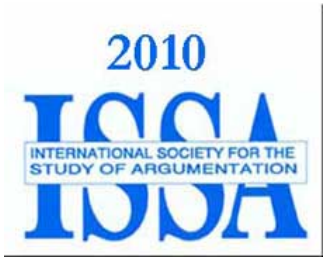
ISSA Proceedings 2010 – The Challenges Of Training Critical Discussants: Dialectical Effectiveness And Responsibility In Strategic Maneuvering And In Science Education



1. Lessons on Teaching Argumentation from Science Education[i]

Teaching argumentation has an obvious entry point in most educational systems through science courses and teaching science. As editors of a recent edited volume summarize: " … there is an increasing emphasis on resting the science curriculum on a more appropriate balance between science process and citizenship skills, and factual or content knowledge of science. The main rationale for the inclusion of argumentation in the science curriculum has been twofold. First, there is the need to educate for informed citizenship where science is related to its social, economic, cultural and political roots. Second, the reliance on evidence has been problematised and linked in the context of scientific processes such as investigation, inquiries and practical work." (Erduran and Jiménez-Aleixandre 2008, p. 19). These curricular reforms – most often connected to NOS (Nature of Science) or SSI (Socio-Scientific Issues), and CT (Critical Thinking) discussions in science education – recognize the need for the explicit teaching of argumentation, and the importance of developing students' existing argumentative skills.

The curricular reforms, however, have rarely born the fruits that supporters and enthusiasts have expected, and that curricular descriptions demand. The results so far are somewhat discouraging with respect to NOS, SSI, and CT, and to the more general argumentative skills. They show that effective teaching of argumentation in science classes is not without difficulties: "Only a minority of people progress to the final, evaluative epistemology, in which all opinions are not

equal and knowing is understood as a process that entails judgment, evaluation and argument." (Zohar 2008, p. 256). One can argue that the curricular expectations are set too high, and do not take the cognitive development of students fully into account. Setting realistic desiderata, however, runs into methodological difficulties. The fact that the results of high-achievers is more informative of the one end of the ability spectrum than the result of weak students (Voss, Segal, and Perkins 1991) is one of the problems that need to be addressed. At present it appears that: "Some desiderata concerning epistemological understanding are never reached by a large percentage of students. This is a serious problem that most curriculum-development has to face and tackle." (Garcia-Mila and Andersen 2008, p. 39). But whether the cognitive constraints of the students or the didactical ineffectiveness of the educational system is the (main) culprit for the rather disappointing results, is hard to tell. Didactics can surely improve, as, despite the efforts at the level of international policies about the science curriculum, "the systematic uptake of argumentation work in everyday science classrooms remains minimal" (Erduran and Jiménez-Aleixandre 2008, p. 20).

Didactic effectiveness is affected by many factors, starting from the theoretical frameworks used in science classroom, through the approaches utilized to reconcile the critical attitude with the authoritative image of science (Donnelly 2002, Zemplén 2007), to the management of the group dynamics in the classroom. Not providing an exhaustive list, this last mentioned aspect needs to be highlighted, as research indicates that: "Arguments by peers may be accepted more easily or defended more robustly according to group dynamics –the impact of social relationships within a group can have a bearing on the course of the argument" (Kolsto and Ratcliffe 2008, p. 123).

Recognizing the importance of social relationships implies that for optimally effective didactic interventions the teachers need to actively seek didactical settings that enhance the desired argumentative performances. The setting needs to take into account – among others – that there is an optimum of emotional involvement on the side of the students: too little of it precludes commitment and defence of positions, while too much of it is detrimental to the argumentative performance. Also, the teacher's role has to depart from the traditionally authoritative image associated with science teachers; otherwise the students can easily assume that the teacher is not willing to change his/her position. (In this

case why should they take part in argumentation?)

Understanding that many factors influence the success-rate of teaching argumentation, science educators have been focusing on framing the didactical situation in ways that are conducive to developing argumentation-related skills (see e.g. Adúriz-Bravo et al. 2005). As an example, in the HIPST project (an European 7th Framework funded science education project the authors participated in) a special spatial allocation of reflective thinking in the classroom was proposed; in this "reflection corner" the students could make statements about science and the scientific method that could be challenged and debated in class. While these situational framing effects might be seen as lying outside the territory of argumentation theory, they clearly affect the argumentative performance: to what extent are students willing to take part in argumentative activity in the first place, to what extent do they utilize their already acquired argumentative skills, and to what extent are they learning how to change their positions as well as argumentative practices reasonably. Situational framing is, therefore, a key to successful teaching of argumentation, as, without creating the perception in the students that they are in a situation where (rational) argumentation is the right behavioural response, they will not even start to argue. Framing situations in certain ways is also important for *maintaining* the preferred attitude.

