Persuasion dialogue in online dispute resolution

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Abstract. In this paper we show how dialogue-based theories of argumentation can contribute to the construction of effective systems of dispute resolution. Specifically we consider the role of persuasion in online dispute resolution by showing how persuasion dialogues can be functionally embedded in negotiation dialogues, and how negotiation dialogues can shift to persuasion dialogues. We conclude with some remarks on how persuasion dialogues might be modelled is such a way as to allow them to be implemented in a mechanical or computerized system of dialogue or dialogue management.

Key words: ADR, alternative dispute resolution, argument, argumentation, dialogue, negotiation, ODR, online dispute resolution, persuasion, persuasion dialogue

Participants in the ICAIL 2003 ODR Workshop of June 28, 2003 in Edinburgh expressed the view that negotiation had dominated as the model for argumentation use in early work, and that persuasion dialogue should be stressed more as an important model as well. This paper presents a model of persuasion dialogue as an argumentation framework and shows how the model is important for ODR. Specifically, this paper considers the question of the role of persuasion dialogue in the ODR process, especially in relation to negotiation dialogue. That is, we consider how to model the functional embedding of persuasion dialogues within a negotiation dialogue, and under what circumstances a negotiation dialogue might shift to a persuasion dialogue.

In the first section of this paper, we present a brief overview of ODR. The aim here is not to provide a general survey of the historical or theoretical development of ODR. Katsh and Rifkin (2001, ch. 2) have already provided a comprehensive historical overview of ODR, which will already be familiar to most readers. Rather, the point of this section is to briefly highlight a few salient features of ODR, which we feel demonstrate the need for a more in-depth investigation of the normative dialogue models which contribute to dispute resolution. This leads to the next section where we note the prevalence of the negotiation dialogue in ODR, and make some observations

regarding how negotiation is frequently characterized in ODR (sect. 2). This is followed in section 3 by a brief overview of the basic types of dialogues modeled in argumentation theory, as well as a section describing the primary features of persuasion dialogues as they have been studied in argumentation theory (sect. 4). In the fifth section, we consider a model of the dialogue process proposed by Mochol (2004) for use in ODR discourse models and support systems. Following our proposal of a modification to Mochol's model (sect. 6), we consider the occasions where persuasion dialogues might be functionally embedded in a negotiation dialogue, and how this functional embedding could be represented in the model of the negotiation process (sect. 7). In section 8 we discuss those circumstances under which a negotiation dialogue might shift to a persuasion dialogue. We conclude in section 9 with some remarks on how persuasion dialogues might be modelled is such a way as to allow them to be implemented in a mechanical or computerized system of dialogue or dialogue management.

1. ODR overview

Online Dispute Resolution (ODR) is typically presented as a form of Alternative Dispute Resolution (ADR) and as a means for resolving disputes. Disputes, in turn, are presented as a form of conflict (Rule 2002, p. 21). ODR is presented as a preemptive way of managing and resolving conflict before it reaches litigation (Rule 2002, p. 2). ODR occurs at the intersection of ADR and internet-based communication technology. ADR is based upon resolution-oriented, normatively structured models of communication, allowing for an orderly, rational exchange of information and opinion. Clearly, then, the ability of ADR to successfully produce resolutions requires successful communication, thus indicating the need for normatively sound models of communication in ADR.

While ADR supplies the theoretical bases of ODR, computer technology provides an online environment affecting such factors as information (access, storage, and processing) and communication. Of primary interest for the purposes of this paper, technology provides ODR with a means of communication which is by-and-large faster, more versatile, and more accessible than other, previously available options. At its base, the role of technology – the so called "fourth party" in ODR – is to provide a structured communication and information environment that can contribute to the efficient, effective resolution of disputes. These occur in a variety of basic frameworks. This can be part of arbitrated settlements whereby an arbitrator sets out house rules, or mediated exchanges where a mediator suggests some ground rules, or even situations where the communicative exchange is structured by the technology as, for example, in automated negotiation, solution set

databases, blind bidding and other forms of automated arbitration and finally multivariable resolution optimization programs (Rule 2002, pp. 55–59). As such, just as with its parent ADR, it is crucial that the communicational models used in ODR are theoretically sound.

Yet, very little attention has been paid to the types of dialogues that can be at work in ADR, the normative structures that characterize each of these dialogues, and the procedural rules that govern them. By contributing to the development of effective models of these various types of dialogue, we hope that argumentation theory can help to contribute to a sound theoretical basis on which communication models used in ODR can be built.

2. ODR and negotiation dialogue

Typically, the primary type of dialogue considered by ADR has been seen as the negotiation dialogue. Negotiation is seen as standing among conciliation, mediation, arbitration and even private judging as approaches to dispute resolution (e.g. Patterson and Seabolt 2001, pp. 11–17; Lodder and Bol 2004, p. 9), and as alternatives to litigation (Rule 2002, p. 2). Yet, negotiation is seen as the basis of many, if not most of these approaches to dispute resolution. Mediation, for example, is viewed as a kind of "assisted or facilitated negotiation" (citing Leeson and Johnson 1988, p. 133; Patterson and Seabolt 2001, p. 53), while arbitration is seen as a contract-based form of dispute resolution (Patterson and Seabolt 2001, p. 115). As a result, while arbitrated settlements are not arrived at directly through negotiation, the decision to enter into arbitration is presented as the result of negotiation.

In taking its theoretical bases from ADR, ODR seems to have inherited a negotiation-based approach. But, there are other hereditary and cultural influences which might also explain this feature of ODR. The prevalence of negotiation-based approaches is perhaps explained by ODR's origins in the literature of business management and conflict-management, where negotiation is seen as the primary mode of much, if not most, business communication. It might also be due to the legal influence of seeing ODR as an alternative to a litigious approach which is seen as adversarial and hence better modelled under a persuasion-based model. Lodder and Bol (2004) propose a negotiation-based model for ODR mainly because parties try to settle their disputes on their own, without any third-party. Finally, ODR might often be seen as a negotiation since the primary issue can often be viewed as one of dividing up some property, asset or resource in such a way as to maximize the interests of the participants. As a result, the tendency has been to model ODR on negotiation-based models while neglecting the role that other types of dialogue can have in the ODR process.

