



*A Dialogue Game for Critical Discussion: Groundwork in the Formalisation and Computerisation of the Pragma-Dialectical Model of Argumentation*

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# A dialogue game for critical discussion

## Groundwork in the formalisation and computerisation of the pragma- dialectical model of argumentation

Over the past twenty years, the use of computational methods in the study of argumentation has been steadily increasing. Full automation of the analysis of argumentation – however appealing – is not yet possible in light of the current state of the field of ‘computational argumentation theory’. Smaller software tools, however, which assist human analysts in their tasks, are becoming increasingly available. To give two examples of such smaller software tools; diagramming software helps to visualise argumentation structures in a uniform output format, and argument mining techniques make it possible to carry out quantitative research on large corpora of argumentative texts. Because each theory of argumentation comes with its own conceptual framework, underlying philosophy, and models, software designed to be used with one theoretical approach will not be fully compatible with another theoretical approach.

The rationale behind the study reported in this dissertation is that a formal preparation of the pragma-dialectical theory of argumentation would facilitate the development of computer tools to support the analysis of argumentative discourse. The pragma-dialectical method of analysing argumentation is widely used and based on a theory of argumentation that has been refined over the past four decennia. Although software tools are steadily making their way into the argumentation scholar’s toolbox, no such tools have yet been developed catering specifically to the pragma-dialectical theory.

Central to the pragma-dialectical method of analysis is the ideal model of a critical discussion. This model is employed as a heuristic instrument to reconstruct the relevant parts of the text that is being analysed. Because of its central position, the ideal model of a critical discussion is the focal point of the preparatory foundation for developing software tools to support a pragma-dialectical analysis of argumentative discourse. This leads to two aims of the current study. The first aim is explorative and concerns the method that is used to prepare the formal

foundation. The second aim is synthetic and concerns the actual development of this foundation.

Making preparations for the development of analytical software tools based on the pragma-dialectical method means taking a step in the development from a philosophical ideal to a software application. The software applies a computational model of argumentation, which is an implementation of a formal model of argumentation. In turn, the formal model is an approximation of a theoretical model. Finally, the theoretical model is based on a philosophical ideal. On the scale indicated by these observations, the pragma-dialectical ideal model is situated between the theoretical model and the formal model. Through the formalisation carried out as part of realising the second aim of this dissertation, the model is brought one step further into the direction of computational implementation and application.

The pragma-dialectical model is already formal in two senses. First, the model is not just focussed on the outcome of an argumentative discussion, but procedural. Second, instead of providing a description of actual argumentative practice, the model normatively defines an ideal procedure for the reasonable resolution of a difference of opinion. A third sense of formal is added to the formalisation of the model in this dissertation, by providing a definition of the linguistic forms that can be used in the model and the way in which these can be combined.

The formalisation aimed for is realised by defining a dialogue game for critical discussion. In a dialogue game, verbal interaction is modelled in terms of a game played by two (or more) interlocutors. In the dialogue game, the interlocutors make communicative moves in order to reach some interactional goal. The dialogue game for critical discussion is defined by means of five categories of rules. First, the commencement rules define the initial state of the game. Second, the move rules define the moves that can be made during the game. Third, the commitment rules define the commitments that are brought about as a result of moves made. Fourth, the sequence rules define for each move under which circumstances it may be made. Fifth, the termination rule defines when the game ends and what the conditions for winning and losing are.

To examine whether such an approach to the formalisation of the pragma-dialectical ideal model actually facilitates the intended connection to the computational modelling of argumentation, a preliminary formalisation is partially translated into the computational Argument Interchange Format. This translation is indicative of the intended connection and facilitates the comparison to existing computational models.

The synthetic aim of the study is realised by developing a dialogue game that is a formalisation of the pragma-dialectical ideal model. The dialogue game is developed incrementally, starting with an elementary game that can be extended to build up an increasingly complex formalisation. With each increment, the formal approximation is brought closer to the full scope of the pragma-dialectical ideal model.

To serve as the starting point for the incremental development, a basic dialogue game for critical discussion,  $CRIT_1$ , is defined. The dialogue game is simplified in various ways, thus constituting a formalisation of a restricted interpretation of the ideal model. Only certain features of the multifaceted ideal model are accounted for in  $CRIT_1$ . These features are chosen because they represent the core of critical discussion.

Of the four discussion stages of the ideal model, the quintessential argumentation stage is accounted for in  $CRIT_1$ , while the confrontation stage, the opening stage and the concluding stage are temporarily abstracted from. To maintain a comprehensive model, particular outcomes of the three remaining discussion stages are assumed in the rules of  $CRIT_1$ . As a result of these simplifying assumptions,  $CRIT_1$  is restricted to a discussion aimed at resolving a difference of opinion about one positive standpoint which is met with doubt, through the advancement of one argument relying on a propositional logical inference.

The rules of  $CRIT_1$  are based on the pragma-dialectical set of fifteen procedural rules for a reasonable resolution of a difference of opinion. These fifteen rules for critical discussion exemplify the dialectical dimension of the pragma-dialectical discussion model. The pragmatic dimension (speech act perspective), logical dimension (reasoning and argument schemes) and rhetorical dimension (strategic manoeuvring in institutional contexts) are abstracted from in the basic dialogue game.

As part of the dissertation, two extensions of the dialogue game are developed. First, in  $CRIT_2$ , the concluding stage and the pragmatic dimension are accounted for. The accommodation of the concluding stage is realised by extending the rules of the dialogue game to allow the players to explicitly establish the outcome of the discussion based on the advanced argumentation. To account for the pragmatic dimension, the speech act perspective of critical discussion is used as a basis for the redefinition of the rules for moves and commitments. The rules for moves in the dialogue game are changed to deal with the speech acts that are instrumental in the resolution of a difference of opinion (in accordance with the distribution of speech acts over the discussion stages of the ideal model). In addition, the commitment rules are changed to reflect the felicity conditions that are associated with the speech acts concerned. By making a move in  $CRIT_2$ , a player becomes committed to the fulfilment of the felicity conditions of the speech act the move corresponds with.

The second extension,  $CRIT_3$ , addresses the complex argumentation structures that come about when more than one argument is advanced during a discussion. Depending on the kind of criticism the additional argument is a response to, this leads to different argumentation structures. Depending on the kind of move that is responded to, the resulting argumentation structure is multiple, cumulative or subordinative – the types of complex argumentation structures distinguished within the pragma-dialectical theory. The sequence rules of the dialogue game are extended to allow the move with which an argument is advanced to be made more than once per game.