similar to the 10 categories in the CWTQ. They assessed for each child the type of war traumas experienced by checking whether a child had experienced each of the 10 trauma categories. For each of the trauma categories the child was given a score of 1 if at least one of the traumas in that category had occurred. To determine whether children's war experience fell into theoretically meaningful patterns of experiences a principal component varimax was used to determine the factor structure underlying the 10 war trauma categories. This created 4 different factors; active involvement, experience of loss, passive involvement and limited involvement.

¹⁹ A comment has to be made, pro-social behaviour is determined Macksoud and Aber (1996) by asking questions comparable to: 'Are you helpful towards other children?' Because this is a question very sensitive for individual interpretation, we do not consider this a accurate measure and therefore we use artefactual experiments to find the true social preferences.

is no other psychological literature on the effects of specific traumas on social preferences at an individual level. Therefore we will focus on the traumas that have a leading impact on individuals in general.

Allwood et al. (2002) studied the relationship of violent and non-violent war experiences to children's trauma reactions and adjustment in a group of children from Bosnia²⁰. Violent events like being threatened, witnessing killing or wounding, and death of a friend or family member has the most effect on Impact of Event Scale, PTSD (post-traumatic stress disorder), attention problems, delinquent behaviour and being anxious/depressed. Again a lot of types of war exposure that have an intensive impact on an individual are not included in the model used by Bauer et al (2010;2011) and Bellows and Miguel (2009).

Although above discussed literature already includes more aspects of war exposure than social economic literature, Harel Fisch et al. (2010) consider even more aspects. Harel Fisch et al. (2010) focus on cross cultural differences in the relation between (1) frequency (how many times did it happen?), (2) intensity (how close to you did it get?), and (3) subjective threat²¹ (how much were you afraid?) of war trauma and mental and behavioural effects. For intensity they use a 'Guttman-Scale' approach of 5 questions, the higher the intensity of the question the higher score is given if the question is answered 'yes'. We will use the previously explained variable in the following way. (1) frequency, we are dealing with a war that lasted ten years, because of this long duration, people are more frequently exposed to violence and find it hard to remember the (1) frequency of events in their childhood, this would give us a biased indication of impact. So just like Macksoud and Aber we choose the options occurrence and no occurrence. (2) Intensity we consider an appropriate indicator, we will use three levels of intensity. (3) Subjective threat is about self-indicated emotional experience by the participant, this seems a variable that is too sensitive for personal characteristics and interpretation. Since we work with adolescents we think it is even harder to get a correct and honest indication that is applicable in one scale of fear.

Harel Fisch et al. (2010) emphasize the importance of maintenance of social network during conflict, especially the importance of children staying with their parents. This relation is also emphasized in other literature like, Macksoud and Aber (1996), Elbedour et al. (1993) and Freud and Burlingham (1943). Since there is also a strong connection between people surrounding a child and social behaviour developed by the child (Fehr et al. 2008) we do want to take the social environment into account while indicating to what extent somebody was exposed to war. We will do this by including the following indicators: *if the participant was displaced during war, whether his parents fought in the war and whether the participant lost any family members in the war.*

²⁰ It is a study of trauma experience and response, in which assessment questionnaires are used (Impact of Event Scale, PTSD Reaction Index, Children's Depression Inventory, Child Behaviour Checklist, and War Experience Questionnaire). To measure war experience they used The War Experience Questionnaire, which includes 14 items assessing demographics, current living arrangements, and events experienced during war

²¹ For (3) subjective threat they have the perceived fear scale with 5 different scales (scored from 0 to 4) of fear for each intensity question. When the questions are answered they multiply the score of each intensity question with the score on the perceived fear scale. The sum of those multiplies gives the indication of victimization (maximum of 60).

These questions are not only indicative for the stability of the social environment of the victim, they are also war exposure intensity indicators.

A new model to measure war exposure

With a short summary of the above literature a new model for a nominal measurement of war exposure will now be introduced. Contrary with Bauer et al. (2010) we do not want binominal values of being a victim or not, but we wish to create a nominal value that can show different levels in war exposure. Just like Harel-Fisch et al. we wish to assign different intensity values to different types of trauma, so that ‘see fighting’ does not result in the same level of warfare exposure as having one of your parents killed in war. We are dealing with victims of a civil war that lasted ten years (which means events probably happened often), ten years ago (which will give the bias of the memory). Therefore we do not take the frequency of traumas into account. Because we are dealing with a sensitive theme that happened more than a decade ago there is a chance people are not willing to tell the truth, or do not know the accurate truth. To avoid biased answers we intend to use questions that are not shameful or extremely painful or complicated to answer.

Taking these requirements and the impact of different traumas attended in psychological literature (Allwood et al. 2002;Harel-Fisch et al. 2010; Durakovic-Belko et al. 2003; Smith et al. (2002); Macksoud and Aber 1996) into account we come to the following model. With this model not all traumas are given the same weight. The nominal scale is in our model not just based on two question, but on a series of eleven questions, which leads to a more correct interpretation of reality.

The categorisation of war exposure is determined by three levels of trauma intensity. These levels of intensity are based on literature. Every trauma is valued, the intensity value of each trauma is showed in table 3.

Table 3. Trauma typology

Trauma type with intensity level 1	Trauma type with intensity level 2	Trauma type with intensity level 3
Hear fighting	Was injured	Mother died
See fighting	One of Parents fought during war	Father died
Saw injured person	Grandmother or grandmother parents died	
Was displaced	Uncle or aunt died	
	Brother or sister died	

In order to determine whether children’s war experiences fell into theoretically meaningful patterns of experiences, a principal components analysis with varimax rotation was used to determine the factor structure underlying the 3 trauma categories. Using the Kaiser criteria (with an eigenvalue above 1), three factors were extracted and subjected to a varimax rotation. The results are presented in Table 4.

Table 4. Principal component analysis of war trauma types, with varimax rotation, values above 0.25 are shown.

Variable	Comp1	Comp2	Comp3
Heard fighting	0.49		
Saw fighting	0.39		
Saw soldier	0.48		
Saw injured person	0.53		
Was injured		0.59	
Parent fought		0.63	
Family died (not parents)		0.42	-0.53
Parent died			0.79
Times displaced	0.30		

Three factors accounted for 60.7% of the variance in the correlation matrix. Participants with a relative high scores on factor 1 have been exposed to hear and see fighting, see an injured person and being displaced. This can be labelled as light exposed. Participants with high scores on factor 2 have been exposed to being injured themselves, parents who fought in the war, the death of a grandparent, uncle or aunt, or the death of a brother or sister. This factor can be labelled as medium exposed. Finally, Participants with a high score on factor three have experienced the death of at least one of his parents. This factor represents heavily exposed. The co-occurrence of the different trauma's underpins that those traumas are put together in the same category based on literature.

From the categorisation of trauma the next steps are done. If a participant experienced a trauma of intensity level 1 the trauma is valued with 1. If a participant experienced a trauma of intensity level 2 the trauma is valued with 2. If a participant experienced trauma of intensity level 3 the trauma is valued with 3. The sum of the intensity values gives the total trauma intensity measure. If a participant has a total trauma intensity measure below 4 the participant is considered to have a war exposure level of 1. If a participant has total trauma intensity measure of 4 or 5 the participant is considered to have a war exposure level of 2. If a participant has total trauma intensity measure above 5 the participant is considered to have a war exposure level of 3. We do not consider level 2 exposed to war subjects to two times more exposed than level 1 exposed subjects. Neither do we consider level 3 exposed subject one and a half more times more exposed to war than level 2 war exposed subjects. Therefore war exposure will put into the regression as a dummy variables. Level 1 will be in the base and war exposure level 2 and 3 will be in the regression.

3.4.2 Operationalizing other characteristics

In this sub-section is explained how independent variables age, education, financial wealth, won and lost, self-image, self-indicated competitiveness and attachment to team are measured.

Age; We asked for the age of each participant.

Education; Each participant is asked for his highest education level. The education system in Sierra Leone is organized as shown in figure 3 Different levels of education are given following values: jss2=1, jss3=2, sss1=3, sss2=4, sss3=5 high school level exams=4 tertiary education=6.

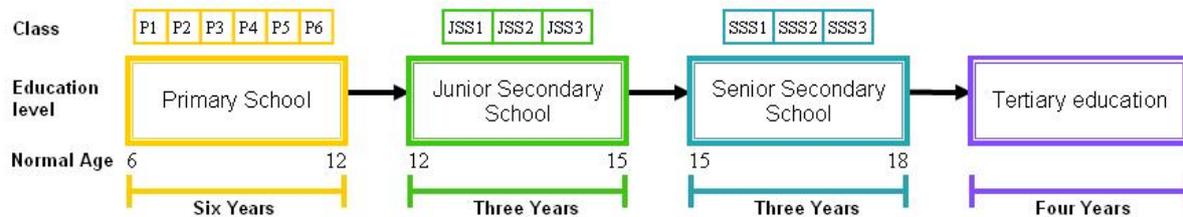


Figure 3. Education system of Sierra Leone

Financial wealth; This variable is the sum of standardized amount of meals a day the participant has, a standardized amount the participant spends on phone credits and a standardized value of the participant having a job or not.

Won, lost or draw; Is valued zero when the participants team lost the football match. When the participants played draw this is valued with value 1. When the participants team won the football match this variable will get value 3.

4. Descriptive results

This section presents the descriptive summary statistics of the experimental subjects. The descriptive summary statistics of the independent variables are shown in table 5. The following variables are presented in the descriptive summary in table 5: war exposure, age, age during war exposure, financial wealth, education. After an explanation of the independent variables follows an overview of the underlying relation among independent variables. Followed by the descriptive results of the dependent variables that are formed with the experimental results, concluding with by a comparison of the results of the dictator game and the allocation game.

Table 5. Descriptive results independent variables.

Variable	Obs	Mean	Std. Dev.	Min	Max
Personal characteristics					
War exposure	162	1.96	0.82	1	3
Age	162	19.75	3.44	14	31
Age war	127	6.59	4.13	0	19
Education	160	4.51	0.98	1	6
Financial wealth	154	-0.058	1.85	-3.07	9.82
Win	162	1.38	1.30	0	3

4.1 Descriptive results independent variable

All war exposure levels of war exposure are almost equally represented in the sample as one can see in figure 4. 33% of the sample has been exposed to war on a level 1, 35% of the sample has been exposed to war on a level 2, 32% of the sample has been exposed to war on a level 3. As shown in table 5, the average age of the sample is around 20 years (with a st.dev. of 3.4). On average the participants experienced war exposure when they were 6.6 years old (with a standard deviation of 4.1). Figure 5 gives an indication of in what year participants were war exposed or displaced. The peaks in figure 5 are in line with the dates Kenema was attacked, as described in 3.1.2

