Social networks and intergroup conflict

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*"…neither cultural, psychological, nor economic differences are **necessary** for the rise of intergroup conflict… Nor are maladjusted, neurotic, or unstable tendencies necessary conditions for the appearance of intergroup prejudice and stereotypes. The **sufficient condition** for the rise of hostile and aggressive deeds …was the existence of two groups competing for goals that only one group could attain, to the dismay and frustration of the other group."*

Muzafer Sherif: In Common Predicament. Social Psychology of Intergroup Conflict and Cooperation (1966a: 85)

CHAPTER 1

COMPETITION AND CONFLICT BETWEEN GROUPS

Introduction

1 COMPETITION AND CONFLICT BETWEEN GROUPS:

1.1 Aims of this study

I passed by a graffiti in the center of Budapest during the Serb-Croatian war, which claimed that “Milosevic is a pig”. Under this text, there was a sagacious response also in English stating that “Human beings are the problem”. Almost a decade later, the graffiti is still there. Nobody repainted the wall; probably in order to leave the graffiti as a memento for the senseless bloodshed in the Balkans.

Human beings are the problem in the sense that despite the painful consequences, they choose to make sacrifices for their group and participate in an action that results in intergroup conflict. There is no need to raise extensive arguments as to why these harmful conflicts should receive special attention in the social sciences. It is also needless to say that not all intergroup relations end up in conflict. Just the opposite, we find that groups in most cases can live peacefully together (Fearon and Laitin, 1996; Gould, 1999). Therefore, the most challenging question for scientific research is to determine the conditions under which peaceful relations prevail. Developments in this direction could offer methods of conflict resolution and hopefully, might lead to policy advice and implementation.

There is no doubt that policy makers are in a strong need of suggestions for handling intergroup relations of several kinds. Recent examples of civil war, ethnic hostility, fights between soccer fans or between urban gangs bitterly show that conflicts often remain unresolved or are only solved with tremendous effort. International warfare of alliances of nations is an analogy on a larger scale and confrontation between pupil groups often causes a similar headache on a smaller scale. And this is by far not the end of the list of poisonous intergroup relations.

For proper advice to politicians we need a better understanding and a deepened explanation of violent confrontations. Sometimes we need to argue from the opposite point of view and have to concentrate on the emergence of peaceful coexistence, like the rise of a live-and-let-live system in the trenches in World War I. Sometimes in similar circumstances we do not have to worry about individual participation, but rather about the lack of participants, like in the case of voting in two-party democracies. All of these and many more examples relate to the very same problem of *competitive intergroup relations* that are based on individual contributions.

To determine the conditions for the emergence of intergroup conflict and peace we have to ascertain under which circumstances group members are willing to make contributions to harmful intergroup competitions. Furthermore, in order to do this, we have to explore the *underlying mechanisms* that drive individuals towards sacrifices against another group. This sort of logic is grounded on the principles of *methodological individualism* (Coleman, 1990) and it is in strong contrast with previous explanations of intergroup conflict that were built on macro mechanisms and are still

very much in fashion. The logic of explanation in this study is also in contrast with theoretical and empirical research that examines individual causes, but fails to reveal the mechanisms behind these effects.

In general, little has been said before now about the social mechanisms that lead to intergroup conflict. As a major contribution, this study aims to highlight causal chains that stem from the *embeddedness* of human action (Granovetter, 1985). Individual decisions in the intergroup context are interdependent, embedded in the social structure, and embedded in a historical context. They are *interdependent*, because contribution to harmful intergroup competition has an effect on intergroup relations and consequently on the well-being of others. Moreover, it has also a direct effect on actions that others undertake. Such influences are especially strong among friends, neighbors, colleagues, and family members, which means that the network of individual relationships constrains individual actions. This explains why *structural embeddedness* has an impact on intergroup relations. On the other hand, lethal clashes in the past and prospects of future relations have firm effects on present attitudes and actions in the intergroup context. This is the reason why *temporal embeddedness* plays a crucial role in intergroup competitions.

The question of how interdependence and embeddedness influence decisions in the intergroup context and consequently the outcome of intergroup relations is central in this study. This question frames the theoretical model building in the research, as well as the methodology we apply to detect fundamental processes. Among effects of structural embeddedness, particular attention is devoted to the effect of *segregation* and to the underlying *social control* mechanisms. With regard to temporal embeddedness, we are mainly interested in tracing typical *scenarios* of intergroup relations and individual *behavioral heuristics* that are responsible for the changes. We use *simulations* and laboratory *experiments* as research tools that are quite unconventional in this field. We do this with the aim of better understanding, explanation, and prediction of intergroup conflict and peace.

In this chapter we summarize the objectives of this study and give an introduction to the analysis of intergroup conflict and peace. Section 1.2 introduces the general research problem. In Section 1.3 we provide an overview of related theories of intergroup conflict and attempt to highlight some fundamental problems of existing approaches. In Section 1.4 we discuss why we line up behind the *team games model* of intergroup relations. A major scientific relevance of this study lies within the incorporation of effects of structural embeddedness into the team games model. The background of this model development is discussed in Section 1.5 and the cornerstones of the model extension are introduced in Section 1.6. A discussion about the effects of temporal embeddedness follows in Section 1.7. The main research questions of this study are formulated in Section 1.8. The primary motivations for using simulations and experiments as methodological tools are presented in Section 1.9. Finally, we provide an outline of subsequent chapters.

1.2 Research problem

1.2.1 The nature of intergroup conflict

In our attempt to determine underlying mechanisms that influence the likelihood of intergroup conflicts, we first have to clarify what kind of conflicts we study. There are many forms and reasons of intergroup conflict, too many and too different to provide a general theory for all of them. Being less ambitious, we restrict our interest to conflicts between two groups that are *unintended* consequences of conscious and voluntary actions of group members. Unintended conflicts are suboptimal outcomes compared to other outcomes, like peaceful coexistence. Examples are violent clashes between ethnic groups in residential neighborhoods or in villages and harmful competitions between pupil groups. We would like to explain such outcomes without assuming that group members actually seek harmful outcomes. As we have a limited scope of interest, we will use the term *intergroup conflict* only in the following restricted meaning.

Definition 1.2.1.1 Intergroup conflict is an aggregated consequence of individual contributions to an action of the group that hurts the interests of the other group.

The definition presumes that we consider intergroup conflict as an *aggregated* consequence of *individual* contributions. The definition applies to situations in which two distinct groups are involved. We emphasize that we do not consider groups as unitary actors, but as collections of individual decision makers who have the right to decide about their contributions. Furthermore, the definition also specifies the relationship that exists between the two groups. If an action of one group hurts the collective interests of the other group, there is a *negative interdependency* between the two groups. Negative interdependency occurs in *intergroup competition* situations, in which territory, power, economic and social incentives, or other scarce resources are at stake. For instance, opposite sides in civil war may fight for power or street gangs may contend to obtain social identity. These situations are symmetrical in the sense that a competitive action of one group hurts the other group and a competitive action of the other side also hurts the first group. If both sides act competitively, it results in a mutually harmful outcome that is worse for all than the lack of competitive action. For example, an endless war or bloody street battles is worse than living in peace for both parties.