Generally in the ADR literature, negotiation is portrayed as a kind of bargaining, and usually as a means of dividing up some set of scarce resources among the parties involved. Patterson and Seabolt (2001) offer the following summary of types of negotiation and negotiators. There are two approaches to negotiation: distributive and interest-based. In distributive, or positional, negotiation, the only goals considered are the explicit, short-term goals of the parties to have a desired share of the scarce resource, and the maximum concession they are willing to make to the other side in getting it. Here, the negotiation process is seen largely as a series of trade-offs. Interest-based, or integrative, negotiation, on the other hand, involves an attempt to uncover unstated, long-term goals that both (or all) parties might have in common, or at least that might be more compatible than the opposed short-term goals. These can then be used as a means to propose alternative solutions aimed at allowing each party to achieve their long-term interests. Further, there are two styles of negotiating, or attitudes a party can take towards negotiation: competitive and cooperative. Competitive negotiators tend to see negotiation as an adversarial process, and seek to maximize their own interests without concern for the satisfaction of the other participant(s). Cooperative negotiators, on the other hand, tend to see negotiation as a cooperative process designed to facilitate the maximization of a mutually achievable goal set of the (two) parties involved in negotiation. They seek to achieve their most important goals while reaching a settlement that will allow a negotiating partner to achieve her main goals if at all possible (Patterson and Seabolt 2001, pp. 26–30).

Following Craver (1994, p. 47ff), Patterson and Seabolt (2001, p. 30) describe the basic structure of the negotiation process has having the following six phases.

I   Preparation Phase
II   Preliminary Phase
III Information Phase
IV   Competitive/Distributive Phase
V   Closing Phase
VI   Cooperative Phase

While these phases are presented as procedural, they are primarily described according to the kind of strategic manoeuvring that each party will engage in.

Another type of dialogue that has been central in the development of ODR is deliberation. In a deliberation dialogue, the goal is for the participants to arrive at a decision on what to do (for instance to solve some problem or adopt some policy), given the need to take action. Hitchcock et al. (2002) set out a formal model of deliberation dialogue in

which participants make proposals and counter-proposals on what to do. In this model (p. 5), the need to take action is expressed in the form of a governing question like, "How should we respond to the prospect of global warming?" In subsequent stages of the dialogue, policies are put forward as proposals for action, and the arguments for and against each proposal are considered. Finally, an attempt is made to close the dialogue by reaching agreement on what is taken to be the best policy.[1]

From the point of view of argumentation theory, a principal theoretical error apparent in some of the ADR literature is the mischaracterization of negotiation as type of formal dialogue. There is a prevalent attitude, especially in the literature of business and management, that negotiation is the primary mode of business communication. Patterson and Seabolt, for instance, write that "People negotiate all the time. From two people deciding what movie to see, to the representative of labor and management bargaining over a labor contract" (2001, p. 21). Problematically, on prevailing models in argumentation theory, only the contract bargaining is an example of a negotiation dialogue. Two people deciding on what movie to see is a paradigmatic example of a deliberation dialogue and, while they often use the same kinds of arguments, the normative structures of these two dialogues are quite different.

Similarly, Patterson and Seabolt (2001, p. 21) follow Goldberg et al. (1992, p. 17) in offering the following definition of "negotiation". Negotiation is "communication for the purpose of persuasion". This definition is highly problematic, from the point of view of argumentation theory, because it mistakenly conflates two quite different types of dialogue: negotiation dialogues and persuasion dialogues. Dialogues of different types are structured differently and have different goals and different structural, dialectical and normative properties. Not only does this mean that the arguments in these different types of dialogue must be evaluated differently. More importantly for ODR it means that different types of dialogue must be managed by different procedural rules.

Importantly, ADR models of negotiation typically allow that argumentative dialogue can be embedded in the negotiation process, particularly in the distributive phase. It is here that, for instance, that Patterson and Seabolt remark that "negotiators are most likely to use competitive tactics such as argument" (2001, p. 36). That is, on the ADR model, negotiation is not simply a process of making offers and counter-offers. Rather, offers and counter-offers can be supported with reasons, and the rejection of offers can be defended with argument. As Patterson and Seabolt describe, "negotiators will take turns making offers and justifying why each offer is reasonable. If the other side buys the argument, they will concede ground and come up (or down) on their offer" (*ibid.*). This points to a theoretical need to be able to model how such argumentation is embedded in the negotiation process.

Before addressing this question, it is worthwhile to briefly inventory the types of dialogue commonly treated in argumentation theory.

3. The classification of types of dialogue

Having considered the prevailing dialogue models commonly employed in ODR models, we now offer a general classification of the types of dialogue. A classification system for the main types of dialogue in which argumentation occurs was presented by Walton in *The New Dialectic* (1998). There each type of dialogue is defined as an abstract normative model that sets standards for judging how a given argument should be used correctly for some conversational purpose in a given case. The six basic types of dialogue described in *The New Dialectic* are persuasion, inquiry, negotiation, information-seeking, deliberation, and eristic (strife) dialogue. The properties of these six types of dialogue are summarized in Table I below.

These models of dialogue are highly simplified in that there are only two participants, a proponent and a respondent, and each takes turns making moves that represent speech acts like asking a question or putting forward an argument. There are no third parties like moderators or referees who ensure that procedures are followed or decide the outcome. Real dialogues tend to be much more complex. For example in a trial there are many participants: the plaintiff, the defendant, the judge, the lawyers for both sides, possibly a jury, and so forth.

The dialogue structures outlined above are commitment-based in the sense of Hamblin (1970, 1971). Commitment refers to what an arguer has gone on record as accepting, according to the evidence of what she said and did,

Table I. Types of dialogue

Type of dialogue	Initial situation	Participant's goal	Goal of dialogue
Persuasion	Conflict of opinions	Persuade other party	Resolve or clarify issue
Inquiry	Need to have proof	Find and verify evidence	Prove (Disprove) hypothesis
Negotiation	Conflict of interests	Get what you most want	Reasonable settlement that both can live with
Information-Seeking	Need information	Acquire or give information	Exchange information
Deliberation	Dilemma or practical choice	Co-ordinate goals and actions	Decide best available course of action
Eristic	Personal conflict	Verbally hit out at opponent	Reveal deeper basis of conflict

indicated by the text and context of discourse in a case. This way of seeing argument as commitment-based makes the evaluation of a given argument determined by the evidence of the given text of discourse in which the argument was put forward. This commitment model is contrasted with the belief model. The problem with the belief model is that an arguer's actual beliefs may be extremely difficult to determine, and doing so is a psychological task.

