

Formal Dialectical systems and Their Uses in the Study of Argumentation

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ABSTRACT In this paper we offer an explanation of how formal dialectical systems are useful for modeling important aspects of argumentation, like dealing with fallacies. This aim is accomplished by presenting a brief outline of the main characteristics and rules of two representative systems, one of the Hamblin type and one of the Lorenzen type. We use these two systems to discuss aspects of argumentation that have turned out to be important, showing that the best way to apply such systems is to build what we call a laboratory of rules. Using this laboratory, formal dialectical systems (and the related method of profiles of dialogue) can be used as flexible instruments to solve specific problems of argumentation. Combining a plurality of dialectical systems with a plurality of types of dialogue to tackle real problems is shown to be the most promising approach.

1. Introduction

Formal dialectic and pragma-dialectics are usually conceived as two related, but distinct, approaches to the theory of argumentation, both sharing the characteristics of a dialectical approach where they emphasize the importance of a procedure of discussion or dialogue but distinct both in their degree of formality and in their use, or lack of use, of speech-act theory. But the two are not on the same footing: Pragma-dialectics presents us with a complete and coherent research program, comprising a philosophical, a theoretical, an analytical, an empirical and a practical component; within formal dialectic, on the other hand, there is no pretension to present such a program. Rather “formal dialectic” denotes a family concept covering variously related theoretical contributions with different kinds and degrees of formality. Also, knowledge about formal dialectic and its potential to contribute to the theory of argumentation is not as widespread as in the case of pragma-dialectics. In fact, the name “formal dialectic” (or “formal dialectics”) is better known than what it stands for. We, therefore, thought it worthwhile to revisit in this paper the idea of a formal dialectical system and to comment on its use for the study of argumentation.

We shall presently introduce two examples of formal dialectical systems (Section 2), which we shall discuss from various angles (Section 3), in particular that of its use for argumentation studies (Sections 4 and 5). But first we must briefly elucidate our use of the terms “dialectic” and “formal,” as well as the term “formal dialectical system” itself.

First, *dialectic*: this term has numerous meanings among philosophers (Hall, 1967), ranging from formal logic to the development of society. According to Robinson (1953, p. 70) “the word ‘dialectic’ had a strong tendency in Plato to mean ‘the ideal method, *whatever that may be.*’” We want, however, to stick to the core meaning of “conversation,” either the practice of conversation or some theory of

conversation. As an adjective, “dialectic” or “dialectical” denotes a relationship to such practices or theories. Being argumentative is not a necessary component of a dialectical practice, even though we shall be mainly concerned with conversations in which arguments may indeed be expected to occur. Following Hamblin (1970, p. 256), we would include as a dialectical system “a dialogue consisting of interchange of statements about the weather.” However, there being at least two parties or roles in the conversation is a necessary component of what we mean by dialectic.

Second, *formal*: again many meanings are attached to the terms “form” and “formal,” so that dialectic can be formal in a number of senses. Three distinct senses of formal were pointed out by Barth (Barth & Krabbe 1982, pp. 14-19), and two more by Krabbe (1982, p. 3). The first sense (formal₁) refers to Platonic forms and need not be considered here. The second sense (formal₂) refers to linguistic forms: a formal dialectical system would be a system in which the locutions are rigorously determined by grammatical rules and in which rules of procedure are laid down with reference to the linguistic forms of these locutions. The third sense (formal₃) refers to regulated or regimented procedures. The fourth sense (formal₄) refers to *a priori* ways of setting up the rules of a system of formal dialectic. The fifth sense (formal₅) refers to dialectical systems that are “purely logical,” i.e. that do not provide for any material move. Material moves are those moves that depend on the meaning of some non-logical term (Krabbe 1982, p. 4; Barth & Krabbe 1982, pp. 104-112), and thus depend not only on linguistic form, but also on facts or interpretations. Formal₅ moves do not have this kind of dependency.

The fourth sense of formal arises from Hamblin’s distinction (1970, p. 256) between formal and descriptive dialectic. In descriptive dialectic, rules are examined that operate in actual discussions, like parliamentary debates and legal cross-examinations. The formal (formal₄) approach, in contrast, “consists in the setting up of simple systems of precise but not necessarily realistic rules,” and studying the properties of such systems. The example provided by Hamblin’s central system (1970, pp. 265-270), partly outlined below, is a good illustration. Clearly the formal₄ approach needs to be complemented by an empirical approach, which examines how people actually argue in legal trials, parliamentary debates, and in all kinds of familiar situations where dialogues occur.

Third, *formal dialectical system*: basically, any system of conversational rules that is in some sense formal might be called a formal dialectical system. However, the way we understand *formal dialectical system* implies that here formal must be taken in the sense of formal₃, though usually formal dialectical systems are also formal in some of the other senses (with the exception of formal₁). Formally, therefore, there are eight possibilities, which are realized according to whether a given formal (formal₃) dialectical system is defined with reference to linguistic forms (formal₂) or not, is descriptive or not (formal₄), and allows material moves or not (formal₅). Theoretically, these three issues are independent of one another, though some combinations are more familiar than others. The examples we shall put forward in the next section are formal in all senses (except formal₁). Material dialectical systems are not formal₅ (and not formal₁), but formal in other respects (formal₂, formal₃, and formal₄). The pragma-dialectical model of critical discussion is formal₃ and formal₄ but not formal in other respects.

There is nothing in the concept of a system of formal dialectic that makes it necessary that argumentation is involved, but also nothing that prevents such involvement. According to the formal dialectical approach to argumentation some dialectical systems may indeed throw light on issues in the theory of argumentation.

