LOGICAL ARGUMENT MAPPING: A METHOD FOR OVERCOMING COGNITIVE PROBLEMS OF CONFLICT MANAGEMENT

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A crucial problem of conflict management is that whatever happens in negotiations will be interpreted and framed by stakeholders based on their different belief–value systems and world views. This problem will be discussed in the first part of this article as the main cognitive problem of conflict management. The second part develops a general semiotic solution of this problem, based on Charles Peirce’s concept of “diagrammatic reasoning.” The basic idea is that by representing one’s thought in diagrams, the conditions that determine interpretations can become visible, we can “experiment” with them, and we can change them eventually. The third part, finally, focuses on a concrete tool, called Logical Argument Mapping (LAM), that can be used in conflict management to perform such diagrammatic reasoning and to cope with the cognitive problems discussed in the first part. The Israeli–Palestinian conflict on the sovereignty over Jerusalem will be used as an example to show how LAM could work in practice.

Keywords: Framing, semiotics, diagrammatic reasoning, Middle-East conflict

Note: I thank Bryan Norton, Barry Bozeman, Roberta Berry, Jon Johnston, Robert Kirkman, Jason Borenstein, and Paul Hirsch for a fruitful discussion of an earlier version of this paper, an anonymous reviewer for some very helpful objections, and Wolff–Michael Roth for providing the data used in the second section. These data were generated in a project funded by the Social Sciences and Humanities Research Council of Canada. Correspondence concerning this paper should be addressed to Michael H. G. Hoffmann, School of Public Policy, Georgia Institute of Technology, 685 Cherry Street, Atlanta, GA, 30332–0345. (m.hoffmann@gatech.edu)
Cognitive Problems of Conflict Management

It is quite obvious that understanding one another is an essential condition of communication, and sometimes also a condition of resolving conflicts by negotiation. Understanding, however, is less trivial than one might think. In conflict research, the problem of understanding has been discussed—to name only the two most prominent research areas—as the problem of “stereotyping” on the one hand (e.g., Bar-Tal & Teichman, 2005), and that of “framing” on the other (e.g., Tannen, 1979; Putnam & Holmer, 1992; Kaufman & Smith, 1999; Schweitzer & DeChurch, 2001; Elliott, Kaufman, Gardner, & Burgess, 2002; Elliott, Kaufman, & Shmueli, 2003; Lewicki, Gray, & Elliott, 2003; Gray 2006). Both these discussions should be supplemented by a further one which I would like to introduce under the heading of “the lifeworld dependence of understanding.”

The term “stereotype” was first coined to name a new method of printing developed at the end of the 18th century. Stereotypes are curved shapes with which the printing cylinders of the rotaries are fitted. Its nowadays well-known social psychological use to describe a “preconceived and oversimplified idea of the characteristics which typify a person, situation, etc.” is first documented in Lippman’s (1922) book *Public Opinion* (cf. Oxford English Dictionary).

In a recent study on “stereotype formation,” the authors argue that stereotyping is not an “erroneous and distorted” process, but “that stereotypes form in order to explain aspects of social groups and in particular to explain relationships between groups” (McGarty, Yzerbyt, & Spears, 2002b, p. i). “Stereotypes as Explanation” is the book’s title, and the main idea is that stereotypes can be described by three characteristics: “(a) stereotypes are aids to explanation,” they make behavior of others understandable, “(b) stereotypes are energy-saving devices,” because they allow such understanding very quickly, without much consideration, and “(c) stereotypes are shared group beliefs,” that is they stabilize social and cultural identity (McGarty, Yzerbyt, & Spears, 2002a, pp. 2–6). Stereotypes’ cognitive function is to enable actions even in situations that are characterized by overwhelming complexity. It has been shown, for example, “that the extent to which people rely on stereotypes about others can be manipulated experimentally by placing participants in conditions of relatively high versus low cognitive loads, with the typical result that greater levels of prejudice are exhibited in the former than the latter condition” (Lambert & Chasteen, 1998, p. 307; cf. Allport, 1954). This corresponds to empirical studies in conflict research showing that decision making processes are the more dominated by emotion—and not by logic or rational considerations—the more people feel threatened (Gordon & Arian, 2001). It turned out—not very surprisingly—that reducing stress and pressure is a precondition for rational argumentation and self-reflecting thinking.

While the term “stereotype” seems mainly to be used when referring to the ways we perceive social groups and members of cultures from which we delimit ourselves, the concept “framing” is applied more generally to all kinds of situations we perceive. Thus, Elliott, Kaufman, and Shmueli (2003) define “frames” as:

cognitive shortcuts that people use to help make sense of complex information. They help us organize complex phenomena into coherent, understand-
able categories. As lenses through which disputants interpret conflicts, frames limit the clarity of communication and the quality of information, as well as instigate escalatory processes.

We could take as an example the case of a man who killed his judge just before the trial began and three other persons during his escape. The public “framed” this shocking event from the very beginning as an act of incredible violence, and the responsible institutions reacted with establishing an improved security system at courts. Alternative acts of “framing,” however, could start by thinking how desperate a well-educated man must be to act in such a way, or could speak about a black “soldier” and his anti-racist “mission”—as the man himself saw it (cf. Warren, 2005). There are different ways to “frame” an event or an utterance in a conversation. Generally, we can define “framing” as interpreting data in a way that they make sense within a given belief–value system.

As has been shown in the contributions to Making Sense of Intractable Environmental Conflicts, edited by Lewicki, Gray, and Elliott (2003), the strength of different frames identified in stakeholder’s utterances and behavior often determine whether a conflict is intractable over a long time or not. Like stereotypes, frames are ‘economical’ means to cope with problems of complexity in social interaction.

One essential characteristic of stereotypes and frames is that the limitations they pose on our possibilities of understanding can be overcome through reflection—at least in principle. Within the framing literature, this has been discussed as “reframing”:

As long as parties believe that their own view is the only legitimate way to understand the issues in dispute, they cannot reframe. But once they begin to realize that their frame depends on their own vantage point, this realization makes reframing possible. (Elliott, Gray, & Lewicki, 2003, p. 424)

To overcome limitations on our conditions of understanding is much harder with what I am calling the “lifeworld dependence of understanding.” The lifeworld concept plays an important role in Habermas’ writings. His point is that “understanding” is possible only within a jointly shared “lifeworld” (“Lebenswelt,” a concept developed in the phenomenological tradition, with Wittgenstein, and with Schütz). Our lifeworld is a set of culturally given, unquestioned, and only implicitly known background assumptions, social practices, and individual skills (Habermas, 1981, vol. I, pp. 449–452., vol. II, pp.189–228; Habermas, 1984, 1987, vol. I, pp. 335–338, vol. II, pp. 124–142; see also Polanyi’s, 1983, “tacit dimension”). We can say a person’s “lifeworld” is the complete set of experiences—in thinking and acting—that is available for this person at a certain time. Since these experiences determine the way we interpret new experiences, lifeworlds define the broadest set of understanding conditions we can think of. In conflict research, a similar idea has been discussed under the heading of culture based “communication codes” (Ellis & Maoz, 2003). The ways people speak and interpret what others are saying “depend on group membership” (p. 263).

For Habermas, a lifeworld enables communicative action and, vice versa, the latter shapes the former: communicative action renews permanently cultural knowledge, it forms social integration and creates solidarity, and it forms our per-
sonal identity. Lifeworld and understanding are thus mutually constitutive. It is, on the one hand, only within a certain socially and culturally defined lifeworld that understanding is possible, and on the other hand, as Dilthey (1968) put it a half-century earlier, “(r)eciprocal understanding secures us the community that exists among individuals” (p. 141). Understanding is at the same time a condition of cultural and social life and a product of this life.