The six dialogue types classified above do not represent all the types that are possible, but only the most common and important types that have proved most necessary for the study of fallacies and other logical problems of argumentation. An important feature of these types of dialogues is that, in many instances, a text of discourse can be mixed, meaning that it combines several types of dialogue. For example, legislative debates, like a debate on whether to build a new dam, combine deliberation with information-seeking dialogue. Experts on dams, like hydro engineers, are brought in to present facts about the dam project proposed. The legislative debate may also involve persuasion dialogue, as one party tries to persuade another. Also, there can be dialectical shifts, or changes from one type of dialogue to another during a connected sequence of argumentation. To cite a common example, a contractor and a homeowner may be engaged in deliberation on whether installing a new concrete basement is a good idea. They may, at some point shift to negotiation on how much the installation would cost. But then the argumentation may shift to an information-seeking dialogue as the contractor informs the homeowner on city regulations concerning requirements for thickness of concrete for house basements.

In some shifts, the new dialogue contributes to the success of the previous one. In such a case, we say that second dialogue is functionally embedded in the first. In other cases, the second dialogue interrupts or even blocks the progress of the first one. Blockages of this sort are often associated with informal fallacies. Reed (1998) studied functional embeddings of dialogues as a problem for computer modeling of argumentation. An example commonly used is that of two agents deliberating on how to hang a picture, where the dialogue shifts to negotiation when one proposes that the other should go and get the hammer and nail.

Negotiation may be contrasted with persuasion dialogue and inquiry. The goal of an inquiry is to prove something, or to disprove it or show that it can be proved, by amassing and verifying all the relevant evidence. Persuasion dialogue is also about trying to find the truth of matter, but the matter is a contested issue on which there is uncertainty and lack of knowledge. The viewpoints on either side of the controversy can only be evaluated looking at the arguments on both sides and weighing up which side meets the burden of proof (Prakken 1991). Negotiation is not primarily about finding the truth of a matter, and if a participant treats it that way, he or she will do poorly in the negotiation. At any rate, to contrast these types of dialogue more precisely,

we need to get a better account of the central characteristics of persuasion dialogue.

4. Persuasion dialogue

In a persuasion dialogue, various kinds of moves are allowed, including the asking of questions, the answering of these questions, and the putting forward of arguments. In persuasion dialogue, the one party, called the proponent, has a particular thesis to be proved, and her goal is to use rational argumentation persuade the other party, called the respondent, to come to accept that thesis. The goal of the proponent is to prove this particular proposition that has been designated at the beginning of the dialogue as her ultimate thesis (Walton 1999). The assumption is that the respondent, at the outset, does not accept it. 'Persuasion' in this sense refers not to psychological persuasion but to rational persuasion where the proponent presents an argument containing only premises that the respondent is committed to, and uses this argument to get the respondent to become committed to the conclusion of the argument – a claim to which the respondent was not committed at the beginning of the dialogue (Bench-Capon 2002).

There are two kinds of cases. In a dispute, the respondent is committed to the opposite (negation) of the proponent's thesis. In a dissent, all the respondent has to do is to cast reasonable doubt on the proponent's thesis. Persuasion, in this sense, refers to the change in the respondent's commitments due to the proponent's chain of argumentation in the dialogue. Before the respondent was not committed to the proponent's thesis, but now he is. The proponent builds up a chain of argumentation using only premises the respondent has become committed to, and her ultimate goal of rational persuasion is only successful when the end point of the chain of argumentation is the her thesis in the dialogue (called the ultimate *probandum* in law). Thus there are four basic requirements that determine when the proponent's argumentation in a persuasion dialogue is successful (Walton 1999, p. 121).

(R1) The respondent is committed to all the premises of the arguments
(R2) Each single argument in the chain of argumentation is structurally correct
(R3) The chain of argumentation has the proponent's thesis as its (ultimate) conclusion
(R4) Arguments meeting (*R1*), (*R2*), (*R3*) and (*R4*) are the only means that count as fulfilling the proponent's goal in the dialogue

The following diagram (Figure 1) gives the reader an idea of how a chain of argumentation works in a persuasion dialogue, following the four basic requirements R1–R4.
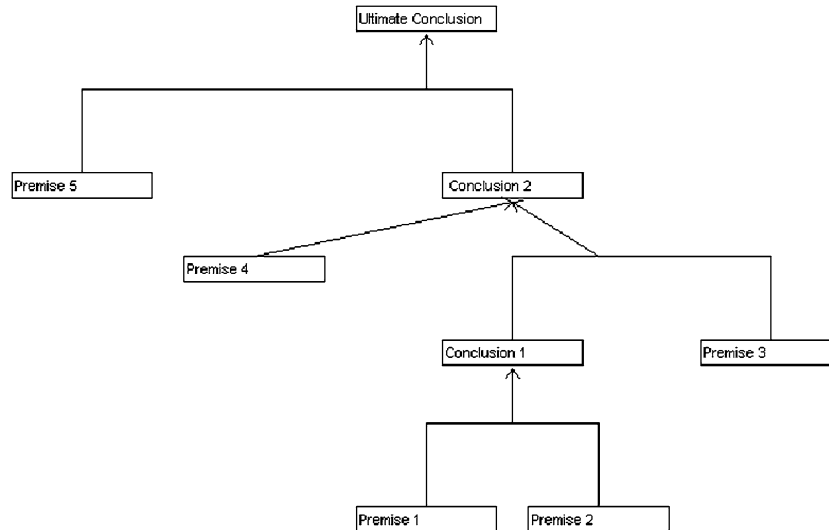
Figure 1. Diagram of a chain of argumentation.

