Chapter 3

CONFLICTS IN SOCIAL THEORY AND MULTIAGENT SYSTEMS: ON IMPORTING SOCIOLOGICAL INSIGHTS INTO DISTRIBUTED AI

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Abstract   This chapter seeks to give the reader an idea of how to import conflict conceptions from sociology into distributed AI (DAI). In a preliminary comparison of conflict research in DAI and sociology, we show that both disciplines talk about essentially the same issues when they refer to conflict, although there are important differences in their motivations and reasons for studying conflict. The main sections deal with conflict from the perspectives of two mainstreams of sociological thought: the theory of autopoietic social systems and the pragmatist theories of symbolic interaction. Following our attempt to derive useful conceptual insights from the two theoretical approaches and to identify potentialities for future interdisciplinary research, six interrelated themes are described which seem to be of particular promise for both DAI and sociology alike.

1.   INTRODUCTION

Conflict is a prominent issue both in DAI and in sociology. Ever since Georg Simmel, one of the forefathers of modern sociology, wrote his famous essay

on strife more than a century ago, conflict has been regarded as one of the central topics of social research, whereas it is a mere ten years since Marc Klein first suggested that conflicts should be given a first-class status in DAI research (Klein, 1991). Today there is a wide consensus that conflict issues are of particular importance in DAI,[1] but there is still a lack of theoretical understanding and important questions are still waiting to be addressed more thoroughly. Sociology, for its part, has addressed some of these questions quite successfully and seems to have gained valuable theoretical insights which merit serious consideration in DAI. Accordingly, in this chapter some ideas of how to import sociological insights into DAI conflict research will be discussed.

As Simmel had shown "the binding values or norms are brought into aware-ness through conflict so that conflict, far from being only incidental to an affir-mation of common values, is an agency through which these values come to be affirmed" (Coser, 1956:127). In the sociological tradition of Simmel, conflict issues have a positive connotation and are widely acknowledged as being ben-eficial for social life. Instead of over-emphasising the negative or destructive aspects of a phenomenon that is as natural to society as cooperation and sol-idarity are, it largely understands conflicts as a legitimate form of expressing discontent and opposition. Conflicts are danger signals and play an important role in a society's immune system (Luhmann) and have a tremendous impact on social innovation. They help to make social pathologies visible and to pre-vent explosive constellations and they also contribute to the restructuring of a society's institutions and to the creation of new participative regulations and democratic procedures (Mead, Dewey). Today it is sociological common sense that conflicts serve as a vital means of affirming a society's fundamental values and as a powerful motor of structural social change.

In contrast to sociology, viewing conflict as something that should not simply be avoided and "out-designed" is relatively new in DAI research (Grasso, 1998, Chantemargue et al., 1998). Ever since distributed problem solving was first introduced as a superior alternative to centralised approaches, the DAI com-munity had been haunted by the nightmare of multiagent systems degenerating "into collections of chaotic, incohesive individuals" (Jennings, 1993:225). In-deed, the ultimate goal of coordinated problem solving, global coherence[2], is threatened in numerous ways: "Agents may spread misleading and distracting information, multiple agents may compete for unsharable resources simultane-

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[1]This wide consensus is also reflected by the increasing number of related workshops and publications (Jokiinen, Sadek and Traum, 1997, Klein and Lander, 1994, Lander, 1994, Müller and Dieng, 2000a, Sen, 1999, Tessier and Chaudron, 1998, Tessier and Chaudron, 1999).

[2]An interesting question is whether DAI should take the problem of "failure indeterminacy" (Gasser, 1991) more seriously and depart from unrealistic notions of coherence and success. Perhaps we just have to accept that "in practice, many negotiations ... may fail ... (and that) there are no a priori guarantees of success" (Hewitt and Inman, 1991:1417).

ously, agents may unwittingly undo the results of each others activities and the same actions may be carried out redundantly ... the dynamics of such systems can become extremely complex, giving rise to nonlinear oscillations and chaos. In such cases the coordination process becomes correspondingly more difficult as well as more important" (Jennings, 1993:227).

Certainly, these are strong arguments in favour of avoiding and out-designing conflicts before they turn virulent. However, it appears as though rational conflict avoidance becomes increasingly difficult as multiagent applications become more complex and more demanding. Meanwhile a new insight has gained ground in DAI: Conflicts cannot be avoided any longer but must be accepted as normal social behaviour (Castelfranchi, 2000:20). Conflicts "become increasingly inevitable" as they have to meet "growing requirements of scale and autonomy" (Tambe and Jung, 1999:1). As conflicts have been identified as "the focal point of interaction", they "must be explicitly addressed" (Lander,1994:9) and can no longer be excluded from the research agenda by simply treating them as "undesirable side-effects which would impair the (agent) community's performance" (Jennings, 1993:246). All these quotations convey the same message: "Conflict in multi-agent systems is ubiquitous" (Wagner, Shapiro, Xuan and Lesser, 1999:1). But what, then, are the conceptual consequences to be drawn from the ubiquity of conflict?

Despite the fact that DAI has made considerable efforts to develop useful techniques for conflict resolution and conflict management, other issues of a more theoretical nature like definitions, causes, dynamics, and outcomes of conflicts have been largely neglected (M üller and Dieng, 2000:6). This is particularly true for the conceptual neglect of the relationship between conflict and coordination, one of the core tenets of any advanced conflict theory. Although it is easy to see that conflict and coordination are somehow twin concepts, it seems much more difficult to see how exactly they are interrelated: Do conflicts have to be modelled, as has been suggested by Shaw and Gaines, as failures of coordination (Shaw and Gaines, 1994)? Or is this view a curious misconception, as suggested by Müller and Dieng, "since usually coordination ... is used to resolve conflicts" (M üller and Dieng, 2000:9)? Instead of seriously analysing and discussing the question whether coordination follows conflict or conflict follows coordination, the issue is dropped from the agenda because it appears to be just another version of the ill-reputed hen-and-egg problem. Instead of striving to uncover the conceptual difficulties inherent in the relationship, business is done as usual. On one hand there are the "modern" approaches operating along the formula of "conflict - coordination" which try to resolve conflicts by explicit negotiation and contracting techniques. On the other there are the "traditional" approaches along the reverse formula of "coordination - conflict" with the aim of out-designing conflicts by multiagent planning or commitment-convention modelling.

Sociological conflict research, in turn, is more theoretically inclined – and has produced some interesting insights into the hen-and-egg problem which could prove useful for DAI. But how can DAI researchers learn from sociologists who are primarily inclined to explain society? What can those who are interested in engineering innovative techniques for conflict resolution learn from those who want to understand how conflicts are generated in modern human society and how social conflict is intertwined with structural social change? Why should it be valuable for DAI as an engineering discipline to gain a theoretical understanding of why social conflicts are in the main not rationally resolved but transferred, suppressed, postponed, translated and transformed? Although it seems clear that DAI and sociology do not talk of essentially different matters when they refer to conflicts, considerable spadework must go into the preparation of the ground for a fruitful collaboration which will – eventually – be able to answer these questions. The first thing to do, however, is to answer the question how to choose the most promising sociological approach to conflict research.

To an observer from the DAI community sociological conflict studies present themselves as a sweeping bouquet of heterogeneous approaches and disparate traditions (Giegel, 1998). Far from having developed a unified theoretical framework, sociologists are by no means unanimous in following Simmel's lead and conceptualising conflict as a positive phenomenon, nor is there a generally accepted conflict definition. Instead, there is an ongoing debate on the opportunities and dangers, benefits and damages of social conflict and political struggle. Conflict issues have been controversially discussed in social philosophy and political theory as a deeply ambiguous phenomenon ever since Thomas Hobbes spelled out strife and struggle as "homo hominem lupus", the "war of every man against every man". Hobbes' sombre conclusion was that in order to maintain social order conflicts had to be vigorously suppressed by an absolute power. The sociologist Talcott Parsons, whose theory of social systems became very influential in the post-war years of the 1950s and 1960s, took the Hobbesian problematic of social order as his point of departure. Parsons viewed conflicts as essentially destructive and thus was primarily concerned with the establishment and maintenance of social stability and harmony. However, unlike Hobbes, he did not believe in "zero tolerance" but explained social order in terms of a system-environment equilibrium based on internalised norms and values. Parsons was later criticised for the bias of his conceptual "equilibrism" which made him blind to one of the most interesting sociological issues: the link between conflict and social change (Coser, 1956). Today, many sociologists are in search of the missing link, but a unified theory is still not in sight. In other words, the most promising sociological approach to conflict research simply does not exist. In the light of this lacuna, the ground for importing sociological conflict theories into DAI must be paved in the following sections by

comparing two of the more promising candidates: the sociology of autopoietic social systems and the pragmatist sociology of symbolic interaction, both of which rank among the intellectual heavyweights of sociological theory.

In the following we will begin by considering some differences and similarities concerning the meaning of conflct in sociology and DAI. These will be highlighted in section 2.1. with reference to two paradigmatic cases of conflct research: scheduling a meeting and the tragedy of Antigone. Having framed the setting with a short comparison of Simmel and Hewitt in section 2.2., section 3 introduces us to Luhmann's autopoietic sociology of conflcts as systems of communicated contradictions. Whereas the sociology of autopoietic systems is closely associated, if not identical, with the name of Luhmann, the pragmatist sociology of symbolic interaction discussed in section 4 does not easily lend itself to personalisation,although it clearly stands in the American pragmatist tradition of Peirce, James, Dewey, and Mead. However, the reader should be prepared to find other names associated with pragmatist symbolic interaction, names like Blumer, Strauss, Maines etc. In section 5 Dewey's theory of inquiry as a democratic learning process based on collective intelligence is contrasted with Luhmann's evolutionary approach of functional differentiation. In section 6 an attempt is made to identify some lines of sociologically grounded DAI research on conflcts.

2.   DIFFERENT REASONS FOR STUDYING CONFLICTS IN DAI AND SOCIOLOGY

2.1   WHAT WE CAN LEARN FROM SCHEDULING A MEETING AND FROM THE TRAGEDY OF ANTIGONE

For preliminary clarification it is useful to draw on the problem of meeting scheduling, a canonic example in DAI research on multiagent systems. A quotation from a report on experiments in conflct resolution with agents which communicate and negotiate via message passing and which are able to relax their individual preferences when conflcts arise, will help to clarify an interesting point of difference between DAI and sociology: "In our experiments ... the agent with the fewest available time intervals becomes the task coordinator who is responsible for sending the first proposal. Each agent that receives a proposal accepts or rejects it by replying the message. ... When ... the proposal was accepted by all agents, the coordinator sums up the priorities to get the group utility measure for that meeting and sends a final confirmation message to all agents ... However, when the proposal is rejected by at least one agent, the coordinator selects a new task coordinator to the agent who opposes the current proposal. If there are more than one opposing agent, the agent with the fewest available time intervals is selected. The new task coordinator relaxes

its time constraints and sends a new proposal and the process is repeated" (Garrido-Luna and Sycara, 1996:88). In the light of the sociological approaches discussed in the following sections in more detail – the pragmatist sociology of interaction and the sociology of autopoietic systems – it is inadequate to call such a scheduling negotiation a conflict. Despite the fact that agents oppose each other while pursuing their respective subgoals, from a sociological perspective it would make more sense to speak of coordination or a coordination problem rather than a conflict or a conflict-resolution process. [3]

The reason for rejecting the idea that negotiating a meeting schedule as shown in the above example should be construed as a conflict is not that the agents are benevolently trying to come to terms with each other in the course of further negotiations. It is rather that the opposition evinced in the course of negotiations is simply too weak. To provoke a conflict, an agent must act in opposition to established norms or conventions. And for a fully-fledged or strong [4] conflict, his or her opposition must be opposed by another agent. Rejecting a proposal per se is not necessarily a conflict, but merely a cooperative opposition – although it may turn into a conflict later on in the course of a problem-solving process. Sociologically speaking, conflict is to be defined by rejecting a rejection of a normative expectation, as, for instance, in the case of Antigone. In Sophocles' tragedy the Greek princess Antigone was caught in a moral double-bind: on the one hand family piety commanded her to bury the corpse of her brother whilst on the other hand the king her father's express command prohibited it. Antigone's is a very special case though. Nevertheless, the message should be clear: Without rejecting or trespassing against the normative expectations of others, there can be no conflict. In the case of scheduling a meeting, however, rejecting other agents' proposals corresponds to socially expected behaviour. This is not to say that expected opposition will never turn into a conflict scenario. Indeed, it may turn into a conflict when agents continue to say "no" to each others' proposals until the point is reached when everybody realises that all further proposals will be rejected too. At that moment allegedly legitimate opposition to a particular schedule is exposed as what it really is: an illegitimate rejection of the meeting itself, or, in sociological parlance, a rejection of an expectation.