Situations, in which intentional actions of individuals result in suboptimal outcomes for everyone, are described as *social dilemmas*. Consider the following more formal definition given by van Lange et al. (1992: 4):

Definition 1.2.1.2 Social dilemmas can be defined as situations in which each decision maker is best off acting in his own self-interest, regardless of what the other

> persons do. Each self-interested decision, however, creates a negative outcome or cost for the other people who are involved. When a large number of people make the self-interested choice, the costs or negative outcomes accumulate, creating a situation in which everybody would have done better had they decided not to act in their own private interest.[1]

Under certain conditions intergroup conflict is a social dilemma, but a special one in which people's *contributions* are in their own self-interest. Contributions are made to a *collective action* of the group. The collective action, however, creates a negative outcome or cost for members of another group and a gain for members of the own group. If a large number of members in both groups contribute to the group actions, then everybody is worse off than they would be in the absence of contributions. Hence, unlike in single group social dilemmas, *contribution is the undesirable action* from the collective point of view. For instance, in civil war, the choice of shooting with many comrades is a contribution to a collective action that hurts the interests of the enemy. When there are enough warriors in both groups, balanced fighting results in bloodshed.

The question now is how can contribution be the self-interested choice. This is a challenging question as in single group collective action *not contributing* is the unconditional best strategy. The structure of interdependency within the group is not different in intergroup related collective action. The difference is the competition between the groups. In order to explore the role of intergroup competition and examine under what conditions it can provide a structural solution for the collective action problem within the group (cf. Bornstein, Erev, and Rosen, 1990; Erev, Bornstein, and Galili, 1993), we need to integrate modeling interdependencies within the group and between the groups. These interdependencies cannot be separated, therefore should not be handled separately. It is quite surprising that this association has been hardly made before in research on intergroup conflict.

1.2.2 Embeddedness and intergroup conflict

The fundamental question is why do people join collective actions that are harmful in the intergroup context, if they have to make sacrifices. This is the question we need to answer in order to find an explanation for the emergence of lethal conflicts between groups.

Specification of all factors that possibly influence individual decisions and consequently the likelihood of intergroup conflict goes far beyond our possibilities. We concentrate on the *competition* between the groups for certain scarce resources and on the *structural* and *temporal embeddedness* of individual actions. First, individuals are encouraged to participate in conflict by rewards of intergroup competition and

[1] There are also less restrictive definitions of social dilemmas that do not require that following self-interest is the unconditional best strategy (Liebrand, 1983; Flache, 1996: 3).

comparison, such as territory, pride, or social identity. Second, they gain merits from social connections and relationships with others in their group. Third, they are mobilized by revenge, experience, and other factors based on the past, and expectations, fear, and other factors based on the future.

The analysis of *structural embeddedness* in intergroup conflict is an original aspect of this study. When individuals decide to participate in conflict, they are influenced by the presence, opinion, and behavior of their friends, neighbors, colleagues, and their family. They also receive relevant information through these connections. Actors and the interpersonal connections among them are referred to as the *social network* (Wasserman and Faust, 1994: 9). Surprisingly, research on intergroup conflict until now has disregarded social network effects almost completely (exceptions are Flap, 1988; Nelson, 1989; Gould, 1999; Bhavnani and Backer, 2000). By focusing on the relevance of networks of social relationships we can gain a better understanding of conflicts in different structural environments. Examples are how different residential structures affect the likelihood of ethnic conflict, how seating policies influence the likelihood of conflict between supporters in a stadium, as well as which settlement policies can help conflict resolution. Since there are many possible structural configurations and several network properties that can be important in intergroup relations, we should specify which structural characteristics are the focus of our exploration.

Inspired by empirical puzzles and debates, our research problem about social network effects is primarily centered around the effect of *segregation* on intergroup conflict. The level of segregation is conceptualized as the extent to which group members have ties among each other compared to all connections in the social network. Consequently, the question why and under what conditions segregation increases the likelihood of intergroup conflict is equivalent to asking why and under what conditions dense within group relations and scarce intergroup relations support the emergence of intergroup conflict.

There are already indications in classical sociology that segregation results in a higher level of intergroup-tension, which makes conflicts more likely (Simmel, 1955[1908]; Sumner, 1974[1906]; Coser, 1968[1956]). In the academic debate over school desegregation, for instance, Blalock (1986) has emphasized the effect of racial segregation on interracial tension. The implementation of school desegregation policy in the seventies in the United States brought improvements to interracial relations (Blalock, 1986; Granovetter, 1986). There is also empirical evidence of the effect of residential segregation on ethnic conflicts (cf. Harris, 1979; Diez Medrano, 1994; Hasson, 1996; Olzak, Shanahan, and McEneaney 1996).

On the other hand, some residential studies debate that segregation in cities would result in the emergence of ethnic conflicts (Duncan and Duncan, 1955; Lieberson, 1963). An outburst of ethnic violence at residential division lines with a mixed population and self-sustaining migration movements towards segregation evoked government policies supporting residential *separation* (Belfast, Jerusalem, Usti nad Labem, Mostar, or Kosovska Mitrovica are recent examples). Building walls and

destroying or closing bridges together with a deployment of armed forces, although radical tools to achieve interethnic peace, they nevertheless provided a solution. This solution often seems only temporary as tension between the opposing ethnic groups is far from being extinguished. In other cases, separation is successful, because intergroup conflict ends with a disappearance of its object (cf. Simmel, 1955[1908]). If negative interdependencies are unavoidable and intergroup competition situations occur over and over again, separation policy can even support lethal conflicts.

It is likely that there is no general answer for whether or not desegregation is an effective policy to decrease violence between groups. In this study we address the question *why and under what conditions segregation increases the likelihood of intergroup conflict*. Since segregation is the aggregation of ego-network attributes and intergroup conflict is an aggregation of intentional individual decisions, the proper way to find explanatory mechanisms is to look at the relationship between ego-networks and individual decisions. Therefore, we have to find an explanation to *why and under what structural conditions individuals are willing to contribute to an in-group collective action that hurts the interest of another group.* In this explanation, we have to reveal the micro mechanisms that cause the effects of structural relations. This also helps to specify how the segregation effect depends on the nature and content of interpersonal relationships.

What complicates our analysis is that groups rarely face only one single competition situation. As they live alongside one another, competition situations occur repeatedly. There might be changes in the nature of interdependency, but often similar situations are recurrent. On one hand, previous outcomes certainly play an important role in subsequent competitions, as they influence forthcoming decisions. On the other hand, foresight of future intergroup and social relations also poses limitations on current actions. Hence, our investigation cannot be complete without considering the effects of *temporal embeddedness*.

General observation in the literature about dynamic intergroup relations is that there are two likely scenarios. One, which fortunately occurs more often, is long lasting peace and the other is a lethal spiral of violence (Fearon and Laitin, 1996). We are interested whether and under what conditions these paths occur and what are the underlying mechanisms causing them. In order to help conflict resolution, we will attempt to show the conditions that best promote the evolution of peaceful scenarios and reduce the emergence of durable conflict. We are interested in *how and why these scenarios emerge*. Furthermore, we examine *how social networks and how the consideration of past and of expected future outcomes influence the dynamic process*. For answers, we have to consult again mechanisms at the micro level. We have to find an explanation to *how individuals behave in repeated intergroup competitions; why and under what conditions they choose a strategy that includes unconditional or conditional contributions to repeated collective action that hurts the interest of another group*.

1.3 Theories of intergroup conflict and peace: an overview

In the previous section, we specified our general research problem. In this section, we briefly discuss a selection of previous research on intergroup conflict. We will also consider studies that use the concept of intergroup conflict in a broader sense or in a different way than we do, since their findings might be instructive for this study. This overview is deliberately biased towards theories that are directed at intergroup competition, social networks, and historical effects as factors that are related to intergroup conflict and peace.