Generally, the formal dialectical approach sees argumentation as an exchange of moves between two parties who are engaged in a kind of regulated conversation, and the argumentative moves are judged in light of formal dialectical rules for that kind of conversation. A system of formal dialectical rules needs to be defined in a clear and rigorous way, so that it can function as a precise model of a given kind of conversational exchanges and so that a given sequence of exchanges can be evaluated as to whether it conforms to its procedure.

2. Examples

By the time Hamblin introduced the term “formal dialectic” (1970) Paul Lorenzen and his collaborators were already involved in the construction of formal dialectical systems for more than ten years. Only, these were not called “systems of formal dialectic(s),”ⁱ but dialogue games (*Dialogspiele*; Lorenzen & Lorenz, 1978). As we shall see, there are indeed great differences between the Hamblin and the Lorenzen kind of formal dialectic; but both kinds are involved in the “setting up of simple systems of precise but not necessarily realistic rules, and the plotting of the properties of the dialogues that might be played out in accordance with them,” to quote Hamblin’s characterization of the formal approach to the study of dialectical systems (1970, p. 256). We shall set forth and discuss an example of a system of each kind, starting with Hamblin’s well known “Why–Because system with questions” (1970, pp. 265-275), also known as ‘system H.’ As a system of the Lorenzen type we have chosen CND (Constructive-NOT Dialectics) from Barth & Krabbe (1982, Ch. III and Ch IV, p. 90, 91). In both cases we shall assume the same underlying language, namely a language of “propositional logic,” with logical constants for “if . . . then” (\rightarrow), “not” (\neg), “and” (\wedge), and “or” (\vee).ⁱⁱ We shall assume that A, B, C, . . . , R are elementary propositional symbols of the language, but use S, T, U, . . . , X as variables for possibly complex propositional formulas (called “statements” by Hamblin). When quoting rules of these systems, we shall sometimes add comment in brackets.

2.1 System H

A Hamblin game of dialectic requires a set of players or participants – in the typical, and simplest case, as in the system H, there are just two, and they are called “White” and “Black.” “White moves first, but the system is otherwise symmetrical between them” (Hamblin, 1970, p. 265). Besides an underlying language, there is also an underlying logic in the form of *axioms*, which “occupy a privileged position,” and *primitive definitions*. Hamblin does not give an example of either of these, but for axioms one may think of common logical axioms such as “ $A \rightarrow (B \vee A)$,” since he tells us that “ $\neg A \rightarrow (B \vee \neg A)$ ” is a substitution-instance of an axiom (p. 268, Comment (11)). Primitive definitions ground equivalences. For instance, a well-known definition of \rightarrow stipulates that for all S, T the formula $S \rightarrow T$ be definitionally equivalent to $\neg S \vee T$. The equivalence extends also to formulas, one of which contains a constituent that is replaced by a definitional equivalent to obtain the other (as “ $\neg A \rightarrow (A \rightarrow B)$ ” and “ $\neg A \rightarrow (\neg A \vee B)$,” p. 268, Comment 10).

There are three kinds of rules: (i) those that were later called *locution rules*, which determine the locutions that can be formed on the basis of the underlying language, and thus the kinds of move that can occur in the game. Then there is (ii) a

set of *structural rules* (also called “dialogue rules”), which define the preconditions and the postconditions of each kind of move, i.e. in what circumstances moves are permitted or required, and in what order they may or must occur. (Hamblin, rather confusingly, calls them “syntactical rules.”) Further there are (iii) *commitment rules*, which regulate at each stage the contents of the *commitment store* of each player – a set of propositional formulas (sometimes also containing challenges or arguments) attached to each player, either initially or in virtue of a move made. For example, if a player asserts a particular statement at some appropriate juncture of the game, that statement is inserted into her commitment store. Generally, statements can be deleted from a commitment store, as well as inserted into it, but axioms are indelibly contained in the commitment sets of both Black and White from the beginning.

The following list given by Hamblin may be read as constituting his set of locution rules (1970, p. 265):

- (i) ‘Statement S’ or, in certain special cases, ‘Statements S, T’.
- (ii) ‘No commitment S, T, . . . , X’, for any number of statements, S, T, . . . , X (one or more).
- (iii) ‘Question S, T, . . . , X?’ for any number of statements (one or more).
[The direct answers to the question are given by the list S, T, . . . , X. Since a question may be supposed to have at least two direct answers, “two or more” would be neater than “one or more.”]
- (iv) ‘Why S?’, for any statement S other than a substitution-instance of an axiom. [Hamblin thinks of a why-question as a challenge or request made to the respondent to provide a justification (an argument) for the statement queried. In other words, the respondent is expected to provide some premises (presumably ones that the proponent is committed to already, or can be brought to concede at future moves), and the statement queried by the why-question is supposed to be a conclusion implied by these premises (according to the axioms or logical rules for inferences in the system). Notice that “Why S?” is ungrammatical in case S is a substitution-instance of an axiom. Another way to stipulate that such formulas cannot be challenged would be to have a structural rule to that effect.]
- (v) ‘Resolve S’.
[Such a resolution demand is thought of as resolving the situation where one’s interlocutor is committed to both S and \neg S, asking him to withdraw either.]

Notice that no locution of H is equal to a formula of the underlying language. One cannot put forward just a propositional formula S. In some other Hamblin-type systems and in the Lorenzen games, however, this is possible. But what is typical for all these games is that though the grammar for the underlying language is recursive, the adding of the illocutionary operators (such as “Statement” and “Question”) is not. A question, for instance, cannot contain a question as a proper part.