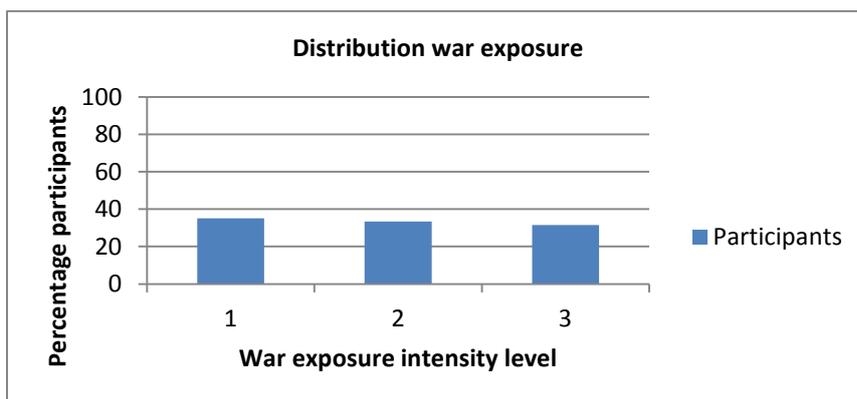


Figure 4. Distribution participants by war exposure level

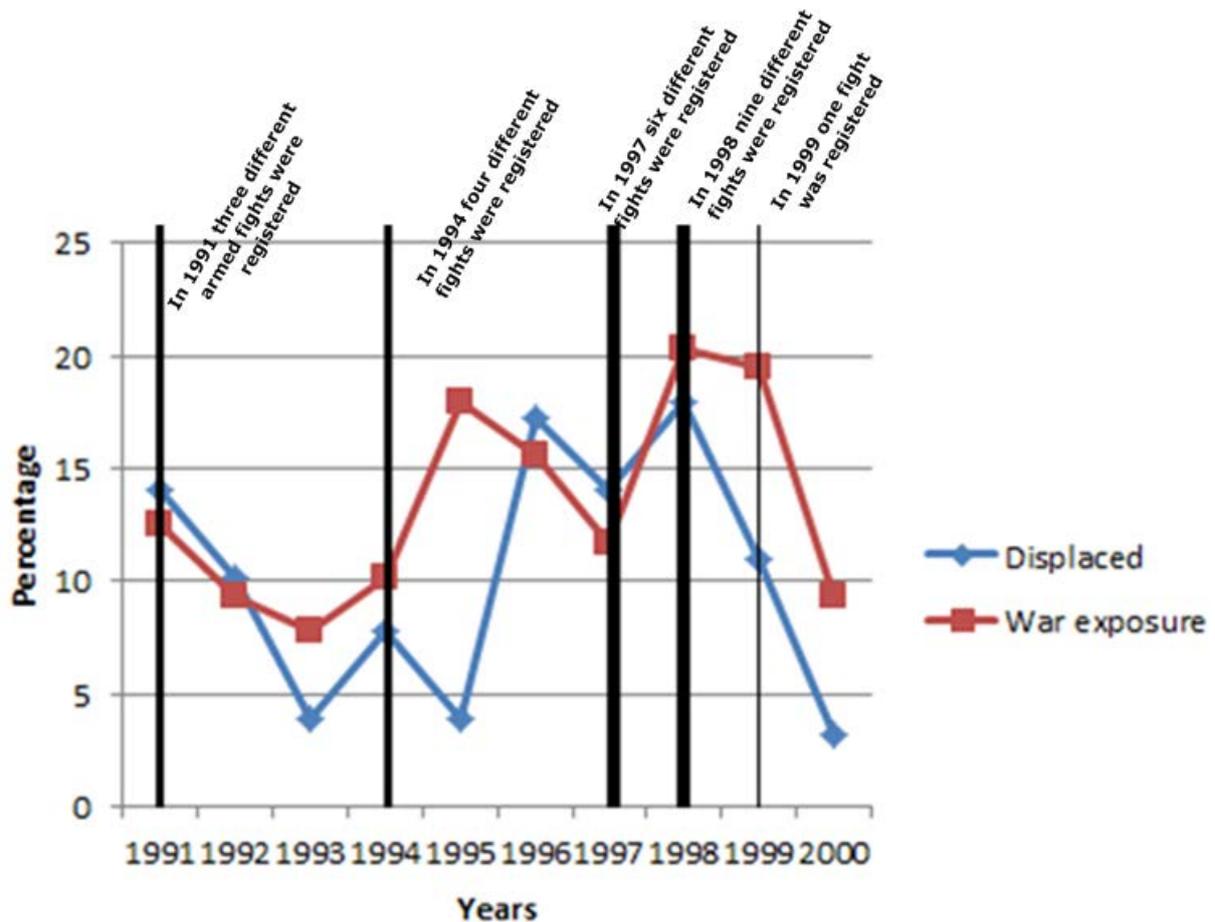


Figure 5. An overview of when what percentage of the sample was war exposed or displaced. The vertical black lines show when fights took place in Kenema registered (Raleigh and Herve, 2005).

Another personal characteristics variable is financial wealth. This variable is a combination of questions on how many meals the participants eat a day, how much they spend on phone credits and whether they have a job or not. Financial wealth is unequally divided with especially peaks with participants that have higher incomes than average. The average highest education level of the participants is the second class of senior secondary school. All participants have at least enjoyed the second class of junior secondary school.

Of the seven matches that were played, 3 matches ended in a draw. One of those draws had as result that one of the teams could go to the next round, therefore the continuing team is marked as a winning team, and the team that dropped out as losing team

4.2 Underlying relations

There are a few correlations between the above mentioned variables (which are presented in table 6). War exposure is not significantly related to the other independent variables. Boys of an older age have more financial wealth enjoyed more education. As expected age is correlated with age during war exposure. The attacks on Kenema were concentrated on certain dates, age during those attacks are related to current age.

Because the concentrations of attacks on Kenema are now a particular time ago, the older a participant was during war exposure the older a participant is now.

A other correlation is that the older a participant is the more his football team won the football match played before the experiment. This can be explained by the possibility that boys of similar age play together in one football team. The older a participant is the higher the chance he has more years experience in football, and therefore is a better football player. This makes older football teams more likely to win. Age during war exposure has similar, but weaker, correlations with the other independent variables as age has.

Table 6. Correlation coefficients

Variable	War exposure	Age	Age war	Education	Financial wealth	Win
War exposure	1.00					
Age	0.07	1.00				
Age war	0.03	0.75*	1.00			
Education	-0.03	0.41*	0.32*	1.00		
Financial wealth	0.05	0.46*	0.33*	0.05	1.00	
Win	0.00	0.16*	0.17*	-0.05	0.12*	1.00

Robust standard errors in parentheses * $p < 0.05$

4.4 Descriptive results dependent variable

In table 7 the descriptive results of the dependent variables are presented. Part A of table 7 shows that when in and out group are not taken in to account, participants give on average 471 Leones to their opponent, with a relatively low std. dev. (137.52, which is 13.7 % of the total optional amount to give away). This indicates that there is little variation in the amount given away by the participant. The same hold for the amount given when we do take in and out-group into account, the division of money rarely divers from a ‘fifty-fifty’ division. Figure 6 shows the average amount given, depending on the level of war exposure. Participants who have been war exposed on level 3 give

2.7 % of the whole amount, less to their game partner than participants who have been level 1 war exposed. Participants give 7.6 % of the whole amount, more to the in-group than to the out-group. It is shown in figure 6 that when one considers the difference

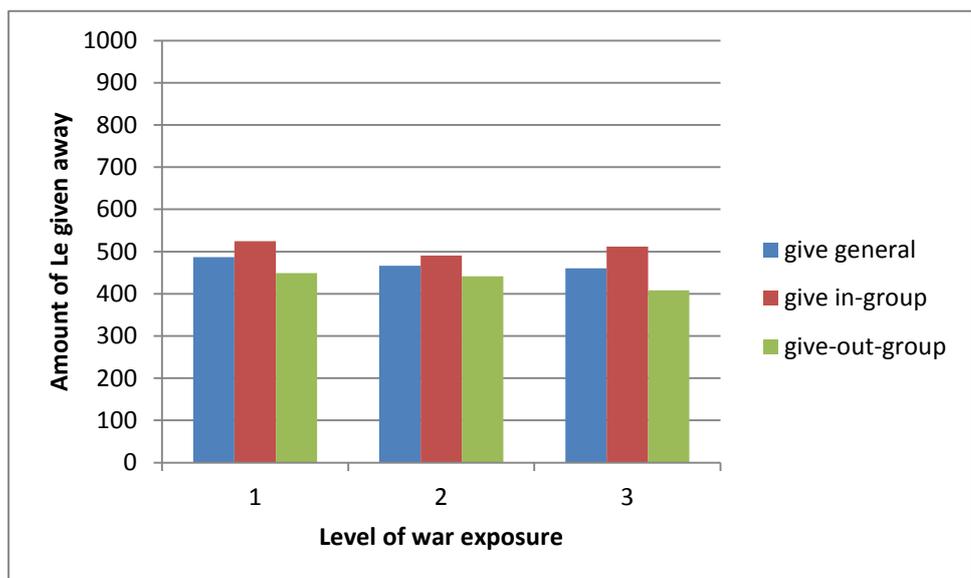


Figure 6. The distribution of giving in the dictator game in relation to war exposure

in giving towards in and out group and the different levels of war exposure, that difference between in and out-group is fluctuating lightly. Level 1 war exposed participants make a 7.5% difference between in and out-group, level 2 war exposed participants make a 5.0% difference between in an out-group, and level 3 war exposed participants make a 10.4 % difference between in and out-group. Even when we do consider in and out-group, participants stay very we close to a 'fifty-fifty' division. The small and contrasting effect measured makes one wonder if this is the correct game to measure the true social preferences of individuals. A experiment with higher stakes and fixed options seems more appropriate to measure real life social preferences.

Table 7. Descriptive results dictator game and allocation game

Variable	Obs	Mean	Std. Dev.	min	Max
A. Dictator game					
Give in general	324	471.45	137.52	0.00	1000
Give to in-group	162	509.26	111.35	100.00	1000
Give to out-group	162	433.64	150.55	0.00	800
B.1 Allocation game in general					
Costly sharing game	324	0.85	0.36	0.00	1
Costly envy game	324	0.66	0.47	0.00	1
Costless sharing game	324	0.78	0.41	0.00	1
Costless envy game	324	0.79	0.41	0.00	1
B.2 Allocation game with in-group					
Costly sharing game	162	0.90	0.31	0.00	1
Costly envy game	162	0.60	0.49	0.00	1
Costless sharing game	162	0.83	0.38	0.00	1
Costless envy game	162	0.73	0.45	0.00	1
B.3 Allocation game with out-group					
Costly sharing game	162	0.80	0.40	0.00	1
Costly envy game	162	0.73	0.45	0.00	1
Costless sharing game	162	0.74	0.44	0.00	1
Costless envy game	162	0.85	0.36	0.00	1
C.1 Types in general					
Inequality averse	324	0.44	0.50	0.00	1
Aheadness averse	324	0.72	0.45	0.00	1
Behindness averse	324	0.60	0.49	0.00	1
Generous	324	0.13	0.33	0.00	1
Spiteful	324	0.06	0.25	0.00	1
Selfish	324	0.06	0.24	0.00	1
C.2 Types towards in-group					
Inequality averse	162	0.40	0.49	0.00	1
Aheadness averse	162	0.78	0.41	0.00	1
Behindness averse	162	0.52	0.50	0.00	1
Generous	162	0.18	0.38	0.00	1
Spiteful	162	0.04	0.19	0.00	1
Selfish	162	0.05	0.22	0.00	1
C.3 Types towards out-group					
Inequality averse	162	0.48	0.50	0.00	1
Aheadness averse	162	0.67	0.47	0.00	1
Behindness averse	162	0.68	0.47	0.00	1
Generous	162	0.07	0.26	0.00	1
Spiteful	162	0.09	0.29	0.00	1
Selfish	162	0.07	0.26	0.00	1

The allocation game is played with bigger amounts (up to 3000 Le). During this game the participant has to choose between two stated options, of which one is an egalitarian choice. These options force the participant to make a clear choice. Part B1 of table 7 shows that the choices made in the in the allocation have a much bigger variation of choices made in the dictatorgame (for example a mean of 0.66 and a std. Dev. Of 0.47). Figure 7 shows average of egalitarian choices made in the allocation games depending on the level of war exposure and if the participant plays with a in-group or out-group member. Here we see a higher variation in answers. The combination of the allocation games is a better parameter to measure social preferences for two main reasons. Firstly, the higher potential earnings and fixed options show a clearer pattern in the social preferences of the participants. Secondly, the combination of the four allocation games make a more detailed interpretation possible. Therefore we will only show the results of the allocation games in the experimental results.