In most cases the framing is carried out via linguistic means. The teacher has to say utterances that have a specific regulative function with respect to the pragmatic situation: the students should engage in and continue with the argumentative activity, and not end up making jokes, start a fight, etc. This aspect of framing is linguistic, and has relevance for theories of argumentation, as we show below. We start by investigating the so-called appeal-framing and discuss its treatment in one specific theory of argumentation, the extended pragma-dialectical framework.

2. *Can linguistic framing be normatively dubious?*

In a recent article Daniel O'Keefe (2007) raised interesting questions concerning the relationship of argumentation studies with persuasion effect studies in psychology and elsewhere. He draws attention to cases, where arguers are using appeal framing; in these instances different "ways of expressing an appeal involve the same underlying substantive consideration" (O'Keefe 2007, p. 154). It is an established fact in social psychology that the different formulations of logically

isomorphic contents might have a causal influence on the mind of the recipient beyond the causal effect of the information given. This extra persuasive effect of the speech act comes from the presentational device used and might affect the evaluation in specific directions (consider: Kahneman & Tversky 1986). Taking an example from O'Keefe, a medical expert might describe identical situations in various ways (O'Keefe 2007, p. 153, 155):

(a1) – success rate framing – "*this surgical procedure has 90% survival rate*"
(a2) – failure rate framing – "*this surgical procedure has 10% mortality rate*"

It is reasonable to expect, that if two utterances have the same informational content then people will react with the same decision. No matter if a1 or a2 is presented, the reaction will be the same. But this expectation is false. We know from social psychology that recipients will more probably answer with an affirmative decision to a1 than to a2. This means that the decision is not only conditional upon the informational content.

The question for O'Keefe is whether we are normatively indifferent with respect to the choice of presentational formats or not. As he writes: "the common intuition would be that there is something wrong with knowingly and purposefully choosing one or another of these formulations" (O'Keefe 2007, p. 156). The reason identified behind this common intuition is that people are usually unaware of the fact that their choices are influenced by the way the information presented was framed. The use of appeal framing can therefore be regarded as manipulative. O'Keefe adds: "This way of putting things makes appeal framing look rather like a fallacy, at least in some traditional ways of thinking about fallacies. A long-standing characteristic worry about fallacies is that they lead an unsuspecting audience to be influenced in ways it otherwise would not have been." (O'Keefe 2007, p. 157)

We think O'Kefee has a good point. And we also agree with him that from the point of view of argumentation theory, normative pragmatics or pragma-dialectics it is not easy to see for these cases what the problem would be with using this or that presentational format, or how the use of a framing device could generally be normatively dubious. In the pragma-dialectical theory, for example, if both a1 and a2 are uttered in the course of an argumentative exchange, then the analytical overview collapses these distinctions (due to their logical equivalence**[ii]**). There is, however, massive empirical basis for claiming that certain formulations that

are logically seen as equivalent are in fact influencing participants in various ways, in situations where this difference in persuasiveness can result in radically different decisions. People trying to be reasonable arguers, when in need of making e.g. medical decisions, are more or less likely to accept a specific position depending on the appeal framing**[iii]**.

As such, these cases may constitute anomalies (in a strong, Kuhnian sense) for certain normative theories of argumentation when rhetorical perspectives are incorporated into them. For this reason we now look at the possibility of finding a place for these framing effects in the notion of "strategic maneuvering", as it has been used in the extended pragma-dialectical theory to unite dialectical and rhetorical insights. There are certainly other respectable and insightful accounts of argumentative discourse, but at present pragma-dialectics appears to be the most systematized and developed research program. Furthermore, the pragma-dialectical method of argument reconstruction is in accordance with the received logic-based accounts of critical thinking that prevail in contemporary approaches to science education, and the method has comparatively clear standards for both reconstruction, and (normative) analysis.