We structure this selection along the division line between macro and micro approaches, although the border between them is probably not as unambiguous as we propose. Furthermore, there is an overlap with the categorization offered by Lindenberg (1997). According to Lindenberg, interdependencies that make group relations interesting can be classified as *functional*, *cognitive*, and *structural* interdependencies. First, we discuss some classical theories in macrosociology that concentrate on functional interdependence in intergroup relations. Second, we turn to highly influential thoughts in the social psychology of intergroup relations that emphasize cognitive interdependencies. Third, we target microsociological and economic approaches that cope with functional and structural interdependencies.

Classical theories mainly focused on *macro explanations* and on *functional interdependence* in intergroup relations. The main concern of the seminal work of Simmel (1955[1908]; 1955[1922]) was the functional role of intergroup conflict on cohesion and solidarity within the group. Besides internal solidarity, another product Simmel emphasized was the integration of the group (Simmel, 1955[1908]: 91): "…the group as a whole may enter into an antagonistic relation with a power outside of it, and it is because of this that the tightening of the relations among its members and the intensification of its unity, in consciousness and in action, occur." Simmel also discussed the content of interpersonal relationships that drives towards participation in conflict. He argued that individuals have a limited choice in conflict situations, as the force to comply to a uniform action is very strong (Simmel, 1955[1908]: 92-93): "A state of conflict … pulls the members so tightly together and subjects them to such a uniform impulse that they either must completely get along with, or completely repel, one another."

Drawing on the work of Simmel, *realistic conflict theory* was oriented towards the functions of intergroup conflict (Coser, 1968[1956]; 1967). As Coser (1968[1956]) claimed, a primary function of conflict is that it establishes and maintains group identities and boundaries. Furthermore it is a basic source of internal solidarity. Besides the functions, the sources of conflict are also of central interest in realistic conflict theory. The starting point of realistic conflict is intergroup competition (Williams, 1947; Blumer, 1958; Coser 1968[1956]; Sherif, 1966a). Groups compete with each other for certain scarce resources and the scarcity of these resources makes intergroup conflict

"realistic". Groups try to obtain these resources, because it is in their economic (or any other type of) interest. For instance, religions are in ideological conflict with each other when they claim to be the one and only true religion (Allport, 1954). In general, hostility towards the competitive group is just the means for obtaining the scarce resources for the in-group. Hence, groups involved in realistic conflict are in a certain sense rational. Still, this approach has nothing to do with rational individual choice (cf. Coenders, 2001: 14), as it considers the groups as the units of analysis and not the individual members of the groups.

Realistic conflict theory was extended in the individualistic direction by Blalock (1967). Blalock handled actual intergroup competition for scarce resources at the macro level separately from individual actions. In his model, individuals are mobilized if they *perceive* intergroup competition or an out-group threat. This perception does not necessarily have to coincide with an actual competition (e.g., LeVine and Campbell, 1972: 41).

The analysis of Richardson (1948a; 1948b) did not consider the group as the unit of analysis, but was based on statistical proportions of individuals with different moods in the rival groups. His study examined the effect of time on the number of persons in different *war-moods* in two opposing nations. Richardson explained changes in these numbers by an underlying mechanism that is analogous to epidemics. Friendly and hostile attitudes spread irreversibly as a disease or fashion and result in transitions from one mood to another. When appropriate transition rules and starting parameters are assumed, the typical phases of symmetrical war can be deduced. For certain values of the parameters a balanced state of armament levels is derived. The other two typical scenarios are escalation of a runaway arms race and complete disarmament (Richardson, 1951; 1960). However, just like the classical macrosociological theories, these derivations fail to reveal the micro foundations of intergroup conflict and peace.

Individuals and *cognitive interdependencies* are the focus of theories about intergroup conflict and attitudes in *social psychology*. On the other hand, these theories tend to neglect the importance of functional interdependencies between the groups that is at least recognized by macrosociological approaches.

The positive association between positive attitudes toward in-group members and negative attitudes toward out-group members is emphasized by the theoretical concept of *ethnocentrism* (Sumner 1974[1906]; LeVine and Campbell, 1972; Brewer, 1981). Sumner (1974[1906]) claimed that this association is universal and every group has a syndrome of ethnocentrism. In this respect, there is sufficient supporting evidence in the empirical literature, for instance, the studies of urban gangs (Suttles, 1967; Jankowski, 1991: 88).

Sherif in his "*theory of conflict*" focused on the emergence of negative out-group attitudes and intergroup hostility (Sherif, 1966b; Sherif and Sherif, 1969). In line with realistic conflict theory, he emphasized that competitions between groups have a fundamental impact on the evolution of group structures, on negative out-group

attitudes, and on the emergence of hostile behavior (Sherif, 1966a; 1966b). In his field experiments in a young boys summer camp, he showed how sport competitions and segregation led to a greater distance between the groups, to prejudice, and even to occasional hostilities (Sherif, 1966b). Sherif also attempted to find possible resolutions of conflict. Contact between members of the groups that does not involve interdependence among them did not improve intergroup relations; occasional meetings just provided a place for hostile behavior and clashes. On the other hand, the establishment of superordinate, common goals fairly improved the situation. As groups faced a series of cooperative interdependencies, hostilities were disappearing (Sherif, 1966b; Brewer, 1996a).

For the emergence of in-group favoritism and out-group hostility it is not required that groups are organized or have an established set of norms. In the pursuit of minimal conditions that are sufficient to facilitate intergroup conflict, Tajfel and his colleagues conducted a series of *minimal group experiments* (Tajfel, 1970; Tajfel et al., 1971; Billig and Tajfel, 1973). In these experiments, there was no social interaction between the subjects, furthermore the groups were created on a cognitive basis and therefore they are referred to as "minimal". *Categorization* based on the estimation of the number of dots in a drawing or on the preferences for the paintings of Klee and Kandinsky was already sufficient for the emergence of in-group favoritism. Besides this highly influential result, a pragmatic value of minimal group experiments was that they were able to distinguish and control for different effects, unlike field experiments, where it is also difficult and partly unethical to create "real" social groups.

The minimal group experiments stimulated the formation of *social identity theory* (Tajfel, 1981; 1982; Tajfel and Turner, 1986). The basic premise of social identity theory is that individuals strive to achieve or maintain a satisfactory image about them and an important aspect of self-definition is group identification. Social identity is primarily relational and comparative in nature as it is based on intergroup comparison. The polarization of the noble in-group image and the evil out-group picture provides positive social identity. The need for a positive psychological group distinctiveness can be achieved through social comparison. Intergroup competition provides this comparison, which explains the emergence of in-group favoritism. Individuals invest emotional energy to develop social identity and this might be the basis of their behavioral decision to participate in actions of the in-group. In these cases social identity is not taken into account purposefully, however the strive for social identity can indirectly explain why group members are mobilized (cf. Macy, 1997).