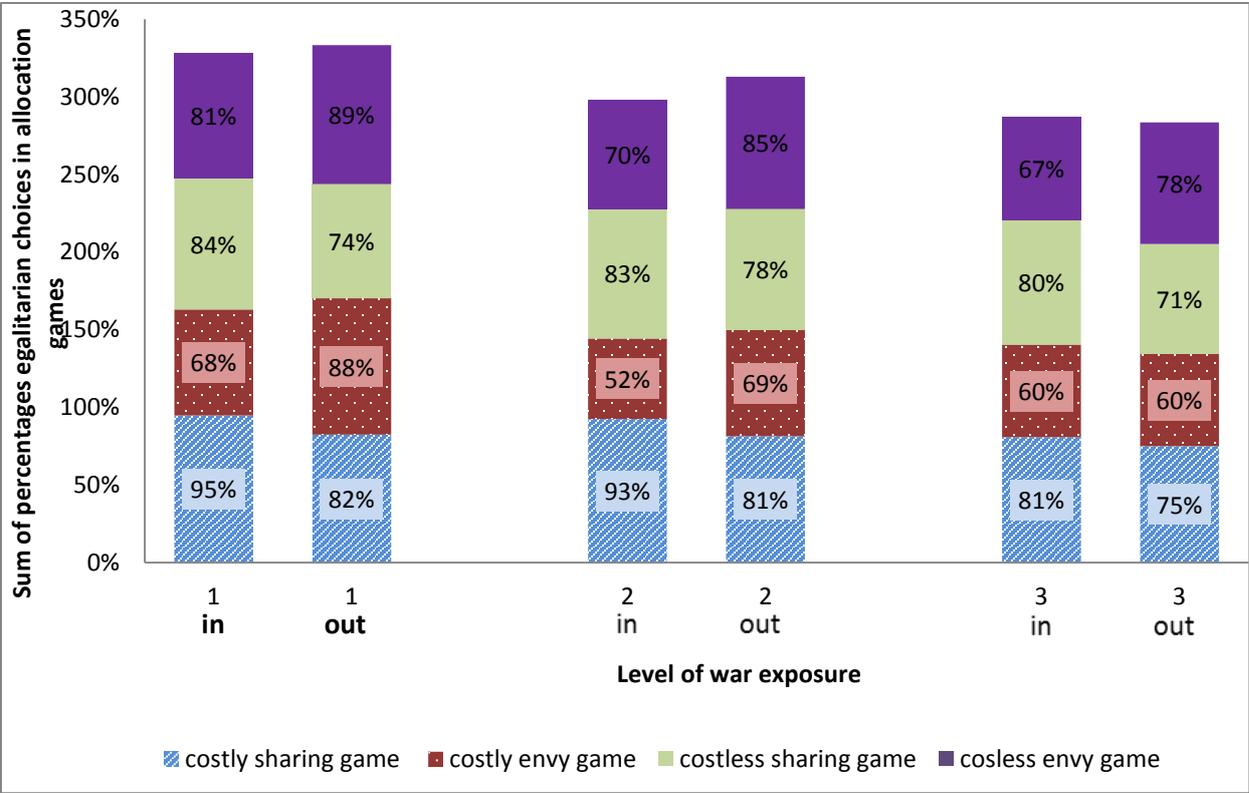


Figure 7. Percentages of egalitarian choices made in the allocation games in relation to war exposure and in and out-group.

5. Experimental results

In this section the results will be discussed to answer both research questions. First the research questions will be broadly answered on the basis of the allocation games. The separate allocation games form the different social preference types. With these social preference types the two research questions will be answered in more detail. In both sub sections we will firstly focus on the research question about the effect of war exposure on social preferences. Based on Miguel et al. (2008), Bellows and Miguel (2006;2009), Bauer et al. (2010;2011) and Voors et al. (2011) our hypothesis is that war exposure changes social preferences. Secondly we focus on the second research question about the effect of war exposure on parochialism. Or, in different terms, whether war exposure makes adolescent men more pro-social to the in-group and anti-social to the out-group. Based on Choi and Bowles (2007) we expect war exposure to increase parochialism. In sub-chapter 5.3 we interpret the results, in 5.4 we explore the robustness of the results.

In order to answer the research questions we use multinomial logistic, multivariate probit, trivariate probit, bivariate probit and probit regressions. In all regressions we use one, several or all of the following models:

$$I: Y_i = \beta_0 + \beta_1 * WE + \varepsilon$$

$$II: Y_i = \beta_0 + \beta_1 * WE + \beta_2 * A + \beta_3 * E + \beta_4 * W + \beta_5 * M + \varepsilon$$

$$III: B_i = \beta_0 + \beta_1 * WE + \varepsilon$$

$$IV: C_i = \beta_0 + \beta_1 * WE + \varepsilon$$

$$V: Y_i = \beta_0 + \beta_1 * W + \beta_2 * D + \varepsilon$$

$$VI: Y_i = \beta_0 + \beta_1 * WE + \beta_2 * D + \beta_3 * DWE2 + \beta_4 * DWE3 + \varepsilon$$

$$VII: Y_i = \beta_0 + \beta_1 * WE + \beta_2 * D + \beta_3 * DWE2 + \beta_4 * DWE3 + \beta_5 * A + \beta_6 * W + \beta_7 * W + \beta_8 * M + \varepsilon$$

Whereby Y_i can be the egalitarian choice in the costly sharing game, costly envy game, costless sharing game, costless envy game or one of the social preference types; inequality aversion, aheadness aversion, behindness aversion, generosity, spitefulness and envy.

WE = war exposure

A= age

E= education

W= financial wealth

M= whether the team of the participant won the just played football match

D=in-group dummy

*DWE2= in-group dummy * war exposure level 2*

*DWE3= in-group dummy * war exposure level 3*

Model I shows the effect of war exposure on Y_i without controlling for different preferences towards in and out-group, or other personal characteristics. In model II is as well no control variable included for the difference in preferences towards in and out-group, but we controlled for personal characteristics. In model III and IV the preferences towards in and out-group are considered separately. In model III B_i can be the egalitarian choice in the costly sharing game, costly envy game, costless sharing game, or costless envy game or one of the social

preference types; inequality aversion, aheadness aversion, behindness aversion, generosity, spitefulness and envy, towards the in-group. In Model IV C_i represents the same as B_i , but towards the out-group. In model V an in-group dummy is included, to control for the effect of different social preferences towards in-group and out-group members. In model VI the interaction terms in-group dummy * war exposure level 2 and in-group dummy * war exposure level 3 are introduced. Model VII is similar to model VI, but additional also controls for personal characteristics.

5.1 Allocation games

To explore what types of social preferences are most influenced by war exposure we start with the results of the allocation games. To measure the effect of war exposure on the choices made in the allocation games we use a series of multivariate probit models, this model takes underlying relations between choices made in the different games into account. Within this model we use the seven models as explained in the introduction. The results of the effects of war exposure on the costly sharing game, the costly envy game, the costless sharing game and the costless envy game are shown in table 8.

5.1.1 War exposure and allocation games

Especially in the costly games there are significant effects of independent variables on the choices made in the allocation games. One can assume this is caused by the fact that the participants actually miss out on money by choosing one of the options, this makes the options in the costly games more distinguishable. Participants who have experienced more war exposure are less likely to be costly sharing or to be costly envy. This implies that the more one has been exposed to war the less one is willing to pay to reduce inequality. Therefore this can be considered as a decrease in inequality aversion. This is in line with the hypotheses that war exposure changes social preferences.

Result 1: War exposure has a negative impact ($p < 0.05$) on costly sharing and costly envy.

5.1.2 War exposure and parochialism in allocation games

When we focus on column III and IV we see that war exposure especially has a diminishing effect on costly sharing when participants play against a member of the in-group, war exposure has especially a diminishing effect on costly envy when participants play against the out-group. When we consider the interaction term of in-group and war exposure (column VI and VII) it shows that while participants in general are more costly sharing towards in-group ($p < 0.01$), war exposure diminishes the difference made between in and out-group ($p < 0.1$). On costly envy we see similar effects. While participants normally are less costly envy towards the in-group ($p < 0.05$), participants who have been level 3 war exposed make a smaller difference between in and out-group. This is in contrast with the hypothesis that war exposure has an increasing effect on parochialism. On the choices made in the costless games we see no effect of war exposure. For further interpretation we will look at the social preference types that are based on six different combinations of the allocation games.

Result 2: Level 3 war exposure has a decreasing impact ($p < 0.1$) on parochialism in the costly sharing and costly envy game

Table 8. War exposure and allocation games in a series of multivariate probit regressions							
A. Costly sharing	I	II	III	IV	V	VI	VII
War exposure level 2	-0.102 (0.23)	0.0441 (0.27)	-0.135 (0.36)	-0.0786 (0.28)	-0.101 (0.24)	-0.0746 (0.27)	0.168 (0.32)
War exposure level 3	-0.453** (0.22)	-0.498** (0.22)	-0.696** (0.34)	-0.301 (0.27)	-0.463** (0.23)	-0.299 (0.27)	-0.274 (0.27)
In-group dummy					0.433*** (0.15)	0.626** (0.29)	0.912*** (0.32)
In-group * w.e. 2						-0.0687 (0.40)	-0.402 (0.44)
In-group * w.e. 3						-0.414 (0.39)	-0.699* (0.42)
Constant	1.214*** (0.17)	-0.175 (0.79)	1.568*** (0.27)	0.962*** (0.20)	1.026*** (0.18)	0.957*** (0.20)	-0.548 (0.82)
B. Costless sharing							
War exposure level 2	0.0574 (0.23)	0.173 (0.25)	-0.0335 (0.27)	0.115 (0.26)	0.0580 (0.24)	0.117 (0.26)	0.217 (0.27)
War exposure level 3	-0.0886 (0.23)	-0.171 (0.24)	-0.0894 (0.27)	-0.0927 (0.26)	-0.0905 (0.23)	-0.0830 (0.26)	-0.178 (0.27)
In-group dummy					0.328*** (0.11)	0.379** (0.18)	0.351* (0.20)
In-group * w.e. 2						-0.134 (0.25)	-0.107 (0.27)
In-group * w.e. 3						-0.0107 (0.27)	0.0210 (0.29)
Constant	0.797*** (0.16)	-0.957 (0.73)	0.984*** (0.19)	0.633*** (0.18)	0.644*** (0.17)	0.622*** (0.18)	-1.247 (0.76)
C. Costly envy							
War exposure level 2	-0.494** (0.19)	-0.392* (0.21)	-0.429* (0.24)	-0.653** (0.27)	-0.510*** (0.20)	-0.659** (0.27)	-0.556* (0.29)
War exposure level 3	-0.509** (0.20)	-0.415** (0.20)	-0.256 (0.25)	-0.868*** (0.28)	-0.523** (0.20)	-0.868*** (0.28)	-0.793*** (0.29)
In-group dummy					-0.379*** (0.12)	-0.674** (0.27)	-0.697** (0.29)
In-group * w.e. 2						0.244 (0.32)	0.255 (0.34)
In-group * w.e. 3						0.622* (0.32)	0.656* (0.34)
Constant	0.757*** (0.12)	0.426 (0.59)	0.478*** (0.17)	1.136*** (0.21)	0.966*** (0.14)	1.141*** (0.21)	0.820 (0.63)
D. Costless envy							
War exposure level 2	-0.234 (0.23)	-0.0432 (0.24)	-0.269 (0.26)	-0.205 (0.30)	-0.245 (0.23)	-0.209 (0.29)	-0.0398 (0.29)
War exposure level 3	-0.361 (0.22)	-0.312 (0.22)	-0.340 (0.26)	-0.395 (0.29)	-0.377* (0.23)	-0.378 (0.29)	-0.318 (0.29)
In-group dummy					-0.411*** (0.12)	-0.396* (0.22)	-0.394* (0.22)
In-group * w.e. 2						-0.0572 (0.29)	-0.0223 (0.29)
In-group * w.e. 3						0.0211 (0.32)	0.0206 (0.32)
Constant	0.987*** (0.16)	0.201 (0.65)	0.805*** (0.18)	1.226*** (0.21)	1.218*** (0.18)	1.204*** (0.21)	0.581 (0.73)
Observations	324	306	162	162	324	324	306
Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1 Clustered on subject level							

5.2 Social preference types

When we combine the different allocation games the different social preferences types are formed: aheadness averse, behindness averse, inequality averse, generous, spiteful and selfish. To measure the effect of war exposure on social preferences, we first run a series multinomial logistics with inequality aversion, generosity,

spitefulness and selfishness as dependent variables²². Followed by a trivariate probit, multiple bivariate probit, and probit regressions, to expand and explore results shown in the series of multinomial logistics.