But, although we think that pragma-dialectics is a suitable framework to unfold the fruitful implications of the problems posed earlier, there is some conceptual work to be done before we can turn our full attention to reformulate our problem as the problem of effectively using presentational devices in a rhetorical and in a dialectical sense.

3. *Strategic maneuvering, derailments, and appeal framing*

In the last decade pragma-dialecticians have worked on incorporating rhetorical insights into their framework under the name of strategic maneuvering (henceforth SM). As they formulated: "The gap between dialectic and rhetoric can in our view be bridged by introducing the theoretical notion of 'strategic maneuvering' to do justice to the fact that engaging in argumentative discourse always means being at the same time out for critical reasonableness and artful effectiveness. […] strategic maneuvering refers to the continual efforts made in principle by all parties in argumentative discourse to reconcile their simultaneous pursuit of rhetorical aims of effectiveness with maintaining dialectical standards of reasonableness" (Eemeren and Houtlosser 2009, p. 4-5). According to the latest exposition (Eemeren 2010) the analysis of strategic maneuvers divides the rhetorical dimension into three inseparable aspects that are mutually attuned to

each other: topical choices, adjustments to audience demand and presentational choices.

The presentational device aspect was earlier described as "the phrasing of moves in light of their discursive and stylistic effectiveness" (Eemeren and Houtlosser 2001, p. 152), and in the contemporary version this aspect is seen as 'framing'. In Eemeren's view "exploiting the possibilities of presentational variation in strategic maneuvering […] boils down […] to 'framing' one's argumentative moves in a communicatively and interactionally functional way" (Eemeren 2010, p. 117). Although we posed a problem in the context of social psychology, as the presentational device aspect of strategic maneuvering 'boils down' to framing moves, incorporating insights from social psychology can contribute to the understanding (and possibly also to the normative regulation) of the presentational device aspect of the new pragma-dialectical framework**[iv]**.

Let us return to the question whether the use of appeal framing (a kind of presentational device) is normatively problematic in the pragma-dialectical framework. In this theory a group of norms limit strategic maneuvers. No maneuver is allowed to violate the so called first order conditions, the (ten) dialectical rules worked out in the pragma-dialectical theory, presupposed as necessary for any reasonable discussion (Eemeren & Grootendorst 2004, p. 187-195). The extended pragma-dialectical theory also accounts for constraints linked to the specific institutional context (e.g. extra discussion rules in the court room) where the discussion takes place, but these are taken as specifications of the general first order rules (Eemeren 2010, p. 197). If a strategic maneuver does not comply with the first order rules, then it is classified as a *derailment*, and is normatively objectionable (fallacious). If it follows the track marked by these rules then it is a *sound strategic maneuver*.

On the one hand, it is hard to see how the appeal-framing scenarios we discuss could violate any of the first order conditions for a critical discussion**[v]**. On the other hand it is easy to imagine cases where the use of appeal framing fits the following loose definition of derailment, which states that "If a party allows his commitment to a critical exchange of argumentative moves to be overruled by the aim of persuading the opponent […] we say that the strategic maneuvering has got 'derailed'" (Eemeren and Houtlosser 2009, p. 13). The reason behind these derailments is that people "also and perhaps even primarily [are] interested in resolving the difference of opinion effectively in favor of their case, i.e. in

agreement with their own standpoint or the position of those they represent." (Eemeren 2010, p. 39). So, a derailment occurs when the attempt to reconcile the two, in part, contradictory goals of arguers is unsuccessful, that is the "rhetorical aim has gained the upper hand at the expense of achieving the dialectical goal" (Eemeren and Houtlosser 2009, p. 5). If the cases of appeal framing we discussed can constitute derailments in SM, we have examples that raise interesting normative questions but which are not treated in the detailed exposition of strategic maneuvering.

How can we know whether there are cases of appeal framing where "strategic maneuvering has got 'derailed'" in the above sense? In certain contexts the argumentative use of the kind of appeal framing discussed earlier can be considered as manipulative. (In such cases in the eyes of a pragma-dialectician the other party "allows his commitment to a critical exchange of argumentative moves to be overruled by the aim of persuading the opponent.") Social psychology also knows of many cases where moves considered as manipulative produce a *boomerang-effect***[vi]** as people act to protect their sense of freedom (Kruglanski & Higgins 2007, p. 267)**[vii]**. It is therefore possible that a party quits the kind of argumentative discourse preferred by the pragma-dialectical theory because this party identifies a move, a presentation device used by the other party as manipulative. A critical discussion can derail without violating the first order rules, as certain behavioural responses block the parties from reaching the dialectical aim of the discussion.