But there is more that we can learn from Antigone's moral predicament: Why, for heavens sake, did she not make as rational a choice as possible, when she was

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[3]The suggestion that has been made to distinguish in DAI between "cooperative conflicts" and "competitive conflicts" (Klein, 1990) is not really helpful; in fact it is a curious contrast of a paradox with a tautology. As a contradictio in adiecto the term "cooperative conflict" is merely a symptom of the underlying difficulty rather than its solution.

[4]In DAI literature we find a similar distinction between "weak" conflicts that can be resolved by the decision of a mediator and "hard" conflicts that must be resolved by negotiating a compromise (Hollmann et al., 2000:182).

prohibited, under penalty of death, from doing what family piety commanded her to do, namely to bury the body of her brother? Why did Antigone not take the strategic decision to, as it were, "bury and run"? Why did she commit herself to "disobedient obedience" and why, despite the fact that she could have escaped, did she commit herself to a voluntary acceptance of her penalty? The reason seems to be as clear as it is simple: social conflicts are morally constituted. They are intertwined with the normative foundations of human society and therefore cannot be treated like so many technical collisions or accidents. This also holds true for less rigid, more differentiated constellations of trust and treason that make life in modern societies much more complicated and much more contingent than life in pre-modern societies. Endowing a heroine's actions with higher degrees of freedom is a feature specific to modern society. So what can be learnt here is that it is the normative dimension of expectations that makes the difference between rational choice and social action. From a sociological point of view it is a misconception to qualify social conventions merely as "useful social laws" (Shoham and Tennenholtz, 1992) in the sense of traffic laws. For obvious reasons, however, society cannot be reduced to the normative or moral dimension alone. Modern society rather embraces a highly differentiated set of intersecting and sometimes conflicting logics of social action. And again it was Simmel who first introduced a concept of conflict based on the idea of intersecting logics of obligations and commitments.

2.2   SIMILARITIES BETWEEN SIMMEL AND HEWITT: "LOGICAL" AND "MATERIAL" CONFLICTS

For Simmel conflicts arise from intersecting circles of social obligations and duties. As part of different social circles, a human individual can be represented as a point of intersecting expectations. Such intersections impact on the individual in the form of more or less incompatible demands, conflicting obligations and colliding duties. Cross-cutting through individual intentions and commitments, the courses of social interaction are shaped by two different types of social conflict, namely "logical" and "material" conflicts (Simmel, 1892/93). A "logical" conflict is characterised by a constellation in which an actor is simultaneously committed to a number of contradictory normative obligations. According to Simmel such conflicts are unavoidable and irresolvable. [5] They are the stuff from which classic tragedy is made: an antagonistic conflict

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[5] According to Simmel, Antigone's tragedy does not lie in her inevitable death. "The real tragedy ... lies in the fact that the very contradictions survive the heroine's death" (Simmel, 1892/93:389). In Simmel's view her self-sacrifice did not constitute the tragic element but rather the fact that her sacrifice was in vain as social circumstances did not allow for a resolution of conflict through a creative restructuring of society's normative foundations.

between legitimate demands transformed into an unbearable individual weight of conscience with, as in the case of Antigone, all exit options blocked. A material conflict, on the other hand, is due to an incidental or contingent collision of goals and interests with no innate or logical contradiction between the goals and interests involved. Material conflicts arise when two courses of action happen to collide because they require the selfsame means or resources in pursuit of their respective ends or goals. Both courses of action are morally compatible and equally qualified as legitimate by the two parties involved. It is not the moral quality of incompatible norms and values which is in question but the economic scarcity of (un)available means and ends that gives rise to material conflict.

Intuitively and at first glance, Simmel's distinction seems to make sense, but a closer look shows his terminology to be unclear and distorted. Why does he qualify normative conflicts as logical and avoidable collisions as material? Does he want to make the dubious point that (material) interests and desires are negotiable while (logical) norms and values are not? Or is he implicitly drawing on the distinction between meaning and causality – logical conflicts have meaning while material conflicts have causes – without realising that there is nothing more logical than causes? Simmel's distinction seems to be inconsistent: material conflicts are neither meaningless nor illogical, logical conflicts are not non-negotiable or non-causal, and both are sometimes foreseeable and sometimes not. Of course, with today's hindsight it is all too easy to criticise a theory that was written more than a hundred years ago: material conflicts are neither meaningless nor illogical, logical conflicts are not non-negotiable or non-causal, and both are sometimes foreseeable and sometimes not. However, what makes this theory so interesting even today is the connection it establishes between normativity and logical necessity, and between material causality and contingency. A further point of particular interest is that Simmel's distinctions and connotations can be found in a slightly different guise in DAI where Carl Hewitt's work can be read as a curious reconfirmation of Simmel's two concepts of conflict.

Open information systems, according to Hewitt, are faced with a problem of overcomplexity that makes itself felt as unforeseeable or contingent conflicts. Such conflicts are not based on "differing ... theories of how to achieve an optimal solution" or "different conflict resolution strategies", but on coincidence and complexity when "the parties ... discover unforeseen interactions in their activities" (Hewitt and Inman, 1991:1417). That conflicts in DAI are generally conceived as unforeseen "material conflicts" in Simmel's sense, seems to be fully in line with DAI mainstream literature. What is different in Hewitt's distinction is the claim he makes that there is another type of deliberative and foreseeable conflict based on contradictory theories of problem-solving and conflict resolution. Although Hewitt is not very explicit on the difference be-

tween the two types of conflict, the deliberative type of conflict seems to be more fundamental and comes quite close to Simmel's logical conflict. Deliberative or theoretical conflicts are rooted in the problem of "logical indeterminacy" (Hewitt, 1977) which occurs when two different "microtheories" of the same knowledge domain, both undoubtedly correct and both in full accord with deductive logic, lead to contradictory conclusions. As Hewitt showed, this type of conflict is irresolvable, unless it is transferred into the pragmatic dimension of social action.

What we can learn from Hewitt and Simmel is that DAI and Sociology are not talking of essentially different things when they refer to conflicts. Rather, the scope of both approaches reaches out and embraces similar topics. It should be clear by now that a set of common ideas, intuitions and distinctions cannot replace a systematic theory of conflict. To prepare the ground for more ambitious conflict theories in both DAI and sociology, current distinctions and definitions of conflicts must be taken as starting points for an explanation of how conflict dynamics are interwoven with structural social change. In the following sections two theories of conflict will be examined more closely: Niklas Luhmann's sociology of autopoietic social systems and the pragmatist sociology of symbolic interaction based on the works of Charles S. Peirce, George H. Mead and John Dewey.

3.   CONFLICTS IN THE SOCIOLOGY OF AUTOPOIETIC SOCIAL SYSTEMS

3.1   CONFLICT AS A COMMUNICATED CONTRADICTION

According to Luhmann a conflict is an explicitly communicated contradiction (Luhmann, 1984:530ff). Wherever a communication is rejected, there is a conflict, and whenever an expectation is communicated and remains unchallenged by a subsequent communication, there is not a conflict. Conflict, in other words, depends on someone saying "no". It is an outspoken opposition defined as a synthesis of two communications which contradict each other.[6] This definition is based on the assumption that social life consists of "autopoietic" systems that use and generate communications, and nothing but communications, as the operational elements of their own reproduction. Communication, in Luhmann's sense, is black box communication at arms-length relationships. This

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[6]It is interesting to note that Luhmann emphasises the defensive over the offensive aspect of conflict . In saying 'no", an individual defends itself against an imputed expectation but does not necessarily articulate the offensive wish to actively change it. In DAI research, the emphasis usually is on defining conflict as an active attempt to change another agent's belief state (Galliers, 1990), for instance by persuasion or argumentation (Sycara, 1985, Parsons et al., 1998).

is not to deny the empirical facts of intrapersonal or psychological conflicts. Rather, this means that the notion of intrapersonal conflict is not a category describing the "autopoiesis" – self-production as a closed process – of a social system but a category of the system's environment, part of which is the human being. In other words, a conflict which remains inside a human individual as an unarticulated feeling of hostile anxiety and aggression is not a social conflict.

The advantages of Luhmann's definition seem to be clear. By strictly defining conflict at the behavioural level of observable communication, speculations about mental or emotional states of hostility or aggression can be avoided. Moreover, this definition helps to clarify the more current sociological confusion between "structural" and "behavioural" conflicts (Luhmann, 1984:531). Conflict dynamics and their structural reasons must be clearly distinguished. Keeping conflicts apart from their structural reasons, has the conceptual advantage of acknowledging and taking into account that everyday social life is massively imbued with conflicts. However, there is an inconsistency in Luhmann's definition that should be settled straight away. After having defined conflict as a communicated contradiction, as an outspoken "no", it is inconsistent to change the definition by labelling the "no" as the mere beginning of a conflict. Luhmann does so when he explains how a hierarchy enables and constrains conflicts: Only those who are in a higher hierarchical position "are free to say 'no' because this will not be followed by a conflict" (Luhmann, 1984:539f).[7] In other words, if a "no" is followed by a conflict, then that "no" as such is obviously not a conflict in itself – unless we assume that Luhmann implicitly distinguishes between a conflictive "no" that is followed by a conflict (e.g. Antigone) and a cooperative "no" that is not followed by a conflict (e.g. meeting scheduling). Consequently, unless we assume that a single "no" is just a necessary but not a sufficient condition for a conflict system to emerge, Luhmann's statement is inconsistent.