The follow-up of social identity theory has taken different routes. On one side, *self-categorization* theory emphasized intergroup behavior in terms of underlying cognitive representations. Radical views expressed that individuals are "transformed into groups" via the process of self-categorization (Hogg and Abrams, 1988: 21), meaning that this cognitive mechanism is sufficient for thinking in group terms. On the other side, critical remarks maintain that social identity is obtained conditionally, only if the group is seen as an acting social unit (Horwitz and Rabbie, 1982). This approach gives more attention

to the instrumental character of intergroup relations in which one group competes with another group to achieve valued goals (Rabbie, 1982). Some critics in political science argue that the establishment of group identity might have no negative effect at all on the other group. An example is the distinction between the concept of "healthy" patriotism and harmful chauvinism at Kosterman and Feshbach (1989).

These approaches in social psychology emphasized the role of cognitive interdependencies in intergroup relations. On the other hand, they disregarded macro relations between the groups and functional and structural interdependencies.

The individualistic perspective of social psychology and the emphasis on functional and structural interdependencies between and within the groups is combined in some *microsociological* and *economic* theories. For this study, these research directions are most essential, as we intend to explore the micro foundations of intergroup conflict and we have only a side interest in analyzing cognitive interdependencies.

Segregation and its evolution were the focus of some pioneer models in *rational choice* sociology. Models of Schelling (1971; 1978) and Esser (1986) have demonstrated how residential segregation can evolve as an unintended result of intentional individual action. These models, however, concentrated on neighborhood preferences as a source of segregation and they did not specify what was wrong with segregation and how it was related to intergroup relations.

Economic incentives are emphasized in intergroup relations by *ethnic competition theory* (Gellner, 1983; Olzak, 1986; 1992). Ethnic groups are considered as effective coalitions that are formed to extract material benefits from others or to defend possessions. This is also the source of ethnic competition and violence. The stronger the ethnic competition, the more severe the attitudes towards the competitor group are (Olzak, 1986). A core hypothesis is that ethnic collective action is intensified by desegregation of the labor market, as employment possibilities are scarce and they are also the targets of ethnic competition (Olzak, 1992: 3). Ethnic groups (and also other groups), however, have fixed group boundaries and membership is not a question of choice. As entry and exit is blocked, ethnic networks enjoy several advantages, like trust, cohesion, and easier establishment of collective action (Wintrobe, 1995).

A substantial element of intergroup relations that was neglected by all models discussed so far is *strategic interdependence*. As a formal study of strategic interdependence, noncooperative *game theory* is ideally suited for sociological concerns (von Neumann and Morgenstern, 1944; Luce and Raiffa, 1957; Schelling, 1960). A contradiction between individual and collective interests is modeled by social dilemma games, including the Prisoner's Dilemma (Rapoport and Chammah, 1965; Axelrod, 1984; Poundstone, 1992). Considering the wide range of societal applications, it is no surprise that for the study of individual behavior in these situations a new research field has evolved (e.g., Dawes, 1980; Liebrand, 1983; van Lange et al., 1992; Kollock, 1998). *Social dilemma research* uses game theory because it provides an adequate

model for the interdependence of actions and not due to its key assumption of rationality (Macy, 1991b: 810).

The strategic interdependence of individual decisions in intergroup relations is emphasized by recent models of Fearon and Laitin (1996), Gould (1999), and Bhavnani and Backer (2000). These models also recognize that ways of resolving intergroup conflict are difficult to find, if explanations are only provided for conflict and not for intergroup (interethnic) peace. Furthermore, individuals have contradicting interests considering intergroup and within-group relations. Conflict between the groups often originates from an establishment of an in-group *collective action* (Gould, 1999; Bhavnani and Backer, 2000). Successful mobilization within the group is difficult to achieve; violent competitions are therefore less frequent than peaceful coexistence.

We follow this research path in this study. In order to explain the emergence of intergroup conflict and peace, we develop an explanation for individual participation in conflict. For this purpose, we base our theoretical model on the *team game* approach that considers strategic interdependence of individual actions both in the intergroup context and within the group. The subsequent section provides an introduction to this approach. In this way, this research diverts from explanations of group conflict that disregarded the purposefulness of individual action and also from studies that failed to recognize the conflict between individual and group interests.

1.4 Competitive intergroup relations modeled as team games

The theories introduced in the previous section are all lacking one or more aspects of what we believe an adequate theory on intergroup conflict should have. First of all, groups cannot be handled as unitary entities as they consist of consciously acting individuals who primarily care about their own gains and losses. The most challenging problem for research is when intergroup conflict is an aggregated outcome of voluntary and intentional individual actions. The theoretical foundations we choose for our analysis should take this into consideration.

The explanation should be supported by a theoretical model that gives meaningful predictions of the conditions under which conflict and peace are likely to occur. The appropriate model should represent the duality of within-group and intergroup interdependencies. Furthermore, the explanation of intergroup conflict should start from a simple and abstract theoretical model (Lindenberg, 1992). In this section, we argue what should be the key elements of a simple model of intergroup competitions and we introduce the theoretical framework that would be the departure point of the theoretical investigation in this study.

Considering within group interdependency as a *collective action problem* is one key element in the model of intergroup relations. Either looking at civil war, violence between football supporters, or fights between urban gangs, participation in conflict

involves high costs and risk for group members. Individuals have to sacrifice time and sometimes money to take part. They can have serious injuries and might even risk their lives. If they do not participate and leave others "doing the job", they can still enjoy the benefits. Benefits of intergroup competition (for instance, public happiness, pride, or social identity) can be considered as group *public goods*, because there is no rivalry in consumption and no group member can be excluded from the consumption. This is the reason why individuals are able to free ride on the effort of others and the within group interdependency can be considered as a collective action problem. Individual contributions are costly, therefore group beneficial collective action is difficult to achieve.

What makes intergroup conflict different from other collective action problems is the *interdependence between the groups*. As it was suggested first by realistic conflict theory (see previous section), the origin of intergroup conflict is that the groups compete for obtaining certain scarce resources. Examples of such resources are territory or economic control. However, intergroup competition can also be heated by immaterial benefits, like pride, avoidance of shame, or social identity. Benefits to football hooligans are certainly only immaterial and consists of, for instance, the pride of being the most feared ultras. As an immaterial benefit that exists only in intergroup relations, the striving for social identity can explain group-beneficial behavior in minimal groups (Tajfel, 1970). It can also provide a reason for why groups are more competitive and aggressive than individuals (cf. Kramer and Brewer, 1984; 1986; Tajfel and Turner, 1986), which is referred as the *discontinuity effect* (Schopler and Insko, 1992; Insko et al., 1993; 1994). Experiments also confirmed that when they are playing alone and when they are members of groups, individuals behave differently (Bornstein, Erev, and Rosen, 1990; Schopler and Insko, 1992; Insko et al., 1994; Bornstein and Ben-Yossef, 1994). Subjects were more inclined to make sacrifices for their group to win from another group than they were for themselves in two-person situations.

Which group is able to realize the benefits of intergroup competition depends on an *intergroup comparison* of strength and efficiency of mobilization of group members. Practically, one of the major determinants is the number of people mobilized. Meanwhile the winning group obtains the benefits, the other group can suffer from negative consequences (for instance, loss of resources, shame, humiliation). For instance, successful recruitment of volunteers into paramilitary units creates possible gains for the in-group, but certainly hurts the interests of the out-group. Both sides are punished in the case of mobilization of a similar strength. Endless civil war, unsettled disputes, mutually harmful clashes are such examples where no benefits are realized. These outcomes are worse for everyone compared to no mobilization and peace.