The discussed framing effects are achieved by presentational devices, but their contribution to reaching or not reaching the dialectical aims cannot be subjected to evaluation in the extended pragma-dialectical theory. Although they have a place in the analytic overview, the presentational devices used in a discourse can be effective or ineffective means of persuasion, but cannot be evaluated normatively. We think that this fact conjoined with the possible behavioural responses to framing raise interesting and possibly fruitful questions for the pragma-dialectical theory. How should we treat moves that can obstruct the dialectical aims, when the best current theory does not account for such obstructions? Or, if the uses of appeal-framing are not regulated by any norms in the pragma-dialectical theory, how can we say that they derail the SM?

4. *From second order conditions to dialectical effectiveness*

The pragma-dialectical theory has resources to overcome this problem. In his new

book van Eemeren devotes a concise section to the so called higher order conditions of a critical discussion: “in order for people to be willing and ready and to have the opportunity for concluding a critical discussion, certain further prerequisites need to be fulfilled” (Eemeren 2010, p. 35). Parts of these prerequisites for a reasonable discussion are psychological, *second order conditions*. If these are not satisfied, then critical reasonableness cannot be fully realized in practice (Eemeren & Grootendorst 2004, p. 189). There is, however, no detailed discussion of these conditions, only their limited controllability is stressed: “Sometimes there are factors beyond the control of the arguers that hinder the adoption of the reasonable attitude toward discussion assumed in the code of behavior.” (Eemeren & Grootendorst 2004, p. 36). And: “To some extent, everyone who wants to satisfy the second-order conditions can do so, but in practice, people’s freedom is sometimes more or less severely limited by psychological factors that are beyond their control, such as emotional restraint and personal pressure.” (Eemeren & Grootendorst 2004, p. 189).

This suggests that there is a second way to hamper the realization of the dialectical goals, distinct from violating any of the first order discussion rules by committing fallacies. Second order conditions can be influenced negatively by presentation techniques without the violation of first order discussion rules, and therefore there is room for the discussed framing examples in the pragma-dialectical theory. Considering this, and in line with the loose formulation of derailment we have quoted in the previous section we suggest some terminological clarification.

In cases where a move is not fallacious (i.e. no first order rule is violated) but results in an uncooperative behaviour of the other party (i.e. second order conditions are violated) we believe that it is sensible to classify these moves as derailments. Pragma-dialectical theory currently treats ‘fallacy’ and ‘derailment’ as co-referent**[viii]**, but some of the definitional attempts suggest that derailment could be used for any move that hampers the full realization of critical reasonableness. Second order conditions currently play a marginal role in most discussions of the theory, even though their violations can also derail conversations.

This terminological differentiation has interesting consequences. During sound strategic maneuvering the parties want to realize their dialectical objectives to the best advantage of the position they have adopted. Strategic maneuvering that

achieves the speaker's rhetorical aim of winning without violating the dialectical standards of reasonableness is effective in reaching these aims.

Effectiveness can also be understood in a different sense when the autonomous causal effects that rhetorical devices can have on second-order conditions are investigated. If the cooperative behaviour of discussants is maintained then the use of presentational devices was effective with respect to the dialectical aims (i.e. maintaining the dialectical standards of reasonableness). As the aim of rational discussion in pragma-dialectical terms is the resolution of the difference of opinion on the merits, moves that hinder this aim are considered derailments. If, for example, a boomerang-effect occurs, an analyst can conclude (and in fact a participator often does conclude) that a specific speech act derailed the critical discussion. Those moves are effective in reaching the dialectical aims that do not hinder the resolution process. This sense of effective communication is a prerequisite of critical discussions.

As presentational devices (and the rhetorical dimension in general) can be used effectively (or not) in both senses, we will distinguish them as "rhetorical effectiveness" E*r* and "dialectical effectiveness" E*d***[ix]**:

E*r*: Effectiveness in the sense that the utterances of a party serve the advantage of the position held by that party (helps the party to win).
E*d*: Effectiveness in the sense that the utterances of a party facilitate cooperative behaviour that is in line with the dialectical aims of the discussion.