Let's say the respondent is committed to premises 1 and 2. Thus when the proponent uses the linked argument based on these premises (shown at the bottom of the diagram), the respondent becomes committed to conclusion 1. And let's say that the respondent is committed to premise 3. The proponent can then use premise 3, along with conclusion 1 to generate another argument going to conclusion 2. But just in case the respondent might decide to retract commitment to premise 3 or conclusion 1, the proponent has another line of argument available. He could use premise 4 as a basis of evidential support for conclusion 2. In any event, once he has gotten the respondent to accept conclusion 2, assuming the respondent is also committed to premise 5, he can use both these propositions in another linked argument to support the ultimate conclusion. Thus if you look over the whole chain of argumentation, its end point is the ultimate conclusion and its start points are premises that the respondent is committed to.

Some possible exceptions to these requirements concerning hypothetical uses of arguments have been discussed in (Hamblin 1970, chapter 7). Different formal models of persuasion dialogue called rigorous persuasion dialogues or RPD's have been constructed in (Walton and Krabbe 1995). RPD's are precise and formally rigorous but do not model realistic natural language argumentation fully, because natural language persuasion dialogue is more flexible and open in certain ways. In a permissive persuasion dialogue (PPD), the moves a participant can make and the ways a respondent can reply are more flexible. The key problem in all these formal model of dialogue is that of retraction.

One particular type of persuasion dialogue that has been widely recognized is the critical discussion, where the goal is to resolve a conflict of opinions by rational argumentation (van Eemeren and Grootendorst 1984, 1992). A successful critical discussion ends with a resolution of the conflict, for otherwise it is "not clear whether the discussion has had any point" (van Eemeren and Grootendorst 1984, p. 86). However, it has been recognized that there are types of persuasion dialogue other than critical discussion, where the dialogue may be regarded as successful if the discussion has thrown light on the issue by bringing out strong and persuasive arguments, making the position on each side clearer and better defended. This clarification effect is called the maieutic function in (Walton and Krabbe 1995), referring the Socratic midwifery of assisting the birth of new ideas by rational dialogue, or the rational process of discovery.

There are four stages in a critical discussion (van Eemeren and Grootendorst 1992, p. 35): the *confrontation* stage; the *opening* stage; the *argumentation* stage; and the *closing* stage. At the confrontation stage the conflict of opinions to be resolved is clarified and identified. The viewpoint (point of view) of the one party needs to be identified, and there has to be some expression of doubt or disagreement about the viewpoint by the other party. At the opening stage, the two parties come to an agreement to resolve this conflict of opinions by engaging in rational argumentation. At the argumentation stage, one party takes on the role of proponent (protagonist) and the other party takes on the role of respondent (antagonist, of opponent), and each side puts forward arguments to support its viewpoint. These arguments fit argumentation schemes (see Walton 1996) representing the proper form each argument should take. At the closing stage, the two parties come to a common evaluation of the outcome of the dialogue and decide who has won.

The argumentation stage of the critical discussion is governed by ten rules (van Eemeren and Grootendorst 1987, pp. 184–293). These ten rules can be expressed in a simplified form as follows. (1) Parties must not prevent each other from advancing arguments. (2) An arguer must defend her argument if asked to do so. (3) An attack on an arguer's position must relate to that position (and not some other position). (4) Giving relevant arguments for a viewpoint is the only way it can be defended. (5) An arguer can be held to his implicit premises as commitments. Rules (6) and (7) can be combined into a single requirement expressed by the following condition. An argument must be regarded as conclusively defended if its conclusion has been inferred by argumentation schemes (structurally correct form of inference) from premises that have been accepted by both parties at the outset of the discussion. (8) Arguments must be structurally correct, or be capable of being made so by the addition of implicit premises. (10) Formulations must not be unduly vague or ambiguous.

Violations of these rules are associated with known informal fallacies. For example, committing the *ad baculum* fallacy of using threats or force is associated with rule (1). Fallacies relating to burden of proof, like argument from ignorance or begging the question, could be violations of rule (2). Violations of rule (3) can commit the straw man fallacy of misrepresenting an opponent's commitments to make his argument look weaker, and more easily refutable. Rule (4) requires relevant argumentation, barring arguments that miss the point or go to the wrong conclusion (*ignoratio elenchi*) including emotional arguments like *ad hominem* or *ad populum*. The critical discussion is not a formal model of dialogue, but the rules have normative bite, and are thus a useful platform for studying informal fallacies and other phenomena.

5. Mochol's model of negotiation dialogue

Having reviewed the basic characteristics of persuasion dialogues in the context of the various dialogue types studied within argumentation theory, we now turn to the question of how persuasion dialogues connect with the negotiation dialogues prevalent in ODR. To address this question at a theoretical level, it is best to start with a specific model of negotiation dialogue as it occurs in ODR. We have chosen the model presented by Mochol at the previous ICAIL ODR Workshop (held in Edinburgh 2003).

Mochol (2004) provides functional models of three different discourse system design patterns for three types of dialogue: deliberation, negotiation and a third which she calls argumentation. Each design system is composed of a set of three models: one describing the system components, a second depicting the use case of the system, and a third mapping the processes or activities involved in each system. While the component model describes the nature and relation of each functionally defined part of the system, the use case model describes the ways in which it is envisioned that users of different types would interact with the system as a whole. The activity or process model is presented as a kind of a flow-chart that describes the sequence of processes or activities by which the system executes its designed function. Mochol then offers a general model of the discourse system design pattern based on the features that are generally common to all three dialogue sub-types. Since it is the process, or activity, diagram which models the procedural aspects of the system, it is primarily this model that describes the argumentative and discursive aspects of the system. As such, it is this model which concerns us for our present purposes.

Figure 2 below is the model of the negotiation process given by Mochol (2004, p. 70).