Such a lifeworld offers resources necessary for the possibility of understanding, but at the same time restricts these possibilities; understanding is possible only within the horizon of our own lifeworld. That explains in particular why understanding across the boundaries of cultures is sometimes so hard (cf. Seng & Lim, 2004; Callister & Wall, 2004; Jenkins-Smith, Mitchell, & Herron, 2004). When stakeholders in a conflict simply do not share the cultural and social experiences and codes necessary to understand the meaning of what the other side is saying, mutual understanding is virtually impossible. And since those experiences cannot simply be generated by reflection, the lifeworld dependence of understanding is harder to overcome than limitations caused by stereotypes and frames.

The concepts “stereotype,” “frames,” and “lifeworlds” are extremely useful to describe conditions of understanding and, therefore, also useful when it comes to conflicts whose resolution depends on mutual understanding. In those conflicts, the decisive question is how to change those conditions of understanding in order to improve communication. This is the central cognitive problem of conflict management on which I am focusing here. However, before we can address this question we have to think about two more theoretical problems. The first one can be called—by extending Plato’s “paradox of learning”—‘the paradox of understanding.’ Based on the assumption that the possibility of understanding depends on conditions of understanding already fulfilled, this paradox can be formulated as follows. In order to understand something or somebody, we must already know what we are trying to understand. The same paradox appears when Habermas says that lifeworld and understanding are mutually constitutive. If understanding is possible only among people who share the same background assumptions, experiences, codes, and social practices, then it is hard to see how we can understand people who are at home in different lifeworlds. This necessary circularity of understanding seems to imply that it is impossible to understand something “new,” or something that is beyond our own horizon.

The second problem concerns the question how we can get access to our own conditions of understanding. This is the point where semiotics, the “theory of signs,” can help.

A Semiotic Approach: Diagrammatic Reasoning

There is one decisive difference between what has been done in many areas of conflict research and what I am proposing here. The predominant strategy up to now has been to identify and to describe conditions of understanding. Approaches have been descriptive, first of all. Lewicki, Gray, and Elliott (2003), for instance, report in their book on framing in environmental conflicts that the research group started discussions of case studies by identifying “several types of frames that were
used frequently by our interviewees.” The goal was to develop finally “a scheme for ‘coding’ the frames used by our interviewees in order to make sense of their situations.”

We asked people why they believed the conflicts were occurring and what kept them from being resolved. We inquired about their own role in the conflict, and their views of their opponents. We wanted to understand how the players themselves “made sense” of their situations—how they accounted for the persistence of their differences. We refer to their interpretations as frames. . . . We sought to investigate the frames that were salient for our environmental disputants and to learn whether and how these frames contributed to the conflict’s intractability. (Lewicki et al., 2003, p. 2)

Others tried to identify and to describe “mental models,” or “mental representations,” of the involved stakeholders (e.g., Morgan, Fischhoff, Bostrom, & Atman, 2002; Bar-Tal & Teichman, 2005), or describe culturally formed modes of perception and values all over the world (eg., Ulijn & St. Amant, 2000; Seng & Lim, 2004), based on the idea that a comparison of those “mental models” and cultural characteristics can offer some insights about underlying assumptions that inhibit communication and understanding.

The main problem of those descriptive approaches is that they face exactly the same cognitive problem they try to describe. The frames and “mental models” they identify are first of all constructions of the respective observers, dependent on their language, their theories, their frames, and—more generally—their conditions of understanding. There is no question that an observer who is not personally involved in a conflict is more likely to see the limitations of perspectives taken by stakeholders, and that professional mediators are professional just due to the fact that they have a language and theories at their disposal to describe more precisely what is going on in a conflict than stakeholders could do it. But who knows whether an external description of frames and models is specific enough to identify really the crucial points? And if we include in our set of understanding conditions what has been discussed above as lifeworlds, we have to admit that a concept referring to an individual’s whole set of experiences can never provide more than a vague idea. An exhaustive description of stakeholders’ lifeworlds would be an endless task.

By contrast to descriptive approaches, what I am proposing here is a method and a tool that can be used by stakeholders themselves to figure out in a collaborative process what the crucial points are that hinder understanding. The focus is not on the description of conflicts but on the practice of conflict resolution. What I am looking for is not a modus describendi but a modus modificandi, that is a “way to change” things. The basic idea of my semiotic approach is that negotiators themselves should learn how to represent their own thinking, and how to change their own conditions of understanding by reflecting on those representations, and by experimenting with them. Just this is meant by “diagrammatic reasoning,” a concept developed by Charles Peirce a century ago to explain the development of knowledge in science and in learning processes (cf. Sjömark, 2000; Hoffmann, 2003, 2004, 2005a, 2005b).
For Peirce, a “diagram” is an iconic representation of relations that is constructed by means of a certain representational system—which means that rules and conventions are involved (Peirce, CP 4.418). To understand this definition, we need to know something about “icons.” In Peirce’s semiotics, the function of icons is first of all to represent relations based on a similarity between an icon and what it represents. That means not only photos, footprints, and the schematically drawn running person with an arrow—a sign used for “exit” in many countries—are icons, but also sentences and algebraic equations. Sentences and equations, however, belong to a certain subgroup of icons, namely, the diagrams we are looking for. The specific difference between “diagrams” and other icons is that they are carried out by means of a certain representational system. If we are confronted, for example, with the complex sign “Plato–Socrates–stands–sits–and,” we could interpret this sign as an icon, because it represents a relation among these words. But if we read “Plato stands and Socrates sits,” we have a diagram, because this complex sign represents a relation that is structured according to English syntax.

A representation system is defined by a set of rules determining both possible relations among the units of a diagram and possible transformations of such a diagram. That means that choosing an adequate representation system is essential for diagrammatic reasoning because the rules of this system define which operations can be performed on a diagram and which not. In the following, my use of “diagram” and “diagrammatic reasoning” is restricted to two-dimensional, graphical representations like the argument maps presented in the next section.

The main idea of diagrammatic reasoning is that we can learn something new when we represent in a diagram what we already know. Any representation of our knowledge offers the possibility to gain new insights about this knowledge. In this way, the paradox of understanding mentioned above can be overcome. This possibility results from the following considerations:

1. Diagrammatization stimulates creativity: We need a representation to see what is missing in order to justify or to relate our assumptions. van den Belt (2004), for example, hints at the fact that stakeholders usually have a certain “mental model of reality” and a set of data supporting those mental models. However, when these data become visible in external representations it often turns out that the data do not support the original mental model. In such a situation, the original “beliefs and [now visible] facts are confronted, thereby presenting an opportunity for learning” (p. 57).

2. Since diagrammatization presupposes the use of a certain representational system, we are forced to “translate”—so to speak—our thinking into this system’s language. In this way, we are forced to clarify, first of all, our thinking.

3. Such a clarification is important especially when we are facing so-called “wicked problems” (Rittel & Webber, 1973; van Bruggen, Boshuizen, & Kirshner, 2003, pp. 26–27). Wicked problems are ambiguous and incompletely specified, they lack clear-cut criteria to evaluate whether a solution has been reached, and they don’t have a predetermined path from an initial state to a goal state. Any attempt to represent a wicked problem leads quickly to the observation that there are many ways to do so, fostering the insight that any
problem representation is, first of all, a problem construction which is, as such, changeable.

4. Diagrammatization facilitates the reduction of complexity since its emphasis on relations makes it easier to distinguish between the essential and the peripheral. Points that are more related to others are more important.

5. When we are successful in constructing a visualization of our thinking, we can “experiment” with it. We can, that is, think about possible implications of our thinking, about tensions and contradictions between elements of our diagram, or about alternative structures and elements.

If we focus particularly on collaborative processes of diagrammatization, the following considerations can explain its knowledge generating function:

6. Representations help to maintain focus and coherence by “putting something in the middle” (Palus & Horth, 2001; Selvin, 2003; van Bruggen et al., 2003).

7. Collaborative diagrammatization creates dialogue; it initiates “negotiation of meaning” and motivates argumentation: Constructing a shared representation forces group members to argue for additions and modifications (Suthers & Hundhausen, 2003).