As we have seen dialectical effectiveness (E*d*) is conditional upon the limited controllability of the psychological processes or second order conditions. Nevertheless, a *derailment-free discussion* of the parties need not only follow the first-order rules, but also has to be dialectically effective.

5. *Critical rationalism and the epistemic and didactical significance of dialectical effectiveness*

The analyst can concentrate on either the rhetorical or the dialectical effectiveness of the presentational devices used when analyzing the rhetorical dimension of argumentative discourse. Certain types of argumentative discussions may provide reasons for focusing on either E*r* on E*r*. If the analyst believes that the arguers "in their assiduity to win the other party over to their side" (Eemeren & Houtlosser 2002, p. 142) neglect commitment to the critical

ideal, then this can support the analytical decision to focus on E*r* and disregard E*d*.
When arguers prioritize winning over the dialectical aims, as in forensic debates, the search for rhetorical effectiveness dominates the argumentative activity types. In other activity types (like rational/critical discussion) dialectical efficiency (E*d*) is prioritized over winning (E*r*).

This distinction can be used to delineate argumentative activity types and can also come handy for those who believe that critical discussions can be epistemically valuable. Commitment to various epistemological positions, including critical rationalism (which gave rise to pragma-dialectics in the first place) entails commitment to dialectical effectiveness, and implies using moves that have a specific function. The function is to maintain the second order conditions necessary for achieving the dialectical aims. If a move has a specific function in an argumentative discourse, then it can be considered as part of the argumentation**[x]**.

The extended pragma-dialectical approach functionalizes the rhetorical dimension independently of the resolution-oriented dialectical goals. What we tried to prove above is that there are dialectically important rhetorical aspects of discussions that cannot be evaluated in this framework. The functionalization of rhetoric in the new theory yielded mixed results. Rhetorical aspects could be seen as a) violating or being in conflict with dialectical rules or as b) sound maneuvers of the resolution-process (the actualization of a potentiality, in quaint parlance). Many dialectically functional audience- and persuasion-oriented aspects are left out if we draw the boundaries of evaluation here. Dialectical effectiveness pertains to second order conditions that need to be satisfied for critical reasonableness to be realized. A communicative move can be seen as (psychological) facilitator or hinderer of the resolution process. The function of the rhetorical aspect of such a move is to maintain the second order conditions. This rhetorical aspect of communicative moves can be evaluated through the notion of dialectical effectiveness in our view.

Let us try to unfold a scenario where such rhetorical aspects might be of significance. In the intellectual climate of the 17th century, scientists living in different countries who differed as regards religious, political and personal outlook, often openly professed to differences of opinion. They made contradictory claims about data (simple measurements), about the validity of

inferences (whether a proposition has been demonstrated or not) and about the scientific method. Is it natural to assume that these people from different countries maintain a critical discussion over years and request copies of each others' letters in case one is lost? What maintains the second order conditions of the participants in the debate? In one concrete example of the this scenario Isaac Newton writes several pages, full of precise descriptions of his different prisms, different measurements of image-lengths in different atmospheric conditions. This is the most detailed data about spectra (and prisms) available at the time, and therefore has scientific significance. From a rhetorical point of view the *ethos* of the meticulous observer Newton is established on these pages. From a pragma-dialectical point of view what function is assigned to these pages? To respond to four lines of a previous letter by Anthony Lucas, a Jesuit living in Liége? The answer is unnecessarily detailed, disproportionately long for the meaningful function we can ascribe to it and potentially irrelevant as a wider readership (and not Lucas) is addressed explicitly as audience (Zemplén 2008, p. 264.). But pages like these play an important role in maintaining second-order conditions.

Meticulous observers become trusted observers, and social historians have a host of other examples that these detailed descriptions functioned as trust-enhancing devices in the community of intellectuals in Early Modernity. This building up of trust is seen as a major impetus for the scientific revolution (Shapin 1994), and is also present in contemporary knowledge-production in many institutionalized forms. The *ethos* of the speaker therefore influences dialectical effectiveness.