The structural rules are the following (1970, p. 266):

- S1 Each speaker contributes one locution at a time, except that a ‘No commitment’ locution may accompany a ‘Why’ one.
[This rule describes how moves in the game may be built up from locutions. It is presumed that the participants move alternately.]
- S2 ‘Question S, T, . . . , X?’ must be followed by
 - (a) ‘Statement \neg ($S \vee T \vee \dots \vee X$)’
[A denial of the presupposition of the question.]
 - or (b) ‘No commitment $S \vee T \vee \dots \vee X$ ’
[A withdrawal of the presupposition of the question.]
 - or (c) ‘Statement S’ or
‘Statement T’ or
_____ or
‘Statement X’
[A direct answer to the question.]
 - or (d) ‘No commitment S, T, . . . , X’
[Withdrawal of each direct answer to the question, leaving commitment to the presupposition intact.]
- S3 ‘Why S?’ must be followed by
 - (a) ‘Statement \neg S’
[A denial of the presupposition of the challenge.]
 - or (b) ‘No commitment S’
[A withdrawal of the presupposition of the challenge.]
 - or (c) ‘Statement T’ where T is equivalent to S by primitive definition.
[Such an argument by primitive definition is one kind of argument that may be offered for S.]
 - or (d) ‘Statement T, $T \rightarrow S$ ’ for any T.
[Modus Ponens is the only other kind of argument for S available within the system.]

- S4 'Statements S, T; may not be used except as in 3(d).
 S5 'Resolve S' must be followed by
 (a) 'No commitment S'
 or (b) 'No commitment $\neg S$ '
 [Notice that there is no precondition given for questions, challenges, or resolution demands. This is perhaps most surprising in the case of resolution demands. Shouldn't the other be committed to both S and $\neg S$ before one can forward such a demand?]

Finally, let us have a look at the commitment rules (1970, pp. 266-67):

- C1 'Statement S' places S in the speaker's commitment store except when it is already there, and in the hearer's commitment store *unless* his next locution states $\neg S$ [or the denial of S, where the denial of S coincides with the negation $\neg S$ of S if S is not itself a negation, but equals T if $S = \neg T$.ⁱⁱⁱ] or indicates 'No commitment' to S (with or without other statements); or, if the hearer's next locution is 'Why S?', insertion of S in the hearer's store is suspended but will take place as soon as the hearer explicitly or tacitly accepts the proffered reasons (see below).
 [The principle is that who does not protest against a statement of S of the other is taken to have agreed: he gets committed to S, unless he denies or withdraws commitment or else puts out a challenge. In the latter case he may become committed to S after all, if he ever becomes committed to the premise or premises that his opponent puts forward in defense of S. This kind of suspension of commitment is here introduced only for challenges that follow upon a statement, but we think it must have been intended to hold for all challenges. Another matter is that, since premises put forward by the other in defense of S are again statements of the other, and may again be challenged (see C2 below), this suspension clause will operate in a recursive way. Thus one's opponent may have to construct a complex structure of argumentation to convince one of S. But then, if one becomes committed to the ultimate premises of such a construct, one also becomes committed to all the intermediate conclusions and to the final conclusion S. It's doubtful whether Hamblin was aware of this recursive aspect of his stipulation, since nowhere does he comment on it, even though the phenomenon can be observed in his own example on p. 267.^{iv}]
- C2 'Statements S, T' places both S and T in the speaker's and hearer's commitment stores under the same conditions as in C1.
- C3 'No commitment S, T, . . . , X' deletes from the speaker's commitment store any of S, T, . . . , X that are in it and are not axioms [or substitution-instances of axioms].
- C4 'Question S, T, . . . , X?' places the statement $S \vee T \vee . . . \vee X$ in the speaker's store unless it is already there, and in the hearer's store unless he replies with 'Statement $\neg(S \vee T \vee . . . \vee X)$ ' or 'No commitment $S \vee T \vee . . . \vee X$ '.
 [A question commits the speaker to its presupposition and, since who does not protest agrees, the hearer unless he denies or withdraws it in his next move.]
- C5 'Why S?' places S in the *hearer's* store unless it is already there or he replies 'Statement $\neg S$ ' or 'No commitment S'.
 [Again, who does not protest agrees.]

Hamblin presented just one example of a dialogue according to the rules of the Why–Because system with questions, followed by a brief list of comments pertaining to particular moves in the dialogue (1970, pp. 267-268). To see how these rules operate we have written out Hamblin's example (1970, p. 267) with the corresponding changes in the commitment stores (additions are written to the right of the move that lets them come into effect, deletions are noted in brackets, our comments in italics):

Figure 1: Hamblin's example of a dialogue in system H

Moves			White's commitment store	Black's commitment store
1	W:	Question A, $\neg A$?	$A \vee \neg A$	<i>The addition of $A \vee \neg A$ is postponed to await Black's reply.</i>
2	B:	Statement A	<i>The addition of A is postponed to await White's reply.</i>	$A \vee \neg A, A$
3	W:	Question B, $\neg B$?	A [deleted at move 21], $B \vee \neg B$	
4	B:	Statement $\neg B$		$B \vee \neg B, \neg B$ [deleted at move 38]
5	W:	Statement B	B <i>White avoids becoming committed to $\neg B$ by denial.</i>	
6	B:	Statement $\neg B$		<i>Similarly, Black avoids becoming committed to B.</i>
7	W:	Why $\neg B$?	<i>White suspends becoming committed to $\neg B$</i>	
8	B:	Statements A, $A \rightarrow \neg B$ <i>Argument 1: whenever White will become committed to A and $A \rightarrow \neg B$, she will become committed to $\neg B$.</i>		$A \rightarrow \neg B$ [deleted at move 10]
9	W:	No commitment $A \rightarrow \neg B$ Why $A \rightarrow \neg B$? <i>The explicit withdrawal of $A \rightarrow \neg B$</i>		