This character of intergroup interdependence resembles the two-person *Prisoner's Dilemma* (e.g., Luce and Raiffa, 1957; Rapoport and Chammah, 1965; Axelrod, 1984; Poundstone, 1992). If groups were unitary entities and they could choose between mobilization and no mobilization, mobilization would be their *dominant strategy*. This means that regardless of the action of the out-group, the in-group would gain more with

mobilization. Following the dominant strategy by both sides would result in a suboptimal outcome.

However, groups do not fight with each other in every situation. They are often unable to establish collective action because of ramifying interests within the group. This way, within group interdependencies can help to solve conflicts between the groups. Hence, there are two different perspectives of the situation. Conflicts between groups can be resolved by interdependencies within the groups. On the other hand, intergroup competition can be considered as a possible structural solution to social dilemmas within the group (Bornstein, Erev, and Rosen, 1990; Erev, Bornstein, and Galili, 1993). To summarize, the model of intergroup competition should capture this duality of within-group and intergroup interdependencies and should represent the mixed motives of individual decisions.

Until now, however, *theories of group conflict hardly made any connection to collective action problems within the groups and theories of collective action overlooked intergroup relations*. A framework that would allow for a combined modeling is offered by the *team games approach* (Palfrey and Rosenthal, 1983; Rapoport and Bornstein, 1987). In team games, competitive group relations are represented by a game. There are two levels of the game. At the intergroup level, groups as aggregates face an interdependent situation. Group action is determined as a consequence of individual actions within the group. Individuals decide either to contribute to the group action (make a sacrifice for their group) or not.[2] Individual decisions are strategically interdependent, which is represented as *n*-person games at the within-group level.

In the *Intergroup Prisoner's Dilemma* (IPD) game (Bornstein, 1992; Insko et al., 1994; Bornstein, Winter, and Goren, 1996; Goren and Bornstein, 2000) individuals are always better off when they do not participate in the group action. Public rewards for group members increase with the difference between the number of participants in the own group and in the other group. Besides, if the numbers of participants are equal, higher rewards are distributed, in case more people are mobilized. In this game, no participation is a dominant strategy equilibrium that is suboptimal in comparison to the outcome in which everyone participates.

Similarly, in the *Intergroup Public Goods* (IPG) game (Rapoport and Bornstein, 1987; Bornstein, 1992) intergroup competition is based on the number of contributors. Public good benefits are distributed in the group with more contributors. In case the numbers of contributors are equal, scarce public good rewards are divided between the groups. In the IPG game, individuals do not have a dominant strategy, since there are situations in which a single decision changes the result of the competition. Still, in most cases, not contributing is a more beneficial option.

The IPG game nicely represents the dichotomy of interdependencies within the groups (provision of a public good) and between the groups (intergroup competition).

[2] In several intergroup competitions individual decisions are not binary, but continuous (for instance, how accurately warriors shoot in civil war).

On the other hand, the IPD game can illustrate the social trap character of harmful intergroup competitions. If both groups are able to mobilize their members effectively, the result of the competition is harmful for both sides. A modification of the IPG game with this character would result in a model that describes more closely lethal intergroup conflicts.

In this section, we introduced the team games approach as a model of intergroup relations. We discussed the key elements of this model and its advantages compared to other approaches. Based on these arguments we choose the team games model of intergroup relations as a departure point for theory development in this study.

Team games, however, *fail to specify the basic mechanisms that generate participation in intergroup conflict*. As the primary objective of this study is to explain why individuals participate in harmful intergroup collective actions, we need to overcome this deficiency of the team games model. Furthermore, *team games completely disregard the structural embeddedness of individual actions*. Behavior is embedded structurally, as everyone's behavior is to a large extent constrained by neighbors, friends, and the family, regardless of group affiliations. Not only the team games approach, but also other prominent theories of intergroup conflict neglected the role of interpersonal relations (including all that was discussed in Section 1.3). As we are interested in the explanation of intergroup conflict and peace, we need a model extension that can deal with behavioral constraints and influences of social networks.

For this reason, in this study *we will incorporate structural embeddedness into the team games model of intergroup relations*. Considering structural embeddedness in the analysis of intergroup conflict is a new development and a major contribution of this research. Before going into details about how we implement this, in the next section we will provide a brief overview of previous research that emphasized effects of structural embeddedness.

1.5 Effects of structural embeddedness

In order to reveal how structural embeddedness constrains individual behavior, in this section we discuss some theoretical suggestions and results of previous research. These recommendations might support the explanation of how interpersonal ties influence individual participation in intergroup related collective action.

With regard to interpersonal contact and interaction between members of the *opposite groups*, the *contact hypothesis* of Allport (1954) suggested that these are crucial to preserve good intergroup relations. In the presence of extensive interpersonal ties across group borders, the emergence of negative attitudes towards the out-group would be less likely. The contact hypothesis indirectly implies an increasing effect of *segregation* on the likelihood of intergroup conflicts. Supportive findings in empirical research showed highest intolerance and most competitive intergroup attitudes in

homogenous ethnic enclaves (Anderson, 1983; Denitch, 1994; Massey, Hodson, and Sekulic, 1999). Although contact across group borders seems to be the key to the reduction of intergroup conflict, it works only conditional on the quality, frequency, and extensiveness of the contact and on the context in which it takes place (Brewer and Miller, 1984; 1996: 132; Brewer, 1996a; 1996b; 1999).

Interpersonal ties between members of the *same group* also influence the outcome of intergroup competition. As intergroup conflict involves collective action problems within the groups (see previous section), this study might build on the recommendations of research about social network effects in *collective action* situations. The importance of the structure of interpersonal contacts for mobilization in collective action is emphasized by both theoretical (e.g. Marwell, Oliver, and Prahl, 1988; Macy, 1991; Opp, 1991; Bonacich and Schneider, 1992; Gould, 1993a; Heckathorn, 1993; Flache and Macy, 1996; Chwe, 1999) and empirical studies (e.g. McAdam, 1986; Fernandez and McAdam, 1988; Chong, 1991; Finkel and Opp, 1991; Gould, 1991; 1995; McAdam and Paulsen, 1993; Opp and Gern, 1993; Sandell and Stern, 1998). It is widely believed that dense in-group relations help the establishment of collective action (Marwell, Oliver, and Prahl, 1988; Coleman, 1990: 318-320; Marwell and Oliver, 1993: 102; Gould, 1993a; Opp and Gern, 1993).

As social networks are known to greatly affect behavior in collective action situations, it is quite surprising that *there is almost a complete lack of research that addresses social network effects and the underlying micro mechanisms in intergroup conflict*. The main drawback of empirical studies is that they are purely descriptive and they do not test micro processes of social network effects and in particular, of segregation effects. On the other hand, empirical results show that segregation can be associated with higher likelihood of intergroup conflict (Blau and Schwartz, 1984; Whyte, 1986; Diez Medrano, 1994; Olzak, Shanahan, and McEneaney, 1996).

Explanations of intergroup conflict should not be satisfied with discovering merely associations between social network properties and intergroup conflict. For a deeper understanding, *underlying mechanisms* of social network effects should be revealed. As these mechanisms work at the interpersonal level, the role of social contacts and their influence on participation decisions in intergroup competition should be specified.

Network ties between individuals work as constraints to individual decisions. These constraints are represented as interpersonal interdependencies in *local interaction games* (e.g., Ellison, 1993; Berninghaus and Schwalbe, 1996; Mailath, Samuelson, and Shaked, 1997; Chwe, 1999; Morris, 2000). Local interaction games are played between connected individuals and might have different payoff structures, for instance, competitive structures between enemies or coordination games between fellows. This approach is highly relevant for the purpose of this study, as local interaction games also deal with individual decisions that are embedded in a network of dyadic interdependencies.