Indeed, Luhmann seems to have noticed the inconsistency in his argument because when touching on the issue again some years later, he took pains to distinguish between a conflict as a communicated contradiction on one hand and the consequences it holds on the other: Political domination allows "to strengthen the rejection of a communication while relieving the rejecter from the strain of having to bear the consequences of conflict at the same time." (Luhmann, 1997:467, our emphasis) Instead of following Luhmann's revised proposal, we would suggest resolving the inconsistency the other way round by introducing the distinction between ephemeral or virtual conflicts and real conflicts. An ephemeral or virtual conflict shall be defined as a communicated expectation followed by a single "no", a real conflict as a rejected expectation

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[7]All quotations from Luhmann translated by the authors.

followed by yet another "no". A first "no" must be followed by a second "no" in order to have a real conflict. [8] This definition is certainly more restrictive. Nevertheless, it is still far less restrictive than those currently circulating in contemporary sociology and hence it is quite in line with Luhmann's intention to effect a sharp distinction between conflict as a mass phenomenon of social communication and its underlying reasons.

Conflicts are mass phenomena (Luhmann, 1984:534). They are constantly flaming up and cooling down again, usually without deeper reason or meaning. They seem to break out spontaneously at almost any occasion and any time only to pass into oblivion again a few moments later. As mass events of social communication, conflicts usually erupt without doing much damage or harm to the structures of social expectation. Communication has an "innate tendency towards conflict" (Luhmann, 1997:462). The fact that minor conflicts are ubiquitous not only reveals that expectations in social life are counter-factual expectations; it also highlights conflict in its role as a permanent stimulus to the "immune system" of a society, as a prime means of reinforcing and modifying social expectations. At this point, however, another conceptual difficulty in Luhmann's conflict theory arises. If conflicts in the guise of harmless mass phenomena appear stripped of their menace, it is because the distinction between rejecting and accepting a communicated expectation has not been sufficiently clarified. Our objection here is that most communications are neither explicitly accepted nor rejected. How can we tell, for instance, whether a communicated information is rejected or not if it is followed neither by a "no" nor by a "yes"? Of course, there is not just the word "no" but many other ways to articulate or communicate a conflict, ranging from not agreeing explicitly or giving cautious signs of discontent to overt resistance and pugnacious opposition. Communicating a conflict may often occur as a somewhat camouflaged form of politeness, of not agreeing explicitly, of pondering other proposals, postponing a decision, or tacitly looking out for potential allies who also give signs of non-agreement or discontent. As will be shown below, this is a conceptual disadvantage that seriously counterfeits Luhmann's proposal as it raises the question when a reluctant "yes" or a tacit "no" is an unambiguous "no".

Perhaps it is the conceptual ambiguity of a "no" which makes conflicts appear to be all too harmless and all too dangerous at one and the same time. For the other side of the coin is that Luhmann conceives conflicts as parasitic social systems, with no standing of their own, parasitically feeding off other social systems in respecifying and reorganising every single communicative act according to the logic of adversarial interests and priorities. Once a conflict

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[8]In the sociological debate two options were put foward: either to ignore Luhmann's inconsistency as being of no vital importance for his conflict theory (Nollmann, 1997) or to resolve it through an unambiguous definition of conflict as a double negation (Schneider, 1994).

has been reciprocally defined and, however casual and meaningless its point of departure might have been, has begun to mature into the adversarial relationship of a double "no" officially declared by both conflicting parties, it is difficult to keep it from escalating. All sorts of communicative events, all elements of the hosting social system and all its heterogeneous acts and actions are sucked into the undertow of an ever widening conflict system. Thus conflict systems tend to "overintegrate" themselves by changing gears from low to high interdependence of all their operational elements and by exchanging loosely coupled structures for tightly coupled ones. The "destructive power of conflict" (Luhmann, 1984:532), therefore, lies in its relationship to the system within which and from which a conflict originally started and gathered momentum. Hence, the metaphor of conflicts as parasitic systems is quite accurate, albeit not in the sense of a friendly symbiosis, but in the destructive sense of absorbing all the attention and resources of the host system. Just like other highly interdependent systems, conflicts too tend to ruthlessly exploit and demolish their environments, because in conflict systems the use of external resources is rigidly defined in advance: subordinating all available material and information to a sharp friend/foe polarisation at the structural level whilst remaining highly receptive at the level of action to all kinds of possibilities for harming and coercing the opponent. This is what we call the "cancer theory" of conflict. [9]

On the other hand, Luhmann emphasises that there is no need for external intervention and containment to stop conflicts from running out of control because of an innate tendency in conflict interactions towards trivialisation and minimisation, expiration and exhaustion (Luhmann, 1984:534). This is the "entropy theory" of conflict. While he considers the cancer theory more or less as a thought experiment, Luhmann seems to take the entropy theory at face value. Conflicts usually do not continue to grow ever larger but tend to extinguish themselves at some point (Luhmann, 1984:537). The difficult thing to explain, then, is how conflicts are to be given a chance for consolidation. Conflicts are consolidated by what Luhmann calls regulation. It is important to note, however, that conflict regulation is not the same as conflict resolution. Within a theoretical framework that does not lend itself as a "nice" social theory of benevolent cooperation, as Luhmann ironically notes, but which is rather interested in understanding the "normalisation of the unlikely" (Luhmann, 1984:537), conflict resolution cannot be more than a by-product of a more encompassing question, namely how is it possible that despite their entropic tendencies to disappear

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[9]The cancer theory of conflict reveals a weakness in Luhmann's conception of autopoiesis. If conflict systems override the established boundaries of functional subsystems, subsystems will no longer be able to follow their specific mode of autopoietic reproduction alone. This conceptual weakness could be cured by disavowing the strong empirical claim that social systems are autopoietic systems. Instead, autopoiesis should be construed as a useful analytical or heuristic concept that allows us to assume different degrees of autopoiesis (Teubner and Willke, 1984).

again, conflicts are able to enjoy outstanding careers of cancerous growth and consolidation (Luhmann, 1984:535).

3.2   CONFLICT REGULATION INSTEAD OF CONFLICT RESOLUTION

The reasons for such exceptional careers are not to be found at the level of interaction but rather at the level of society. Society needs conflicts because they help to disclose and highlight problematic social structures. By reinserting uncertainty (or "doubt", as pragmatist philosophy would have it) into well established structures of expectation, conflicts irritate and strengthen a society's "immune system". Society recruits conflicts, i.e. allows and, to a certain extent, even hatches opposing actions like refusal, disobedience, and deviant communication in order to keep itself on the alert via the installation of specialised systems of self-awareness and early warning. But how does that work if there is no way of consciously reconstructing or changing a society? The answer is: by differentiation. Differentiation develops "top down" (Luhmann, 1984:574) from the top-level of social systems – which is the level of society – without necessarily having to be backed up by differences at the lower system-levels of organisation and interaction. How conflicts are encouraged by evolutionary differentiation is shown in the following four points.

1. Firstly, conflicts are encouraged by a society that at the same time discourages and suppresses the exertion of illegitimate violence. This is made possible by installing what Luhmann calls asymmetric power relations, those displayed in stratified societies. Asymmetry of power and/or wealth is guaranteed by a sharp differentiation between a dominant or a ruling class and a dominated or subservient population. Examples here include ancient Greece, the Indian caste system, and European feudalism. Obviously – and this applies to stratified societies and our modern world in equal measure – those who are in a dominant position and equipped with sufficient monetary and political power are more easily able to say "no" than those without financial or political clout since they do not have to fear the consequences of conflict (Luhmann, 1997:467).

2. Secondly, by introducing a third party as an impartial mediator or moderator[10], it is possible to reintroduce uncertainty again (Luhmann, 1984:540). The presence of third parties usually tends to discourage conflict tenden-

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[10]Apart from the judge or the impartial mediator, Simmel envisages two other types of interested third parties (Simmel, 1908:108ff): the powerless third who stands aside and passively waits until the conflicting parties have weakened each other so much that he turns out the exultant winner ('tertium gaudens'); and the powerful third who divides and rules by actively taking sides and encouraging both conflict parties ('divide et impera').

cies, aids in the deescalation and easing of tension and prevents conflict systems from overintegrating their host systems. In the course of evolutionary differentiation conflict procedures have been furnished with a growing body of operational capabilities known as law and justice. The operational capabilities of law and justice function to lower the threshold of conflict risks including for those who are powerless as well – as long as they comply with and conform to the law and to the rules and procedures of conflict regulation. A significant feature of this development, moreover, is that it leads to an enormous enhancement of conflict possibilities without necessarily posing a threat to the social structures.

3. Thirdly, evolution evokes a differentiation between conflict reasons and conflict topics. There may be deep structural reasons that give rise to repeated and perpetual outbreaks of conflict, but, as Luhmann points out, conflict systems often prefer to choose other topics and issues instead of directly addressing the reasons and attacking the roots of the underlying structural problem which has brought them about in the first place (Luhmann, 1997:469). At this point Luhmann's sceptical message is very clear. He does not believe in conflict resolution but, at best, in evolutionary change. For him, conflict resolution – in the sense of an ultimate solution – is a futile endeavour because it is hardly ever possible to abolish the underlying reasons for conflict by consciously changing a society's structure. Or, even worse, he considers that deliberate attempts to pull up conflicts by their roots all too often drastically aggravate the situation instead of restoring peace and harmony.

4. Fourthly, highly specialised conflicts are enabled by functional differentiation between and disintegration of specific expert arenas. A conflict or dispute among the experts of a specific expert community in the main is a highly sophisticated, recondite affair which nobody else seems to understand or be interested in. This is particularly true for the arts and sciences. Power and law are early evolutionary achievements going far back to pre-modern times, but the growing differentiation between different kinds of conflict themes along the lines of disjointed functional subsystems (politics, economy, religion, science etc.) is a peculiarly modern phenomenon. In the course of social evolution, each of these subsystems has developed a highly specialised code and speaks an idiosyncratic tongue of its own. And rather than denying or suppressing conflicts, they are forward in the promotion and enhancement of specific types of conflict communication.

The scientific subsystem of modern society furnishes a prime example of how conflicts are specified within the boundaries of functionally differentiated subsystems. To understand the way it operates as a functional subsystem, we must

recall that the scientific community is not to be defined as a cancerous conflict but rather by its innovative function in producing new knowledge of a very specific type: scientific truth. In order to hatch scientific truth it has to foster a discovery-friendly cultural climate , i.e. a climate in which new proposals may emerge and be tested and modified without discouraging those who propose and those who criticise. To achieve this climate it is necessary to release participants from what would otherwise be considered as normal, polite, smooth behaviour at the level of social interaction. Here aptitude for contradiction and zest for conflict must be underpinned by a specific professional attitude. Accordingly, subsystems like the scientific community fulfil a specialised function within modern societies. They "use asymmetric relations, corroborated by professional and/or organisational structures, and they must encourage contradiction as a means of control, advancement, and improvement. This leads to highly artificial rules for interactions, which then become ,dried up' and functionally specialised – and unpleasant. (...) In spite of the formal equality of all fellows, the society must recognise the asymmetry between the researcher and his or her critical audience. In spite of its interactional mode of communication it must encourage polite distrust, delay in acceptance and critical contradiction" (Luhmann, 1987:123).