		<i>seems superfluous.</i>		
10	B:	No commitment $A \rightarrow \neg B$		[delete $A \rightarrow \neg B$]
11	W:	Statement B <i>According to Hamblin "White doesn't need to reiterate B, but it does no harm." (Comment (5))</i>		
12	B:	Why B?		
13	W:	Statements A, $A \rightarrow B$ <i>Argument 2: whenever Black will become committed to A and $A \rightarrow B$, he will become committed to B.</i>	$A \rightarrow B$	
14	B:	Why $A \rightarrow B$?		
15	W:	Statements $\neg A$, $\neg A \rightarrow (A \rightarrow B)$ <i>Argument 3</i>	$\neg A$, $\neg A \rightarrow (A \rightarrow B)$	
16	B:	No commitment $\neg A \rightarrow (A \rightarrow B)$		$\neg A$ [deleted at move 18]
17	W:	Resolve A		
18	B:	No commitment $\neg A$		[delete $\neg A$]
19	W:	Statement $\neg A$		
20	B:	Resolve A		$\neg A$ <i>A resolution demand does not avert becoming committed to $\neg A$ again.</i>
21	W:	No commitment A	[delete A]	
22	B:	Why $\neg A \rightarrow (A \rightarrow B)$?		
23	W:	Statement $\neg A \rightarrow (\neg A \vee B)$ <i>Argument 4 (based on primitive definition)</i>	$\neg A \rightarrow (\neg A \vee B)$	
24	B:	Why $\neg A \rightarrow (\neg A \vee B)$?		
25	W:	Statements $\neg A \rightarrow (B \vee \neg A)$, $(\neg A \rightarrow (B \vee \neg A)) \rightarrow (\neg A \rightarrow (\neg A \vee B))$ <i>Argument 5: Hamblin tells us that the first premise "is a substitution-instance of an axiom and cannot be further challenged" (Comment (11)).</i>	$\neg A \rightarrow (B \vee \neg A)$, $(\neg A \rightarrow (B \vee \neg A)) \rightarrow (\neg A \rightarrow (\neg A \vee B))$	
26	B:	Question $A \wedge C$, $\neg A \wedge C$? <i>Since Black doesn't negate, deny, withdraw, or challenge a premise, he becomes all at once committed to a number of formulas on account of arguments 5, 4, 3, and 2.</i>		$(A \wedge C) \vee (\neg A \wedge C)$, $\neg A \rightarrow (B \vee \neg A)$, $(\neg A \rightarrow (B \vee \neg A)) \rightarrow (\neg A \rightarrow (\neg A \vee B))$, $\neg A \rightarrow (\neg A \vee B)$, $\neg A \rightarrow (A \rightarrow B)$, $A \rightarrow B$, B [deleted at move 34]
27	W:	No commitment $(A \wedge C) \vee (\neg A \wedge C)$		
28	B:	Statement C		C
29	W:	No commitment C		
30	B:	Statement C <i>Hamblin: "This can go on forever" (Comment (13)).</i>		
31	W:	No commitment C		
32	B:	Why B?		
33	W:	Statements B, $B \rightarrow B$ <i>Argument 6</i>	$B \rightarrow B$	
34	B:	No commitment B Why B?		[delete B] $B \rightarrow B$
35	W:	Statements B, $B \rightarrow B$ <i>Argument 6 repeated. Hamblin: "So can this." (Comment (14)).</i>		
36	B:	Statement B		B
37	W:	Resolve B		
38	B:	No commitment $\neg B$		[delete $\neg B$]

We shall comment on system H in Sections 3 and 4.

2.2 System CND

The system of constructive-NOT dialectics must be described more briefly. We cannot here quote extensively from Barth and Krabbe's hierarchy of rules by which they try to give a motivation for the rules of that and similar systems. In the end,

however these rules boil down to some simple rules for discussants, which we may summarize.

There are two participants: a Proponent (P) and an Opponent (O). The initial situation is such that only P has a thesis to defend on the basis of a (possibly empty) set of concessions granted by O. P and O move alternately, using only one locution in each move. The locutions are of the following types:

- (a) formulas of the underlying language for propositional logic: S
- (b) three formulas for questions or challenges without a statement: ?, L?, R?
- (c) formulas for questions or challenges with a statement: (?)S
- (d) a winning remark: !

In this game the role of Proponent is comparable by that of the questioner in Greek dialectic and the role of Opponent with that of the answerer. O challenges, and P defends, whereas P asks questions (in order to obtain more concessions) and O, who has no thesis to defend, answers. Nevertheless, the forms of statement–challenge–defense triples equal that of statement–question–answer triples. All such triples are determined by the so-called *logical rules* of the game (also know as Lorenzen’s strip rules for logical constants). They are here assembled in a survey (Figure 2).