A certain amount of trust is necessary for a critical exchange, and some aspect of this trust can be translated as the willingness of the discussant to entertain his fallibility. Entertaining fallibility can be conditional upon the trust in the knower. If I believe that my expressed opinion is the rationally most acceptable position available then I trust myself as a knower. If I believe this to characterize someone else's position then I trust that person's position on the issue. Fallibility in this sense is the measure of distrust towards a knower's position. It is a prerequisite of critical discussion that the parties have some distrust towards themselves as knowers, and have some trust towards the other party as knower. Idealized models of symmetrical rational debate usually presuppose that the trust that positions receive is not affected by the trust in the proponent of that position as knower. One property of this debate-type is that if differences of opinion emerge then the models base the resolution-process on the consideration of the merits of

argument. A critical rationalist in our view prefers this process to others and accepts that the trust in the proponent of a position as a knower itself has to be decided on the merits of argument if differences of opinion emerge with respect to this**[xi]**.

Maintaining dialectical effectiveness in the process of argumentation is one behavioural property of (ideal) critical debaters, and so an ideal critical debater is dialectically effective. Dialectical effectiveness is furthermore required to realize dialectical goals, as we can only talk of a derailment-free resolution process of a critical discussion if dialectical effectiveness is a property of that discussion.

An example discussed earlier can be used to illustrate this point. A teacher teaching argumentation 'has to say utterances that have a specific regulative function with respect to the pragmatic situation: the students should continue with the argumentative activity, and not end up making jokes, start a fight, etc.' If students do not engage in critical discussion or break up the discussion, due to the peer pressure they experience then the teacher is not dialectically effective. This lack of dialectical effectiveness also implies that the dialectical goals have not been met, a characteristic of didactical interventions that teachers of argumentation try to avoid. But is anyone responsible for this dialectical ineffectiveness? Does a critical discussant have dialectical responsibility?

6. *Dialectical responsibility and the didactical challenges of training critical discussants*

Responsibility implies freedom of choice. Dialectical responsibility emerges when a party aims to be dialectically effective and is able to choose dialectically effective moves. To the extent that dialectical effectiveness of moves can be calculated such a party is responsible to pick dialectically effective moves. Dialectical effectiveness of the parties is a prerequisite to a critical discussion, and is therefore a key element of successful teaching of argumentative skills. Pragma-dialecticians appear to say something similar when they state that: "The fulfillment of the second-order conditions can be promoted by good training" (Eemeren & Grootendorst 2004, p. 37). Their didactic advice, however, is needlessly limited in our view. This training should encourage "reflection on the aims and merits of argumentation" as "compliance with second-order conditions can to some extent be stimulated by education that is methodically directed at reflection on the first-order rules and understanding their rationale." (Eemeren & Grootendorst 2004, p. 37, 189)

As we argued, complience with "second order conditions" is conditional upon many factors. Reflecting on first-order rules and understanding their rationale prepares the arguers to use non-fallacious moves. But derailment-free argumentative activity also implies that the arguers are dialectically effective, their utterances facilitate cooperative behavior that is in line with the dialectical aims of the discussion.

If we think of any teaching situation, any kind of didactic intervention, where the aim is to develop skills for critical discussion, we can think of many ways to increase the dialectical effectiveness of the parties. In the opening section of this paper we mentioned a number of factors that influence argumentative performance in a school-setting. Group dynamics, optimal emotional involvement, and instructional strategy all influence the success of developing argumentation-related skills. These factors all have something to do with second order conditions, therefore compliance with second-order conditions can be stimulated in many ways.

In practical terms, this means that optimal learning (or testing) environments need to be designed to increase the dialectical effectiveness of the parties. As good arguers – or, more specifically, good critical discussants – are expected to behave in certain ways, some behavioural cues can be used to judge certain didactical settings preferable to others. If changes of opinion are seen as one such behavioral cue (as is generally assumed in science education), then didactical settings that induce this behavior are valuable in teaching critical discussion. If, for example, a researcher finds that discussion of issues in role-play "was the first [of all the studies we have conducted so far] in which changes of opinion were observed" (Simonneaux, 2008, p. 185), we can use this as an argument for designing learning environments that scaffold argumentative performance using role-plays. The teacher, in this example, seeks to create an environment conducive to (developing skills for) critical discussion within a classroom with the use of specific instructions.