Table 9. Series of multinomial logistic regression of war exposure and social preferences							
COEFFICIENT	I	II	III	IV	V	VI	VII
A. generous							
War exposure level 2	1.301** (0.55)	1.025* (0.58)	1.247** (0.61)	1.664 (1.15)	1.293** (0.55)	1.664 (1.15)	1.496 (1.15)
War exposure level 3	1.724*** (0.54)	1.548*** (0.56)	1.470** (0.62)	2.498** (1.11)	1.709*** (0.56)	2.498** (1.11)	2.246** (1.13)
In-group dummy					1.036*** (0.31)	1.739 (1.12)	1.773 (1.12)
In-group * w.e. 2						-0.417 (1.24)	-0.528 (1.26)
In-group * w.e. 3						-1.028 (1.21)	-0.922 (1.21)
Constant	-2.335*** (0.42)	-1.016 (1.72)	-1.758*** (0.49)	-3.497*** (1.02)	-2.934*** (0.45)	-3.497*** (1.02)	-2.660 (1.91)
B. spiteful							
War exposure level 2	-0.373 (0.74)	-0.851 (0.89)	-11.54*** (0.53)		-0.367 (0.74)	-0.416 (0.76)	-1.008 (1.00)
War exposure level 3	1.265** (0.56)	1.132** (0.50)	22.83 (0)		1.276** (0.56)	0.552 (0.65)	0.328 (0.63)
In-group dummy					-0.762 (0.48)	-21.58*** (0.63)	-22.50*** (0.72)
In-group * w.e. 2						-11.22*** (0.89)	-17.16*** (0.99)
In-group * w.e. 3						21.75 (0)	22.77 (0)
Constant	-2.335*** (0.43)	1.200 (2.08)	-23.82*** (0.48)		-2.060*** (0.49)	-1.705*** (0.45)	2.318 (2.45)
C. selfish							
War exposure level 2	1.301* (0.74)	0.889 (0.83)	1.758 (1.16)	0.144 (0.58)	1.303* (0.74)	0.971 (0.91)	0.537 (0.97)
War exposure level 3	1.670** (0.73)	1.528** (0.71)	1.693 (1.20)	0.958* (0.54)	1.674** (0.73)	1.651* (0.87)	1.468* (0.84)
In-group dummy					-0.252 (0.44)	-0.564 (1.25)	-0.664 (1.25)
In-group * w.e. 2						0.787 (1.41)	0.863 (1.45)
In-group * w.e. 3						0.0426 (1.43)	0.176 (1.43)
Constant	-3.029*** (0.59)	0.794 (2.87)	-3.367*** (1.02)	-1.417*** (0.40)	-2.923*** (0.63)	-2.803*** (0.73)	1.301 (2.94)
Observations	224	214	108	116	224	224	214
Pseudo R-squared	0.053	0.12	0.11	0.051	0.080	0.10	0.17
Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1							
Clustered on subject level							

5.2.1 war exposure and social preferences

In the series of multinomial logistics we use the same models as used to measure the effect of war exposure on the separate allocation games. We look at the effects of the independent variables on inequality aversion, generosity, spitefulness and selfishness. The results presented in part A of table 9 show that the effect of level 2 and level 3 war exposure on the ration generous/inequality aversion is significantly positive. Especially participants who have been war exposed at level 3 are relatively more generous in general (especially towards

²² For now we leave aheadness aversion and behindness aversion out, because multinomial logistic does allow for overlap among the dependent variables.

out-group) than participant who have been war exposed at level 1. This implies that either level 2 and 3 war exposure has a decreasing impact on inequality aversion or an increasing impact generosity or both. The interaction term of preference towards in-group and war exposure is not significant.

Only a few participants are categorized as being spiteful, therefore the distribution of spiteful types among the level of war exposure has a particular pattern. This results in a few unreliable results, presented in part B of table 9. Overall, level 3 war exposure has an increasing effect on the spiteful/inequality aversion ratio. This implies that either level 3 war exposure has a decreasing impact on inequality aversion or an increasing impact spitefulness, or both. The interaction term of preference towards in-group and war exposure is not significant.

Although only a few participants are categorized as being selfish, selfish types are distributed among war exposure levels without any particular patterns. The results are presented in part C of table 9. Overall, level 3 war exposure has an increasing effect on the selfish/inequality aversion ratio. This implies that either level 3 war exposure has a decreasing impact on inequality aversion or an increasing impact on selfish, or both. The interaction term of preference towards in-group and war exposure is not significant.

When we compare above results with the series of trivariate probit regressions²³, it shows (in table 10) that the increasing effect of war exposure on generosity in comparison to inequality aversion are due to both an increasing effect on generosity and a decreasing effect on inequality aversion. This suggests that the more a participant has been exposed to war the more he is willing to give to others, not considering his own endowments. Hence, when a participant has experienced more war exposure he becomes more inequality averse. Because one is classified to be inequality averse when one is both aheadness averse and behindness averse, it is logical that they are all influenced by war exposure in the same direction (although the decrease of aheadness averse types and behindness averse types is less strong and less significant as presented in probit regressions in part A and B of table 11). We can interpret from these results that when a participant has experienced more war he cares less about the endowment of others in relation to his own endowment.

For the effect of war exposure on selfishness in comparison to inequality aversion holds the same. Only is the effect less significant and disappears when we add an in-group dummy and a interaction term to measure the relation between war exposure and preference difference towards in and out-group.

²³ It would have been best if we could have used a multivariate probit here. Due to the complicated nature of a multivariate probit and the small sample size of this experiment we could not use a multivariate probit including all social preferences.

Table 10. Series of trivariate probit regressions with war exposure and inequality aversion, generosity and selfishness

A. inequality aversion	I	II	III	IV	V	VI	VII
War exposure level 2	-0.295 (0.21)	-0.116 (0.23)	-0.338 (0.24)	-0.291 (0.24)	-0.291 (0.21)	-0.292 (0.24)	-0.143 (0.27)
War exposure level 3	-0.491** (0.20)	-0.438** (0.20)	-0.514** (0.25)	-0.515** (0.24)	-0.498** (0.20)	-0.495** (0.24)	-0.480* (0.25)
In-group dummy					-0.167 (0.10)	-0.175 (0.18)	-0.212 (0.20)
In-group * w.e. 2						0.00367 (0.23)	0.0736 (0.26)
In-group * w.e. 3						-0.00848 (0.28)	0.0687 (0.30)
Constant	0.109 (0.14)	-0.860 (0.67)	0.0231 (0.17)	0.205 (0.17)	0.192 (0.15)	0.196 (0.17)	-0.769 (0.67)
B. generous							
War exposure level 2	0.460* (0.24)	0.420 (0.26)	0.619** (0.29)	0.520 (0.46)	0.459* (0.25)	0.450 (0.37)	0.538 (0.39)
War exposure level 3	0.678*** (0.24)	0.635** (0.25)	0.714** (0.31)	0.931** (0.44)	0.706*** (0.24)	0.843** (0.34)	0.835** (0.36)
In-group dummy					0.473*** (0.14)	0.592* (0.36)	0.625* (0.37)
In-group * w.e. 2						0.0109 (0.44)	-0.217 (0.45)
In-group * w.e. 3						-0.217 (0.42)	-0.273 (0.44)
Constant	-1.537*** (0.18)	-1.783** (0.73)	-1.387*** (0.22)	-2.029*** (0.38)	-1.832*** (0.20)	-1.893*** (0.28)	-2.027*** (0.78)
C. selfish							
War exposure level 2	0.639** (0.32)	0.429 (0.37)	0.823 (0.53)	0.539 (0.48)	0.664** (0.29)	0.324 (0.44)	0.202 (0.48)
War exposure level 3	0.649* (0.34)	0.639* (0.34)	0.839* (0.51)	0.712 (0.49)	0.586* (0.32)	0.630 (0.42)	0.625 (0.44)
In-group dummy					-0.119 (0.15)	-0.372 (0.52)	-0.309 (0.51)
In-group * w.e. 2						0.573 (0.57)	0.434 (0.56)
In-group * w.e. 3						-0.202 (0.63)	-0.140 (0.64)
constant	-1.989*** (0.29)	0.0160 (1.20)	-2.212*** (0.47)	-1.964*** (0.44)	-1.897*** (0.29)	-1.783*** (0.37)	-0.162 (1.35)
Observations	324	306	162	162	324	324	306
Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1 Clustered on subject level							

To statistically test if war exposure has the same effect on inequality aversion, generosity and selfishness we run comparison tests after the trivariate probit regressions. This shows that war exposure level 3 has a significant different effect on inequality aversion and generosity ($p < 0.01$), and inequality aversion and selfishness ($p < 0.05$). The effect of war exposure on a level 3 is not significantly different on generosity and selfishness ($p > 0.1$). Results are shown in the appendix.

Table 11. Probit regressions with war exposure and aheadness aversion, behindness aversion and spitefulness							
COEFFICIENT	I	II	III	IV	V	VI	VII
A. Aheadness averse							
War exposure level 2	-0.0427 (0.22)	0.0794 (0.25)	-0.0385 (0.27)	-0.0472 (0.25)	-0.0433 (0.23)	-0.0472 (0.25)	0.108 (0.28)
War exposure level 3	-0.231 (0.21)	-0.323+ (0.21)	-0.208 (0.27)	-0.256 (0.25)	-0.234 (0.22)	-0.256 (0.25)	-0.323 (0.26)
In-group dummy					0.356*** (0.11)	0.338* (0.17)	0.412* (0.21)
In-group * w.e. 2						0.0479 (0.28)	-0.0135 (0.32)
In-group * w.e. 3						0.00871 (0.26)	-0.0618 (0.31)
Constant	0.688*** (0.16)	-1.101+ (0.71)	0.867*** (0.19)	0.529*** (0.18)	0.521*** (0.17)	0.529*** (0.18)	-1.311* (0.74)
Pseudo R-squared	0.00474	0.0800	0.00396	0.00572	0.0196	0.0196	0.0963
B. behindness averse							
War exposure level 2	-0.363* (0.20)	-0.203 (0.21)	-0.292 (0.24)	-0.474* (0.26)	-0.374* (0.21)	-0.474* (0.26)	-0.329 (0.27)
War exposure level 3	-0.332+ (0.21)	-0.228 (0.21)	-0.175 (0.24)	-0.531** (0.26)	-0.342 (0.21)	-0.531** (0.26)	-0.453* (0.27)
In-group dummy					-0.426*** (0.10)	-0.605*** (0.22)	-0.663*** (0.24)
In-group * w.e. 2						0.356 (0.27)	0.404 (0.29)
In-group * w.e. 3						0.182 (0.26)	0.220 (0.29)
Constant	0.480*** (0.13)	-0.119 (0.63)	0.199 (0.17)	0.805*** (0.19)	0.706*** (0.15)	0.805*** (0.19)	0.197 (0.67)
Pseudo R-squared	0.0125	0.0561	0.00678	0.0255	0.0330	0.0354	0.0812
C. spiteful							
War exposure level 2	-0.295 (0.31)	-0.433 (0.38)		-0.341 (0.36)	-0.300 (0.32)	-0.341 (0.36)	-0.504 (0.38)
War exposure level 3	0.433* (0.26)	0.398* (0.24)		0.0653 (0.32)	0.489* (0.26)	0.0653 (0.32)	-0.0192 (0.34)
In-group dummy					-0.535*** (0.20)	-4.855*** (0.28)	-5.960*** (0.34)
In-group * w.e. 2						4.855 (0)	
In-group * w.e. 3							6.0005 (0)
Constant	-1.620*** (0.19)	-0.575 (0.95)	-1.187*** (0.23)	-1.252*** (0.22)	-1.431*** (0.22)	-1.252*** (0.22)	-0.0785 (0.95)
Pseudo R-squared	0.046	0 0.098	0	0.015	0.080	0.082	0.15
Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1 Clustered on subject level							

Result 3: War exposure has a significant (p<0.05) negative impact on inequality aversion. The hypothesis that war exposure changes social preferences is not rejected when it comes to inequality aversion.

Result 4: War exposure has a significant ($p < 0.05$) positive impact on generosity. The hypothesis that war exposure changes social preferences is not rejected when it comes to generosity.

Result 5: War exposure has a significant ($p < 0.1$) negative impact on selfishness. The hypothesis that war exposure changes social preferences is not rejected when it comes to selfishness.

For the effect of war exposure on the social preference spitefulness, we will consider the separate probit regressions (part C of table 11). Similar as in table 9, in table 11 is shown that there are multiple peculiarities in the results. The coefficient for the in-group dummy and interaction term in model VI en VII are extremely high or do not convert. We assume this is due to low quantity of spiteful types in our sample, and that the few spiteful types are divided over the different war exposure levels in a peculiar pattern. We find that war exposure has a significant positive impact on having a spiteful social preference ($p < 0.1$), as long as we do not control for an in and out-group effect. This result should be interpreted with caution.