Figure 2: Logical Rules

	Statement	Challenge/question	Defense/answer
Rule \rightarrow	$S \rightarrow T$	(?)S	T
Rule \neg	$\neg S$	(?)S	none
Rule \vee	$S \vee T$?	S T
Rule \wedge	$S \wedge T$	L? R?	S T
Rule EI	A (or any other elementary propositional symbol)	? (can be used only as a challenge)	none

Each dialogue (or discussion) starts with O challenging P’s initial thesis T. The logical form of T determines which row of Figure 2 applies. If T happens to be one of O’s concessions P may make a winning remark (!). Otherwise, P may either opt for a direct defense, that is a defense as given by Figure 2, or he may first ask some questions on account of some of O’s concessions. Again, the logical form of the concession determines which row of Figure 2 applies. When P has obtained a number of answers he may then choose a direct defense against the original challenge (or make a winning remark). The game then continues with the formula used in P’s direct defense as the new thesis: it will be the *local thesis* during the next bout of questioning (the next *local discussion*).

Must O answer P’s questions? In case the question does not contain a statement, she must. But if the question does contain a statement, she has the option to challenge the statement instead (in the case of a concession $\neg S$ this is the only option available). This challenge will then introduce a new local discussion. In any case, O must always directly react to P’s preceding move.

Thus a question (?)S by P is to be understood as giving O the option of either answering the question (if possible) or else to challenge S and start a new local discussion. A challenge (?)S by O, on the other hand, is to be understood as a concession S for the sake of argument.

May P always put forward a winning remark? Certainly not: he may only do so if one of O's concessions is equal to the local thesis (the initial thesis being the first local thesis) of the current local discussion. It may be that the local thesis was first challenged and later conceded, or that it happens the other way round. Once P has made a winning remark, he is the winner of the last local discussion and thereby of the discussion as a whole.^v

Can O also make winning remarks? No, for O to win, P must have exhausted his possibilities of making moves. Therefore there must be rules that prevent P from pointlessly repeating himself. In fact, one rule stipulates that P may ask each question with respect to a certain concession only once in each local discussion (asking a question again in another local discussion is not always pointless), and another one that P may not repeat a former local thesis (whether in a direct defense or in a question), unless a fresh concession has made its appearance in the meantime. The latter rule happens to block circular argument in CND.

The following example will hopefully suffice to get an idea of the workings of CND and may also show how much this system differs from System H.

Figure 3: Example of a dialogue in CND

		Initial situation and moves	Comment
c1	O:	$\neg A \vee B$	<i>initial concession</i>
c2	O:	$(C \rightarrow A) \wedge (C \rightarrow \neg B)$	<i>initial concession</i>
t	P:	$\neg C$	<i>initial thesis</i>
1	O:	(?)C	<i>O challenges the initial thesis (t). C is now a concession.</i>
2	P:	?	<i>P questions the first initial concession (c1).</i>
3	O:	$\neg A$	<i>O answers (the other option would have been B).</i>
4	P:	L?	<i>P questions the other initial concession (c2).</i>
5	O:	$C \rightarrow A$	<i>O answers (there is no other option).</i>
6	P:	(?)C	<i>P questions the concession in move 5.</i>
7	O:	A	<i>O answers. A challenge of C would lead to a quick loss for O. The statement C in move 6 didn't become a local thesis and has therefore no further role to play in the dialogue. The first local discussion continues.</i>
8	P:	(?)A	<i>P questions the concession in move 3.</i>
9	O:	?	<i>O has no other option but to challenge the statement A in move 8, making it into the local thesis of the second local discussion.</i>
10	P:	!	<i>Since O conceded A in move 7, P can make a winning remark and win the dialogue.</i>

We shall comment on CND and compare it with System H in the sections that follow.

3. A Comparison between the two systems

The two examples of a formal dialectical systems presented above, which both are not formal₁, but clearly formal in the other senses of formal listed in Section 1, are still very different in other respects. A comparison between dialectical systems should take into account for each system (1) the nature and goals of the practice to which it pertains, (2) its degree of competitiveness, (3) its degree of symmetry (equality between roles), and (4) its degree of permissiveness (number of options for participants). We shall say something about each of these.

Even though the systems here considered are a priori constructs (formal₄) that are not meant to give an accurate description of empirical reality, they must still recognizably pertain to some real practice of conversation in order to contribute to the

study of that practice. Thus one may ask what the system is about: is it about negotiation, or about persuasion, or about deliberation, or something else?

For CND this question is not hard to answer: it is about the practice of trying to resolve differences of opinion (also called “conflicts of avowed opinions”) by verbal methods; i.e., the practice of persuasion dialogue. As such CND, together with a number of other systems, is proposed as an instrument of which potential discussants may avail themselves (Barth & Krabbe, 1982, pp. 56-57).

For System H, it is harder to tell to which practice it pertains. Hamblin does not explicitly discuss this. In his (1971), however, he states for the systems described in that paper, that they are “information-oriented” (p. 137) and later refers to systems that are “not strictly information-oriented” but that permit “a participant to develop an argument by securing assent to individual steps.” He then refers to System H as “an alternative argument-development system using questions of the form ‘Why?’” (p. 148; see also: Walton, 2007, II.10, p. 83). By these lights, System H may have been intended to pertain to conversations that are somewhat information-oriented, but not exclusively, since they include argumentation used to make the other step by step accept a point of view. One consequence of this unspecific nature of System H, is that the system becomes more complex than a system like CND. In CND all moves are concerned with one issue: should the Opponent accept the thesis or not? In System H, attempts to get the other to accept a thesis may be interspersed with arguments about unrelated matters, requests for information, and *obiter dicta*.