The task of scientists is to produce new knowledge and in order to do so they are constrained to contradict established doctrines and currently accepted knowledge. In other words, it is their job to say "no" to entrenched belief expectations and to face stubborn opposition. Indeed, a scientific controversy is a highly conflict-ridden affair. If a scientific knowledge proposal were but a reappraisal of a current doctrine or a mere replication of what other people have found out already, it would be considered as a truism by the scientific community, unworthy of mention, publication or criticism. But if it lays claim to being new, then it is essentially conflictive in nature because its very newness poses a threat to earlier discoveries. And whether the new proposal will be accepted and the old doctrine rejected or vice versa is dependent on the process of peer review. Peer review is essentially conflict communication. Any scientific proposal implies a "no" to another proposal and hence runs the risk of rejection or disqualification by the scientific community as being false or irrelevant. Before being dismissed or accepted as a discovery that adds more truth to the accumulated knowledge of mankind, a proposal must run the gauntlet of much hostile interrogation. And, as Luhmann argues, this kind of punctilious hostility is acceptable for those who risk proposing only because of what he calls the evolutionary differentiation between an author and a person. In order to make scientific conflicts functionally possible, it is necessary to shelter those whose contradiction is contradicted from being totally discredited as people – in the event that their contribution is rejected by the scientific community.

This means that all other contexts of personal interaction must be buffered from the potentially discrediting effects of controversial scientific discourse. Marriage, friendship, income, public reputation, and the political right to vote must remain untouched (Luhmann, 1992:243). Buffering the person from the damages done to the author does, even nowadays, not always work as it should - a deplorable empirical fact of life, as Luhmann readily admits. Even so modern vicissitudes are as nothing compared to the case of the 16th century Polish astronomer Copernicus who was vilified as a liar and condemned as a blasphemer for his scientific discoveries. Nowadays, within the boundaries of a differentiated scientific arena and other specialised subsystems, modern societies refrain from conflict suppression and enable flourishing cultures of controversial debate. So conflict is systematically elevated and cultivated through evolutionary differentiation. Thus it is not conflict resolution which sociology must address but conflict regulation, and it is not the intended "solution" of the established procedures of conflict regulation that should stimulate our curiosity, but the questions how evolution and conflict are interrelated and how it is possible that there is always something unexpected about to happen somewhere else once a conflict system has gained momentum.

4.   CONFLICT IN THE PRAGMATIST SOCIOLOGY OF SYMBOLIC INTERACTION

4.1   FROM HOSTILE FEELINGS TO ADVERSARIAL RELATIONSHIPS

In George H. Mead's theoretical framework for a pragmatist sociology of symbolic interaction, conflicts are closely associated with strife and struggle, hostile feelings and adversarial relationships. Conflict is anthropologically rooted in socio-physiological impulses or behaviour tendencies that lead to social antagonism among individuals (Mead, 1934:303f). Thus Mead's approach seems to be much more in line with common sense notions of conflict and struggle than Luhmann's more sophisticated definition. Conflict, here, is more than just someone saying "no" to someone else's proposal. Rejecting a proposal in an attitude of friendly cooperation is not a conflict but an act of cooperation between two or more individuals who express different views on how to attain a collective goal. Unless explicitly symbolised as an attitude of aggression or enmity or hostility, a social situation cannot be conceived as a conflict. Accordingly, an unstructured social setting in which different views or opposing opinions impact as a need for further clarification and alignment holds a potential for both conflict and cooperation. Thus a pragmatist sociology of symbolic interaction can neither be reduced to a concept of conflict along the lines of Coser nor to one of harmony as suggested by Parsons. To quote Mead's well known disciple, H. Blumer, who coined the phrase "symbolic inter-

actionisms": "Imposing either of these two optional patterns of human sociality on the breadth of social interaction is a fallacious claim" (Blumer, 1966:538).

Social interaction is a fundamental concept that covers the whole range of sociality and is constitutive not only for human societies but for the human individual as well. In Mead's pragmatist sociology the point of departure is not the individual human being or the individual social action, as in Max Weber's sociology, but a group activity of at least two individuals exchanging significant gestures or symbols. Meaning is reciprocally attributed through a mechanism called "role taking". The mutual assumption of each other's role by participants shapes the course of social activity whilst those engaged in symbolic interaction simultaneously confer meaning on the respective social settings. For it is not the individual intention but the exchange of significant gestures among actors in the flow of everyday group life which constitutes meaning. Hence, meaning is always socially situated meaning. It does not have an existence outside and apart from the social situation in which it is socially constituted. By taking the role of the other, both participants develop a shared meaning, a common or mutual understanding of their situation and of themselves as socially intelligent beings. This links in with the intuition of pragmatist sociologists that, in a more general sense, the human mind and human society are constituted in essentially the same way. Mind, self, and society are shaped just like any other meaningful object in a fundamental process of symbolic interaction. Society is created and formed in a never-ending process as a web of interlocking actions and reactions, proposals and responses that give rise to new objects and conceptions, new patterns of behaviour, and new types of social intercourse.

Within the conceptual framework of symbolic interactionist sociology, conflictive interaction can be defined by an exchange of significant gestures and symbols that generate feelings of aggression, for instance shaking a fist or announcing the withholding of vital resources or the revocation of a given commitment. There is no automatism of conflict escalation envisaged in pragmatist sociology. Role taking enables the conflict parties to anticipate a possible chain of escalating reactions, and, through anticipation and reflection, enables human actors to consciously interrupt an impending escalation and to resolve a conflict by reconstructing the situation in a novel way. Viewed in this manner, role taking looks like a powerful mechanism for interrupting blindfolded chain reactions and restoring agency to the social group of actors by allowing them to combine conflict prevention with deliberative social change. Thus a pragmatist sociology of symbolic interaction claims to wield a conceptual tool of innovative conflict resolution, where Luhmann's theory of social systems has to step back and wait cap in hand for evolution to occur. Advantage pragmatism? Not quite. The case for overcoming the structural reasons for conflict through collectively redefining and restructuring social life is not as strong as it looks at first sight. It cannot explain stability and robustness because it construes

human societies as fragile webs of reciprocal commitments that could collapse at almost any moment.

Indeed, the very fragility of patterns of joint action emerging in a process of permanent behavioural adjustment and readjustment makes it difficult to explain why and how these patterns can be sustained and confirmed, whereas it looks altogether too easy to change them or make them collapse. If symbolic interaction is conceived as a process of permanent readjustment of group life by defining and reinterpreting social norms and shared knowledge, it looks as though it is an unlikely candidate to affirm and maintain established patterns through their continued use. Pattern maintenance seems to require a permanent and exhaustive effort of explicit approval and tiresome reapproval from all members of a social group. People seem to have to say "yes" all the time. Or, as Blumer explicitly points out, group life just does not carry on by itself but depends on recurrent affirmation and agreement. This means, in Luhmann's terminology, that the established patterns of sociality are overintegrated and highly vulnerable to dissent and disagreement. They can be easily undermined or disrupted by changing definitions from others and may easily be brought to collapse. On the other hand, variations in the use of the original schemes of conduct and discontinuities in the use of shared knowledge seem to be acknowledged by symbolic interactionist sociologists as the most normal things to happen. Here, conflict seems to be just one more way among others – though a particularly important one – for the production of discontinuities: "In the flow of group life there are innumerable points at which the participants are redefining each other's acts. Such redefinition is very common in adversary relations, it is frequent in group discussion, and it is essentially intrinsic to dealing with problems" (Blumer, 1966:538).

Blumer's statement comes quite close to what Luhmann writes about the bubbling-up of myriads of minor conflicts at the level of face-to-face interaction. What is different, though, is that Luhmann explicitly states that these minor conflicts usually do not reach the system level of society. Pragmatism, in turn, does not clearly differentiate between interaction and society and is largely unable to explain its self-made mystery why and how a modern society can stand living under the permanent threat of being questioned and renegotiated all the time. Seen from the perspective of pre-modern societies, and particularly from the perspective of segmented societies like tribes and clans, this type of self-questioning communication would indeed be unbearable. Tribal societies are largely interactional societies, which means, according to Luhmann, that the system levels of interaction and society are largely undifferentiated and that every communication is communicated at the interactional and societal level simultaneously. Hence, a conflict in a group of tribesmen sitting around a fire is not as harmless as a conflict among a casual group of friends drinking in a pub as it would pose a direct threat to the foundations of kinship and the continuance

of tribal existence. Therefore, along the lines of Luhmann, the immediate suppression of even minor conflicts becomes a matter of sheer survival. In the casual-friends-in-the-pub case, a conflict would usually be a minor event, over and done with the next day because it does not impinge on the job, the family, the church, the school, the government or the economy. It does not even inhibit the return to the pub the next evening because, even in a worst case scenario when the conflict is still fresh, there are still other pubs and other friends.

Another controversial point has to do with the conceptual distinction between explicit and implicit conflicts. According to Luhmann's theory of autopoietic social systems, a "no" which remains unspoken or a fist that is secretly shaken in the pocket is not a conflict. A contradiction which is not explicitly communicated as a contradiction but remains inside a human being as a pure mental state, as an unarticulated frustration, or a tacit objection, cannot be acknowledged as a conflict unless a distinction between manifest or external and latent or implicit conflicts is introduced and conceived of as being useful. [11] The pragmatist sociology of symbolic interaction considers this to be a very useful distinction indeed, and one quite in line with Mead's idea of internalisation (Mead, 1934:307). The distinction between internal or latent and external or manifest conflicts is conceptually implied in the sociology of symbolic interaction because the mechanism of role taking is based on the interplay between internal and external behaviour. Taking the role of the other means interiorising or internalising the other actors' normative expectations and impulsive intentions in a process of reciprocal socialisation and developing what sociologists like Habermas or Joas call "intersubjectivity": the capability to anticipate another actor's reactions to one's own actions – as in the case of Antigone's intrapersonal conflict which is, of course, a social and an interpersonal conflict. [12] At this point it is possible to build a bridge between internal and external conflicts. A human being, or in Mead's terminology a social "self", is able to anticipate and balance the risks and outcomes of a conflict by an inner dialog between the "I", representing an individual's spontaneity and impulsiveness, and the "Me", representing the expectations and normative demands of the "generalised other" or the society. Thus, external or manifest conflicts are but the tip of the iceberg of latent or tacit conflicts most of which are below the surface of observable social interactions and it would certainly be fascinating to know more about the

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[11] Again there is a parallel in DAI literature: Impressed by Gasser's critique (Gasser, 1991), Hewitt was too hasty in abandoning the interesting distinction he had made between 'trials of strength" and 'conflicts" which comes quite close to Luhmann's distinction between plain contradiction and conflict as a communicated contradiction: 'Sometimes a trial of strength occurs without manifest conflict. One participant says ,Let's do it this way', and everybody agrees, so no conflict is noticed, but there is always the potential for conflict" (Hewitt, 1991:91).
[12] DAI distinguishes between inter-agent (social) and intra-agent (mental) conflicts (see Castelfranchi, 2000, Wagner, Shapiro, Xuan and Lesser, 1999).

circumstances of why and when conflicts are switched from the internal to the external level and back again.