8. Collaborative diagrammatization helps to see and to explore the multi-perspectivity of a problem (Kanselaar, Erkens, Andriessen, Prangsma, Veerman, & Jaspers, 2003). Any attempt to construct a shared representation of a conflict reveals quickly that there are different ways to do so, different interpretations of what has to be taken into account and what relates to what in which way.

9. Constructing a shared representation allows to connect the expertise that different stakeholders might have regarding “different aspects of the problem to be solved, making effective problem solving more a social process than a cognitive one” (van Bruggen et al., 2003, p. 29).

10. Diagrams serve as an external memory: We can simply hint at a certain element to evoke all those meanings and interpretations that were negotiated earlier.

With regard to conflict management, the following functions of diagrammatic reasoning should be emphasized:

11. Collaborative diagrammatization helps to protect minority positions: It is harder to ignore previously formulated ideas or implications of those ideas if they remain openly visible (Suthers & Hundhausen, 2003, p. 185).

12. Diagrams produced in negotiations record and document what has been reached within a certain time span. It is harder to fall back again to previous positions, habits of thinking, and arguments when a diagram shows clearly in which way a previous status has already been modified by the negotiation process.

13. As far as diagrams make visible (a) what has been discussed, (b) the arguments used, (c) what has been agreed upon, and (d) what remains an open question, those diagrams can be used to explain the whole process to those who are affected by its results without being involved in the negotiations themselves.

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14. Challenging negotiators to use a shared representation system reduces inequalities that are based either on varying fluency in the everyday language used in negotiations or on different rhetoric capabilities. The reason is simply that the rules and conventions that define this representational system have to be learned, first of all, by each negotiator in the same way.

15. Especially when we are using Logical Argument Mapping (LAM) as representational system as proposed in the next section, the following knowledge generating function of diagrammatic reasoning can be emphasized: Argument mapping does not only make visible those arguments, but also the implicit assumptions of those who formulate a specific argument (see also Shum, 2003, pp. 14–15). Visualizing these assumptions in diagrams means to represent just those conditions of understanding that have to be changed in order to resolve a conflict, or to promote at least mutual understanding.

This last point is essential for the semiotic approach of conflict management I am proposing here. The main idea is that a representation system that is supposed to facilitate mutual understanding in conflict resolution has to be conceptualized in a way that it addresses the cognitive problems discussed in the first section of this paper. In those conflicts in which understanding is the main problem, we need a form of diagrammatic reasoning that allows to make explicit the very conditions of understanding, that is the stereotypes, frames, and lifeworld experiences that limit understanding possibilities and that have to be changed in order to resolve a conflict.

To demonstrate how this might be possible we have to develop first of all a small theory of how the conditions of understanding we discussed above work in principle. This theory is based on Charles Peirce’s semiotics which he have to discuss now more generally after having learned already something about his more specific idea of “diagrammatic reasoning.”

There are many different semiotic theories and approaches (cf. Posner, Robering, & Sebeok, 1997–2003), but the essential advantage of the American philosopher’s “theory of signs” is that it can be combined with those cognitive questions that are in focus here. For Peirce, a sign is embedded in a triadic relation that is constituted by what he calls an “object,” a “sign,” and an “interpretant” (cf. Figure 1). This relation is triadic since a sign generally is something that represents something else to somebody. The “interpretant” in this relation, however, should not be confused with an interpreter. In its most general form, the interpretant is defined as “the proper significant outcome of a sign” and as its “effect” (Peirce, CP 5.473, 5.475). Thus, the interpretant is a reaction to a sign that can be given in acting, feeling, or thinking.

This “interpretant” is most interesting with regard to our analysis of understanding. By means of this concept, quite different interpretations of the same sign can be described. A sign is necessary for the genesis of an interpretant, but what exactly is represented in a certain interpretant is also determined by other factors. The role of these other factors can be clarified if we take into account some recent empirical research about how people interpret familiar and unfamiliar graphs. Roth and his colleagues (Roth & Bowen, 2003, p.468, p.470; cf. Roth, 3003 in Canada analyzed how scientists work with graphs that were either from their own field of

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expertise or from other fields. It turned out that scientists asked to interpret graphs from their own field seem to have immediate access to the reality as described by those graphs. Although being confronted by signs, people speak as if there were no signs at all but directly what is represented by those signs. Thus, in the case of familiar graphs, “when they know a graph very well scientists conflate them with the phenomenon itself.” Familiar graphs are “transparent” to us, so to speak, “allowing direct access to the phenomena the graph is said to be about.”

While in the case of familiar graphs these graphs are only a means to get access to what is represented, they are the very object of investigation in the case of unfamiliar graphs. We have to struggle what a graph could mean when it is new for us, so the sign itself is what we study, not the represented object world. In an article I wrote together with Wolff–Michael Roth, we analyzed these two different situations to describe what we called the “knowledge mediating” function of signs (Hoffmann & Roth, 2005; cf. Hoffmann, 2005a, pp. 34–38). Signs do not only have a representational function as defined by Peirce—a sign represents something for somebody—but they also mediate our relations to things in our world: they permit knowledge and cognition. This knowledge mediating function is realized, for example, when a graph for a scientist is a means to direct access the reality represented by this sign.

In the case of a scientist interpreting a familiar graph, both the representational and the knowledge mediating function can be modeled by Peirce’s triadic sign relation (cf. Figure 1). The graph, on the one hand, represents a certain situation in the world, and the scientist, on the other, reads this graph as a means to getting access to this situation. With unfamiliar graphs, however, which are problematic and not so easy to understand, it is different. In this situation, the graph is not a means but an object in itself. We look at the graph, trying to find out what it represents, how it is to be understood. Scientists in such a situation formulate a lot of hypotheses, they try this and that, and—as shown in Hoffmann and Roth (2005)—they activate a lot of background knowledge to get a hunch of what is going on (cf. Roth, 2004). Exactly this situation of activating knowledge to find an adequate interpretation of a sign can semiotically be modeled as in Figure 2. We use what is

Figure 1
Peirce’s Triadic Sign Relation

![Peirce's Triadic Sign Relation Diagram]

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called “collateral knowledge” here to develop an adequate understanding of a sign. What we need here is a further “level of mediation,” so to speak. While a familiar sign on the first level mediates both as a representation and as a knowledge-generating device between object and interpretant, a problematic sign is itself an object that is accessible only by a second level of mediation at which given knowledge is used to find an adequate interpretation.

The term “collateral knowledge” was introduced by Peirce again (CP 8.183, 6.338, 8.314; cf. Hoffmann & Roth, 2005). “Collateral” means literally “running side by side” with something else. In our context, collateral knowledge can be defined as those forms of knowledge that remain hidden though being an essential condition for focusing on something. Let me give you a quite trivial example that Peirce (CP 8.178) used to illustrate his concept of collateral knowledge. Suppose somebody says to you “Napoleon was a lethargic creature.” I guess you will be surprised to hear that the great conqueror should be “lethargic.” But the point is, to be surprised by this sentence one must already know who Napoleon was and what he accomplished. If we do not know about Napoleon, we can only guess whether it is the name of a lethargic person. We are surprised only when our collateral knowledge about Napoleon contradicts what is said in this sentence.

The interesting point here is the following. Since collateral knowledge is defined as that set of conditions of understanding we activate when focusing on something, we are usually not aware of our collateral knowledge. What we are aware of is only what we are focusing on. That means, nobody knows actually how many ‘items’ of collateral knowledge one has at his or her disposal. That fits very well with empirical research in psychology about “implicit learning” showing that what we know implicitly seems to be always “ahead of explicit knowledge” (Reber, 1989, p. 229). Being unconscious, implicit knowledge is vague, dynamic, and indefinite. In studies Reber performed in 20 years, it turned out that even if subjects improved their abilities to communicate knowledge they generated while learning the syntax of an artificial grammar, their implicit knowledge of this syntax...
was always richer. The “former never caught up with the latter; that is, as subjects improved in their ability to verbalize the rules that they were using, they also developed richer and more complex rules. Implicit knowledge remained ahead of explicit knowledge” (p. 229).