Result 6: War exposure has a significant ($p < 0.1$) positive impact on spitefulness. The hypothesis that war exposure changes social preferences is not rejected when it comes to spitefulness.

Both the increase in spiteful and selfish types seem to conflict with the increase in generous types. This can be explained in two ways: Firstly, only 5.6% of the subjects is selfish and 3.7% of the subjects is spiteful, so the increase in spiteful and selfish types is based on only a few individuals. Secondly, these conflicting results can be due to a difference in social preferences towards in- and out-group. In the next sub-chapter we will interpret these results further.

5.2.2 war exposure and parochialism

Above it is already shown that war experience has an effect on social preferences. Now we will emphasize on the effect of war exposure on parochialism. First we look at the differences in results in model I en II in all regressions. Sometimes there seems to be a substantial difference in significance or the value of the coefficient when one's playing partner is an in-group member (model III) and when one's playing partner is an out-group member (model IV). When we run biprobits with one dependent variable for preferences towards in-group and one dependent variable for the preferences towards out-group, and test if war exposure has the same effect on both. We see that the effects are not significantly different ($\text{Prob} > \chi^2 > 0.05$) (data available on request).

Secondly, when we focus on the interaction terms in the multinomial logistic presented in table 9. (column VI and VII) we see that none of them have a significant effect on the social preference types generosity, spitefulness, selfishness in comparison to inequality aversion. Also in the trivariate probit regressions presented in table 10 and the probits regressions presented in table 11 none of the interaction terms are significant. Therefore we reject the hypothesis that war exposure has an increasing effect on parochialism.

Result 7: We reject hypothesis 2; that war exposure has a positive impact on parochialism.

5.3 Interpretation

In this sub-chapter we explore and interpret above results and link them with existing literature.

The decrease in inequality aversion (including aheadness and behindness aversion) seems to be based on a decrease in aheadness aversion in general and a decrease in behindness aversion towards the out-group. An explanation for the decrease in inequality aversion (including aheadness and behindness aversion) due to war exposure, is that the participants in our sample were exposed to war during the time inequality aversion behaviour develops as social preference (between the age 3 and 8) (Fehr et al., 2011).

The increase in generosity can be a reaction to the uncertainties war exposure brings and create more security. If one is generous to another, one naturally lowers the chance on a conflict with another. An increase in generosity makes sense during and after conflict because it increases information and resource sharing (Choi and Bowles, 2007). Moreover, an increase in generosity smoothens cooperation (Fehr et al., 2011) which is crucial after conflict. These results are in line with Blattman's (2009;2010) and Bellows and Miguel's(2006;2009) conclusions that war exposure increases cooperation and participation. So far our results are in line with the social preferences part in the evolution theory by Choi and Bowles (2007). Their theory predicts that altruism is higher²⁴ in societies that have survived war. Our results show that generous behaviour (which is equal to altruism) is higher among participants who have been more exposed to war.

The diminishing effect of war exposure on parochialism conflicts with the evolution theory by Choi and Bowles (2007), though it is in line with our earlier suggestion, that war exposure makes adolescent men more conflict avoiding. Due to war exposure adolescent men become more generous and less parochial. Bauer et al. (2011) show in Sierra Leone that age during war exposure is crucial to the effect of war exposure on parochialism. If individuals are exposed to war at a young age, they have a higher chance to become conflict avoiding; more generous and less parochial in general.

It is noteworthy that only 5.6% of the participants in our sample can be categorized as being selfish. While in an experiment by Bauer et al. (2011) with men and women who experienced war around the age of 20 categorized almost 50% of their participants as being selfish. They used similar methods as used in this thesis. The same holds when it comes to spitefulness. 3.7% of our sample can be categorized as being spiteful, while Bauer et al. (2011) categorized 12.8% of their sample as being spiteful. It can be that the participants in this thesis could not develop selfish and spiteful preferences because the participants were exposed to war on a very young age. That selfish and spiteful behaviour slightly rises due to war exposure can be due to coincidence (it only involves a few participants).

Bauer et al. (2011) focused on a sample that experienced war on the age between 7 and 20 years, immediately after the trauma, and found an increase in inequality aversion and parochialism, and a decrease in altruism and selfish behaviour. This thesis looks instead on the consequences of war trauma on social preferences of a less varied cohort, finding that more exposed individuals are less inequality adverse, more altruistic and less parochial (and a lot lower frequency of selfish and spiteful types). We expect that these differences in results are due to the different way of measuring war, the fact that that in our sample only men are included and Bauer et

²⁴ Together with parochialism, which will be discussed in the next sub question.

al. (2011) also includes women. But the difference in results could also be due to the difference in age during war exposure between both samples.

For a more speculative interpretation of the combination of the above results it is necessary to take a step back to theory explained in section 2.3. In section 2.3. is explained that this study is not discussing a preference shift or discovery of the true social preference, rather this thesis discusses the effect of war exposure on the development of social preferences. Furthermore the development of social preferences is explained. According to developmental psychology and neurological science, social behaviour and preferences are mainly developed during childhood, and are therefore more compliant by experiences during childhood (Hubel et al. 1977; Daw, 1994; Berfardi et al., 2000; Shonkoff and Philips, 2000; Bremner and Vermetten, 2001; Knudsen, 2004; Horn, 2004). In section 2.3.2 is shown on what age an individual starts to develop what type of social preferences (Fehr et al., 2008; Almas et al., 2010; Fehr et al., 2011). Nelson and Carver (1988), Toth and Cicchetti (1988), Pynoos et al. (1999) state that the effect of an experience (like war exposure is) on social behaviour depend on the social characteristics one already has developed, is developing and is about to develop at the moment the experience takes place. Social behaviours are most prone to be irreversible formed by experiences during the time they are developing (Knudsen, 2003; Knudsen et al., 2006; DeBello et al., 2001). Individuals first develop lower characteristics, followed by higher level characteristics (Knudsen et al., 2006). The functioning of the higher level characteristics depend on the functioning of the lower level characteristics (Knudsen et al., 2006). This would imply that if humans have been war exposed around the age of 7 (like the sample in this thesis) it seems plausible war exposure has a prime impact on the social preferences that are developing at that moment; lower level social preference inequality aversion. Through the effect on inequality aversion, the next in line to develop social preferences, altruism (this is also a lower level social preference, and starts to develop when inequality aversion starts to decrease (Fehr et al., 2011)) and parochialism (this is a higher level social preference because an individual not only has social preferences, but starts to distinguish social preference towards in and out-group) will also be effected. Theory gives no prediction in which direction these effects go.

So far the results show that adolescents, war exposed around the age of 7 become less inequality averse, more generous and less parochial. On the social preference selfish and spiteful, which are already fully developed before the age of 7, we barely find any effect. When one compares the empirical results of this thesis with the above theory it seems plausible that the effect war has on social preferences depends on the social preference an individual is developing at the time of exposure: when a child is war exposed around the age of 7 inequality aversion is not developed to its full potential and altruism can develop more. Therefore, children effected by war at a relatively early stage in life will have a relatively weaker developed social preference of inequality aversion and consequently a relatively stronger developed social preference for altruism. Because of the underdevelopment of lower level social preferences, higher level social preferences cannot function well. Therefore parochialism cannot develop to its full potential during adolescence. Because the development of social preferences is age related (Fehr et al., 2008; Almas et al., 2010; Fehr et al., 2011), the effect of war exposure on social preferences is also age related. Results of this thesis are in line with above developmental psychology and neurological theory.

Though this innovative theory is beyond the scope of this thesis, the relation between the age during war exposure and the effect of war exposure on social preferences can be statistically shown in a regression. Unfortunately we do not have a reliable indicator of the age of the participants during war exposure at our disposal²⁵. When we do run a regression including an approximate of the age during war exposure, it shows that that the approximate only has a significant ($p < 0.1$) impact on generosity (especially towards the out group $p < 0.05$). It Shows that the older you are during war exposure the more generous you become (Table A1 is presented in appendix A).

5.4 Robustness

Because we are aware of the potential concerns about self-reported data, endogeneity of war exposure, selective migration, gender, the robustness of the model to measure war exposure, and the effect of NGO programs on social preferences. All six concerns are discussed in this robustness section.

5.4.1 Self-reported war-exposure

To map the level of victimization of individuals we rely on individuals' self-reported data. This raises concerns about systematic response bias, including possible over-reporting of victimization. In the survey we intended to only include questions that are not too painful or induces shame, hence we intended to use questions that are likely to be answered truthfully. For example, our result will not be dependent on questions on being involved in sexual assaults, or if the subject himself fought in the war.

5.4.2 Endogeneity of war exposure and selective migration

There are three reasons to be concerned about selective war exposure. Firstly, violent attacks reported by Smith et al. (2004) give reason to believe that the RUF rebels in the beginning of the war mainly targeted community leaders. Secondly, it is plausible that individuals with a specific social preference are more likely to select themselves into war. This would denote that war exposure does not influence social preferences, but that social preferences determine the level of war an individual is exposed to. Thirdly, participants with families with more financial wealth could have had more option to migrate, this can lead to selective migration. All three concerns would bias our results, because the concerns would change causality or be influenced by other variables than war exposure.

Firstly, Smith et al. (2004) suspect that community leaders were mainly targeted during the beginning of the civil war. If community leaders in general have specific social preferences, this would mean that individuals with those specific social preferences have a higher chance to be selected into war exposure. To control for that non-random victimisation Bellows and Miguel (2006;2009) use pre-war controls and a national sample in Sierra Leone. They reject the hypothesis of non-random victimisation²⁶. Our sample is even much younger in time of the war than Bellows and Miguel's (2006;2009) sample during the war. Younger subjects are less likely

²⁵ Because it was a long war, participants were multiple times exposed to war, we have not a good indication which exposure had the most impact and when it exactly was.

²⁶ Bauer et al. (2011) do not check for non-random war exposure themselves. They "interprets their results in the broader context of Bellows and Miguel (2006;2009). Bellows and Miguel (2006;2009) conclude against the hypothesis of selection into victimization using a large national representative sample.

to have been subject of targeted violence than adults because they cannot have been community leaders during the war. Moreover the hypothesis that financial wealth or education, is not related to war exposure is not rejected in our sample, as one can see in table 12. Though there is a weak relation between age during the experiment and war exposure ($p < 0.1$). The older a participant is the more likely it is that he has been exposed to war. This is a explainable relation, the older a participant is the more time he has spent in a country in war, so the more likely that the participant gets exposed to war. All the above indicates that we can assume that the impacts we observe are due to random exposure to war.

Table 12. The relation between age, financial wealth, education and war exposure and displacement

Coefficient	War exposure	Displaced
Age	0.044* (0.26)	0.98* (0.51)
Education	-.067 (0.74)	0.021 (0.14)
Financial wealth	-.01 (0.48)	-.01 (0.088)
Constant	1.42 (0.48)	-.93 (0.93)
Observations	153	153
R-squared	0.023	
Pseudo R-squared		0.04
Robust standard error in parentheses *** < 0.01 , ** $p < 0.05$, * $p < 0.1$		

Secondly, participants were young during the war, and mainly dependent on their parents for their level of war exposure. Only if social preferences influences how much parents are willing to self-select their child in to war exposure, and social preferences are inheritable, self-selection into war exposure could be influencing our results.

Thirdly, participants with families with more financial wealth could have had more options to migrate, this can lead to selective migration. In our sample the hypothesis of no relation between financial wealth or education and displacement is not rejected, as one can see in table 12, column 1.

Though age sows to have a lightly related to being displaced ($p < 0.1$). Which again is explainable, the older a participant is, the longer he has lived in a country in war, the more likely he will get displaced.

5.4.3 Gender

There is a gender difference in social preferences. For example boys show stronger parochial tendencies and are more generous than girls (Fehr et al. 2008; 2011). There is a significant gender difference when it comes to social preferences, focusing on both sex at the same time could thin out conclusive results. Because our sample only consist of men, and this is not representative for other populations, we have to keep in mind that the results have a lower external validity.

5.4.4. Robustness of the new model to measure war exposure

To test the robustness of this new model to measure war exposure, we compare the results of the new model with result of two alternative models with a different structure to measure war exposure, to see if those models will give similar results. In addition we will look at the effect of using the ‘robust’ command. The other models to measure war exposure are constructed as presented in table 13.