Is introspection via intersubjectivity to be regarded as a legitimate empirical method? Social systems theory does not believe in building a bridge between internal and external conflicts – except by what Luhmann calls "structural coupling" – not just because such a theoretical move would blur the distinction between sociology and psychology, but because it confuses conflicts with conflict reasons and opens a Pandora's box of speculation on the observability of unobservable conflicts. If there is no conflict visible, is this due to conflict suppression, because people do not dare to express their hostility and frustration or is the absence of conflict to be explained by an invisible consensus based on common values and norms? Or does the internal/external distinction help to explain why and when a society allows a conflict to develop into a full-blown conflict system? These are the sceptical questions that must be raised from the perspective of a theory of social systems. In spite of his conceptual scepticism regarding social theories of action, Luhmann does not hesitate to draw heavily on an implicit notion of the intersubjective capabilities of human actors which comes quite close to a Meadian concept of taking the role of the other. This is obvious in Luhmann's account of open decision-making processes where conflicts are handled not by the process of communication as such, but by empirical participants who are able to intelligently adjust their individual contributions and responses to each other by anticipating the others' possible reactions. When it comes to the point when an influential group member has given his or her definitive commitment to the case in question, the others will be cautiously weighing their chances for overt opposition. And, as in the case of the tribesmen sitting around the fire, they will choose their words very carefully, before daring to express disagreement, because they know "by introspection" or by "taking the role of the other" that this might provoke a destructive conflict.

4.2   CONFLICT APPEARS WHERE ROUTINE COORDINATION BREAKS DOWN

In a pragmatist sociology of symbolic interaction, social change and innovation is based on nothing more than human beings defining and reinterpreting each other's acts. Reinterpretations and redefinitions, be they of minor or major scope, are intimately linked to conflict resolution, or, as Blumer explicitly states, to adversarial relationships. More generally speaking, however, Blumer's point is that all social situations are ambiguous to some extent and that redefinitions are nothing particularly exceptional or peculiar. Redefinitions are mass phenomena that occur in all different kinds of everyday situations that must be distinguished from problematic situations which are quite exceptional events. Whenever the continuous flow of routine action is seriously inhibited, people

start to rethink their situation and, after having found out that restoring the status quo ante is out of reach and not just a matter of minor repair, they tackle the situation by trying to find an innovative solution. In pragmatist sociology, finding a new way out of a problematic situation is considered a creative act of problem-solving that, after the new solution has been successfully proven, leads to a new routine and allows action to flow continuously again.

The concept of creative action is a core tenet of a pragmatist theory of social change (Joas, 1992). Creative action marks the turning point within a process of change that transforms an established pattern of individual or joint conduct into a new one. Charles S. Peirce, the founding father of pragmatist philosophy, was the first to elaborate the idea that knowledge and action are deeply intertwined and that the notion of objective knowledge or belief apart from human behaviour is false.[13] In his view, the objective world of facts is a Cartesian illusion because it is based on the epistemological separation of subject and object, of a material world separated from an extra-mundane mind. Descartes' separation is an untenable misconception because the world cannot be construed at all unless it is construed as our world, a world for us, constructed by real human beings whose cognitive actions are inseparably interwoven with their practical actions (Peirce, 1991a). And this interwovenness explains how "objective" knowledge is possible and why it changes as the relationship between action and world changes. Peirce's formula for knowledge transformation is "belief - doubt - belief".

In rejecting Descartes' tenet of "radical doubt" as a fallacious abstraction from the empirical roots of practical problem solving in a real world, Peirce claimed that belief and doubt cannot exist apart from the reality of practical action. Hence, "radical doubt" must be replaced by "real doubt". It is a fact of life that people normally do not doubt their beliefs unless they have a practical reason for doing so. As long as everything runs smoothly they stick to their practical beliefs and generally they are not even aware that they "believe" in something. Whenever people begin to doubt, however, they have a very practical reason to do so – the experience of a dissonance, for instance, or a difficulty arising in the course of action. But they do not experience doubt in a situation of smooth flowing, uninhibited routine action. Real doubt begins to make itself felt when well proven and hitherto unquestioned patterns of action and knowledge unexpectedly break down in the face of an obstinate reality. This is the moment when, in Peirce's terms, belief abruptly changes into doubt. At the outset doubt

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[13]That knowledge and action are irreducibly intertwined is one of the fundamental assumptions of pragmatist sociology adopted by bottom-up or behaviour-based approaches to AI which speak of "situated agents" (Maes, 1990, Steels and Brooks, 1995). It should be noted that this view is incompatible with another distinction which has become popular in DAI, namely between epistemic or belief conflicts and intentional or goal conflicts (Garagnani, Fox and Long, 1998:55, Maudet and Evrard, 1998, Galliers, 1989).

is experienced as a state of disorientation and despair which later passes over to a state of creative problem solving. Solving a problem means analysing the reasons that have caused the breakdown of a routine and rearranging the entire course of action, including its goals and means, in a thoroughly novel way. After the new solution has passed the reality test and turns out to be successful, it will be established as a new pattern of action and will eventually be accepted as an unquestioned belief. And it will remain unquestioned until a new problem arises.[14]

Mead's concept of symbolic interaction differs from Peirce's formula "belief - doubt - belief" inasmuch as it is both more general and more sociological. More sociological, since Peirce, although he emphasised that "logic is rooted in the social principle" (Peirce, 1991b:218) and referred to the scientific community as its paradigmatic case, conceived both cognitive and practical action as individual exercises.[15] And more general, since Mead treated reasoning as a special case of symbolic interaction, among many others. Mead, too, believed that "reasoning conduct appears where impulsive conduct breaks down" (Mead, 1934:348), in other words, that a human being who experiences a critical situation of inhibited action is shocked from the usual prevalent attitude of immediate experience to a more exceptional attitude of reflexive analysis. Facing a situation of maladjustment, human beings feel extremely insecure before they seek to adapt themselves to the new circumstances by conscious intellectual reconstruction. According to Mead, this is but a special case in a more general conception where two human beings, alter and ego, produce meaning by reciprocally defining and interpreting each other's actions. But what has caused the routine conduct of symbolic interaction to collapse in the first place is, of course, nothing else but a conflict among individuals. Hence, the sociological term for Peirce's doubt is conflict: I do not believe what you do believe. And

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[14]Gasser introduced the pragmatist model of Peirce and Dewey into DAI research in terms of settled and unsettled issues: "... internalised conventions are the outcome of previously 'solved problems' or 'settled questions' that have been codified into routines. Conventions and routines are built in this way by repeated negotiation and problem solving ... settled issues ... can be taken for granted and for further reasoning. However it is important to remember that a settled question – in this case the solution to a coordination or control problem – may have to be unsettled in a new situation; the problem may have to be re-solved in a new way for the new situation. In Dewey's terms, certain tentative positions or reasoning perspectives of the agent will have to be given a 'loan of certainty' so that the agent has a ground of belief on which to stand for the purpose of taking action" (Gasser et al., 1989:57). However, some of the most important "certainties", e.g. agent roles and communication structure, are designed into the multiagent architecture and cannot be revised by the agents. It would be interesting to explore how an agent community could be endowed with capabilities not only of distributed reasoning about organisations but of collectively changing or restructuring it.

[15]The difference should not be overestimated, though, since Mead like Peirce was convinced that problems can only appear in the experiences of the individual. In Campbell's words: "Unless individuals are able to bring to social consciousness anticipated ills, we will never be able to respond to them. This involves listening to the reports of individuals" (Campbell, 1981:197).

thus "belief - doubt - belief" can be translated into the formula "cooperation - conflict - cooperation".

In the main meaning is changed and adapted in exactly the same way as it is originally constituted and there is nothing particularly shocking about that. In everyday communication, an "ego" usually does not conceive an "alter's" interpreting reaction to his own defining action as extremely irritating or at the point of a serious inhibition, even if the reaction unexpectedly redefines and changes the social situation. According to Blumer openness and change is just the normal way of producing and reproducing any socially defined situation. And as all situations, objects and realities are defined or constructed socially, this goes hand in hand with people acting in a continuum of attitudes shifting between immediate experience and reflexive analysis, sliding from conscious to unconscious, from unreflexive to reflexive attitudes. Thus, symbolic interactionist sociology envisages a continuum of social change instead of a discontinuum between little readjustments at the interaction level and deep transformations at the level of society.

What makes Peirce's epistemological formula different from Blumer's view, then, is the idea that changing a shared belief or an established body of knowledge is an experience of abrupt discontinuity. Experiencing doubt as a shocking event implies that the continuous flow of impulsive (inter)action must have been previously channelled into a solid state or pattern of routine action or an unquestioned normative social structure. Indeed, a belief is acknowledged as a belief only to the extent that it has the quality of consolidated trustworthiness, of some kind of structural unchangeability. And this is the point where a powerful sociological conception of "doubt", now conflict, can be introduced. Although sociologists of symbolic interaction like Blumer refrain from construing society as a rigidly objectified pattern of shared values, norms, and convictions which, as in social systems theory, cannot easily be bent to and by the will of individual or collective actors, they clearly dispose of a concept of normative social structure: the "generalised other". This concept allows us to respecify Peirce's original formula in sociological terms of conflict: Alter's redefining reaction to ego's action may trigger a conflict if it is experienced as a shocking violation of ego's expectation and if ego's spontaneous readjustment is seriously inhibited. Moreover, conflict in a sociological sense is characterised by an inhibition or a blockade of ego's spontaneous adjustment which is not simply given by alter's refusal, but by a particularly unexpected and unacceptable refusal that must be interpreted as a refusal of the generalised other, i.e. as an offence against the cultural and normative foundation framing ego's and alter's situational interaction. What is at stake here is not ego's more or less idiosyncratic "expectation" in the sense of a disappointed wishful hope or desire, as in the case of loosing a fair competition. What is at stake are the very foundations of sociality, as in

the case of loosing a competition not because of defeat in fair play but because of fraud and deception.[16]

The distinction between a conflict in the sense of a "problematic" encounter with another person, i.e. a rule-breaking reinterpretation of an expectation on one hand, and an almost unnoticed everyday adjustment of a normative pattern on the other, paves the way for specifying the impact of conflict for a theory of social transformation. A problem arises from the shocking experience of a continuous flow of action being exacerbated and disrupted by an unexpected obstacle, but a conflict must be defined as a problematic event caused by a very specific obstacle, namely the unexpected action or reaction of another human being. However, this alone is not sufficient to define conflict. Since people often act and react in an unpredictable and unexpected manner, usually without provoking any serious irritation – since unpredictability is normally expected in everyday human interaction too – conflict must further be specified as a reaction that trespasses against a normative expectation. Again, as long as rule-breaking behaviour is limited to minor incidents and harmless exceptions that rather confirm the rules of, for instance, a competitive game like football, or, in other words, as long as ego is not seriously inhibited or shocked by alter's unexpected reaction, there is no conflict impending.

A conflict begins to escalate when alter's rule-breaking actions can no longer be interpreted by ego as casual or exceptional incidents, even under idealistic assumptions of benevolence, but must be seen as deliberative and harmful violations of a normative pattern of action to ego's disadvantage. In the course of a conflict, both parties, at first, will be claiming to act in accordance with the established patterns of action, i.e. with the normative basis of social behaviour. Sooner or later, however, a conflict will escalate and bring the normative basis itself into question. This is the case when ego begins to reinterpret alter's actions as a definitive departure from the shared normative foundation which both alter and ego, and all other members of a social group, have so far been committed to. More than ego's frustration at being inhibited by alter in the attainment of a goal or satisfaction of a personal desire, more than ego's moral disappointment that alter has played unfair or broken a promise, is the discovery that, because alter has definitely departed from the shared normative basis, the basis itself is shattered and cannot be trusted any longer. Taking the role of the other, here, precisely means that ego can no longer believe in the trustworthiness of an established and well-proven pattern of interaction, once she or he has realised that alter has already stopped believing in the generalised other.