The point, however, is that such collateral, or implicit knowledge can partly become visible when we are confronted with problems, that is when there is a “breakdown” of the function our collateral knowledge is supposed to fulfill. Such a breakdown occurs, for instance, when we are surprised by the sentence about Napoleon. When somebody surprises us by saying Napoleon was a lethargic creature, we are forced to think about our collateral knowledge of Napoleon. In this situation there is a chance to focus on it. Exactly this happens when scientists are confronted with unfamiliar graphs. Let us take a closer look at one of the scientists–interpreting–graphs examples (Figures 3 and 4).

Facing a problem of understanding with the unfamiliar graph, the physicist starts his interpretation by reflecting on his general strategies, that is by reflecting on his collateral knowledge. That these strategies are indeed part of his collateral knowledge can be seen when we look at what he is doing when confronted with a familiar graph. In this situation he uses exactly the same strategy implicitly on which he reflects explicitly when confronted by an unfamiliar graph. That means that even in situations in which we seem to have an immediate access to what a sign represents—as modeled by Peirce’s triadic sign relation (Figure 1)—there is implicitly given, or “collateral” knowledge that determines a certain interpretation. The only difference is that this knowledge does not come into the focus of attention. Without this hidden, collateral knowledge a scientist was not able to interpret a familiar graph. Or to put it differently: the graph is “familiar” only in so far as there is collateral knowledge that permits an interpretation of this graph in a way that seems to be immediate, but in fact is mediated by something that is not visible, namely the already given collateral knowledge of the experienced scientist.

A general hypothesis that can be based on this observation is the following. In each case of knowing something, or being able to handle something, we can distinguish knowledge that is in focus and knowledge that works as a collaterally given condition. While we can speak about what is in the focus of our attention, our collateral knowledge is implicit and invisible. In a breakdown situation, however, when understanding is problematic, we can reflect on our collateral knowledge by making it explicit. What has been collateral becomes knowledge in focus, whereby this focusing again is conditioned by collateral knowledge of a “higher” level. In this way, it should be possible to explore the ‘dark space’ of understanding conditions step by step.

This roughly sketched semiotic theory of cognition has two decisive implications. On the one hand, the terms “knowledge in focus” and “collateral knowledge” do not describe independently existing realities, but only what can analytically be distinguished in a concrete situation, and only in relation to each other. Their roles can change. On the other hand, since we never know what kind of collateral knowledge we are carrying around with us, we need these breakdown situations. And we need something explicit, that is a representation to start reflection. In the same way as we need the utterance “Napoleon was a lethargic creature” to reflect
“So these curves tell you where an electron is likely to be in terms of the distance from the nucleus given a certain excitation level of the atom.”

“Yeah well first thing you do when you look at a graph like this you try to make sure you understand the axes this is what I tell my students”

(Transcripts and photographs kindly provided by Roth, 2003)

on our own collateral knowledge about Napoleon, we can use any representation to reflect on the very conditions of understanding and communication.

This is the essential idea of using diagrammatic reasoning to cope with the problem of understanding in conflict management. As described in point No. 15 of

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our list above, the function diagrammatic reasoning can fulfill is to visualize the implicit assumptions of those who represent their ideas in a diagram.

All this can shortly be summarized as follows:
- Stereotypes, frames, and lifeworld experiences are part of our collateral knowledge.
- When we do not understand a sign, or representation, we are forced to reflect on our collateral knowledge.
- By challenging negotiators to create a diagram of their conflict situation their collateral knowledge can become visible.
- By representing this collateral knowledge itself within this diagram it becomes an object of exploration—we can reflect on it.
- Experimenting with those representations of collateral knowledge opens up possibilities to change it.
- In this way, that network of collateral knowledge that forms the roots of a conflict can be explored step-by-step.

**Logical Argument Mapping**

The basic idea of our semiotic theory of cognition is that a representation can only be understood by means of collateral knowledge (cf. Figure 2). Looking more formally at the way collateral knowledge mediates understanding, we could say it works like an input–output transformer. Let us take, for instance, a stereotype: Seeing a person with certain characteristics, a certain concept, or image, flashes through our mind. On the one hand, there is a certain input, seeing the person, and on the other the stereotype that transforms the input into a certain output. Assuming that such a mechanical picture of input–output transformation is an adequate description of those cognitive processes that are unconsciously mediated by collateral knowledge, we can say that not only stereotypes work in this way, but all processes in which conditions of understanding mediate cognition as described in Figure 2.

Based on such a simplified picture of cognition we can use one of the oldest forms of logical inference, the so-called *modus ponens*, to describe what is going on. In a *modus ponens* argument we have two premises and a conclusion:

\[
P_1 \quad \text{If } A, \text{ then } B \\
P_2 \quad A \\
C \quad \text{Therefore } B
\]

This is a logically valid argument form. (Its validity is based on the definition of the first premise, “if *A*, then *B*”: The term as a whole is defined as true for all cases where *A* is either false or *B* true; that means, “if *A*, then *B*” is only false when *A* is true and *B* false. This again means that in case of “if *A*, then *B*” being true and also *A* being true as claimed in the second premise, the conclusion—*B*—is necessarily true, simply based on the definition of “if *A*, then *B*.”)

When “if *A*, then *B*” is defined in this way we call it a “material conditional.” From a logical point of view, conditionals raise a lot of problems since the relation between *A* and *B* can be understood quite differently (cf. Sainsbury, 2001, pp. 83–
The three main possibilities are (a) \( B \) must be true if \( A \) is true; (b) \( B \) is probably true if \( A \) is true; and (c) there is no connection between \( A \) and \( B \) (cf. Feldman, 1999, p. 183). To avoid these and other problems, my use of the material conditional is restricted by an epistemic condition: whenever something is claimed here in the form “if \( A \), then \( B \),” it has to be interpreted as meaning that the person who formulates this claim believes, or is convinced, that there is a law-like relation between \( A \) and \( B \). That is, for this person \( B \) must be true if \( A \) is true.

The reason for introducing this epistemic condition is that we need the material conditional only for one purpose: to describe conditions of understanding. Those conditions can be characterized by two points: first, they are present in our mind even in situations in which no input is present (i.e.: \( A \) is false, but the material conditional as a whole is true, as defined above); second, in situations in which the input is present (i.e.: \( A \) is true) we get just the outcome that is determined by the condition (i.e. \( B \)), meaning that there is a necessary—but, of course, changeable—relation between input and output.

So what? Why should such a basic introduction to a specific logical form be interesting? The interesting point is the following: Imagine someone formulates an argument, that is she provides reasons for a claim. (“Providing reasons, or one reason, for a claim” is the general definition of “argument” I am using here. If the reasons, or the “premises” of an argument, imply the conclusion necessarily—i.e. based on the validity of a certain argument form like the *modus ponens*, I call it a *logical argument.*) For example, Mary might say: “Paul is responsible for what he did, because he is a rational human being.” The point is, if Mary formulates such an argument we can assume that she would accept something like the following additional premise: “If someone is a rational human being, then this person is responsible for what he or she does.” I do not claim that Mary has to formulate this additional premise explicitly to make her argument, but I would claim that this conditional statement is in one form or another part of her collateral knowledge. Otherwise it would simply be arbitrary that she provides just this reason for that claim. There is no doubt that she formulates her argument in this way because it makes sense to her, but it only makes sense when we presuppose an at least implicit knowledge about the relationship between responsibility and being rational as formulated in the additional “if–then” premise.

Based on these considerations we can formulate three conclusions: (1) it is clear that we can transform any argument into a logical argument simply by adding a premise which connects the reason(s) and the claim of this argument in form of a material conditional: “if \( A \), then \( B \)”; (2) we can argue as follows: If it makes sense for a person to provide a certain reason \( A \) for claim \( B \), we can assume that something like the material conditional “if \( A \), then \( B \)” is part of this person’s collateral knowledge; (3) if (2) is true, then formulating this additional premise explicitly would allow to reflect on this part of the person’s collateral knowledge. This way, conditions of understanding which usually work implicitly and unconsciously can become visible, and that again opens up the possibility of reflecting on them, criticizing them, and changing them.