When we consider the effect of the different definitions of war exposure on social preference types, the sign of the coefficient is similar to the signs of the effect of the new, with literature underpinned, definition of war

exposure, on social preferences. The pseudo R-squared while the new model is used, is always higher than when ones uses one of the other definitions of war exposure.

In the new model there is no change in the regression results if we use the robustness command. This indicates that there is no robustness to control for, hence, the new model to measure war exposure seems to be robust.

Table 13. Alternative models

Models	Description alternative model to measure war exposure
Model A	War exposure is a dummy variable. Which contains a value of 0 if the participant has not experienced trauma or if the participant experienced a trauma type with intensity level 1. The war exposure dummy in this model is 1 if the participant has experienced one or more trauma’s with level intensity 2 or 3.
Model B	War exposure can hold a value of 0 to 6. This value is determined by the sum of intensity levels of the trauma type a participant has experienced. Hence, if a participant has experienced one or more trauma’s with a level 1 intensity he is appointed 1 point, if a participant has experienced one or more trauma’s with a level 2 intensity he is appointed 2 points and if a participant has experienced one or more trauma’s with a level 3 intensity he is appointed 3 points. The sum gives war exposure indication.

5.4.5 The effect of NGO programs

We realize that part of effect we measure of war exposure on social preferences could be caused be a intervention by a NGO program after war exposure. If NGO especially targeted war especially war exposed children there is a change that we do not measure the effect of war exposure alone , but also the effect of a NGO program. Though we keep this possibility in mind we are not too concerned about this possible effect, because our research is done in Kenema. Kenema is located far away from the capital, in an area that was neglected by NGO’s in the years after the war. Therefore there have not been many NGO programmes implemented in Kenema that focused especially on peace building.

6. Discussion and Conclusions

This thesis explores the unknowns of post-war recovery of human and physical capital, investigating whether war exposure causes changes in social preferences and parochialism of adolescent football players in post war Sierra Leone. This is done by observing real life behaviour in the football field, doing artefactual experiments and conducting interviews, using a sample of 162 footballers who have been exposed to war around the age of seven²⁷. In order to indicate the level of war a subject has been exposed to, we developed a new model to measure war exposure. This thesis shows that war exposure results in less inequality aversion and a higher chance to become conflict avoiding; being exposed to war related violence at a young age, subjects become more generous both towards the in and the out-group, as well as less parochial.

While previous studies have found that inequality aversion (counting both aheadness and behindness aversion) develops early in childhood (i.e. between the age of 3 and 8) (Fehr et al., 2008), this thesis finds that participants experienced war exposure on a young age, they become less inequality averse. We find that war exposure has an opposite effect on altruism: the more exposed to war the participant has been the more altruistic he becomes. This confirms findings by Voors et al. (2010) who show that people in war exposed villages become more altruistic towards fellow villagers. The increase in altruism might be a reaction on the uncertainties war exposure brings –victims strengthen their networks to feel more secure. Moreover, an increase in altruism smoothens cooperation (Fehr et al., 2011), which is crucial after conflict. The results of this thesis are also in line with Blattman's (2009; 2010) and Bellows and Miguel's (2006; 2009) conclusions that war exposure increases cooperation and participation. Our findings are partially in line with Choi and Bowles's (2007) theory on the evolution of social preferences. Their theory predicts that altruism is higher²⁸ towards the in-group in societies that survive war (parochial altruism). Our results show that altruism towards the in and out-group (tolerant altruism) is more common among war-exposed adolescents .

Perhaps the most important finding in our study is that parochialism– the differential treatment between in-group and out-group members– is not increasing with war exposure. According to evolutionary theory by Choi and Bowles (2007), altruism and parochialism can only exist because they co-exist and together make societies more capable to survive violent conflict. Instead, the results of this thesis reject the hypothesis that war exposure enforces parochialism. Expressed in terms used by Choi and Bowles; this thesis does not confirm that war increases the percentage of parochial altruists (PA) in a society. Rather, findings of this thesis suggest that war increases the percentage of tolerant (non- parochial) altruists (TA). Our research is not put up as an instrument to test the evolutionary theory by Choi and Bowles (2007). The main differences between their theory and our research is that their theory is based on that parochial altruist survive in societies over centuries²⁹. While we investigate the effect of one war and how this changes the social preferences, or the

²⁷ The average age of war exposure in our sample was 7 years old, with a minimum of 0 and a maximum age of 19.

²⁸ Together with parochialism, which will be discussed in the next research question.

²⁹ Because, parochial altruists increase the chance of a society to win war whereby parochial altruist are more likely to survive and reproduce with the newly enlarged potential partner pool and the effect on societies this selection has over centuries.

development of social preferences, within two decades. Moreover, subjects in our research were too young to fight during time of war exposure (probably even too young to be a child soldier). Therefore subjects in this thesis are not likely to have survived war based on social preferences that make one more likely to survive a battle. Nor was the survival of subject in our research likely to be based on other social preference of their own. Due to the subjects young age during war, the subjects were depending on their guardian for survival.

A particularly noteworthy finding of our study is the fact that our sample shows a relatively low quantity of selfish and spiteful types in comparison to other studies done in Sierra Leone with older participants (Bauer et al., 2011). One reason could be that our subjects experienced war trauma in a pre-adolescent age, when the capacity to generate spite and selfishness is still limited and developing. Further research should be carried out to better understand the heterogeneity of war-related changes in social preferences across age levels.

Bauer et al. (2011) focused on a sample that experienced war on the age between 7 and 20 years, and found an increase in inequality aversion and parochialism, and a decrease in altruism and selfish behaviour. This thesis looks instead on the consequences of war trauma on social preferences of a less varied cohort, finding that more exposed individuals are less inequality adverse, more altruist and less parochial (and a lot lower frequency of selfish and spiteful types). We expect that these differences in results are due to the different way of measuring war, the fact that that in our sample only men are included and Bauer et al. (2011) also includes women. But the difference in results could also be due to the difference in age during war exposure between both samples.

For a more speculative interpretation of the combination of the above results it is necessary to take a step back to theory. According to developmental psychology and neurological science, social behaviour and preferences are mainly developed during childhood, and are therefore more compliant by experiences during childhood (Hubel et al. 1977; Daw, 1994; Berardi et al., 2000; Shonkoff and Philips, 2000; Bremner and Vermetten, 2001; Knudsen, 2004; Horn, 2004). Individuals first develop lower characteristics, followed by higher level characteristics (Knudsen et al., 2006). The functioning of the higher level characteristics depend on the functioning of the lower level characteristics (Knudsen et al., 2006). When we combine above theory with empirical evidence by Fehr et al. (2008), Almas et al. (2010) and Fehr et al. (2011) we can come to a model that shows what types of social preference will be most formed by experience during what age. Theory gives no prediction in which direction the effects of experience go. When we compare the, based on the model made, vulnerable and invulnerable social preference during the age of 7, and compare them with the results of this thesis it is shown that the results are in line with the model. To our knowledge there is no literature that considers the age during a shock while looking at the effect of a shock on social preferences. Because this innovative theory is beyond the scope of this thesis, future studies should research if these results hold when one adopts multiple age groups, based on when what social preference forms.

We are aware of potential concerns about the endogeneity of war exposure. In our sample the hypothesis of a correlation between education and financial wealth and war exposure is rejected, therefore subjects are less likely to have been the victim of selective violence. Moreover, our participants are unlikely to have selected

themselves into participating in the war, because they were too young during the war to make independent decisions. We realize that our sample only contains urban manly youth which is not representable for the whole population and therefore has a lower external validity: future studies should research if these results also hold for mixed gender sample from different areas. Next to the limitation on gender other shortcomings of this thesis are the incompetence to check for the effect of NGO programs on the impact of war exposure on social preferences and the lack of an appropriate measurement for the age during war exposure. Though it is impossible it would be best if we had more information on the social environment of the adolescents before, during, and after war exposure, so that we could check to what extent the social environment absorbs or enforces the effect war exposure has on individuals.

That these differences are still present a decade after the war took place shows that exposure to war has long term consequences that cannot be neglected. Instead of an increase in parochial altruism (Choi and Bowles, 2007), this thesis shows an increase in tolerant altruism and a decrease of inequality aversion in individuals. These consequences have implications for policy. Post-war youth policies (like for example the Truth and Reconciliation Commission in Sierra Leone) should no longer focus on peace building but instead focus on supporting efficient cooperation and provide access to institutions and materials to rebuild the nation. Based on this thesis war exposure seems to raise generosity and decrease inequality aversion and parochialism in adolescent individuals. The three changes in social preferences increase within and between group cooperation, which are important for the reconstruction of a post war country (Knack and Keefer, 1996). Therefore, the results may partially explain the pattern of recovery observed in many post conflict settings, and thereby provide new evidence for an optimistic view on the potentials of a country which is recuperating from war.

7. Reference

- Allwood, M.A., Bell-Dolan, D. and Husain, S.A. (2002). Children's trauma and adjustment reactions to violent and nonviolent war experiences. *Journal of the American Academy of Child and Adolescent Psychiatry*; 41, 450–457.
- Almås, Ingvild, A.W. Cappelen, E. Sørensen, and B. Tungodden.(2010). Fairness and the Development of Inequality Acceptance. *Science*; 328(28 May): 1176-1178.
- Bauer, M., Alessandra, C. And Chytilova, J. (2010). Warfare and social preferences in children; Working paper
- Bauer, M., Alessandra, C., Chytilova, J. and Henrich, J.(2011). Warfare Experience during Ontogeny Increases Egalitarian and Parochial Motivations; Working paper.
- Bellows, J., and Miguel, E. (2006). War and Institutions: New Evidence from Sierra Leone. *American Economic Review*; 96(2): 394–399.
- Bellows J. and Miguel E. (2009). War and Local Collective Action in Sierra Leone. *Journal of Public Economics*; Volume 93, Issues 11-12, December 2009, Pages 1144-1157.
- Belsky, J. (2006). Early child care and early child development: Major findings from the NICHD Study of Early Child Care. *European Journal of Developmental Psychology*; 3, 95-110.
- Berardi, N., Pizzorusso T., Maffei, L., Berardi, N., Pizzorusso T. and Maffei, L. (2000). Critical periods during sensory development. *Curr Opin Neurobiol*; 10: 138-145
- Bernhard, H., Fehr, U., Fischbacher, U. (2006). Group Affiliation and Altruistic Norm Enforcement. *The American Economic Review*; Vol. 96, No. 2 (May, 2006), pp. 217-221.
- Bernhard H., Fisch acher U. and Fehr E. (2006). Parochial altruism in humans. *Nature*; 442 912–915.
- Bewley, T.F. (1998). Why not cut pay? *European Economic Review*; 42(3-5): 459-490
- Blattman, C. (2009). From Violence to Voting: War and Political Participation in Uganda. *American Political Science Review*; 103: 231-47
- Blattman, C. (2010). Post-conflict recovery in Africa: the micro level. Entry for the *Oxford Companion to the Economics of Africa*.
- Boehm, C. (1997). Impact of the Human Egalitarian Syndrome on Darwinian Selection Mechanics. *The American Naturalist*; Vol. 150, No. S1, Multilevel Selection: A Symposium Organized by David Sloan Wilson (July 1997), pp. S100-S121 .
- Bolton, G.E. , Katok, E. , Zwick, K.(1998) Dictator game giving: Rules of fairness versus acts of kindness. *International Journal of Game Theory*; Volume 27, Issue 2, July 1998, Pages 269-299
- Bowles S. (2008). Conflict: Altruism's Midwife. *Nature*; 456 326-327.
- Bray, F. (1986) *The rice economies: technology and development in Asian societies*. Basil Blackwell.
- Bremner JD, Vermetten E (2001). Stress and development: behavioral and biological consequences. *Dev Psychopathol* ; 13:473–489