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[16]Of course, the former case may trigger a conflict too, when the looser of a fair competition feels too disappointed or humiliated to accept her or his defeat and starts to play foul, although she was not taken by surprise since loosing was part of the expectation. In that case, however, it is the looser who is provoking a conflict with his unexpected reaction.

The crucial point in a conflict process is reached when both parties realise that the foundation of binding norms and shared values that has hitherto structured their relationship is on the verge of collapse. This is the reason why conflict parties are overcome by a feeling of deep insecurity far beyond their situational frustration at being inhibited in attaining a certain goal. Conflict, then, highlights the strategic importance of doubtful or problematic situations for a pragmatist theory of social change. As the grand old men of classicist pragmatism, Peirce, Mead and Dewey, repeatedly emphasised, the touchstone of inhibited action is the shock, the immediate experience that the inhibition can neither be removed nor by-passed nor ignored which goes hand in hand with panic-stricken feelings of doubt and despair. In the case of a conflict, this could be the devastating experience that all other participants who frame or contextualise ego's and alter's situational setting – and particularly those who, like the referee, somehow act on behalf or in the name of the generalised other – begin to reinterpret and reorganise their actions according to the logic of conflict. This can be illustrated with the fiction of a football player who, in a Kafkaesque reinterpretation of Mead's paradigm of a game, has been fouled by another player only to be told by the referee that his protest is out of order because the rules have just been changed. Or, to take a more realistic example, it is the experience of someone threatened by the Mafia who turns to the police for help only to find that they are in league with the very gangsters gunning for him.

This is the moment when the conflict parties will be aware of walking on very thin ice. The sociological insight that unquestioned norms cannot be trusted unless they are permanently reconfirmed is revealed as an insight of everyday knowledge which appears when the official representatives of the generalised other no longer acknowledge and approve the established patterns of normative action. At this point first-order conflicts about rule-breaking behaviour can turn into second-order conflicts about the appropriateness of an underlying social rule. However, Mead's idea of the generalised other is not organised as a static construction but rather as a dynamic web of reciprocal commitments. Usually, in case of a conflict there are always some others who still can be trusted, there are other committed players and referees who act according to the rules of the game, other police officers, attorneys, and judges who still respect the law. And even the criminal who consciously breaks the law is contributing to its reproduction, so long as crime remains the exception: A criminal act reconfirms the foundation of shared values not only by provoking retaliation by the police, but by the very fact that the offender must first know the law before she is successfully able to break it. The example of the police officer and the criminal shows that conflict interaction is based on a layer of shared knowledge below the contested terrain of rule-breaking behaviour. Since it is not possible to outwit an opponent and to win a conflict without taking the

role of the other, both conflict parties, the law breaker and the law restorer, must share the same norms and values and must know what is right and wrong. Hence, both parties share the knowledge of what it means to break a law. What they do not share, however, is the moral conviction that it is wrong to do the wrong thing (Haferkamp, 1985:179).

5.   CONFLICT AND SOCIAL CHANGE

5.1   CONFLICT NEGOTIATION AS INQUIRY INTO INQUIRY

The interesting question, now, is not how to resolve a conflict in the case of unambiguous criminal behaviour and how to restore social order by coercing the maverick back onto the right track. The point in question now concerns conflicts between parties who both claim to be right in the face of a value conflict and are unable or unwilling to resolve their disagreement by violence. What will happen if a value conflict cannot be resolved by coercion or violence because such measures are prohibited by a superior third party or because the conflict parties are equally powerful and shun the risks of open violence with its concomitant risks of moral and material self-destruction? The answer is that nothing will happen. Instead, both conflict parties will experience the famous pragmatist shock of inhibited action. And as long as nothing happens, there will be an undeclared moratorium or a kind of tacit armistice which, after it has been unofficially respected for a while, may begin to crystallise into shared knowledge with gradually growing normative implications. However, so long as the parties are far from accepting the status quo and so long as conflict is still imminent, the shock of inhibition will pass over into what pragmatists call the attitude of reasoning or reflexion. Reasoning and reflexion may begin with cautiously taking the bite out of the conflict by declaring a unilateral armistice and by taking other one-sided measures of de-escalation. And they will gain momentum when both parties agree on a bilateral or collective exchange of arguments. Such a collective process of conflict reasoning is called a negotiation. While unilateral, individual conflict reasoning alone usually tends to produce avoidance behaviour and conflict latency by encapsulating and by-passing the conflict, negotiations as a multilateral or collective form of conflict reasoning have the potential for restructuring the situation in such a way as to resolve the conflict by creating novel forms of social order.

Negotiation is a collective process of consciously restructuring a conflictive situation, and its outcome is a "negotiated order" (Strauss, 1978).[17]   Its for-

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[17]According to Strauss, negotiation is not only conflict negotiation. Strauss distinguishes between three aspects or levels of negotiation: the types of interaction, the immediate context of negotiation, and the structural context. Hence, although negotiations usually influence the immediate or situational context, they

mula is "order - conflict - negotiation - order". Once the new order has been established, the way in which the conflict has been successfully resolved is not forgotten but stored in the memory of a society's accumulated wisdom. Whenever a similar conflict reoccurs, the successful mode of earlier conflict resolution will be drawn on again, and, via case-based reasoning and repeated use, will be gradually transformed into an established pattern of conflict negotiation. Any negotiated order, therefore, is endowed with its own complementary institutions of negotiation. From now on, order does not follow conflict alone but conflict follows order, too. The new order of negotiation consists of its own regulations and methods and is specifically institutionalised as a "social inquiry" (Dewey, 1991/1938) to settle the conflicts from where its own institutionalisation originates. Thus, conflict settlement becomes a routine. As this happens a remarkable shift in the meaning of conflict takes place. The conflict looses its original shocking quality and no longer functions as a crisis-trigger. People just remember how they have learned to resolve it collectively. In this way, through accumulated learning, conflict is turned into regular competition, and "struggle" becomes an expected, legitimate form of behaviour. Of course, this is only true to the extent that opponents adhere to the new rules of conflict negotiation. Creating order from conflict via negotiation is, by and large, no longer an excursion into unknown territory, but has been turned into a meta-routine that effaces the disturbing ambiguity of conflicts and conflict negotiations.

Transformed into a negotiated order of negotiation, the origins of negotiation in conflict are no longer visible, and conflict negotiations appear to be plain negotiations, devoid of hostile impulses and ill-feelings. This may be the reason why the protagonists of the negotiated order approach do not explicitly discuss the connection between conflict and negotiation. They speak rather vaguely instead of "ambiguities" that "require negotiation, either explicit or implicit" (Maines, 1982:269). Seen this way, a scientific dispute within the conventions of civilised discourse cannot be conceived as a conflict, but rather should be seen as a normal collaborative search for truth among people who share the same values and follow the same goals. What makes it so difficult for those who adhere to the sociology of symbolic interaction to perceive the original conflict as having been domesticated by, and incorporated into, a regulation is Mead's fundamental anthropological distinction between friendly or cooperative impulses and hostile or conflictive impulses. This is not to say that Mead ignores or excludes phenomena like argument, dispute, or disagree-

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may even have an impact on the higher level and can be measured in changes in structural contexts (Maines, 1982:270). However, negotiations do not determine the context; rather, the lines of influence can go both ways (Strauss, 1978:101). This means that it is also the context which influences the course of negotiations. The relevant features of the immediate negotiation context enter into the process of negotiations directly and affect its course in a more direct way, whereas the larger structural context constrains and conditions the course of negotiations in a more indirect way.

ment from his agenda. On the contrary, he vividly argues for the individual right of disagreement and even claims, as though he were personally sharing Antigone's burden, that an individual should not be punished for disagreeing with the majority, as long as she is acting in full accordance with her own moral judgement (Campbell, 1981:199). Mead is able to make such a claim because he does not believe in fundamental value conflicts but in an ever growing, all encompassing moral order of universal values. However, Mead's moral justification of disagreement would not really make sense unless he expected such disagreements to continue in the future and, as Campbell remarks, they will certainly continue, simply because "different evaluations of human goods are related, not to factual disputes, but to different positions on the nature of a good human life." (Campbell, 1981:199)

Again, it is obvious that Luhmann was absolutely right to criticise the lack of an elaborated sociological conflict terminology. The lack of clarity in the sociology of symbolic interaction makes it difficult to understand how underlying conflict reasons like "hostile impulses" and "different value positions" are related to visible conflict symptoms like "factual disputes" and "negotiations", and whether a disagreement should be called a conflict as long as it is a legitimate form of behaviour regulated by an order of negotiation. In any case, Campbell feels encouraged by Mead and Strauss to abandon hope for ultimate solutions and to adopt an approach of "continual readjustment" (Campbell, 1981:197) in order to anticipate value conflicts and to preclude their most damaging consequences. What he suggests is the creation of a kind of early warning system endowed with flexible modes of response that seeks out and resolves problems and conflicts "before they come upon us full-blown ..." (Campbell, 1981:197). In his philosophical terminology, John Dewey calls such an early warning system an inquiry. "Inquiry is the controlled or directed transformation of an indeterminate situation into one that is so determinate in its constituent distinctions and relations as to convert the elements of the original situation into a unified whole" (Dewey, 1991/1938:108). Translated into contemporary sociological terms, Dewey is imagining a "nonindividualistic society, based on cooperative, experimental intelligence" (Denzin, 1996:66) which voluntarily institutionalises public processes of conflict negotiation.

According to Dewey's pragmatist social philosophy, history is made by conscious human beings who, under given conditions of pragmatic interaction, produce what he calls "potentialities" by actively mediating between possibility and reality – a conception which seems to come quite close to Luhmann's definition of meaning as the difference between actuality and potentiality. Working on the same lines as Peirce's problematic-situation approach, Dewey developed the idea that mankind's historical progress in democracy, science and technology is based on a cooperative process of goal-oriented and self-correcting inquiry. Inquiry is a kind of practical inference and its settled outcome is called

a judgement. Dewey's theory of inquiry is explicitly modelled on the procedural principles of "due process" or a fair and prompt trial: "A literal instance of judgement ... is provided by the judgement of a court of law in settling some issue which, up to that point, has been in controversy. The occurrence of a trial-at-law is equivalent to the occurrence of a problematic situation which requires settlement. (...) This settlement or judgement is the outcome of inquiry conducted in the court-hearings" (Dewey, 1991/1938:123). However, inquiry and judgement are more than a first-order mode of conflict settlement constructed on the blue print of a democratic court of law and its trial regulations. The crucial difference here is that Dewey's idea of continually readjusting a democratic society does not stop short when it comes to improving democratic institutions, the very modes of a society's cooperative and explorative intelligence. Inquiry is essentially self-adjusting. It is inquiry into inquiry.