Initiating such a process of visualizing conditions of understanding is the basic idea of Logical Argument Mapping (LAM). With regard to conflict manage-
ment, LAM could be used as a tool to facilitate the reflection on those conditions of understanding that hinder communication and mutual understanding. In order to fulfill all the 15 functions of diagrammatic reasoning listed in the last section, LAM has been developed as a graphical method to represent argumentation. The goal is to “map” even complex argumentations in a way that all relevant elements and relations can become visible at a glance within a coherent two-dimensional space. We can move around in this space, focus on details, or look at the whole. This way we can see more easily the weak parts of an argument: missing links, unjustified claims, unclear concepts.

LAM is part of a tradition whose most famous proponent is Stephen Toulmin with his well-known “Toulmin–model” of argumentation (Toulmin, 2003; Toulmin, Rieke, & Janik, 1984), but it is also influenced by other ideas, for example by the “logical diagrams” developed by Luckhardt and Bechtel (1994), Peirce’s already mentioned concept of “diagrammatic reasoning,” and the Russian psychologist Lev Vygotsky’s concept of “semiotic mediation” (Hoffmann & Roth, in press). The software that seems to me most suitable at the moment to develop logical argument maps is Cmap, a freely available “knowledge modeling kit” that has been developed by the Institute for Human and Machine Cognition (IHMC), a not-for-profit research institute of the Florida University System (http://cmap.ihmc.us/). Cmap also allows synchronous mapping over the internet.

Logical Argument Mapping can be used for two very different purposes: on the one hand, to convince an opponent by developing (or reconstructing) an argument for a certain position and, on the other, to solve a complex problem collaboratively. While the former approach is driven by the motivation to “win” a controversy, the latter focuses on resolving conflicts by agreement, and by interacting in a way that different perspectives can be mediated, unified, harmonized, or at least visualized in their own right. In both cases the main goal of LAM is to make argumentation more efficient by (a) motivating self-reflexivity, (b) facilitating the incessant reconsideration of all the elements of a problem, (c) fostering the development of the structure and coherence of a problem representation, and by (d) challenging the creativity of those who engage in argumentation.

In order to provide an idea of how these goals could be achieved, an example would be helpful. Since a more complex conflict will provide more justification for the effort of becoming familiar with the LAM notation and certain procedural conventions (cf. Hoffmann, 2006), I will present here a fictional application of Logical Argument Mapping to one of the most “wicked” problems of our time: the conflict between Palestinians and Israelis. Based on restrictions of space, however, I will focus here only on some details that were, nevertheless, central sticking points during the Camp David summit in 2000. (Cmap itself is not limited by those restrictions, it offers a virtually infinite two-dimensional space.)

An Example: The Holy Places in Jerusalem

Looking at this last important attempt to end one of the longest conflicts in recent history by direct negotiations between the leaders of both sides, it is not only the complexity of the issues discussed in Camp David that is striking, but also the
fact that there is an impressive disagreement among the many participants and observers concerning the question why the summit eventually failed.

Was it—as the first and dominant narrative goes (cf. the overview in Swisher, 2004, pp. 331–352)—the personal fault of Yasir Arafat who did not grasp the historic opportunity because he “was unable or unwilling to confront history and mythology,” unable to “redefine” himself instead of incessantly repeating “old mythologies” (Ross, 2005, pp. 13, 699, 758)? Was Arafat unable to “disengage from his self-image as a religious, not just a secular, leader,” from his self-perception “as a warrior engaged in a mythological campaign of moral decision against a state born in sin,” as “a conqueror, a modern Saladin” (Ben-Ami 2006, pp. 249–250, 259)? Or was it the strategy of Ehud Barak who from the very beginning emphasized his “red lines,” and who tried to use these red lines as “pressure cookers” for his Palestinian counterparts (Ross, 2005, pp. 654–656, 676–679, 684; cf. Agha & Malley, 2001), while it became more and more clear by the moves he made over the 14 days in Camp David that “he did not really have red lines” so that, as Shlomo Ben-Ami put it, the Palestinians could feel invited “never to accept an Israeli position as final”? (Ben-Ami, 2006, p. 251; Ben-Ami was at the time Israel’s Minister of Internal Security and acting Foreign Minister.) Or was it that Arafat did not focus on a pragmatic resolution but on rights and principles granted by several UN resolutions (Hanieh, 2001, p. 86), or on “emotional, legendary and Islamic values such as Jerusalem, the Temple Mount (Haram al-Sharif for the Muslims), and the core of the Palestinian national ethos, namely refugees” (Ben-Ami, 2006, p. 249), or on weighing the possible benefits of an agreement that only got materialized in the form of “parameters” on the one hand and the costs of giving up internationally manifested “rights” on the other (Agha & Malley, 2001)? Or wasn’t he interested in ending the conflict at all, as parts of the Israeli delegation suspected (see Swisher, 2004, pp. 255–256)? Or was it Barak’s strategy, as an American participant assumed, to “put down an offer that your interlocutor cannot accept, you hope that the Americans can sell it to him but if they can’t you then go ahead and blame and expose the other side” (p. 353)?

Was the reason for the summit’s failure that the Palestinians perceived the Americans more “as an Israeli agent” than as neutral mediators, or that Clinton’s delegation was not adequately prepared—neither with regard to all the details and possibilities, nor with regard to the parties’ bottom lines—and not strong enough to develop things independently instead of following Barak’s lead “too blindly” (Swisher, 2004, pp. 259, 261, 264–270, 356–358, 376; Hanieh, 2001)? Or was it, as Ben-Ami put it, the “incompatibility” of two extreme characters, “the Israeli Prime Minister, an intellectually arrogant and undoubtedly brilliant general who was totally blind and deaf to cultural nuances and always convinced that he possessed the powerful Cartesian logic that would surely persuade his interlocutor of the invalidity of his own arguments on the one hand, and Arafat, a mythological leader who at the time was full of personal complexes and would only speak in slogans, catchwords, Islamic metaphors” on the other (Ben-Ami, 2006, p. 253)?

Whatever the reasons for the failure may have been, looking at the summit from a semiotic perspective that focuses on problems of understanding, there are in particular three observations that are remarkable. The first one is that the leaders of...
both sides did not meet even once for substantial negotiations during the whole time in Camp David. Only in “a last-minute panic,” as Swisher says, when the parties had to agree on a final statement describing the outcome of the summit, the Americans realized that they would hardly “be able to honestly tell journalists that as mediators they had really brought Arafat and Barak together” (2004, p. 333). Based on the Prime Minister’s reluctance, they “never required a direct, substantive discussion between Barak and Arafat” (Ross, 2005, p. 709; cf. 686; Hanieh, 2001, pp. 79, 93). There was not a continuous development from a starting to an end point but hundreds of talks among different groups and individuals whose outcome had to be synthesized to a coherent picture in the leaders’ heads independently from each other and mediated only by second-hand reports. It should not be surprising that in this way the leaders of both sides continued to mistrust each other and their host. They were hardly challenged to question their own prejudices. The resulting mood between the conflicting parties became visible when, during a dinner arranged by Madeleine Albright, Barak—to the embarrassment of some of his own team members—“would not even so much as look at Arafat, much less exchange pleasantries with any of his negotiators.” Instead, he said to Ben-Ami who was standing beside a wall clock, “If an agreement is reached with that character [Arafat], I will make that wall clock walk” (Swisher, 2004, p. 313; cf. 370).

The second remarkable point is that the American idea of “mediation” was obviously overshadowed by the idea that pressure on the conflicting parties, especially on the Palestinians, was the key to an agreement. “Pressure cooker” is one of the favorite words Dennis Ross, Special Middle East Envoy throughout the Clinton presidency and the lead US negotiator, used to characterize the strategy that the Americans shared with Barak. Ross describes in detail the instructions he gave President Clinton at several opportunities to “corner” Arafat (e.g., Ross, 2005, pp. 5, 12, 666, 675–676, 686–687, 689, 699)—in explicit contradiction to an advice he quotes himself as given once by Clinton to Barak: “The most important is don’t corner your adversaries and don’t corner yourself; always leave yourself a way out” (p. 695).