- Chen, Y. and S.X. Li. (2009). Group Identity and Social Preferences. *American Economic Review*; 99(1): 431–57.
- Choi J. and Bowles S. (2007). The Coevolution of Parochial Altruism and War. *Science*; 318 636-640.
- Cicchetti D, Toth SL. Developmental psychopathology perspective on child abuse and neglect. *Journal of the American Academy of Child and Adolescent Psychiatry*; 1995;34(5):541-565.
- Collier, P. (1999). On the economic consequences of civil war. *Oxf. Econ. Pap*; 51 (1): 168-183.
- Collier, P. and Hoeffler, A. (2002). Greed and grievance in civil war. *Centre for the Study of African Economies Working Paper, Oxford; WPS 2002-01*
- Collier, P. and Hoeffler, A. (2004). Aid, policy and growth in post-conflict societies. *European Economic Review*; Volume 48, Issue 5, October 2004, Pages 1125-1145
- Daw,NW. (1994) Mechanisms of plasticity in the visual cortex. *The Friedenwald Lecture. Invest Ophthalmol Vis Sci.*; 1994 Dec;35(13):4168–4179.
- DeBello, W.M., Feldman, D.E. and Knudsen, E.I. (2001). Adaptive axonal remodelling in the midbrain auditory space map. *J. Neurosci*; 21: 3161-3174, 2001.
- Durakovic-Belko, E., Kulenovic, A. and Dapic, R. (2003). Determinants of posttraumatic adjustment in adolescents from Sarajevo who experienced war. *Journal of Clinical Psychology*;59, 27–40.
- Ebbinghaus, J. and Visser, B. (1999). When institutions matter: Union growth and decline in Western Europe, 1950-1995. *European Sociological Review*; Volume 15, Issue 2, 1999, Pages 135-158
- Eisenberg, N. and Mussen, P. H. (1989) The Roots of Prosocial Behavior in Children. *Cambridge Univ. Press*
- Elbedour, S., Ten Bensele R., and Bastien, D.T. (1993). Ecological integrated model of children of war: Individual and social psychology. *Child Abuse and Neglect*; 17, 805–819.
- Fagerberg, J. (1994). Technology and international differences in growth rates. *Journal of economic literature*; Vol. 32, No. 3
- Fehr, E., Schmidt, K. (1999). A Theory of Fairness, Competition, and Cooperation. *Quarterly Journal of Economic*; 114: 817-868.
- Fehr, E. and Schmidt, K.M. (2006). Chapter 8 The Economics of Fairness, Reciprocity and Altruism – Experimental Evidence and New Theories. *Handbook on the Economics of Giving, Reciprocity and Altruism*; Volume 1, 2006, Pages 615-691
- Fehr, E., Bernhard, H., and Rockenbach, B. (2008). Egalitarianism in Young Children. *Nature*; 454: 1079-84.
- Fehr, E, Rutzler, D. and Sutter, M. (2011). The Development of Egalitarianism ,Altruism, Spite and Parochialism in Childhood and Adolescence, Working paper IZA .
- Ferme, M.C. (2001). *The Underneath of Things: Violence, History and the Everyday in Sierra Leone*. Berkeley: Univ. of California Press.
- Freud, A., and Burlingham, D. (1943). *War and children*. New York: Ernest Willard

- Gintis, H. (2000). *Game theory evolving: A problem-centered introduction to modelling strategic*. Princeton University press: 528 pp.
- Glaeser, E.L., R. La Porta, F. Lopez-de-Silanes and A. Shleifer (2004). Do institutions cause growth? *Journal of Economic*; Volume: 9, Issue: 3, Pages: 271-303
- Glennerster, R., Miguel, E. and Rothenberg, A. (2010). Collective action in diverse Sierra Leone. NBER Working paper.
- Gneezy, A. and Fessler, D. (2011) Conflict, sticks and carrots: war increases pro-social punishments and rewards. *Proceedings of the Royal Society*.
- Goette, L., D. Huffman and S. Meier (2006). "The Impact of Group Membership on Cooperation and Norm Enforcement: Evidence Using Random Assignment to Real Social Groups. *American Economic Review*; 96, 212–216.
- Harbring, C. and Irlenbusch, B. (2011), Sabotage in tournaments: evidence from the lab. *Management science*; Volume: 57, Issue: 4, Pages: 611-627
- Harel-Fisch Y., Radwan, Q., Walsh, S.D., Laufer, A., Amitai, G., Fogel-Grinvald, H. and Abdeen, Z. (2010). Psychosocial outcomes related to subjective threat from armed conflict events (STACE): findings from the Israeli-Palestinian cross-cultural HBSC study. *Child Abuse Neg*; 2010;34:623–638.
- Henrich, J., R. Boyd, S. Bowles, C. Camerer, E. Fehr, H. Gintis, R. McElreath, (2001). In Search of Homo Economicus: Behavioural Experiments in 15 Small-Scale Societies, *American Economic Review*; 91: 73-78.
- Henrich, J., R. Boyd, S. Bowles, C. Camerer, E. Fehr, H. Gintis, R. McElreath, M. Alvard, A. Barr, J. Ensminger, N. Smith Henrich, K. Hill, F. Gil-White, M. Gurven, F.W. Marlowe, John Q. Patton and D. Tracer. (2005). "Economic man" in cross-cultural perspective: Behavioural experiments in 15 small-scale societies. *Behavioral and Brain Science*; 28: 795-815
- Hensch, T. K. (2005). Critical period mechanisms in developing visual cortex. *Curr. Top. Dev. Biol*; 69, 215–237.
- Horn, G. (2004). Pathways of the past; the imprint of memory. *Nat. Rev. Neurosci.*; 5, 108–120.
- Hubel, D. H., Wiesel, T., LeVay, S. (1977) . Plasticity of ocular dominance columns in monkey striate cortex .*Philos. Trans. R. Soc. London; B* 278, 377–409.
- Human Rights Watch. (1999). "Sierra Leone: Getting Away with Murder, Mutilation, and Rape." *New York: Human Rights Watch*.
- Katz, L. C. and Shatz, C. J. (1996). Synaptic activity and the construction of cortical circuits. *Science*; 274, 1133–1138.
- Keefer, P. and Knack, S.(1996). Does Social Capital Have An Economic Payoff? A Cross-Country investigation. *The Quarterly Journal of Economics*; 112 (4): 1251-1288.
- Keen, D. (2005). *Conflict and collusion in Sierra Leone*. International peace academy, New York.
- Knudsen, E. I. (2004) . Sensitive Periods in the Development of the Brain and Behavior. *J. Cognit. Neurosci*; 16, 1412–1425

- Knudsen E, Heckman J, Cameron J, Shonkoff J. (2006). Economic, neurobiological, and behavioral perspectives on building America's future workforce. *Proc Natl Acad Sci U S A.*; 2006;103:10155–10162
- Leboef, A. (2008). Sierra Leone: List of extremely violent events perpetrated during the War, 1991-2002. Online encyclopedia of mass violence, *SciencePRO*.
- List, J.A. (2007). On the Interpretation of Giving in Dictator Games. *Journal of Political Economy*; vol. 115, no. 3.
- Macksoud, M. (1992). Assessing war trauma in children: A case study of Lebanese children. *Journal of Refugee Studies*; 5(1), 1–15.
- Macksoud, M., and Aber, L. (1996). The war experiences and psychosocial development of children in Lebanon. *Child Development*; 67, 70–88.
- Miguel, E., Saiegh, S. and Satyanath, S. (2008). National Cultures and Soccer Violence, *Mimeo*, University of California, Berkeley.
- Nelson, C. A., & Carver, L. J. (1998). The effects stress and trauma on brain and memory: A view from developmental cognitive neuroscience. *Development and Psychopathology*; 10, 793–810.
- Peden, E.A. and Bradley, M.D. (1989). Government size, productivity, and economic growth: The post-war experience. *Public choice*; Volume 61, Number 3, 229-245.
- pep bonet (2003), *One goal - amputees soccer dreamteam*, NOOR.
- Peters, K. (2011). *War and the Crisis of Youth in Sierra Leone*. Cambridge University Press
- Pynoos, R.S., Steinberg, A.M. Piacentini, J.C. (1999). A developmental psychopathology model of childhood traumatic stress and intersection with anxiety disorders. *Biological Psychiatry*; 46,1524-1554
- Raleigh, C. and H. Hegre, (2005). 'Introducing ACLED: An Armed Conflict Location and Event Dataset'. Paper presented to the conference on 'Disaggregating the Study of Civil War and Transnational Violence', *University of California Institute of Global Conflict and Cooperation*, San Diego, CA, 7–8 March.
- Ramey, S. L. & Ramey, C. T. (1999). Early experience and early intervention for children 'at risk' for developmental delay and mental retardation. *Ment. Retard.Dev. Disabil. Res. Rev.*; 5, 1–10.
- Richards, P. (1998). *Fighting for the rain forest: war, youth and resources in Sierra Leone*. James Currey Ltd.Oxford.
- Sesay, I.M., Karam, A.A. and Ngobeh, J.J. (2006). Republic of Sierra Leone: 2004. Population and Housing Census: Analytical Report on Population Distribution, Migration and Urbanisation in Sierra Leone.
- Shonkoff, JP. and Phillips, DA. (2000) eds; Committee on Integrating the Science of Early Childhood Development, Board on Children, Youth, and Families. *From Neurons to Neighborhoods: The Science of Early Childhood Development*. Washington, DC: National Academy Press
- Sigmund, K., Hauert, C. and Nowak, M. A. (2001). Reward and punishment. *Proc. Natl Acad. Sci. USA*; 98, 10 757–10 762.

Smith, P., Perrin, S., Yule, W., Hacam, B., and Stuvland, R. (2002). War exposure among children from Bosnia-Herzegovina: Psychological adjustment in a community sample. *Journal of Traumatic Stress*; 15, 147–156.

Smith, L. Alison, Gambette, C., Langley, T. (2004). Conflict Mapping in Sierra Leone: Violations of International Humanitarian Law from 1991 to 2002. *No Peace Without Justice March*.

Sober, E. and Wilson, D. S. (1988). *Unto Others: The Evolution and Psychology of Unselfish Behavior*. Cambridge, MA: Harvard University Press.

United Nations Development Program. (2008). *Human Development Report 2007/2008: Fighting Climate Change: Human Solidarity in a Divided World*. New York: United Nations.

United Nations Inter-agency Group for Child Mortality (2011). *Estimation released the latest estimates on child mortality*. Link: <http://www.childmortality.org/>.

Voors, M.J. and Bulte, E.H., (2008). Unbundling Institutions at the Micro Level: Conflict, Institutions and Income in Burundi. Institute of Development Studies, Sussex: HiCN Working Paper 49.

Voors, M., E. Nillesen (2010) Sierra Leone forest edge dataset

Voors, M., E. Nillesen, P. Verwimp, E. Bulte, R. Lensink and D. van Soest, (2011). Does Conflict affect Preferences? Results from Field Experiments in Burundi. *American Economic Review*; Forthcoming.

World Bank (2008). The Aftermath of Civil War. *World Bank Econ Rev*.

Yang, Y. and Raine, A. (2009). Prefrontal Structural and Functional Brain Imaging findings in Antisocial, Violent, and Psychopathic Individuals: A Meta-Analysis. *Psychiatry Res.*; 30; 174(2): 81–88.

Zheng, W. and Knudsen, E.I. (2001) GABAergic inhibition antagonizes adaptive adjustment of the owl's auditory space map during the early stages of plasticity. *J. Neurosci.*; 21: 4356-4365.

8. Appendix

Appendix A

Table A1. The effect of age during war exposure on generosity

Generous					
COEFFICIENT	III	IV	V	VI	VII
War exposure	0.301** (0.15)	0.547** (0.22)	0.366*** (0.13)	0.491** (0.22)	0.354 (0.26)
Age war exposure	0.00402 (0.033)	0.0990** (0.039)	0.0344 (0.026)	0.0349 (0.026)	0.0722* (0.041)
In-group dummy			0.645*** (0.18)	1.064* (0.61)	0.845 (0.68)
Warexp*In-group				-0.185 (0.25)	-0.0549 (0.28)
Education					-0.337*** (0.13)
Financial wealth					0.0417 (0.081)
Win					-0.151* (0.083)
Self-image					-0.648** (0.28)
Competitive					0.338 (0.23)
Attached team					0.0898 (0.070)
Constant	-1.523*** (0.37)	-3.459*** (0.59)	-2.510*** (0.32)	-2.805*** (0.53)	-3.078** (1.45)
Observations	127	127	254	254	220
Pseudo R-squared	0.03	0.15	0.10	0.10	0.21
Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1 Clustered on subject level					

Test effect war exposure on different social preferences

(1) **[inequalityaverse]_IWE_3 - [generous]_IWE_3 = 0**

chi 2(1) = **8.83**
Prob > chi 2 = **0.0030**

(1) **[inequalityaverse]_IWE_3 - [selfish]_IWE_3 = 0**

chi 2(1) = **6.48**
Prob > chi 2 = **0.0109**

(1) **[generous]_IWE_3 - [selfish]_IWE_3 = 0**

chi 2(1) = **0.03**
Prob > chi 2 = **0.8579**

Appendix B Experiment instructions

GENERAL INSTRUCTIONS

Welcome to this study of decision-making. The tasks we ask you to do will take about 30 minutes. The instructions are simple, and if you follow them carefully, you can earn a considerable amount of money. All the money you earn is yours to keep, and will be paid to you, in cash, in private, at the end of today. Your confidentiality is assured.