When considering Mochol's model of a negotiation system, there are several noteworthy features that merit a brief discussion. The first of these
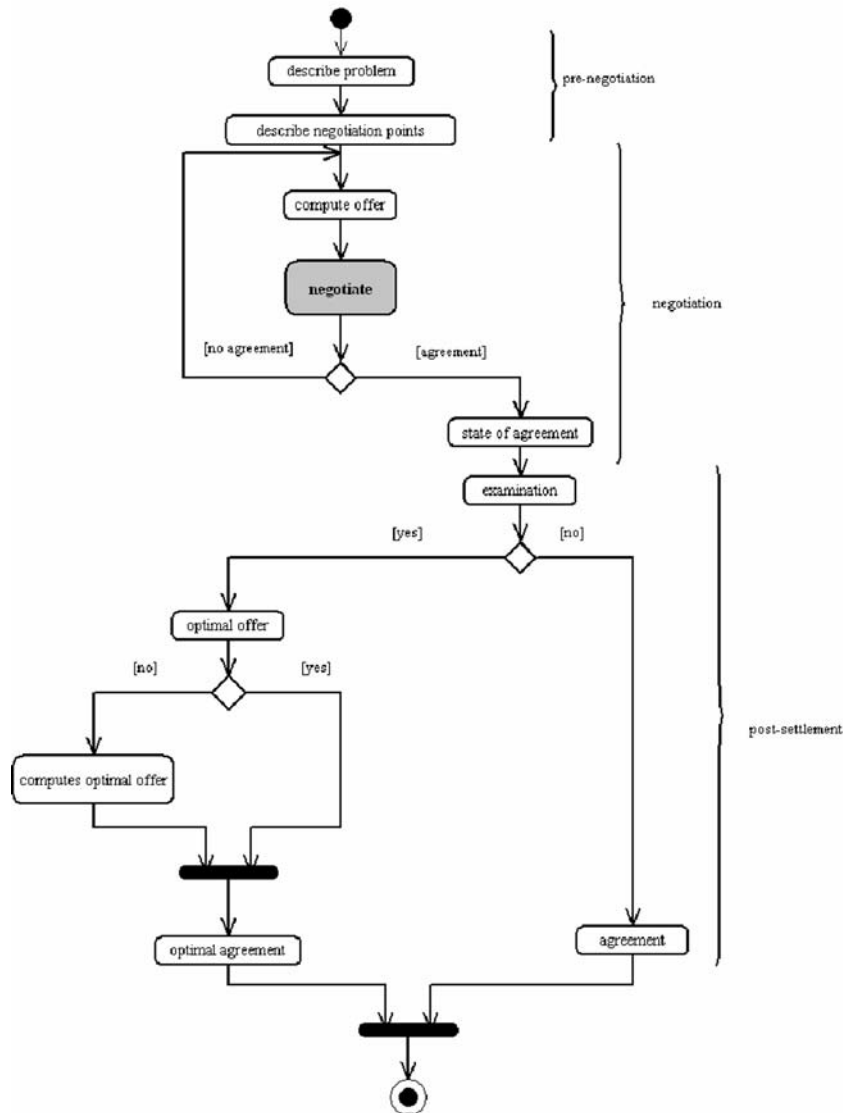
Mochol's Model of the Negotiation Process

Figure 2. Mochol's model of the negotiation process.

features is that the model does not allow that the negotiation end in disagreement. As such the model is descriptively inaccurate since not all negotiations end in agreement. Furthermore, even if the model is conceived of as a normative model of an ideal negotiation process, it should still provide for disagreement as a possible outcome, since sometimes the most rational course of action in a negotiation could be to end the discussion (e.g. when a negotiator whose initial position is manifestly unreasonable steadfastly

refuses to make concessions over the course of negotiation). As such, we feel that models of negotiation discourse systems should provide for disagreement as a possible outcome.

Perhaps the most important feature of this model, though, is that it leaves the actual process or activity of negotiation as a black box. (In the above diagram, we have highlighted the "negotiate" box in light grey.) Yet, from the perspective of argumentation and discourse theory, it is precisely at this point where all of the work in the model occurs, and it is here where the model must soundly reflect the normative, structural and pragmatic features of argumentative discussions such as the negotiation dialogue. Moreover, when considering the question of where, within the overall negotiation process, persuasion dialogues could be functionally embedded, it will largely be within the actual negotiation dialogue itself that the embedding occurs.

6. A proposed revision to mochol's model of negotiation dialogue system

In light of these observations, we propose a revision to the above model of the negotiation process. In the diagram below, we offer a model of the actual normatively structured discursive activities involved in the activity of negotiation. We propose that this model replace that section of Mochol's model called "negotiation" (i.e. the recursive section between pre-negotiation and post-settlement). In the proposed model, "P" represents an agent or participant in the negotiation process.[2] "O" represents an offer. At its basis, the negotiation process is represented as a sequence of offers made by one or other of the participants, which are discussed and either accepted or rejected in a structured way. In the event that an offer is not accepted, it could be revised, or a counter-offer could be proposed. Alternately, it might be determined that no satisfactory resolution is possible. The process is recursive; as it recycles, offers are revised or counter-offers are made. Each time the process returns to the first step where a new offer is made, the number of the offer under discussion increases by one. In the event that a counter-offer is made, the roles of the participants in the dialogue switch (this is reflected by the change in values of i and r.). Finally, in each 'decision box' (represented by diamonds) it is assumed that the negotiator will make her decision based on her commitments (those claims in her commitment store) as well as her goal-set (including her maximally and minimally acceptable resolution, and other long-term goals).

Here (Figure 3, below), then, is the revision we propose to Mochol's model, which we feel will better allow it to capture the normative dialectical structure of the negotiation process.