What all this meant for the Palestinians has been vividly described by Gamal Abouli, a Palestinian legal adviser who participated in parallel negotiations in Emmitsburg:

Barak and Clinton seemed to think that by putting pressure on senior Palestinian leaders, and by attempting to isolate them from their advisers and public opinion, they could force the Palestinian side to accept a poorly thought out, one-sided and vague deal. This approach was indicative of a somewhat colonial approach to diplomacy: bring in the natives, use immense amounts of psychological pressure, and hope they succumb. This approach was bound to fail. (cited in Swisher, 2004, p. 304)

This strategy was pushed to its farthest extreme during the last weeks of Clinton’s presidency. During the months after the Camp David summit the Americans were repeatedly challenged by both parties “to work the collective memory that was created at Camp David into a document” (Ben-Ami, cited in Swisher, 2004, p. 368; cf. pp. 360–369). But it was only on December 23 when the President
presented at the White House the famous “Clinton parameters.” He introduced what he called his “best judgment of what it will take to conclude an agreement in the next two weeks” with the remark that these “ideas” cannot be “renegotiated,” only refined “within the boundaries I will set forth,” as Clinton said (cited in Ross, 2005, p. 809). Of course, there was no time any more to enter an open discussion, but how could anybody expect, as Swisher puts it, “the Palestinians or the Israelis to make any commitment to Clinton’s guidelines without having the clearest understanding of all the terms presented” (2004, p. 401)? Both sides finally accepted Clinton’s parameters, but with reservations (cf. Swisher, 2004, p. 397–402)—although some tried to make the world believe that Arafat’s “yes” was actually a “no” by interpreting his reservations as “deal killers” (cf. Ross, 2005, pp. 3, 11, 13, 757–758, 781; Ben-Ami, 2006, pp. 272–273; for Clinton see Swisher, 2004, p. 399).

Swisher reprints in full a letter that Arafat faxed to Clinton on December 28 in which he asks the president for “help in clarifying and explaining the basis of your initiative” (pp. 399–401). The questions Arafat formulates in this letter are legitimate questions, and he hints at many other questions for which he needs “maps, details, and clarifications that can help me take the necessary decisions with my leadership and people” (p. 401). I will reflect here only on one point on which my example will focus, the problem of sovereignty over what for Israel is the “Temple Mount” in Jerusalem and for Palestinians the “Haram al-Sharif.” Clinton is right when he says in his “parameters” that this is “clearly one of your most sensitive issues and concerns the interests of religious communities beyond Israel and Palestine” (quoted in Ross, 2005, p. 811; cf. Dayan, 2002). The parameters offer two different formulations for an agreement at this point—besides mentioning others on which the parties might agree—both of which include “Palestinian sovereignty over the Haram” and Israeli sovereignty over the Western Wall “and”—something else which is different in the two alternatives:

1. Israeli sovereignty over either “the Western wall and the space sacred to Judaism of which it is a part” or “the Western Wall and the holy of holies of which it is a part.”

2. Israeli sovereignty over the Western Wall and for “shared functional sovereignty over the issue of excavation under the Haram or behind the Western Wall.” (quoted in Ross, 2005, p. 811)

Arafat asks in his letter how to define exactly “the Wailing Wall, its borders and extensions, and the effect of that on the concept of full Palestinian sovereignty over al-Haram al-Sharif” (quoted in Swisher, 2004, p. 400). The fact that Arafat speaks of the “Wailing Wall,” not the “Western Wall” as Clinton does, might be a result of Clinton’s decision not to provide a written copy of his parameters on December 23; instead, he “read the points slowly so that they [the negotiators of both sides, but not Barak and Arafat who were not present] could record them” (Ross, 2005, p. 751). However, behind this wording lurks already the first problem. The Wailing Wall is only a small part of the Western Wall so that Arafat’s question regarding the former’s extension is justified.

Much more important, however, is his question how Israeli and Palestinian sovereignty should be divided exactly. At least the first alternative is extremely

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vague since it does neither specify “the sacred space of Judaism” nor “the holy of holies.” As Moshe Amirav, who was appointed after Camp David as Barak’s adviser on the issue of a permanent settlement in Jerusalem, said in an interview with Ha’aretz, although the “Holy of Holies” refers historically to “the four square meters which the High Priest would enter on Yom Kippur,” “Barak applied this term to the entire plaza, including the mosques” (cited in Dayan, 2002; cf. Klein, 2003, p. 122). This interpretation, however, would directly contradict “Palestinian sovereignty over the Haram.” Since Arafat could not know how his counterpart would interpret “the sacred space of Judaism” or the “holy of holies,” and since nobody knows for sure where exactly the remains of these four square meters are located on the mount, it would have been simply irresponsible to agree on a point that had highest significance for him without knowing what exactly he agreed upon.

The general point of this example is, however, that it can never be sufficient when the stakes are high to press conflicting parties to agree on formulations. Agreement is also necessary on the interpretations of those formulations, and this means that nobody should expect an agreement on a proposal when he denies at the same time an open debate on how to interpret it. And it should be beyond any doubt that such a debate can best be performed in direct communication between the conflict parties themselves. It is highly improbable that an outsider knows all the details of controversial mountains.

A third remarkable point concerns the way the negotiators worked with papers in Camp David. Dennis Ross describes his strategy as follows: “My overarching strategy for the summit was to produce a paper that would be the basis for the negotiations” (Ross, 2005, p. 658). This corresponds to what has been experienced as a good practice by William Quandt who took part in the first Camp David negotiations between Egyptian President Anwar Sadat and Israeli Prime Minister Menachem Begin under the auspices of US President Jimmy Carter in 1978:

“I’ve considered one of the key innovations that we used at Camp David I the idea of a simple negotiation text, which we would put forward as our best judgment of what would work. The text was constantly subject to revision. We’d talk to one side about it, then the next side, and it was kind of an attrition process. We had twenty–three drafts. By the time we got to the end, we kind of wore them down on all the little stuff and the one or two issues that they really cared about were in sharp focus, and everything else had been agreed upon.” (quoted in Swisher, 2004, p. 262)

Based on this experience, Quandt was “quite surprised that that technique was totally not explored” at Camp David II in 2000 (p. 262). Indeed, after a first “draft framework agreement” that had been hastily composed by the US team—in spite of Ross’ feeling, as he says, that “we needed more to know from each side before presenting definitive U.S. positions on each of the issues” (Ross, 2005, p. 657)—after this draft came under the wheels of a chaotic interchange with the Israelis, only to be rejected by the Palestinians afterwards as preferring the Israeli position (cf. Hanieh, 2001, p. 87), the consequence was that “virtually all the American ideas would henceforth be conveyed through oral presentation” (Swisher, 2004, p.

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But, as Clayton E. Swisher concludes at this point,

such verbal commitments could hardly satisfy the complexity of the issue involved. Even though the first American draft was flawed, the worst mistake was to abandon this drafting process altogether. With its abandonment, multi-dimensional core items were reduced to bazaar-style haggling, subjected to the inherent frailties embodied in each negotiator’s understanding of the English language, note-taking ability, and memory, at times selective. (Swisher, 2004, p. 270)

At this point we can see the practical significance of the semiotic approach for which I am arguing here. Even in situations where there is no need to use Logical Argument Mapping, the general method of diagrammatic reasoning as described earlier would have facilitated, I assume, the interaction between the Middle East negotiators. Remember especially the functions diagrammatic reasoning can fulfill in collaboration and in conflict management.