There are several other models and theories that might provide suggestions for how to conceptualize underlying mechanisms and constraints posed by network relations. Prominent examples are the theory of social impact (Latané, 1981; Nowak, Szamrej, and Latané, 1990), models of social influence (e.g., Carley, 1991; Friedkin and Johnsen, 1999), and the model of dissemination of culture (Axelrod, 1997b). A concept that embraces a wide range of micro mechanisms and specifies the content of dyadic interdependencies is *social control* (Heckathorn, 1990; 1993; Macy, 1993a).

Definition 1.5.1 Social control is defined as a constraint on individual decision posed by the influence as well as the presence, opinion, expectations, and behavior of relevant other individuals.

In this section, we discussed that individual actions are embedded in the social structure. Social control and other mechanisms explain why structural embeddedness has an influence on individual actions. Hence, the model of intergroup relations should consider effects of social networks and the underlying mechanisms. However, these mechanisms have not been related yet to intergroup relations. For this reason, *as a major contribution of this study, we will incorporate micro mechanisms of structural embeddedness into the team games model of intergroup relations*. The next section will specify the key elements of this model development.

1.6 Social control mechanisms and intergroup conflict

As we discussed in Section 1.4, structural embeddedness is missing from existing explanations of intergroup conflict. This is a major deficiency since individual behavior is embedded in the social structure also in the intergroup context (see Section 1.5). In this study, a more comprehensive theoretical model of competitive intergroup relations will be developed by an incorporation of different *social control mechanisms* into the team games approach.

We will concentrate on three different social control mechanisms. Social control in these forms constrains individual action by creating positive and negative incentives. First, the close social environment is a source of distribution of *selective incentives*, including social norms (Sandell and Stern, 1998). Durkheim (1984[1893]) and Parsons (1937), well before the rise of social dilemma research, have claimed that social norms help to solve the conflict between individual goals and common interest in favor of collective goals. The concept of selective incentives originates from Olson (1965), who showed the conditions under which the provision of selective incentives solves social dilemmas in a world of rational actors. Selective incentives from group fellows help the establishment of collective action as they reward participation and punish free riders within the group (Olson, 1965). The provision of these incentives is completely dependent on choices made in the intergroup context and does not require separate

decisions. Therefore, it is more appropriate to consider them as additional incentives rather than produced normatives that raise a second order free rider problem (Heckathorn, 1989).

Second, behavior is constrained by social control as individuals strive for *behavioral confirmation* (Lindenberg, 1986). Behavioral confirmation is received for an action that is identical to behavior of related individuals. Finkel and Opp (1991) have found that participation in collective political action can be largely explained by willingness to conform to the expectations of important others. Furthermore, empirical evidence shows that people do not participate in collective actions in isolation, but together with friends and neighbors (see McAdam 1986; Gould 1991; Opp and Gern 1993). Individuals decide to participate, if they are assured of the participation of their friends (Chong 1991; Oberschall 1973; 1994). Chong (1991) and Oberschall (1994) described this as an assurance process. In the assurance process, behavioral confirmation has a two-fold effect. Confirmation by participating fellows provides an incentive for contribution and confirmation by free riders works against contribution.

Third, in intergroup relations, ties that connect members of the opposite groups pose a different constraint to individual behavior. Friends from competing groups have contradictory interests in the intergroup context. Since their friendship is valuable for them, they reward the other's action that is against the own group's interest (e.g., Kuran, 1995, 9-10). For instance, supporters surrounded by fans of the other club are esteemed for *traitor* behavior and for remaining silent, if their team scores.

As a result of dyadic social control, individuals can be mobilized to participate in collective action that has harmful consequences in the intergroup context. This raises further interesting questions about how the relative strength of social control mechanisms influences structural effects on intergroup conflict. We will explicate these research questions in Section 1.8. The new theoretical model that incorporates these forms of social control in the team games model of intergroup relations will be discussed in detail in Chapter 2.

1.7 Temporal embeddedness and intergroup conflict

Besides the structural embeddedness of behavior we should not forget the role of *temporal embeddedness* in intergroup relations (Granovetter, 1985). In this section, we will discuss the societal relevance of this factor. Moreover, we provide a brief overview of micro mechanisms specified by previous research that explain how temporal embeddedness influences intergroup relations. This study will rely on these mechanisms at the formulation of hypotheses for repeated intergroup encounters.

There is no doubt about the *societal relevance* of temporal embeddedness for empirical applications. Interdependencies arise repeatedly, giving a chance for the offended party to revenge. Examples are hostile relations between families in Corsica,

Montenegro, Albania, or medieval Iceland, where insults are endlessly retaliated and the accepted norm of vengeance creates a spiral of clashes (Frank, 1988; Hardin, 1995). Similar dynamics of revenge can be traced between urban gangs, football supporters, nations, or ethnic groups. The Hutus and Tutsis have a long history of ethnic slaughter, in which killings are reciprocated by killings (Bhavnani and Backer, 2000). Fortunately, in many contexts, third party interventions or institutional solutions can break the spiral of violence. But the intention for revenge cannot be subdued easily. Hatred can elicit conflicts later in time, perhaps even a generation later, as in the case of Bosnia (Kaplan, 1993). Once conflict is established, it is difficult to bring it to an end. As Hardin notes (1995: 121) the really interesting question is not how the groups became enemies, but how their conflict is maintained. Counterexamples of competitive, but peaceful group relations are plentiful (cf. Fearon and Laitin, 1996; Gould, 1999). This leads us towards the inquiry of the determinants of the emergence of lethal and of peaceful scenarios.

In this inquiry, it is inevitable to discover *how* temporal embeddedness influences intergroup competition. A fundamental question of whether *the past or the future* governs individual decisions is a sharp division line in the theoretical literature and it is strongly related to debates over individual rationality.

Models that assume perfect rationality exclude the influence of the past. Individuals have a clearly forward-looking perspective, they choose for alternatives that offer the best future consequences. Such models are widespread in research on social dilemmas (e.g., Olson, 1965; 1982; Taylor, 1987; Sandler, 1992; Bicchieri, 1993; Buskens, 1999; Flache, 2002). Despite their theoretical value, these models have serious deficiencies in describing individual behavior in empirical and in experimental social dilemma situations (e.g., Dawes and Thaler, 1988; Caporael et al., 1989; Camerer, 1997). The problem is not merely that people have no knowledge or have misbeliefs about preferences and knowledge of others (Kreps et al., 1982). They also often fail to choose the alternative that would be optimal based on their beliefs and expectations (Rapoport, Bornstein, and Erev, 1989; Orbell and Dawes, 1991; Smelser, 1992). However, the fact that expectations often do not match with choices does not mean that expectations do not influence behavior at all. At the other extreme, a wide variety of models that assume backward-looking actors make this mistake, including several models of learning, imitation, reciprocity, and regret.

Comparison of extreme models of forward-looking and backward-looking behavior provided important insights for social dilemma research (Flache, 1996; Chen and Tang, 1996; Ho and Weigelt, 1996; Erev and Roth, 1998; Flache and Hegselmann, 1999b). However, in less extreme versions, forward-looking action and backward-looking behavior are not obviously in contradiction. In case of incomplete information forward-looking action can use experience from the past as indication of intended behavior. On the other hand, backward-looking action can also be purposeful and intentional in the

sense that behavior is updated based on the past in order to gain future success (Vanberg, 2002).