Admittedly, the proposed model of the discursive activity of negotiation is highly simplified. For example, on this model there are only two parties
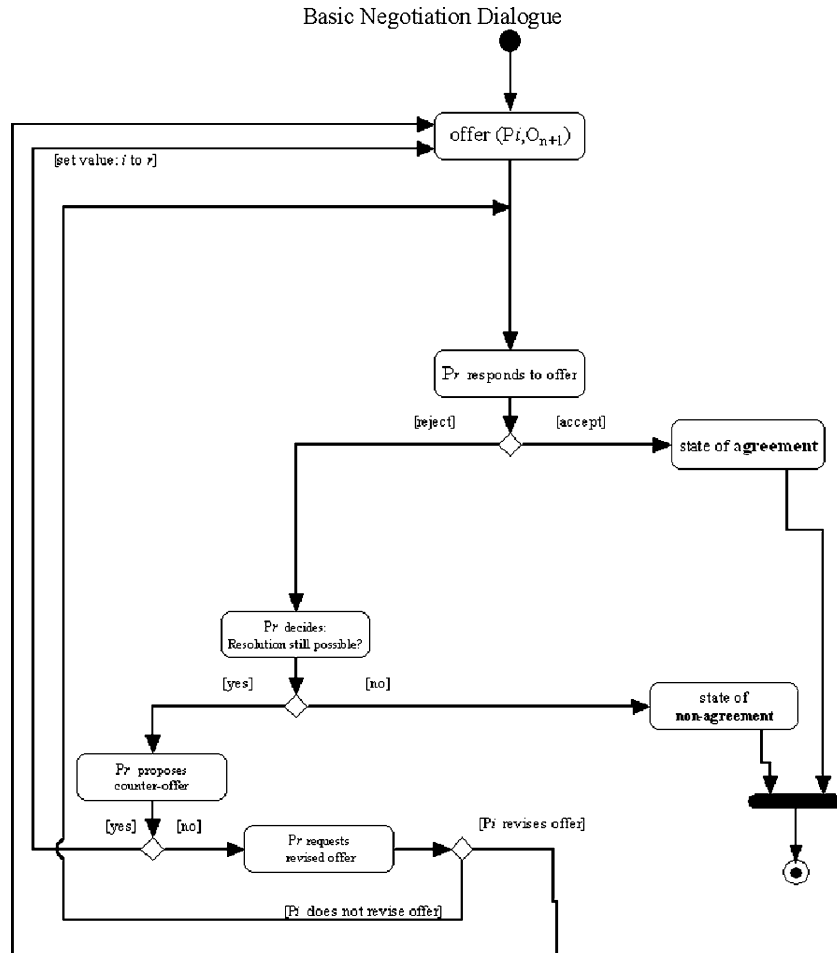
Basic Negotiation Dialogue

Figure 3. Basic negotiation dialogue.

involved in the negotiation, and each offer originates from one or other of these parties. Developments of this model might allow for more participants (whether interested parties or neutral ones), and provide that offers (i.e. proposals for the resolution of the dispute) could originate from any party involved, including the computer system itself. Further, the model represents negotiation largely as distributive as opposed to interest-based. The activity involved is represented as a kind of bargaining, instead of an integrative activity where the inexplicit, long-term interests of the negotiators are explored in an attempt to find novel solutions. Developments of the proposed model might include sub-routines aimed at uncovering and making explicit the broader, long-term interests of participants in the negotiation as a means to discovering alternative resolutions to the dispute which might not other-wise have been proposed as an offer or counter-offer.

So, the proposed model is highly simplified and could be developed in several respects. That said, it has several advantages. In the first place, it reflects the interactive, turn-taking activities that characterize and regulate the process of negotiation. This is an important normative and procedural feature of all argumentative discussions including negotiations, and one which we feel should be structurally implemented into all ODR systems if they are to be effective in managing a discussion aimed at reaching resolutions satisfactory to the parties involved. Yet, not all communicative environments available to ODR can (without some further modification) regulate discussion in this way. For example, many synchronous interfaces allow for parties to interrupt one another by composing and sending messages before their interlocutors have had a chance to reply to an initial message (e.g. in instant messaging, or chat-room forums). As Rule has observed (2002, p. 52) this not only gives the faster typist a significant advantage, it also frustrates effective communication which is a necessary requirement for any successful ODR system. Indeed, we would argue that it violates the basic Gricean principles of co-operation (1967/1989) and the idea that meaningful dialogue involves turn-taking.[3] In general, we feel that, in order to be effective as a means to achieving resolution, ODR requires structured dialogue models in which the communicational activities of participants are normatively regulated.[4]

A second advantage of the proposed model is that reveals the internal structure of the negotiation process in such a way as to show how and where persuasion dialogues might occur within it.

7. Functional embedding of persuasion dialogues in a negotiation dialogue

Considering the proposed model, there are several places in a negotiation dialogue where a persuasion dialogue could be functionally embedded. That is, there are several places where there could be a shift within the process of negotiation to a process of persuasion, only to resume the negotiation process later. For example, in the proposed model of negotiation, we have assumed that participants need not defend or justify their offers with reasons. Offers can be made solely in the hope that they will be accepted, and that this will maximize the desired goal-set of the party making the offer. Similarly, a negotiator can reject an offer without having to justify her rejection with a reason. Because negotiations are primarily agreement-based, the making or rejection of an offer does not bring about any burden of proof on the relevant party to justify their move in the negotiation. Negotiators are not required to justify their offers or defend their rejections with reasons. Yet, while not required to do so, negotiators can do so, and they may even see a strategic advantage in doing so. Negotiators might well

choose to support their offers or their rejections of offers with reasons, in an attempt to negotiate a better settlement. (Better settlements might be seen as more fair, or simply as more lucrative, for the individual negotiator.) Yet if this happens, the dialogue has shifted from a negotiation to a persuasion dialogue.

So, in the negotiation process itself, there are two primary occasions where persuasion dialogues can be embedded: (i) following an offer (where reasons are provided in support of the offer), and (ii) following a rejection of an offer (where reasons are provided to demonstrate the unacceptability or unreasonableness of the offer). These two functional embeddings can be represented by modifying the model of the basic negotiation dialogue in the ways indicated in the following diagram (Figure 4, below).

In the above model, the persuasion dialogue (PD) itself is represented as a 'black box' (the grey activity state bubbles), the structural and procedural features of which are not given. (This topic is briefly taken up below (in section 9).) What is important to recognize is that the entire argumentative process of the persuasion dialogue is contained entirely within the negotiation dialogue. Further, the persuasion dialogue can result in one of two outcomes, where the thesis (claim or standpoint) under dispute is either successfully established, or is not successfully established.

We have tried to simplify the above model by making some assumptions about the thesis that will be argued in each of the two situations where persuasion dialogues can occur. In the first situation, where a negotiator supports an offer with reasons and argument, we assume that the thesis being asserted is that the respondent should accept the offer. Thus, should the proponent be successful in her argumentation, this claim would be added to the commitment store of the respondent who is then rationally obliged to abide by this commitment and accept the offer. Should the argumentation fail, the model simply behaves as if no reasons had been offered. That said, certain claims will likely have been added to, or removed from, the commitment stores of the negotiators over the course of the argumentation. Since the model prescribes that negotiators will make decisions based on their goals as well as their commitments, the argumentation may well affect the subsequent course of negotiations. For example, the persuasion dialogue might well affect how a negotiator revises her offer, or how a counter-offer is formulated.