Thank you for your participation. You will receive 2000 Le for transportation for sure.

Pay attention to these instructions. Please do not talk with each other from this point on. If you have a question, you can raise your hand and ask. Otherwise, please be quiet and listen carefully. After the instructions are finished, we will take you aside and you will play the game.

Give the informed consent form to the player, and talk in through, then start the survey 1

INFORMED CONSENT

Football, Sports and Conflict Project

Erwin Bulte

My name is _____. I am a research assistant working for the Wageningen University and I am here to conduct a study on football, sport and conflict.

Before we begin, I would like to take a minute to explain why I am inviting you to participate and what I will be doing with the information you provide to me. Please stop me at any time if you have any questions. After I've told you a bit more about my project, you can decide whether or not you would like to participate.

This research is being conducted by researchers from the Department of Economics at Wageningen University. We will use the information we collect in articles that might be published, as well as in academic presentations.

Participation should take about an hour. Participation is on a purely voluntary basis. You will be asked to answer some questions about yourself. You will also be asked to make some choices and take part in some activities in which you can earn some money. There are minimal risks to you from answering the questions and taking part in the activities. The information we collect today is private and confidential. We will not share any details from the survey and activities with anyone besides the research team from Wageningen University. These surveys will go to a secure location at Wageningen University.

If at any time and for any reason, you would prefer not to answer any questions, please feel free not to. If at any time you would like to stop participating, please tell me. We can take a break, stop and continue at a later date, or stop altogether. You will not be penalized in any way for deciding to stop participation at any time.

If you have questions, you are free to ask them at any time. If you have questions later, you may contact me by calling Maarten Voors at 078-697-411. You may also contact the researchers at Wageningen University. Maarten Voors is the student researcher responsible for this project, and he can be reached in the following ways:

Maarten Voors
Development Economics Group, Wageningen University
Hollandseweg 1, 6706 KN, Wageningen, the Netherlands
+31-317-484-879
voors.econ.research@gmail.com

Survey – I

Enumerator code _____

Team Code: _____ Opponent Team code: _____

Personal Code: _____

Name: _____

1. Age: _____
2. Height: _____
3. Weight: _____
4. Left handed: _____ Right handed: _____
5. How many meals do you have a day? _____
6. How much money do you spend on mobile phone credits last month? _____
7. Which level of education do you have? _____
8. Do you have a job? _____ 1 = yes, 2 = no
9. What type of job? _____
10. Are you married? _____ 1 = yes, 2 = no,

11. Did your team win the game (+score)? _____ 1 = yes, 2 = no, score: _____
12. Did you play in the match of today? _____ 1 = yes, 2 = no,
 - a. If yes, how many minutes? _____
 - b. How many goals did you score? _____
13. How many matches have you played in this tournament? _____
14. How many times have you played with this team? _____
- 14b. What position do you play? _____
15. How many yellow and red cards did you receive in this tournament (including today's match)?
yellow _____ red _____
16. Do you consider yourself competitive? _____
1 = very much, 2 = much, 3 = average, 4 = little, 5 = very little
17. How many players are in your team? _____
18. How many players are better/equal/worse than you in your football team?
better _____ equal _____ worse _____

GAME – RISK

Personal Code: _____

Name: _____

In this task you can again earn some money. How much money you earn depends on your choices in the task and on chance. Before we start we will give you some instructions.

We will ask you to make several choices. For each choice you have to choose which option you would prefer to have. For each question you have two options:

Option 1 (certain): you receive a certain amount. This amount increases per question 'from a minimum of 100 to a maximum of 2500'.

Option 2 (game): you play a coin-toss game, 50%-50% chances, in which you can win 3000 Le. If the coin lands on tails and you receive nothing '0 Le'. If the coin lands on heads you win 3000 Le. *[Show them the coin, the head and the tail].*

For example: you can choose to either receive 1000 Le for sure, or play a coin flip game where you win 3000 Le if heads and nothing '0 Le' if tails. Realize that in the first case you win for SURE and in the second one you risk to win either 3000 Le or NOTHING!

Now please answer all 8 questions. We will pay you for ONE question. At the end of ALL activities we will draw a number from 1 - 6. Whatever number comes up, we will pay you for that choice. Winnings are in Leones.

Ask the person each question. Circle the options that the person chooses. Make sure they UNDERSTAND the game, if you feel they don't, explain it again.

	Option 1	Option 2 FLIP a coin
	Win for CERTAIN	If HEADS:
Question 1	100	3000 or 0
Question 2	500	3000 or 0
Question 3	1000	3000 or 0
Question 4	1500	3000 or 0
Question 5	2000	3000 or 0
Question 6	2500	3000 or 0

After everything is answered, explain again that we will select ONE of the 6 questions to be paid at the end of all activities.

GAME - ALLOCATION (opponent team)

Personal Code: _____

Name: _____

For this game you are coupled to somebody from the OTHER TEAM

In this task we ask you to make choices on allocating money to yourself and someone from the OTHER TEAM.

Remember, all the choices you make in this task are confidential. You will not know the identity of this person, and this person will not know your identity.

First, we ask you to divide 1000 Le between you and someone from the OTHER TEAM. This money will be given to you and the other for SURE in the way you prefer.

Allocate 1000 Le between you and the other from the OTHER TEAM. *(sum has to be 1000)*

For example you can keep 900 for yourself and give 100 to the other, or keep 600 for yourself and give 400 to the other, or 400 to yourself and 600 to the other, or keep 100 and give 900, etc.

SELF	OTHER

Now we will ask you 4 questions. At the end of ALL tasks we will draw a number from 1 - 4. Whatever number comes up, we will pay you for that choice.

Next, please indicate what allocation you prefer between YOU and somebody from the OTHER TEAM:

		Allocation 1	Allocation 2
	SELF	OTHER (opponent team)	SELF
1	1000	1000	1000
2	2000	3000	1000
3	1000	1000	1000
4	2000	0	1000

[NOTE: order of questions is determined by counting how many respondents you have done: the first respondent will start from question 1 and end with question 4, the second respondent will start with 2 and end with question 1, etc.]

After everything is answered, explain again that we will select ONE of the 4 questions to be paid at the end of all activities.

GAME - ALLOCATION (own team)

Personal Code: _____

Name: _____

For this game you are coupled to somebody from YOUR TEAM

In this task we ask you to make choices on allocating money to yourself and someone from YOUR TEAM.

Remember, all the choices you make in this task are confidential. You will not know the identity of this person, and this person will not know your identity.

First, we ask you to divide 1000 Le between you and someone from YOUR TEAM. This money will be given to you and the other for SURE in the way you prefer.

Allocate 1000 Le between you and the other from YOUR TEAM. (*sum has to be 1000*)

For example you can keep 900 for yourself and give 100 to the other, or keep 600 for yourself and give 400 to the other, or 400 to yourself and 600 to the other, or keep 100 and give 900, etc.

SELF	OTHER

Now we will ask you 4 questions. At the end of ALL tasks we will draw a number from 1 - 4. Whatever number comes up, we will pay you for that choice.

Next, please indicate what allocation you prefer between YOU and somebody from YOUR TEAM:

	Allocation 1	Allocation 2
	OTHER (own team)	SELF
1	2000	0
2	1000	1000
3	2000	3000
4	1000	1000

[NOTE: order of questions is determined by counting how many respondents you have done: the first respondent will start from question 1 and end with question 4, the second respondent will start with 2 and end with question 1, etc.] *After everything is answered, explain again that we will select ONE of the 4 questions to be paid at the end of all activities.*

Survey - II

Personal Code: _____

Name: _____

A. For the next questions use the following scale:

1= At least once per every week, 2=At least once per month, 3= A few times per year, 4=At most once per year, 5= Never

- a. How often do you watch witchcraft movies/series (as on African Magic)? _____
- b. How often do you watch war movies? _____
- c. How often do you watch other violent movies (on gangs, etc)? _____

1. Religion: _____

2. Ethnic group: _____

3. Did you ever experience witchcraft? (if yes, you can write down comments)

4. Were you or anybody of your family or friends ever affected by witchcraft? (+comnts)

5. Were you and/or your family displaced due to warfare _____ 1 = yes, 2 = no

6. In which chiefdom did you stay during the war?

Period (year): _____ chiefdom: _____

7. In the war, did you...

a. Hear fighting _____ 1 = yes, 2 = no

b. Saw fighting _____ 1 = yes, 2 = no

c. Saw an injured person _____ 1 = yes, 2 = no

d. Saw soldier and/or rebel _____ 1 = yes, 2 = no

e. When (years) _____

8. Did you fight in the war? _____ 1 = yes, 2 = no

a. If yes, did you ever fire a gun in the war? _____ 1 = yes, 2 = no

9. Were you injured during the war? _____ 1 = yes, 2 = no

10. Did one of your parents fight in the war? _____ 1 = yes, 2 = no

11. Did anybody of your family get killed in the war? _____ 1 = yes, 2 = no,

12. Who? 1 = father, 2 = mother, 3 = brother/sister, 4 = grandparents, 5 = uncle/aunts

Thank you for this interview

COMPETITION GAME - BALL TROWING

Enumerator code _____

Personal Code: _____

Name: _____

The task that we ask you to perform is throwing this ball into a bucket from a line. (*Show them the ball, bucket and line*). You will have 10 chances and you will be paid for your performance. Before you do the task, you will have a choice between 2 ways of earning money.

Option 1 (Individual Payment): If you choose this option, you receive 500 Le for each ball you throw in successfully.

Option 2 (Tournament): If you choose this option, your performance will be compared with a random person from either your team or a random person of the other team. You will receive a reward only if you succeed more times than this person. If you succeed more times than your opponent and win the competition, you will be paid 1500 Le for every ball you throw in successfully. But you will only receive a reward if you are better than your opponent. Otherwise you will get nothing '0 Le'. If you both succeed the same number of times, you still get 500 Le for each success.

Do you have any questions? Do you understand the game? Do you understand the 2 different options?

Let us give the following examples:

- "If I choose the individual payment (that is, if I do not choose to take part in the tournament), and I throw in 5 balls successfully how much money do I get?"
- "If I choose to compete and I throw in 3 balls successfully and my opponent makes 2 balls, how much money do I get?"
- "If I choose to compete and I throw in 4 balls successfully and my opponent throws in 5 balls, how much money do I get?"
- "If I choose to compete and I throw in 2 balls successfully and my opponent throws in 2 balls also, how much money do I get?"

Do you have any questions?

Remember that with Option 1 you get 500 Le per successful throw. With Option 2 you get 1500 Le per successful throw if you are better than your opponent, zero if you are worse, and 500 Le per successful throw if your performance is the same.

If you choose **tournament** you will be playing with someone from:

A. your team (own team) B. the other team (opponent team)

who did the same task. If you choose competition, we will compare your performance this person. Now, please tell us which option you would like to choose—individual pay (Option 1) or competition (Option 2).

What do you choose:

A. Individual Payment or B. Tournament

[Circle answer]

How do you think you will perform?

1. the best 2. good 3. average 4. poor 5. the worst

[Circle answer]

Now you can start throwing the balls.

[Subject throws 10 balls, helper puts a check on the record sheet for each ball made, adds]

Now please throw the ball 10 times:

Throw	Made ball? (tick box if yes)
1	
2	
3	
4	
5	
6	
7	
8	
9	

10	
SUM	

[Put a check on the record sheet for each ball made, adds]

How well do you think you performed?

1. 2. 3. 4. 5. 6.
- the best good average poor the worst

[Circle answer]