In collaboration (following the numbering introduced above):

6. to focus attention by putting something in the middle so that the course of complex negotiations can be organized and guided by a step-by-step growing representation in which everything relevant becomes visible in relation to other points;

7. to motivate rational argumentation, the clarification of ideas, and the negotiation of meanings simply based on the fact that whatever gets represented triggers objections, defense, and the work of interpretation—concepts like “the space sacred to Judaism” or “the Holy of Holies” would not survive for a minute without getting interpreted if somebody writes it on a piece of paper in a collaborative situation;

8. to explore the multi-perspectivity of a problem as it is inevitable when a formulation proposed by one party provokes an interpretation of the other one;

9. to connect the expertise that is given in a group of people; and

10. to provide an external memory to which can be referred in the future—by contrast to a remarkable experience of the Camp David process: When Israeli and Palestinian negotiators, who continued the talks in the months after Camp David in many meetings without US participation, asked Dennis Ross for some details regarding agreements reached in Camp David they got the answer: “We don’t have records of Camp David” (Swisher, 2004, p. 364; cf. 373).

And then in conflict resolution:

11. to protect positions and perspectives of the weaker party since whatever is represented in a diagram remains part of the discussion until it may be revised based on a new agreement;

12. to document what has been reached at each step in a way that the conflict parties do not fall back time and again to positions and arguments that have already been overcome;
13. to provide a means to communicate negotiation results to others since the arguments that lead to a certain decision can be reconstructed more easily;
14. to reduce inequalities in power and argumentation styles if negotiators are challenged to use a shared representation system; and finally
15. and this is the basic function of Logical Argument Mapping, to visualize the collateral knowledge of negotiators that determines the way they interpret and frame a conflict.

While some of these functions can be fulfilled by nearly any kind of representation—Peirce, indeed, defines a “diagram” in a very general way as any representation of relations that is carried out upon a “consistent system of representation” (Peirce, CP 4.418) so that any sentence that is formulated according to the grammar of a language would be a diagram (cf. Hoffmann, 2004, 2005a,b)—most of these functions require a visible and durable form of representation, something drawn or written on paper or on a computer. The last two functions, however, are specific for Logical Argument Mapping, a sub-class of diagrammatic reasoning.

Before elaborating an example for LAM, I should mention some limitations of this method. Since it is primarily designed to facilitate mutual understanding, it will not work in conflicts in which there is either no interest in mutual understanding or understanding problems are insignificant compared to incompatible interests, needs, values, or other problems. However, even if the method would not lead to conflict resolution in those situations, it could help (a) to identify more clearly those hidden sticking points whose significance is not visible at the beginning; (b) to test the seriousness of negotiators and (c) to reveal what people try to hide since it should be hard to hide your real motives and interests if you are challenged to put something on paper and to defend its visible existence; (d) to test argumentations and to experiment with them; and (e) to reduce the influence of tactical maneuvers; it would have been impossible, for instance, if this tool had been used in Camp David, that Arafat realizes suddenly that what Clinton offers him as “American ideas” are in fact “Israeli ideas” which he received “unofficially from the Israeli delegation two hours ago” (Hanieh, 2001, pp. 87–88; Swisher, 2004, p. 297).

Before Logical Argument Mapping is employed in a conflict, negotiators should be informed that it is primarily a communication tool that is supposed to fulfill the functions described above. An agreement to use it could be made a precondition for entering a negotiation process, because stakeholders themselves are probably not very interested—for strategic reasons—to make their considerations visible. The method can be used by the conflicting parties themselves if they know how to do it, but it might be better to use it as a tool that is handled by an independent mediator whose main task were to find formulations for the parties’ positions and to define the relations between those formulations based on an agreement with the proposing party, respectively. By making visible for all participants what has been proposed, both parties are challenged to formulate objections, refutations, rebuttals, or further support for the original proposal, and to develop, to clarify, and to modify their arguments in one central map that can also have sub-maps.

From the very beginning, there should be an agreement on what happens with the maps in dependence of different negotiation outcomes; it might be useful, for
example, that the negotiators characterize the mapping process in the beginning only as a “playing with ideas” in order to prevent that participants use what has been developed during the process against each other afterwards. Commitments to confidentiality or an agreement that the maps are kept only by the mediator who is responsible for their usage would also be possible.

In order to use the full potential of LAM, the mapping process should be performed according to the conventions that are established elsewhere more extensively (Hoffmann, 2006). However, it should be possible at any point to map ideas and considerations spontaneously, more like brainstorming, without following the method’s rules slavishly. This way, Logical Argument Mapping and diagrammatic reasoning can be performed within the same map. Since the focus is on the process of communication and interaction, everything can be changed at any time, an idea could be transformed into an argument, or an argument could be reduced to a statement, and so on.

The example I am proposing here, although fictional, could historically be situated on July 18, 2000, when Barak went an essential step forward in Camp David by suggesting for the first time that the Palestinians could “be granted sovereignty over the Christian and Muslim Quarters of the Old City, with guaranteed custodianship—but not sovereignty—over the Haram al-Sharif / Temple Mount” (Swisher, 2004, p. 295; cf. Ross, 2005, pp. 688f.; Hanieh, 2001, pp. 87–88). At the end it turned out that—besides other points—the “Haram was a genuine problem for Arafat and he really could not accept even nominal Israeli sovereignty over it” (Ross, 2005, p. 699; cf. Hanieh, 2001, pp. 92, 95–96). At this point, in order to defend their claim on sovereignty over the Temple Mount, the Israeli delegation could have argued as presented in Figure 5. (Since in Cmap the available space can be extended only to the right and downwards, argument mapping should start with positioning a claim in the top left corner of a newly created map and reasons for that claim on the right so that negotiators can work to the right and downwards.)

**Figure 5**
**The First Step of Argument Mapping, Providing a Reason for a Claim**
*(all maps are created with IHMC Cmap tools: [http://cmap.ihmc.us/](http://cmap.ihmc.us/))

Israel gets sovereignty over the Temple Mount and "an area for Jewish collective worship" on the mount (Klein, 2003, p. 76; cf. Hanieh, 2001, p. 83) therefore The Temple Mount is the most sacred place in Jewish tradition

To transform this first argument into a *logical* argument, we have simply to add a material conditional “if A, then B” as the second reason for the claim. This can be done more or less mechanically, the result—see Figure 6—is a logically valid *modus ponens* argument as described above. Note that the if-then statement is
highlighted by a different text box. The reason is that the material conditional has some characteristics that need special attention: While any factual statement (normal text box) can only be doubted, a hypothetical statement (oval text box) can be refuted since—as we saw above—a material conditional is false in case the antecedent \((A)\) is true and the consequent \((B)\) false. Another characteristic is that the hypothetical if-then statement remains true if the antecedent is false, again according to the definition mentioned above.

**Figure 6**
Second step, Transforming the Argument into a Logically Valid *modus ponens*

The distinction between a reason “A” and the hypothetical statement “if A, then B” is essential for LAM. Formulating both in a complete modus ponens means that we can see that we have to defend two very different things: on the one hand, the reason “A” and, on the other, the hypothetical statement “if A, then B” which we formulated to justify our argument. Both can independently be criticized since we need to reject only one of them to reject the whole argument.

The point of representing arguments in this way is that all its essential elements become visible in their respective function. By constructing arguments according to a fixed scheme, we can reflect at each level on whether what is formulated in our map is already convincing, or needs further justification. The Palestinians, for example, could object to the reason “The Temple Mount is the most sacred place in Jewish tradition” by saying that, at least today, the holiest place for Jews is not the Temple Mount, but the Wailing Wall in the West of the Temple Mount.

The crucial element is, however, the hypothetical statement which alone makes an argument into a logical argument. For it turns out that there are hardly
any hypothetical statements that are true without exception (see Figure 7). But this is the very idea of Logical Argument Mapping. If—as I argued above—a hypo-
Theoretical statement that we use to justify the argumentative step from a reason to a claim represents at the same time a part of our collateral, implicit knowledge, then changing this knowledge is the easier the more obviously it can be questioned and criticized. It is just this open process of justifying claims by reasons and criticizing the very foundations of such a justification that should allow, finally, to change those stereotypes, frames, and lifeworld experiences that lie at the roots of our thinking and acting, and that are sometimes decisive for conflict resolution.