Similarly, where a negotiator offers reasons for her rejection of an offer, we have assumed that the thesis being argued is that the offer is unacceptable (or unreasonable). For this reason, if the argumentation is successful the model requires that the negotiator having made the offer revise her offer so as to accommodate whatever aspects of it were unacceptable or unreasonable (since these will now be reflected by claims in her commitment store). On the other hand, should the argumentation here be unsuccessful, the model again

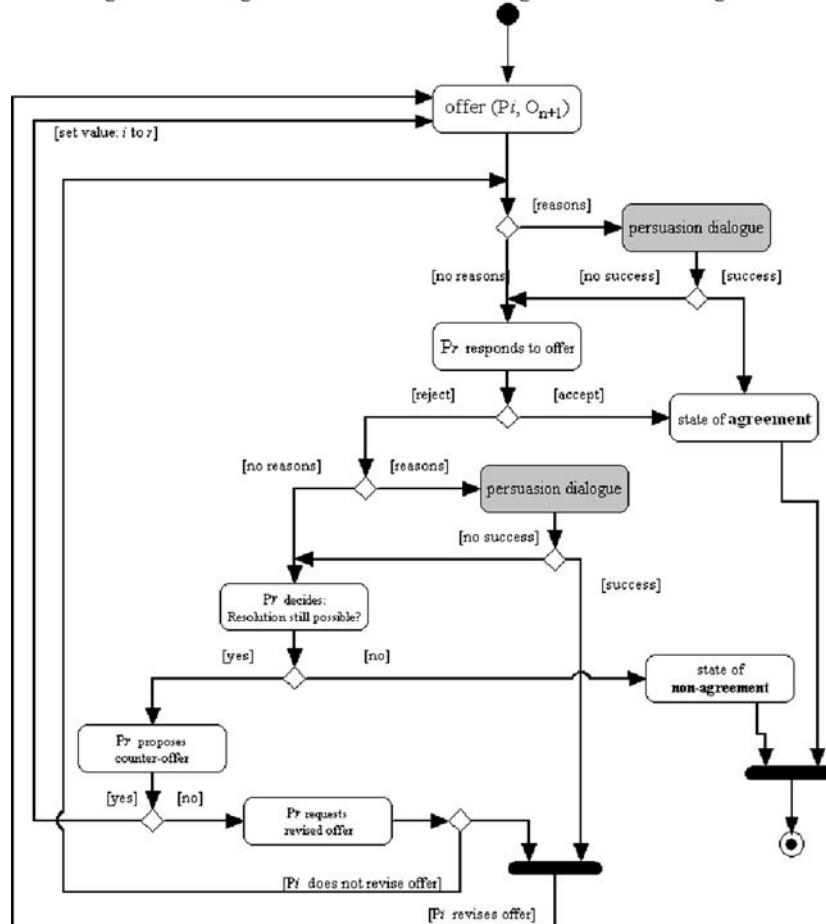Negotiation Dialogue with Functional Embedding of Persuasion Dialogue

Figure 4. Negotiation dialogue with functional embedding of persuasion dialogue.

simply behaves as if no reasons had been offered. As was said before though, negotiators must act on the basis of their commitments as well as their goals, and so argumentation can well influence the process of negotiation even when the main claim at issue is not successfully established.

Having set forth the model, and given a brief description of it, several observations can be made. The first is that the model shows how the functional embedding of different types of dialogues as sub-routines in a larger discourse process can quickly complicate the model. Indeed, the simplicity of the negotiation model is due largely to the limited number and type of moves that can be made within it. If we were to provide a model that allowed for all of the various kinds of communicative acts which might occur at any juncture in the negotiation process (e.g. requests for information or clarification, asking questions about goals, interests or commitments, etc.) the model

would quickly become so complicated that no diagrammatic representation of it would be beneficial, if indeed it was even possible.

A second important feature of the proposed model is that is shows the importance of persuasion dialogues on negotiation by prescribing the effects of persuasive argument on the negotiation process. Specifically, as was discussed above, effective persuasion can compel a negotiator to accept or revise an offer. It can also effect changes in the commitment store of a negotiator which will subsequently guide that negotiator in the decisions she makes throughout the rest of the negotiation process. The effects of persuasion in the process of negotiation are, therefore, substantial.

Finally, there are still other places where persuasion might have a role in negotiation. For example, in the post-settlement phase, when the fairness or optimization of the result of the negotiation dialogue is evaluated. (In Mochol's model this is discussed in terms of the "optimal offer".) The judgment that a resolution is fair or optimal is one that requires reasons, and could become subject of dispute if, for instance, the judgment is objected to by some party either internal or external to the negotiation itself.

8. Shifting from negotiation to persuasion dialogues

Having considered how persuasion dialogues can be functionally embedded in the process of negotiation, it remains to be seen whether there are other ways in which persuasion is connected with negotiation. A second way in which negotiation can switch over to persuasion is if the entire dialogue shifts from one type to another. When dialogues are functionally embedded, one dialogue occurs wholly within another as a sub-routine. When the sub-routine ends, the primary dialogue resumes, albeit perhaps in some changed way that reflects the outcome of the nested dialogue. When a dialogue shift occurs, a dialogue which begins as having the characteristics of one dialogue type shifts into a dialogue of a different type. Here, the structural and procedural features of the initial dialogue itself change and, as a result, the procedural regulations and normative standards which govern the dialogue change accordingly.

While it is more difficult to model precisely at what point in a negotiation dialogue such a shift could occur, it is quite clear that negotiation dialogues can change to persuasion dialogues or perhaps to deliberation dialogues. Such a shift in dialogue type can be said to have occurred when basic features of the dialogue including the participants' attitude towards the goal of the dialogue, as well as their general approach to this goal and strategic manoeuvring within the dialogue, have changed from that of one dialogue type to that of another. One example of such a shift could be when participants no longer 'barter' their way to agreement, but instead they undertake

to base any agreement they might reach on the reasoned defense of a claim with positive supporting evidence and response to critical argument. Here, one of the participants would take up a position on what the best solution would be, and then support her standpoint with reasons offered to try to convince the other participant in the dialogue. The other participant would attempt to provide reasoned objections to this standpoint, and perhaps to provide positive reasons in support of an alternative and opposing standpoint.