Since both CND and System H can be seen as models of persuasion dialogue (CND wholly, and System H partly), and persuasion dialogues generally have both cooperative and competitive aspects (Krabbe, 2008), one may ask how these two examples fare in this respect. All dialectical systems assume a kind of minimal cooperativeness: both parties agree to “play the game,” but beyond this CND seems more competitive, and System H more cooperative. This is so because CND has a concept of winning and losing and also a clear division of labor: the global roles of Proponent and Opponent, with opposing aims. It may be that ultimately both sides are committed to a common task: that of achieving a resolution of their initial difference of opinion; but as long as the dialogue runs, they are very much opposed. In System H, on the contrary, there is no such thing as winning or losing, not even an assignment of points. On the one hand then, one would say that System H is not competitive (though in some respects it must be competitive, being a model of persuasion dialogue, where one discussant tries to persuade the other), but on the other hand System H is not very cooperative either, if one thinks of how easy it is to destroy a carefully constructed argument by wanton withdrawals of commitment.

The issue of symmetry is related to that of competitiveness in so far as asymmetry enhances competitiveness. One may think that in any reasonable discussion the same rules should hold for all, but actually the concept of equity that is at work here does not apply to reasonable discussion, the role of the seller being different than that of the buyer, and that of a proponent of a thesis being different than that of its opponent. Thus one can have a reasonable system for the resolution differences of opinion that is highly asymmetrical. CND is a case in point, and so is the pragma-dialectical model of critical discussion. System H, on the contrary, is almost completely symmetrical. The only exception to symmetry is that White begins.

Hamblin’s stipulation in rule S1 that a “No commitment” locution may accompany a “Why” one in one and the same move is crucial to maintain symmetry. Without this rule White could enforce an asymmetric situation by starting with a question (a challenge or another question), upon which the reaction would have to

consist either of statements or withdrawals (see rules S2 and S3). White could then ask another question, and so on. Thus White will be giving herself the role of a kind of questioner and foisting the role of answerer upon Black. But thanks to rule S1 – which permits Black to take up a challenger’s role while replying “No commitment” to White’s question – this cannot happen in System H. In other Hamblin-type systems, however, such a foisting of a role on one’s interlocutor is often a real possibility, for instance in Mackenzie’s Systems 1 through 4, which contain a rule RQest to the effect that a question (not a challenge) must be followed by a statement or a withdrawal (Mackenzie, 1990). Systems of Permissive Persuasion Dialogue (PPD) avoid such opportunities of foisting a role on the interlocutor by their feature of permitting a move to consist of many locutions (Walton & Krabbe, 1995). Such an approach would also allow a withdrawal to accompany a resolution demand, and thus avoid the problematic situation at move 20 of the dialogue in Figure 1. In that move, a reasonable resolution demand by Black prevents him from withdrawing commitment to $\neg A$ in reaction to White’s statement of $\neg A$ in move 19.

As to permissiveness: CND is clearly more restrictive, and even more so for O than for P. For O the maximal number of options is three. (It is three when O has conceded $(U \wedge V) \rightarrow W$ and P explores this concession by the question $(?)U \wedge V$: in that case O may react by conceding W or by challenging either with L? or with R?.) For P, there may be more options, dependent on the complexity of the situation, but the number will always be finite (presuming that we start with a finite number of formulas). In System H, however, the participants may put forward as a statement or challenge any formula they like; so the number of options is infinite. If one looks at the rules, one sees that there are a number of postconditions for certain locutions, but hardly any preconditions.

As it is, System H seems too permissive, especially where withdrawals are concerned. How can one ever successfully argue for a thesis if the interlocutor may at any point withdraw his commitment again to some established part of the argument? Mackenzie proposed to extend the notion of a resolution demand to apply to immediate inconsistencies (“immediate” according to some underlying syntactical notions) as well as to the withdrawal of a conclusion of an immediate consequence (e.g., in Mackenzie, 1990). By Mackenzie’s rules, one may, in favorable circumstances, if the other denies an immediate consequence of premises to which he is committed, force the other to withdraw his denial, but even then one cannot force him to assert this consequence itself. But if one conceives of being subjected to a resolution demand as a kind of losing part of the dialogue, or getting negative points, one could say that such demands help to decrease the permissiveness of the system by making it harder to withdraw commitments. This goes to show that the Hamblin-type systems need to be supplemented by some notion of winning and losing (parts of) a dialogue.

4. A Laboratory of Rules

What is particularly attractive in Hamblin’s approach is that instead of just presenting system H (and other systems) as a fixed system, he examines, in a flexible way, specific modifications of the rules or additional rules for making moves (questioning moves, challenging moves, replying moves), discussing how they might work. In this way formal dialectical systems function as research tools for the study of argumentation in a “laboratory of rules.” Rather than as attempts to create a perfect

model of argumentative discourse, the efforts of formal dialecticians should be seen as explorations in such a laboratory context.

By way of an example, let us briefly review the discussion about the fallacy of begging the question that started with Hamblin’s proposals to block circular reasoning in System H. One proposal (Hamblin, 1970, p. 271) consists of two rules (only the second of which was announced explicitly as blocking circular argument, though one needs both). Woods and Walton called them (W) and (R1) (Woods & Walton, 1978, p. 78; 1989, pp. 147,148), but here we shall use the names introduced by Walton (2007, p. 81, where the reader can find more discussion of Hamblin’s rule proposals):

Why-question Rule 1: “Why S?” may not be used unless S is a commitment of the hearer and not of the speaker.