The argument map as hypothesized in Figure 7 shows clearly that—with regard to the Haram al-Sharif/Temple Mount—argumentations based on religious foundations cannot lead to a resolution of the conflict. Both the hypothetical statements formulated by the Israelis at the top and by the Palestinians at the bottom simply contradict each other. In Arafat’s statement, however, another possible argument becomes visible. It can be represented as in Figure 8.

Figure 8

A “New” Palestinian Approach

As long as neither Israel nor the USA recognizes UN resolutions 242 and 194 as a basis for a final settlement, they have only symbolic value.

If UN resolutions 242 and 194 demand a withdrawal of Israeli forces from the Old City and protection of, and free access to, the Holy Places, then either the United Nations or the Palestinians get full and unconditional sovereignty over the Haram al-Sharif

UN resolutions 242 and 194 do neither imply United Nations nor Palestinian sovereignty over the Haram al-Sharif. There can be a withdrawal of forces and free access under Israeli sovereignty.

Arafat, 2000, in Camp David: The Palestinians “will not accept less than their rights as stated by international resolutions and international legality” (cited in Hanieh, 2001, p. 85). UN resolution 242 demands “Withdrawal of Israeli armed forces from territories occupied in the recent conflict,” i.e. the 1967 war, and UN resolution 194 says that protection and free access to Holy Places in Palestine “should be under effective United Nations supervision.”

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The hypothetical statement in this case would be interesting because it reveals something about the collateral knowledge of those who argued in this way. Besides the possible refutation and objection mentioned in the map, more important should be that this argument would visualize a principal dichotomy between an argumentation that is based on “rights and principles” on the one hand, and an approach that focuses on a pragmatic solution, a doable compromise, on the other. Akram Hanieh in his account of the Palestinian position emphasizes time and again that Arafat’s main point was the reference to “international law. The American negotiators, however, became strangely touchy at the mere mention of principles and rights. They kept citing the need for pragmatism, as if what was at stake was some kind of merchandise” (Hanieh, 2001, p. 86; cf. p. 96).

Dennis Ross and Shlomo Ben-Ami, on the other side, mention only “old mythologies” and “a mythological campaign of moral decision” when they describe Arafat’s position (Ross, 2005, pp. 13, 699, 758; Ben-Ami 2006, p. 249). There is no doubt that Arafat already in the past referred to the UN resolutions, but why should that be part of a “mythology”? Obviously, Ross and Ben-Ami have problems to see here a serious argument. The function of Logical Argument Mapping at this point would be to document in a map what is important for one side or the other. Even if we think an argument is simply crazy or unbelievable, as long as it is important for somebody it can only be addressed if it is taken seriously, and that means first of all: it has to be represented. Only then its weaknesses—as mentioned in Figure 8—can become an object of further investigation.

The visualization of this last argument is important since it could reveal a fundamental difference regarding the collateral knowledge of the involved parties: on the one hand a legalistic point of view and, on the other, a form of reasoning that focus on a pragmatic approach. The respective collateral knowledge does not only determine what kinds of arguments are proposed, but also how these arguments are perceived and framed by the other side. A representation that would allow negotiators to see this difference might help them to overcome the problems that result from the incommensurability of collateral knowledge.

**Discussion**

It would be naïve to assume that protracted and violent conflicts that many perceive as irreconcilable due to incompatible interests, needs, and values could simply be resolved by improving mutual understanding. However, even if we presuppose that conflicting parties are only pursuing their own interests, being in a conflict situation with somebody else implies necessarily to be in interaction with this other party. And since all behavior in an interactive situation has “message value,” it is communicative in its nature so that any conflict relationship is a “communicative relationship” (Ellis & Maoz, 2003, pp. 257–258).

Logical Argument Mapping is first of all a communication tool. It is based on the fundamental idea that anybody who wants something should be ready to provide a reason for it, that is, they should be able and ready to formulate an argument. The tool itself is structured in a way that it should be able to fulfill especially the following three functions: First, to clarify and to structure a conflict situation in...
a way that the real sticking points—and their relations to each other—and the collateral knowledge of the involved parties becomes visible and a possible object for reflection. The goal of Logical Argument Mapping is to explore the ‘dark space’ of collateral assumptions that determine how we interpret and understand the world around us. This way, Logical Argument Mapping is supposed to facilitate conflict resolution as far as it depends on understanding problems and on collateral knowledge that needs to be changed. There is of course no guarantee that the method will lead to success. If a conflict hinges on opposing interests, needs, and values, for example, that cannot be reconciled at a certain time, there is no way that Logical Argument Mapping could change that. But if it turns out that we are facing a conflict whose resolution might be possible by developing the collateral knowledge of the involved parties, LAM could be a useful tool to facilitate this process.

The second fundamental function LAM is supposed to fulfill is to reduce inequalities between negotiators. Since the method demands from its users the same commitments—to reveal their interests, their reasons, and their collateral knowledge—and since it “forces” them, so to speak, to follow the same rules of communication and interaction, they should become more equal partners than without it—in spite of different cultural, ethnic, social, economical, and political background, and in spite of different communicative skills and power relations. The tool itself seems to me so simple that—although it is an offspring of the Western tradition of logic and critical thinking—I cannot see any inequalities that would result from different abilities to work with it. By contrast, as a kind of universal language it should be a tool to cope with cultural differences. However, these assumptions should be tested empirically.

The third function LAM can fulfill is to clarify a conflict situation by checking the seriousness of conflict parties to reach an agreement and their readiness to pay a price for it. Those who are not ready to submit to the tool’s rules and requirements demonstrate that they are not ready to use the opportunities described by the first two functions. It will be, of course, a strategical consideration in each case to weigh the possible profits of entering a process of Logical Argument Mapping against the possible costs and risks. At this point, empirical research is necessary to get a clearer understanding of these possible profits, costs, and risks.

Whether Logical Argument Mapping will work in real conflict situations as described in this paper has to be tested empirically, as well as the question how it would work in different sorts of conflicts. However, LAM should be an interesting tool in all those situations in which stakeholders are actively seeking to reach an agreement and where it is necessary—based on the complexity of a conflict—to focus attention by “putting something in the middle,” to stimulate creativity and self-reflexivity, to initiate negotiation of meanings and justification of assumptions, to explore the multi-perspectivity of a problem, to maintain structure, coherence, and progress, to reduce inequalities and the impact of tactical maneuvers, and to visualize those conditions of understanding that form the patterns according to which we think and act.
Conclusion

I have argued that a crucial problem of negotiations is the fact that we always interpret and frame what happens based on our respective belief and value systems, and based on the experiences that are specific for our respective lifeworlds. Since those patterns of interpretation become naturally habituated over time, it is hard for negotiators, as Ellis and Maoz (2003) write, “to think or behave outside their own symbolic boundaries. Theses incapacities lead to confusion, obstinacy, and a deterioration of the resolution process, and are just the sort problems that must be overcome” (p. 257).

As my cognitive analysis of this problem showed, the possibility of understanding depends on what I have called, following Peirce, collateral knowledge. It is our implicit, collateral knowledge that conditions all our interpretations of what is going on in negotiations. Thus, getting access to this collateral knowledge, and changing it eventually, or developing a common ground of collateral knowledge, is an essential precondition to resolve those conflicts that are intractable because of understanding problems.

The central idea of my semiotic approach is that collateral knowledge becomes accessible by Logical Argument Mapping (LAM). Thus, if stakeholders in a conflict are challenged to develop arguments by using a tool that makes visible the conditions of their thinking, there is a chance to reflect on collateral knowledge. Logical Argument Mapping (LAM) is a communication tool that is supposed to open up possibilities to change habits of thinking.

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The International Journal of Conflict Management, Vol. 16, No. 4, 2005


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Received: March 23, 2006
Accepted after a revision: July 5, 2006