While this approach might at first seem more adversarial than a straightforward negotiated settlement, it can often be an effective approach to agreement when negotiations have broken down as might occur when the topic of the dialogue is highly personal or when a negotiation dialogue has become highly emotional. For example, Jacobs and Jackson et al. (1987) have observed the benefit of this type of dialogue shift in child custody cases. Suppose the parents are negotiating on who should get custody of the children. This struggle can become very personal and emotional. But suppose the mediator shifts the discussion to a persuasion dialogue on the issue of who is better equipped to look after the children. This is a matter more of objective facts that can be discussed dispassionately. Jacobs and Jackson describe how this type of dialogue shift can be effected by mediators of a negotiation through the careful and strategic employment of questions designed to frame the issue under discussion in a more de-personalized way, and to elicit reasoned, as opposed to eristic or emotional, responses to moves made by other dialogue participants. While well beyond the scope of the present paper, an important question for ODR is how the need for such a shift could be detected, and the shift itself effected, by an automated negotiation system.

9. Modeling persuasion dialogues

Having shown a number of ways in which persuasion dialogues are connected with negotiation, and the kinds of effects persuasion can have on the negotiation process, it remains to consider how persuasion dialogues should be modeled. While we feel that this is an important question for ODR, the provision of such a model is well beyond the scope of the present paper. But a few preliminary comments can be made here which might help to inform the development of such a model.

In the first place there are at least two contextual features which provide certain constraints on any model to be developed. From the point of view of the technical aspects of ODR, any model of persuasion dialogue must be applicable within the computerized framework of ODR. So, if our aim is to fully automate the task of mediating the negotiation process, we require a technical, or formalizable, model of persuasive discussions that can be implemented at the

mechanical or functional level of computer systems. On the other hand, we also require a model that accurately reflects the normative procedural and structural features of persuasion as a type of dialogue. That is, persuasion is a type of human dialogue exchange which is governed by a number of rules, both procedural and epistemic, which come from a variety of sources, including the nature of the speech acts which are involved in persuasion.

This brings us to another important point. Our model of persuasion dialogue must reflect the variety of speech acts that can be made as part of the complex speech act of persuasion itself. And it must do so in such a way as to reflect all of the combinatorial possibilities presented by these speech acts and the possible responses to them. Modeling all of these possibilities will generate a good deal of complexity which could quickly become unmanageable if models are developed along certain lines.

A rule-based model of the sort offered by Hitchcock et al. (2002) concerning deliberation dialogues presents a fuller analysis of the structure of the dialogues involved than the diagrammatic type of model considered in this paper. A rule-based model is a dialectical type of model that begins with an inventory of the possible locutions that can occur within a dialogue of some type. This includes speech acts (construed as moves within the dialogue) such as assertion, questioning, hypothesizing, etc. Governing each of these dialogue moves are a set of procedural rules giving the pre-conditions and post-conditions for each speech act. Such an approach allows that a variety of speech acts can be made at any move in the dialogue, just so long as the pre-conditions for that dialogue move are met. This is a more effective way of representing the dialogue while managing its inherent complexity than attempting to provide a diagram of the entire dialogue-type.

In addition to these rule-governed speech acts, an effective model of persuasion dialogues would have to have several other components. It would have to have a commitment store for each agent in the dialogue. It would be necessary that this commitment store could be changed in light of retractions. Further, the model would require a set of inference rules which would license the drawing of certain conclusions inferred from the commitments in the commitment store. These inference rules could include not only formally deductive rules such as *modus ponens* or *modus tollens*, and rules for inductive inference (taken from the probability calculus) but also licenses for defeasible patterns of inference such as those provided by argumentation schemes (see Walton 1996).

Finally, the dialogue system would have to include not only logically based rules of inference, but also pragmatically based rules. For example, the model could incorporate Gricean rules of conventional and conversational implicature (1967/1989). These would help to specify the practical rules governing certain speech acts and their consequences, and as such could help to inform the statement of the pre-and post-conditions of individual dialogue

moves as well as more general procedural regulations of the dialogue itself. While this sketch alone does not encompass those considerations which will be required in the development of a model for persuasion dialogues, it does provide a number of considerations and components which will have to be taken account of in any model.

10. Summary and conclusions

In this paper, we have attempted to show the how persuasion dialogues can be connected with negotiation dialogues in the larger context of Online Dispute Resolution. Having provided a model of negotiation dialogue, we have shown how persuasion can be incorporated into this model by locating the places at which persuasion dialogues can be functionally embedded into negotiation dialogues. In doing this, we have demonstrated the effects that persuasion can have on the process of negotiation, and the need for ODR systems to incorporate persuasion into their dialogue models.

More generally, this has shown the need for ODR models to reflect the different types of dialogue and other speech acts which can have a role in the resolution of a dispute handled in an ODR system. Also, we have suggested that ODR systems must be able to manage and regulate communication in such a way that basic cooperative principles are not violated, if they are to be effective as systems which support or facilitate the resolution of disputes. Finally, we have recommended an approach for developing models of persuasion dialogues as well as other dialogue systems as they have a role in ODR.

Notes

[1] While we do not argue this thesis here, we feel that there is good reason to contextualize many, if not most, situations in ODR primarily as deliberations rather than as negotiations. Essentially, the participants are trying to resolve some problem to the satisfaction of all concerned, and this resolution typically requires that certain parties take some specific action. Negotiation might be one means of finding this solution, but there could be other available means.

[2] In the model, i and r are variables ranging over the participants in the dialogue, who could be named with letters such as 'a' and 'b'. Since the roles of the participants can switch when a counter-offer is made, there is a rule for the model which states that "$i = a \leftrightarrow r = b$" and "$i = b \leftrightarrow r = a$".

[3] It is not immediately apparent which of the four principal Gricean Maxims (of quantity, quality, relation and manner) (1967/1989, 28ff) are violated by interruption.

[4] Almost all pragmatic theories of argumentation have incorporated Grice's conversational maxims into their dialogue models, and we feel that the creation of effective dispute resolution systems in ODR involves implementing these maxims in to the regulative structural and procedural features of the dialogue models used in ODR. This question is well beyond the scope of the present paper, and one which we will have to leave for future consideration.

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