Why-question Rule 2: The answer to “Why S?,” if it is not “Statement \neg S” or “No commitment S”, must be in terms of statements that are already commitments of both speaker and hearer.

It may be seen that in the example of Figure 1 these rules would block the circular arguments at moves 33 and 35. They also block the so-called Circle Game (Woods & Walton, 1978, 1989).

Figure 4: The Circle Game

Moves			White’s commitment store	Black’s commitment store
1	W:	Why A?		
2	B:	Statements B, $B \rightarrow A$		A, B, $B \rightarrow A$
3	W:	Why B?	$B \rightarrow A$	
4	B:	Statements A, $A \rightarrow B$		A, $A \rightarrow B$

The Circle Game cannot occur in a dialogue that follows the rules of System H and also the two new rules. It cannot occur, even if we consider the Circle Game as a segment of a larger dialogue with other commitments than those shown. For, according to Why-question Rule 2, B must be a commitment of White’s at Black’s move 2, but according to Why-question Rule 1, B must not be a commitment of White’s at move 3. In between no retraction took place.

So far so good, but then Woods and Walton (1978,1989) came up with a segment of dialogue that abided by all these rules, yet might be called circular: the so-called Woods-Walton segment:

Figure 5: The Woods-Walton segment

Moves			White’s commitment store	Black’s commitment store
			$A \rightarrow B$ $B \rightarrow A$ B [deleted at move $n+5$]	$A \rightarrow B$ $B \rightarrow A$ B A
$n+1$	W:	Why A?		
$n+2$	B:	Statements B, $B \rightarrow A$ <i>Argument 1</i>		
$n+3$	W:	Statement A	A	
$n+4$	B:	Statement C		C
$n+5$	W:	No commitment B Why B?	[delete B] C	
$n+6$	B:	Statements A, $A \rightarrow B$ <i>Argument 2</i>		
$n+7$	W:	Statement B	B	

Evidently, more laboratory work needed to be done. One puzzle is whether Black’s sequence of argumentation in the dialogue fragment should be said to be circular or

not, and if the argument is circular, whether it should count as an instance of the fallacy of begging the question. If so, the next puzzle is by what rules the fallacy could be blocked. A large part of the problem appears to center on the retraction of commitments in a Hamblin type of system, as there is no rule in such a system barring, or even regulating the retraction of commitments. A participant is free to make a commitment to a statement, and then to retract commitment to it, at some later point in the dialogue, with no penalty being attached to such an apparent fickleness in her position.

What was especially brought out by the attempts to solve the first problem was the importance of a property of argumentation in dialogue called “cumulativeness” by Woods and Walton (1978, 1989). A sequence of argumentation in a dialogue is *cumulative* if, and only if once the proponent or the recipient of the argument has incurred commitment to a particular statement, she can never, at any future point in the sequence, retract commitment to that statement. Cumulativeness means that commitment in a dialogue, once made, is non-retractable. Generally, cumulativeness is quite a strong condition to impose on argumentation in a dialogue, but the opposite extreme, of freely allowing retraction without any restriction, is far too weak to yield the right kind of structure for modelling fallacies that Hamblin was aiming towards.

The second problem led to various further laboratory experiments (Mackenzie, 1979, 1984, 1990; Woods & Walton 1982, 1989) we must forego to discuss. The main challenge was to let new rules block the fallacy without banning ways of arguing that are generally acceptable.

This kind of laboratory investigation can also take place in a way that is more informal, but still inspired by the idea of a formal dialectic. We are referring to the method of profiles of dialogue (Walton, 1989a, 1989b; Krabbe, 1992, 2002), which studies possible sequences of moves and reasonable options in particular situations without defining a system of formal dialectic.

5 The pluralism of the formal dialectical approach

Hamblin recognized well enough that there could be different types of dialogue, and he did not advocate one particular formal model of dialogue or type of dialogue as the exclusive one. Indeed, one can see from his distinction between formal and descriptive dialectic that he countenanced a plurality of different formal models, as well as a plurality of different kinds of actual discussions like those found in law and political debate. But he did not go so far as to make a systematic attempt to define or classify these different types as goal-directed structures. Since then, the literature has gone on to build formal models of different types of dialogue. Each type of dialogue has its characteristic goal (Walton & Krabbe, 1995). How well an argument is used in a given case must then be evaluated with respect to the type of dialogue that the theorist assigns to the speech event in which the argument occurs, and hence with respect to how well it helps to fulfill the goal of that type of dialogue.

The goal of the persuasion dialogue is to resolve or clarify a conflict of opinions on some issue by airing the strongest arguments and the strongest criticisms on both sides. This requires an interesting combination of competitiveness and collaboration. The competitive motivation is there to advocate one’s own viewpoint, while fallacies like straw man, *ad hominem*, and so forth show that carrying this competitiveness too far is an obstacle to reaching the common goal of the dialogue. In pragma-dialectics, this problem is now studied in publications on strategic

maneuvering (Van Eemeren & Houtlosser, 2002; Van Eemeren, 2010). The goal of the inquiry is to prove (or disprove) some proposition by collecting all the available evidence in favor of (or against) it. The goal of negotiation dialogue is to reach a settlement of a conflict of interests that both parties can live with. The goal of information-seeking dialogue is transfer of information from the one party, who has it, to the other party who lacks it. The goal of deliberation is to decide on a course of action from the alternatives in a given situation. The goal of eristic dialogue is to reach at least some provisional accommodation in a relationship. Eristic dialogue may transgress the boundaries of polite conversation in order to reveal deep feelings that the other ought to recognize, or to show one's superiority in the relationship. Each type of dialogue has a particular goal, and therefore when an argument used in a given case is to be evaluated from the perspective of a certain type of dialogue, those kinds of moves and arguments that would obstruct reaching the goal of that type of dialogue need to be identified and normatively condemned as inappropriate.