There are some models that combine elements of forward-looking and backward-looking perspectives (Zeggelink, 1993; Stokman and Zeggelink, 1996; Buskens and Weesie, 2000), and there is also illustration for how strategic decision making may include rational learning from experience (Friedman, 1986: 126-136). The concepts of bounded and procedural rationality just deny the assumption of perfect rationality, but not the relevance of future (Simon, 1976; 1981). These concepts also dispute the logic of backward-looking models with long-term memory and a wide horizon. Instead, they assume that individual behavior is guided by a set of simple heuristics or rules of thumb (Orbell and Dawes, 1991) that might contain the influence of the past as well as the shadow of the future. The question is what might these simple heuristics be?

In a *forward-looking perspective*, assuming bounded rationality, there are several strategies that are based on expectations about subsequent outcomes and might be relevant in intergroup encounters. Shortsighted strategies vary in their assumptions regarding individual rationality, calculating capabilities, and access to information. Below we just mention some examples that will be used in the theoretical analysis of Chapter 2. Individuals might recognize their *dominant strategy*, if they have any. If they have sufficient information and calculating capabilities, they might give their *dominant reply* to dominant strategies of others. Even more extensive information is assumed, if there is *common knowledge* between friends or neighbors about the dominant reply of relevant others. Furthermore, in the lack of dominant reactions, individuals might decide on the basis of their *expectations* about the outcome of intergroup relations and about the decisions of related persons.

A simple forward-looking decision heuristic that is also based on expectations about the subsequent outcome is the *criticalness* principle. In case an individual expects that his or her decision would be a decisive one in the subsequent situation, which means that his or her decision would change the outcome of the intergroup competition, he or she is guided to participate in the collective action of the group. The median voter theorem of Downs (1957) was probably the first one to recognize the importance of objective criticalness. Later, research on step-level public goods showed that *perceived* criticalness is an important predictor of contribution (Rapoport, 1987; Kerr, 1989; Erev and Rapoport, 1990; Marwell and Oliver, 1993; Chen, Au, and Komorita, 1996; Au, Chen, and Komorita, 1998).

In a *backward-looking perspective*, strategies are conditional on previous events and decisions, that is, they are built on *past* experience. However, decision rules that build on the full record of past experience are not likely to be followed in practice. For instance, people rarely make as extensive calculations as it is assumed by fictitious play (Brown, 1951; Fudenberg and Kreps, 1993). It is plausible to assume that individuals act according to simple heuristics that use experiences about the outcome

and about the behavior of a limited set of players from the recent past only. These heuristics can be interpreted as programs that trigger *conditional responses* to earlier events (Vanberg, 2002).

In this study, we will test the presence of some simple backward-looking heuristics in repeated intergroup encounters. One simple heuristic that received broad attention and empirical support in previous social dilemma research is *reinforcement learning*. Reinforcement learning describes that the chance of remaining at the previous individual decision increases after that particular action resulted in a satisfactory outcome. Otherwise this likelihood decreases. This mechanism has been found adequate in describing animal and human behavior in simple experimental situations. Its theoretical origin goes back to Thorndike's (1898) 'law of effect' and to Skinner's (1938) behaviorism. Bayesian updating and stochastic learning (Bush and Mostseller, 1955) are mathematical formulations of this simple rule. In slightly different versions, reinforcement learning has been useful to model and understand human behavior in social dilemmas (Nowak and Sigmund, 1993; Macy 1989; 1990; 1991b; 1993a; 1993b; 1995; Messick and Liebrand, 1995; Roth and Erev, 1995; Flache, 1996; Buskens and Snijders, 1997; Erev and Roth, 1998; 1999).

Another simple heuristic that has received enormous attention in the literature on social dilemmas is *reciprocity* (Axelrod, 1984; 1987; 1997a; Komorita, Hilty, and Parks, 1991; Komorita, Parks, and Hulbert, 1992; Kollock, 1993; Wu and Axelrod, 1995; Bicchieri, 1997; de Vos and Zeggelink, 1997; Wagner, 1998; Komorita and Parks, 1999; Watanabe and Yamagishi, 1999). There are theoretical arguments for reciprocity being a rational individual strategy (Friedman, 1971; Axelrod, 1984; 1997a). Reciprocity is also an important mechanism in intergroup relations (Fearon and Laitin, 1996; Goren and Bornstein, 1999). All empirical and anecdotal evidence of vengeance supports the consideration of this heuristic. Peaceful attitudes of the rival group are tolerated, but harmful collective action is retaliated in the subsequent encounter, if reciprocal strategies are applied.

Besides the aggregate action of the other group, the behavior of neighbors can also be retaliated (Whatley et al., 1999). Such *local reciprocity* is often named by journalists as the "main ingredient" of violent ethnic conflict (Hardin, 1995: 148). Local reciprocity is a direct way of imitation as it is a reaction to actual behavior in the past. The intergroup context provokes vengeance in interpersonal relations between members of the opponent groups, but there are also indications that intergroup relations support in-group reciprocity (Brewer, 1981).

In this section, we provided a brief introduction and overview of the forward-looking and the backward-looking behavioral mechanisms we will investigate in this study as a basis of dynamic intergroup relations. Our research questions about these micro mechanisms of temporal embeddedness and their macro consequences will be formulated in the next section.

1.8 Research questions

In the previous sections, we discussed the general research problem and the theoretical foundations of this study. In this section, we formulate our main research questions that can be classified along three dimensions. First, we are interested in the effects of *structural* and *temporal embeddedness* and their *interactions* on intergroup conflict. Second, we are interested in *macro effects* on intergroup conflict and in the *underlying micro mechanisms*. Third, research questions are open for a *theoretical* or for an *experimental* investigation. There are only effects of structural embeddedness in single intergroup encounters. In repeated intergroup relations, effects of structural and temporal embeddedness and also their interactions are present. Table 1.8.1 provides a simplified overview of this classification.

Table 1.8.1 Overview of research interests

	Chapter 2 theoretical	Chapter 3 experimental	Chapter 4 theoretical	Chapter 5 experimental
	structural embeddedness			
			temporal embeddedness	
macro effects on intergroup conflict	**segregation effect**			
			dynamics of intergroup conflict and peace	
micro effects on individual decisions	**social control mechanisms operative**			
			behavioral heuristics	

In order to gain a transparent overview, interaction effects of structural and temporal embeddedness are omitted from Table 1.8.1. This overview also expresses our objectives to have a close correspondence between the content of research questions that are formulated for theoretical and for experimental investigation. Keywords in the cells indicate our specific research interests. Main research questions for these interests are as follows.

Segregation effect on intergroup conflict:

- *What are the **structural conditions** under which the likelihood of intergroup conflict is higher and what are the conditions under which peaceful coexistence might be expected? Particularly, why and under what conditions does **segregation** promote intergroup conflicts?*

These research questions will be addressed in a theoretical investigation in Chapter 2. We test some of the derived model predictions under experimental conditions. Experimental analysis will address these questions in single intergroup competitions in Chapter 3 and in repeated encounters in Chapter 5.