In order to understand why Dewey calls an inquiry a controlled or directed transformation, it is necessary to take the institutional model of a court of law seriously but not literally. Inquiry as a highly generalised model of a creative decision-making process is abstracted from both jurisdiction and legislation, and enriched with elements from scientific discourse. Inquiry does not mean solving standard disputes by standard jurisdiction, but producing "legislation" by creatively resolving unprecedented conflicts, quite in the Anglo-American judicial tradition of a precedent. It is the model of a democratic process of collectively analysing and negotiating a controversy and transforming it – as well as the institutions of negotiation in cases of second-order conflicts – into a novel solution that can be reactivated as a precedent for the future resolution of similar conflicts. Dewey envisages four or five stages in a cyclical process of inquiry beginning with a conflict of an exceptional quality and ending with a practically proven judgement. Unless the initial conflict does not immediately end in a catastrophe,[18] the stage of inhibition is followed by an attitude of detached reasoning and the attempt to delineate the conflictive constellation by arranging what Dewey calls a "logical division of labour". All aspects which might be conducive to a solution are identified and decomposed, propositions and hypotheses are generated and debated in expert hearings, further empirical evidence is collected, and experimental settings are explored and tested until "functional fitness" between a conflict and its resolution is reached. Indeed, inquiry is largely described as a scientific method, but as a rational method whose rationality is rooted in practical action: "functional fitness", by defini-

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[18]Hence, any inquiry presupposes that social life is just partially, but not totally, collapsing in the face of a conflict. Apart from the broken routine there must be a large amount of other routines and other resources available which are not affected by the crisis and which allow normal social life to be continued outside the realm of inhibited action. Moreover, these routines and resources will be badly needed to fuel the resource-intensive process of inquiry.

tion, cannot exist apart from those individuals who have the problem. It is a non-starter unless accepted and confirmed as a shared judgement by those who are practically involved. Judgement[19], thus, is the operational link between expert cultures and common sense, and inquiry is the mode of reflexive mediation that allows a society to change the way in which the link is institutionalised and justified in accordance with democratic progress and human rights. Indeed, Dewey's "defence against the rise of totalitarian states always returned to the level of the individual. It was up to cooperating individuals to create voluntarily institutions that would protect their most vital liberties" (Denzin, 1996:67).

5.2   COMPETING EXPLANATIONS: INQUIRY VERSUS EVOLUTION

In contrast to the proponents of American pragmatism, Luhmann neither believes in voluntary democratic reforms, planned change, nor in establishing a direct operational link between expert cultures and common sense via inquiry and judgement. In his eyes, concepts like inquiry and judgement must appear to be heavily overburdened with the onus of having to operate both ways: as an institution of routine negotiations on one hand and as a creative procedure of planned self-modification of routine negotiations on the other. Unlike pragmatist sociologists of symbolic interaction and their philosophical ancestors, he is firmly convinced that social change is a matter of evolution or unplanned self-adjustment. Conflicts play a double role in Luhmann's evolutionary conception. They are enabled by functional differentiation and they enable functional differentiation. To begin with, specialised conflict communication is the outcome of evolutionary differentiation. Conflicts become more visible and more tractable – and more harmless. They are more harmless because they are encapsulated within the closed worlds of expert cultures and, according to Luhmann, it is neither possible nor desirable to bring expert cultures in direct touch with, or translate them into, common sense judgements and democratic progress.

Luhmann's conceptual equivalent to the pragmatist formula of inquiry is evolutionary change. As has been shown earlier in section 3, social life is packed full of conflict communications with their heady brew of deviance, coercion, and persuasion all of which are adept at producing masses of new variations of surplus "semantic material", which mostly vanishes soon after it has been communicated. Far from being confirmed and stabilised by acceptance and repetition, most conflicts are hardly ever noticed and disappear without trace Some of these variations, however, happen to have been selected and reconfirmed in

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[19]"Judgement may be identified as the settled outcome of inquiry. It is concerned with the concluding objects that emerge from inquiry and their status of being conclusive. Judgement in this sense is distinguished from propositions. The content of the latter is intermediate and representative and is carried by symbols; while judgement, as finally made, has direct existential import" (Dewey, 1991/1938:123).

a largely unintentional, unplanned process of contingent social exchange – and afterwards, in the rear-view mirror of historical hindsight, this looks curiously like a progress in system differentiation. Social change is an evolutionary process, quite in Darwin's sense, that follows the three stages of variation, selection and restabilisation. It cannot be conceived of as a conscious, planned change since communicating a new or an unexpected proposal (variation) is systematically disconnected from being either accepted or refused (selection) and from being transformed into structures or institutions by perpetual repetition (restabilisation). Conflict tolerance is like the invention of writing, an evolutionary achievement which helps accelerate and propel the evolutionary process. Conflicts allow us to test the potential for rejection (Luhmann, 1997:466) and this helps to strengthen the immune system of a society and its self-adaptation. Thus, conflicts propel the evolutionary process of differentiation on the one hand, while, on the other, they are reinforced and stabilised by functional subsystems.

Within the theoretical framework of autopoietic social systems it is easy to show how subsystems immunise and reproduce themselves with the help of domesticated conflicts. However, it is difficult to demonstrate how further advances in social differentiation might occur via conflict systems by thoroughly restructuring a subsystem's mode of reproduction. But the truly difficult thing to explain is how conflicts contribute to the transformation of the structural foundations of a given mode of subsystemic autopoiesis. If these cannot be fundamentally restructured by conscious reasoning or by collective decision, but solely by evolution, then how is it possible that an old subsystem gives birth to a new one? Luhmann's theory can demonstrate how the modus operandi of conflict regulation in a social subsystem like the scientific community produces and generalises cognitive knowledge. What is difficult to explain, however, is how the modus operandi of conflict negotiation in the scientific subsystem was originally generated, and, turning from retrospection to prospection, to what extent it will be able to transform itself into more differentiated subsystems in the future. According to Luhmann, it is quite clear that as long as a specialised type of conflict is bound by the regulations of an existing subsystem like the scientific community, it is prevented from both entropic expiration and cancerous escalation. As a result of scientific conflict communication, an ever growing body of knowledge is being accumulated, perpetually refined, reworked, and revolutionised. But how do conflicts account for generating a qualitative differentiation between, say, the code of religious truth and the code of scientific truth in the era of enlightenment? Or, in trying to anticipate future developments, how is it possible that new modes of autopoietic reproduction will be generated from old ones?

Retranslated into the pragmatist terminology of negotiated order, it seems as though scientific conflicts within the scientific subsystem tend to reproduce

the same old procedural rituals or modes of inquiry again and again during the creation of innovative knowledge, and while the system's stock of knowledge is rapidly changing it seems as though the system's structural order of negotiation always remains the same. In other words, scientific controversies are revolutionary only with regard to cognitive content, but appear blatantly conservative with regard to the subsystem's order of negotiation. They seem to lack the potential for second-order conflicts characterised by the fundamental challenge they pose to a given mode of conflict regulations. The question whether a subsystem is able to change its own structural regulations – or its own order of negotiation – by means of internal conflict communication or whether it can only be interrupted and modified from outside or from above (Luhmann, 1984:532) remains essentially unanswered. Perhaps an answer could be sought in Luhmann's historical reconstructions of evolutionary change, for instance in his analysis of the semantics of passionate love in French literature (Luhmann, 1982) or in the transformation of the concept of truth from a medieval religious category into a modern scientific category. What we might find there, however, will not resemble a social order negotiated by participant actors. Rather we should brace ourselves to find interesting changes in areas where those who brought them about would least have expected them. Unlike the sociologists of symbolic interaction, Luhmann would never recommend following social actors to find out what really happens in a society. He would recommend excavating a society's semantic material instead.

However, pragmatists have no reason to be self-righteous. Dewey's scenario of inquiry, where conflict parties, judges, attorneys, lawyers, witnesses and experts sit around a table elbow to elbow with democratic common sense, in order to purposely organise a unique procedural structure or a "logical division of labour" for conflict resolution, also stops short when it comes to inquiring into its own procedural foundations. In our view, inquiry into inquiry is a misleading label as long as the underlying structures of inquiry remain untouched throughout the process of inquiry. The crucial point here is that, apart from certain cosmetic modifications, questioning the foundations of inquiry is not provided for by pragmatist theories of inquiry and negotiation. There is no provision for an aggressive rule-breaking inquiry into the institutionalised setting of the court of law itself with all its roles and regulations. In contrast to Hewitt's conclusion, Dewey does not seem to have seriously considered that "negotiating conflict can bring the negotiating process itself into question" (Hewitt, 1986/88:323) in a radically obstructive way. Instead, pragmatists seem to reify the theoretical concept of inquiry with existing institutions that must be respected by everybody – conflict parties, judges, attorneys, lawyers, witnesses and experts alike. Pragmatists seem to assume that playing with regulations by inviting unexpected new witnesses, calling for other experts with different expertise, or even by exchanging a biased judge for an impartial one is self-reflexive inquiry. But

this leaves the institutional structures themselves untouched. Luhmann, who in any case does not believe in inquiry into inquiry, would probably argue that it is impossible to question social structures by practical inquiry because structural change is not a short-term achievement but a long-term accumulation of minor events – of masses of conflict events which usually will not even be recognised as crucial symptoms of a fundamental change before the new structure has been established and consolidated.

As we do not have to believe in the existence[20] of autopoiesis either, we should try to exploit Luhmann's approach as a heuristic way of referencing conflicts from different subsystemic perspectives. We should begin to observe how conflicts migrate across the boundaries of subsystemic domestication and become cancerous. From here, ecological conflicts or social movements can be construed as symptoms of structural or tectonic tensions which fall betwixt and between the established codes of subsystemic conflict communication (Luhmann, 1986). These conflicts have no choice. They must become "cancerous" in order to produce resonance and amplification. Evolution begins with masses of tiny conflicts bubbling up at the level of social interaction. Some of these will be recruited by larger systems which are endowed with powerful amplifiers, the mass media, for instance. The interesting question here is cross-boundary conflict recruitment or conflict migration. How is it possible for conflicts to be recruited across the established boundaries of subsystems? Is it possible that a "no" which is communicated in a particular subsystem language may contain a sort of information which is useful – for whatever reasons – for some other subsystem? If so, then it might have a chance to be recruited as a starting point for structural differentiation. When a conflict communication is rejected by one subsystem but accepted as a useful contribution by another one, it has already won a natural ally. Thus it could be stabilised and strengthened and eventually remigrate into its originating subsystem to induce structural change there by enforcing a new mode of differentiation within the subsystem in question. To elaborate on the idea of differentiation by cross-boundary conflict migration, however, would imply a departure from the essentially negative connotations of Luhmann's cancer theory of conflict.

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[20]Strictly speaking, autopoiesis is not an "ontological" category. Relative to Luhmann's theory architecture, however, autopoiesis shares a quasi-ontological status with other terms like communication, differentiation and system. Luhmann's "ontology" assumes that "systems exist" (Luhmann, 1984:30). Things that "exist" can be distinguished in his theory from more "constructivist" categories like action, intention, observation, perception etc. ascribed by the sociological observer.

6.   CONCLUSION: IMPORTING SOCIOLOGICAL INSIGHTS INTO DAI

Importing conflict theories from sociology into DAI opens new opportunities for both disciplines. Viewing conflict as rule-breaking behaviour in a sociological sense and defining it – with Luhmann – as a double "no" or a communicated rejection of a rejected expectation, appears to be a promising point of departure for future collaborative work. Moreover, viewing conflict as conflict communication allows us to construe intrapersonal conflicts as internalised interpersonal conflicts or – with Mead – as inner dialogues between "I" and "me". But more questions have emerged which need further investigation. How can a conflict be conceived as a rule-breaking behaviour when it has been domesticated by social institutions and negotiation procedures? How can a conflict be experienced as a shocking event or a deep crisis of inhibited coordination if it is just a competitive game? How are conflicts interrelated with structural social change along the lines of the pragmatist formula "coordination - conflict - coordination", and how is it possible to translate this formula into a useful design for multiagent systems? To understand and answer these questions is of importance for both sociology and DAI. Developing multiagent systems that are able to effectively and efficiently handle conflict and coordination as twin concepts signals a departure from the myopic assumption that coordination mechanisms can be designed to perfection. Rather it would be more adequate to build computational systems under the premise that states of coordination and conflict continuously alternate – no matter what coordination mechanisms are applied. Along these lines we can identify six research topics that would repay future collaborative work.