Given these facts of the situation, it is reasonable to expect a plurality of different kinds of dialogue in real discussions and argumentative exchanges, as well as a plurality of formal models that can be applied in some respects to these real discussions. The problem is one of matching up these two elements, because formal models by their nature need to be precise and comparatively simple in relation to the vague but flexible kinds of dialogues in which everyday arguments are put forward and criticized. For these reasons, the idea of having a laboratory of rules remains an extremely useful research project.

In real argumentative practices we typically run into problems, for example where fallacies occur that require some precise rules of retraction. In such instances, there can be alternative rules of retraction that can be applicable. Adopting a meta-dialectical perspective, we often need to debate and discuss these rules to see which one should best be applicable to deal with the problem. As we saw in the case of the fallacy of begging the question, this kind of situation is typical in argumentation research, and indeed typical in all scientific research that uses abstract models.

The kind of research that needs to be done is to take a problematic example, explaining the kind of problem or fallacy that needs to be dealt with, and discuss different proposals for formulating a precise rule, or set of dialogue protocols, which should be brought to bear. The pluralism in formal dialectic we support should not lead to a proliferation of formal dialectical systems, similar to all the different formal systems of deductive logic that have grown up: each rule and its alternatives need to be discussed in relation to some real problem that has arisen in argumentative practices in everyday conversation reasoning or in special contexts like legal reasoning or scientific reasoning. Current pragma-dialectical research about strategic maneuvering in specific institutional contexts, often using the method of profiles of dialogue, has much the same focus.

A problem similar to that of matching a plurality of kinds of dialogues with a plurality of models has arisen in computing, where one attempts to cross over between the practices of dialogue design in multi-agent systems in artificial intelligence and models provided by formal dialectical systems. A way of reconciling these two approaches comes through the development of what Reed has called a dialogue system specification (DSS). Such a specification describes how the various components that make up all dialogue systems, the locutions, commitments, rules and so forth, may be combined into packages to form particular dialogue systems for particular uses. The user can then create a dialogue system needed for a specific kind of task quickly by picking out the rules needed from the dialogue system

specification. According to Reed (2006, 26), a dialogue system can be captured completely by specifying preconditions and postconditions of every possible locution, along with a characterization of the commitment stores of the participants. The only other thing that is needed is a list of closure rules of the dialogue system.

6. Conclusion

In this paper we have explained the concept of a formal dialectical system, by presenting the two best known such systems, the Hamblin type and the Lorenzen type. The explanation was based on an earlier system integrating these two types proposed in (Walton & Krabbe, 1995). We used the Hamblin and Lorenzen systems to discuss certain aspects that we showed to be especially important for the analysis of argumentation. We also showed that when considering the way these systems are used, the idea of building what we call a laboratory of rules was crucial. In this laboratory, formal dialectical systems (and the related method of profiles of dialogue), were used as flexible instruments to try out various possibilities. The plurality of dialectical systems was seen to be a consequence of the plurality of types of dialogue.

Among the plurality of dialectical systems, the pragma-dialectical model of critical discussion stands out as particularly fruitful and interesting, especially since it has been applied in studies of strategic maneuvering in specific contexts. Admittedly, one does not usually think of this system as a system of *formal* dialectics. And indeed critical discussion is not formal in all senses; but then, one could hardly deny that it is both formal₄ and formal₃. This formal character may not be so evident if one just studies “the ten commandments,” though these are specific enough to present a normative view on a practice that we can recognize people engaging in on a daily basis across cultures. The formal character of critical discussion shows itself much clearer in the official system of, formerly seventeen, but now fifteen rules that constitute the discussion procedure (Van Eemeren & Grootendorst, 2004). The system may be underspecified at points, but this is a feature it shares with most formal dialectical systems. There is no formal language specified to underlie the system, but this only means it is not formal₂. In fact the system is specified with enough precision to be amenable to metadialectical analysis (Krabbe, 2007). At the beginning of this paper, we stated that formal dialectic and pragma-dialectics are not on the same footing. Now we may conclude that neither are they very far apart.

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ⁱ The "s" in "dialectics" is unnecessary, and was probably introduced by Barth & Krabbe (1982).

ⁱⁱ These symbols will be substituted for those used in the quoted passages.

ⁱⁱⁱ That Hamblin intended to include the possibility of dropping a negation sign, instead of adding one, is clear from his example on p. 267 (move 5 in Figure 1 below) and his Comment (1) on the same page.

^{iv} In the move after Hamblin's Comment (11) (move 26 in Figure 1) Black asks a question instead of denying, withdrawing, or challenging one of the premises of the preceding argument; as a consequence he becomes, by complex argument, committed to B. Here Hamblin's comment is perhaps inadequate, but not incorrect. (Earlier however, in Comment (9) (on move 21 in Figure 1) his comment is incorrect when he remarks that both parties are now "internally consistent," whereas in fact Black is at that point committed to both A and to $\neg A$.)

^v For simplicity, we assume that discussions consist of only one *chain of arguments*, i.e. one series of local discussions as described above, and forego treating the option of trying out various developments within one discussion (Barth & Krabbe, 1982, III.13: Thoroughgoing dialectics).