Social control mechanisms operative:

- *What are the **underlying mechanisms** of network effects at the interpersonal level? How do different forms of **social control**, namely **selective incentives, behavioral confirmation,** and **traitor rewards** contribute to intergroup conflict and what is the impact of their relative size?*

These questions aim to highlight why and under what conditions individuals participate in collective action that hurts the interest of another group and might result in mutually harmful consequences. In particular, we will predict that different forms of social control influence individual decisions conditional on the local network neighborhood and consequently are responsible for the segregation effect on intergroup conflict. We will test these predictions in single-shot encounters in Chapter 3 and in repeated intergroup relations in Chapter 5. In the theoretical analysis of Chapter 2, we will also investigate whether the effects and macro consequences of social control mechanisms are dependent on assumptions about *individual rationality* and access to information or not.

Regarding effects of temporal embeddedness, we aim to answer the following research questions.

Dynamics of intergroup conflict and peace:

- *How do intergroup relations change over time? Are there **typical scenarios**, like an endless regression of conflict or a spiral of peace?*

Behavioral heuristics:

- *What are the simple **heuristics** that guide individual choice and as a consequence, are responsible for the emergence of macro scenarios? Are **criticalness, reinforcement,** and **reciprocity** important determinants of individual action in repeated intergroup relations?*

These questions will be investigated in repeated intergroup competitions. We will elaborate more on the exact nature of behavioral heuristics and their relation to aggregated scenarios in Chapter 4. Derived hypotheses will be tested in experiments in Chapter 5. Furthermore, we will also test interaction effects of structural and temporal embeddedness. At the macro level, we will investigate whether typical scenarios differ with structural conditions. At the individual level, we will analyze if we find different behavioral heuristics in different structural environments and we will test if experiences from the local neighborhood can trigger conditional responses.

To answer our research questions, we will apply simulations and experiments as research methodology. In the next section, we will give arguments why do we choose for these methodological tools.

1.9 Research methodology: simulations and experiments

Due to the complexity of real settings, behavioral rules and social network effects are often untraceable and our predictions about them cannot be tested. We would need to analyze very simple (for instance, ancestral or tribal) environments in order to investigate individual level mechanisms that are responsible for social network effects and dynamic intergroup processes.

A powerful alternative to prehistoric or anthropological testing is computer simulation and conducting laboratory experiments. In *simulations*, computational capacities allow to investigate the effect of parameter values and explanatory variables in any deliberately chosen environment. Using a computer the properties of a higher level system can be derived from simple laws governing the lower level units (Epstein and Axtell, 1996). Simulations are also experiments in the sense that different combinations of parameter values can be tried out to investigate the theoretical research questions. Simulations have the aim to explore general answers, but only in a simplified environment that is not a true representation of reality (Gilbert, 1995). They are favored to analytical methods when the formal derivation of system properties is difficult from the model assumptions.

A criticized feature of simulations is that they require simplified assumptions and cannot cope with the complexity of real situations. A sound reply to this criticism is expressed by Axelrod (1997a: 5): "… if the goal is to deepen our understanding of some fundamental process, … then simplicity of the assumptions is important and realistic representation of all the details of a particular setting is not." The lack of complexity is a virtue of simulations, not a vice. Based on simple assumptions they are perfect tools of theoretical investigations and abstract model building. As Macy (2002) summarizes, "Making these models fit actuality would add complexity that undermines their usefulness as theoretical tools."

In our case, we intend to use simulations for exploration of underlying mechanisms that cause the macro phenomenon of intergroup conflict. In this respect, our study is one of the first attempts to use simulation methodology to understand intergroup conflicts.[3] Furthermore, we will use the simulations to derive hypotheses for our experiments.

The experimental design is constructed in order to test these hypotheses. Laboratory *experiments* have the advantage that by manipulating conditions and controlling for disturbing variables it is possible to detect the presence of predicted mechanisms. For this reason and because the values of other parameters can be fixed, experiments are ideally suited to test hypotheses about mechanisms of the simulation model. In laboratory conditions, interdependencies can be created, in which individual

[3] Existing simulation studies deal with different kinds of intergroup relations than we do (cf. Suleiman and Fischer, 1996; 2000; Fischer and Suleiman, 1997; Rapoport and Amaldoss, 1999; Jager, Popping, and van de Sande, 2001).

payoffs are measurable. Non-strategic uncertainty can be kept to a minimum and control of information can be easily achieved (Crawford, 1997: 216). Non-monetary incentives can be separated by experimental manipulations (Roth, 1995). Furthermore, laboratory experiments do not face serious ethical concerns that field experiments of intergroup conflict do.

Experiments also have their drawbacks. It is difficult to generalize their results, because subjects are most often students, therefore the pool of participants does not represent the entire population. This would be a serious concern, if there had been a major difference in the effects of structural and temporal embeddedness for students and for the general population. Since the number of experimental sessions and participants is vastly limited, only effects of few variables can be tested and only a small set of parameter values can be used. However, this is only a disadvantage compared to simulations. In field experiments or in case studies there is no way to vary parameter values at all.

Furthermore, there is a rather large gap between the simulations and the experiments with regard to their behavioral assumptions. This follows from the difference in the objectives of these research methods. Simulations are devoted for understanding the theoretical relationship between structural embeddedness and intergroup conflict. This relationship is explored in general when auxiliary assumptions on individual rationality and on access to information are introduced and varied. Interactions between these assumptions and effects of structural embeddedness are certainly interesting, but questions about individual behavior are not as central as in experiments. In the experiments the actual behavior of subjects is studied and hypotheses about decision heuristics that appear in repeated encounters are tested. Moreover, there are also differences in how the results are analyzed. In the simulations, simple rules are assumed about individual behavior and macro phenomena are derived through the application of these rules. In the experiments, behavioral assumptions as well as emergent macro phenomena are tested using statistical analysis.

1.10 Outline of this study

In *this chapter*, we provided an introduction to the analysis of intergroup conflict and peace. We presented an overview of the societal relevance and theoretical background of this problem. We discussed the necessary theoretical developments and the major contributions of the present study. We formulated our research questions and we provided arguments for the chosen simulation and experimental methodology.

The structure of subsequent chapters follows the classification of research interests as they were provided in Table 1.8.1. *Chapters 2* and *3* are devoted to the analysis of effects of structural embeddedness in single intergroup encounters. The emphasis is on the explanation of why and under what conditions intergroup conflicts are promoted by

segregation and on the underlying mechanisms of this macro phenomenon. In Chapter 2, the Intergroup Public Good (IPG) game model of competitive intergroup relations is extended by dyadic forms of social control that can be responsible for social network effects. Next to the theoretical contributions, this chapter aims to answer theoretical research questions by using simulation methodology. In Chapter 3, a new experimental design is introduced to test the segregation effect and the underlying social control mechanisms in a series of single-shot IPG games.

In *Chapters 4* and *5*, we analyze repeated intergroup encounters. Besides the effects of structural embeddedness, this allows for the investigation of how and as a result of which mechanisms intergroup relations change over time. In Chapter 4, we specify elementary behavioral rules that might be relevant for individual decisions in the repeated IPG game and we derive hypotheses about micro and macro effects of temporal embeddedness. Model predictions about effects of structural and temporal embeddedness, and about their interactions are tested in Chapter 5.

In *Chapter 6*, research problems and results of this study are summarized and conclusions are drawn. Furthermore, limitations of the study are discussed and suggestions are given for future research. It is argued that policy implications should be handled with reservations as there is no general remedy for real intergroup conflicts and resolutions have to take into consideration the unique circumstances of the given situation.