(1) *Conceptual clarifications*

As shown in the introductory sections, there is a broad variety in the ways the term "conflict" is used in DAI. The sociological theories treated in this chapter provide two interesting starting points for more precise definitions of this term. First, by following the theory of autopoietic social systems, a computational conflict could be defined in terms of a communicated contradiction, that is, as an agent's communicated rejection of another agent's communicated rejection. Second, by following the pragmatist theories of symbolic interaction, a conflict could be defined as a rule-breaking action that contradicts shared values and harmfully violates the expectations of other agents to such an extent that it is experienced as a shock. Both definitions offer a perspective that goes far beyond a friendly rejection of a proposal within a shared framework of coordination, and beyond a casual exchange of different views on how to use joint resources and how to treat detected (or perhaps even undetected) inconsistencies in the knowledge bases of agents. To make these ideas computationally tractable raises a number of interesting research questions for DAI. What forms of explicit

rejection are possible in multiagent systems, given the agents' communication facilities? Does rejection always require an exclusive and definite "no", or would it make sense for computational agents to also interpret a conditioned "no" (i.e., a "no, under this or that circumstances") as a communicated rejection? Similarly, would it make sense to adopt a more relaxed, extended form of Luhmann's definition by also considering an implicit rejection (i.e., a rejecting by not saying "yes") as a sufficient condition for the existence of a conflict? How can agents decide whether an expectation is in accordance with established norms or whether an action violates some normative expectation? Can this kind of accordance be measured in absolute terms or is some relative metrics more appropriate? Does this decision require a neutral and commonly accepted third-party instance as a mediator? Should the violation of norms be treated in an absolute yes-or-no style, or would it be more appropriate to introduce some relative measure that allows differentiation between levels of violation?

(2) *Levels of conflict and conflict tolerance*

The sociological considerations in the previous sections show that it is problematic to think of conflict as a phenomenon that either is available with maximum impact or is not existent at all. Instead, it seems to be justified to think about conflict as a phenomenon that can show different levels of intensity – maturity, urgency, and implication. Moreover, conflict cannot be expressed and measured in absolute terms because it is recursively related to a structural social context – in DAI terms: a multiagent world composed of other agents' interactions – where each conflict level is potentially associated with different levels of conflict tolerance. Different levels of conflict and conflict tolerance could be distinguished on the basis of different degrees of rejection or different degrees of violation of normative expectations. Distinctions like those between ephemeral and real conflicts or between first-order and second-order conflicts can be considered as a basis for levels of conflicts and conflict tolerance. From an individual or agent-oriented point of view, different levels of conflict and conflict tolerance could be distinguished on the basis of different degrees of goal and belief inconsistency among agents. From a societal perspective, they could be distinguished on the basis of different degrees of maintaining, repairing and adapting structural patterns of coordination. Introducing levels of conflict appears to be particularly attractive for DAI, because this could result in more sophisticated and finer-grained models of, and mechanisms for, coordination and conflict treatment. However, taking levels of conflict into consideration is not equally appropriate for all problems. Hence, the solution variety (or the specificity of the solution requirements) of a problem should also be introduced as another criterion for computational appropriateness.

(3) *Solution variety and global coherence*

What is meant by solution variety can be shown by comparing analytical problems with synthetic problems: Analytical problems like medical diagnosis typically require an optimal solution and thus do not leave much room for alternatives, while synthetic problems like meeting scheduling or computer configuration typically possess several alternative solutions of equal quality. Clearly, high conflict tolerance is likely to be more damaging for problems displaying a highly constrained solution space, while low conflict tolerance may unnecessarily complicate the treatment of weakly constrained problems which dispose over a much larger solution space. Moreover, we suppose that it may be useful to define levels of conflict and conflict tolerance dependent on the phases or stages of a problem-solving process. For instance, and in analogy to the simulated annealing methodology, one could tolerate (or even desire) a high conflict tolerance in the early phases of problem-solving which is then successively lowered as the problem-solving process proceeds. Obviously the computational realisation of levels of conflict and conflict tolerance opens a broad range of open research questions for DAI, and finding answers to these questions is also of relevance to sociology: What are appropriate qualitative and quantitative measures for computationally capturing and handling different levels of conflict and conflict tolerance? How can agents decide what level of conflict is available and what level of conflict tolerance is most appropriate in the current situation? How can agents resolve meta-disagreements on the level of conflict and conflict tolerance (and thus on the actions to be taken in response to the conflict they identified)? How are levels of conflict and conflict tolerance related to degrees of rejected or violated expectations? How are they related to coordination and to multiagent systems' overall coherence? Do they imply corresponding levels of local cooperation and global coherence?

(4) *Detection and prevention of conflicts*

The idea of levels of conflict violation and of levels of conflict and conflict tolerance constitute a promising starting point for the design of "early warning systems" for conflict detection and conflict prevention in multiagent systems. Here, DAI will have to contend with the dilemma that conflict prevention often either comes too early or too late. Intuitively it seems clear that the earlier a conflict (or the possibility of the formation of a conflict) is detected the better are the chances to resolve it and prevent its escalation because it looks easier to handle a low-level conflict or a minor violation of socially grounded expectations than a high-level conflict or a major violation of expectations with far reaching impacts for a large number of agents. However, this intuition is misleading: Immature or low-level conflicts cannot be tackled adequately because at an early stage it is still unclear how they will develop, whether they will be entropic or cancerous, damaging or beneficial, while mature or high-level conflicts often have gained considerable momentum and cannot be stopped from running out of control although they may now be thoroughly understood and

analysed. With these difficulties, conflict detection and prevention based on "levelled conflicts" is a highly interesting, yet still unexplored topic in DAI and it is worth noting that sociological theory provides a basis for the development of computational conflict detection mechanisms. An interesting starting point is Mead's concept of role taking according to which intrapersonal conflicts are construed as internalised interpersonal conflicts – as inner dialogues between "I" and "me" – which (as in the case of Antigone's moral conflict) do not occur in splendid isolation from other people's expectations but are directly interwoven with them. Thus, transposed to DAI, role taking can be viewed as a mechanism of conflict detection and prevention. Similarly, Dewey's reflexive conception of inquiry could be translated into a meta-strategy of conflict resolution which becomes part of the societal memory. Again, DAI will have to face the difficulty of making a complicated social process computational, i.e. designing an adequate program of transforming first-order conflicts (regulated by institutionalisation) into second-order conflicts (regulated through collectively restructuring the institutions of conflict regulation). It should be understood that neither role taking nor inquiry can be taken as a blueprint or as a ready-made solution for an immediate transfer into computationally executable models – this transformation challenges DAI.

(5) *Conflict regulation instead of conflict resolution*

The primary reason for studying conflicts in DAI is to develop mechanisms for resolving them. However, as Luhmann convincingly argues, conflict resolution is but one way – and often a rather unlikely way – to cope with conflicts. In this respect DAI can learn from sociology that there are other ways of dealing with conflicts. Apart from resolving them, conflicts may also be regulated by toleration, suppression, externalisation, postponement, ignorance, encapsulation, prevention and institutionalisation. In contrast to the sociological view, conflict research in DAI is predominantly based on the assumption that conflicts can and have to be resolved, and so it is hardly surprising that other forms of coping with conflicts have not been seriously considered in DAI so far. Since it is reasonable and realistic to assume that not all conflicts can be fully resolved under given time and cost constraints, DAI will have to be more careful in addressing theoretical issues like conflict generation, conflict development, and conflict outcome – issues which have hitherto been largely neglected by DAI research. Apart from the theoretical questions, issues of conflict regulation too open a broad range of practical questions for DAI. What, for instance, are the conditions under which agents should decide to tolerate, postpone, ignore, by-pass (and so forth) conflicts? Under what criteria should agents consider a conflict as being irresolvable at least for the moment (so that it is better to tolerate it for a while), and what are the criteria for continuing work on a conflict? Can tolerance and ignorance of conflicts be appropriately captured in an algorithmic framework at all? What are the criteria for appropriate computational

mechanisms of conflict suppression? How is it possible to computationally capture the institutionalisation of conflicts as a collective learning process, either through evolution (Luhmann) or through negotiation (Strauss)? What will happen if some agents think that a given conflict is irresolvable, while others insist on further trying to solving it? Is there a need for separately designing what sociologists would call the normative foundations of conflict regulation? Addressing questions like these should help to keep us from building multiagent systems that waste a lot of time trying to solve irresolvable conflicts.

(6) *Robustness, adaptivity, innovation*

Conflict studies in DAI should be understood as inquiries into the robustness and adaptivity of multiagent systems. As sociological theories of conflict show, societies immunise themselves through conflicts and recover from them by repairing their structures and restoring their status quo ante – or by gradually or radically changing their structures. Conflict, thus, appears to be an important source of innovation in human societies. The computational realisation of the restorative or innovative use of conflicts as stimuli for learning to restructure and reorganise their interaction patterns, their normative expectations, their cultural values, and their power relations constitutes another major challenge for DAI. By accepting this challenge in a fundamental way, the sociologies of symbolic interaction and autopoietic systems could be of particular inspiration for DAI research on multiagent learning, adaptation, and organisational self-design. Sociologists, in turn, could considerably profit from constructing and experimentally comparing models of conflict and structural change with respect to both streams of sociological theories considered here. Conflict models of autopoietic origin will have to experiment with producing masses of variations of ephemeral or virtual conflicts to test an artificial society's structural resistance; and conflict models inspired by the sociology of symbolic interaction will have to demonstrate how first-order conflicts turn into second-order conflicts by escalating to such an extent as to radically challenge a given procedure of negotiation if it is no longer capable of first-order conflict resolution. Such models could teach sociologists how to develop a better understanding of how human societies learn from or adapt through conflict, how they take advantage of conflict to build novel regulations and institutions, and – more optimistically speaking – how they might transform conflict into democratic progress. Furthermore, in a highly abstracted way these two models could also be developed into generic technologies of adaptive robustness and graceful degradation for multiagent systems.

Despite their preliminary status these considerations clearly indicate that conflict research both in DAI and in sociology could considerably profit from interdisciplinary cooperation. A joint exploration of the research issues listed above does indeed have the capacity to substantially advance our understanding

of theorigins, dynamics, and consequences of conflict in human and computational societies. It is important to see, however, that a set of common ideas and shared intuitions cannot replace a theory of conflict. To prepare the ground for more ambitious conflict approaches in both disciplines, it is necessary to take preliminary distinctions such as those of logical and material or interagent and intraagent conflicts not as the explanans but as the explanandum of inquiries into socionics, to seriously consider sociological theories as a source of inspiration for designing computational technologies, and to exploit DAI technology as a sociological method of experimentation and simulation. For sociologists and DAI researchers alike the comparative exploration of models of conflict and structural change should be ventures of the keenest interest.

Acknowledgments

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