Much of the empirical knowledge of social psychology can be used to improve the dialectical effectiveness. And remedies can likely be offered to common derailments that result in dialectical ineffectiveness. If the earlier discussed boomerang-effect is likely to deem the parties (and therefore the situation) dialectically ineffective, practical suggestions to decrease the likelihood of the boomerang-effect taking place are conducive to dialectical effectiveness. But this

kind of knowledge comes with responsibilities. If a critical discussant has even limited / partial knowledge about the dialectical effectiveness of various communicative moves, then he has a responsibility to choose the dialectically more effective move. This move facilitates more / hinders less the resolution process that is the preferred epistemic route for a critical rationalist, so achieving dialectical effectiveness is a dialectical responsibility of critical rationalists. This perspective suggests that much work is to be done.

7. Conclusion

In this paper we showed that incorporating insights from social psychology can contribute to the understanding (and to the normative regulation) of the presentational device aspect of the new pragma-dialectical framework. During this investigation we developed the notion of dialectical effectiveness. Dialectically effective utterances of a party facilitate cooperative behaviour that is in line with the dialectical aims of the discussion. And any discussion that achieves these dialectical aims is also dialectically effective. This perspective opened up a position where the aim of a critical rationalist discussant matches the goal set for the critical discussion. This connection was used to introduce the notion of dialectical responsibility, and thus allowed the formulation of critical rationalist responsibilities with respect to the dialectical aims. We argued that these responsibilities stretch well beyond conforming to first order rules, and imply that for the successful training of critical discussants significant preparation may be required to maintain dialectical effectiveness.

NOTES

[i] The authors thank Jean H.M.Wagemans for fruitful discussions, Gábor Kutrovátz for commenting on the manuscript, and the anonymous reviewers for their helpful suggestions. The financial support from the HIPST project, the OTKA K 72598 grant, and the Bolyai postdoctoral scholarship (G.Z) is hereby acknowledged.

[ii] The 'Reflective Judgment Model, for example, suggests that the reasoning skills of high school students do not display the ability to contrast evidence from different sources, to explicate criteria for decision making, etc (King and Kitchener 1994). More recent research reinforces this, and strong arguments have been made that inquiry and argument are the central skills of science education (Kuhn 2005).

[iii] This clearly holds for the standard version of the pragma-dialectical theory.

For the extended one, the case is more complex. In this framework the reconstruction of utterance a1 and a2 is still isomorphic from a dialectical point of view. From a rhetorical perspective, however, it is not, as there is a difference in the persuasive effectiveness of the utterances. The extended pragma-dialectical approach functionalizes the rhetorical dimension independently of the resolution-oriented dialectical goals. As for strategic maneuverers the only limit for using rhetorical means is given in the pragma-dialectical norms, the normative evaluation of the rhetorical aspect of communicative moves remains a problem, as, to return to the point raised earlier, there is something normatively dubious in choosing this or that framing of the same content. What we are interested in is the conceptualization of this observation in the extended pragma-dialectical framework.

[iv] This can lead to moral issues in certain scenarios: if a doctor has any kind of interest in treating certain patients and not treating others, and knows how framing influences the response, then the doctor can influence the likelihood the patient opts for or rejects a certain treatment.

[v] It is to be noted here, that the sense in which Eemeren uses the term framing is narrower than as we use it, and basically refers to phenomena traditionally studied in stylistics. He divides the domain of presentational variation into two sub domains. Variations are possible in the language register and in the semantic dimension. We acknowledge that those kinds of framing effects that are highlighted in O'Keefe, are not obviously incorporated into this approach, but it is also true that there are no reasons for not to incorporate them either.

[vi] Here a proponent of the pragma-dialectical theory might cast some doubts and suggest that such a maneuver might be handled under by the 10th rule of dialectics, the norm that regulates language use. In (Eemeren & Grootendorst 2004, p. 195) the rule states that "discussants may not use any formulations that are insufficiently clear or confusingly ambiguous". We think that as in examples like ours the informational content is sufficiently clear, this norm is insufficient to handle the problem.

[vii] In our view the boomerang-effect is a possible perlocution of the communicative move in the case of appeal framing, although there are no externaliseable commitments of the speech act performed that might contradict the pragma-dialectical norms. Similar effects, in this paper subsumed under the term "framing", could suggest to some that the meta-theoretical principle of externalization put forward by the pragma-dialectical approach when studying argumentative statements is given up, and internalized positions are taken into

account. This need not be the case. The contribution of social psychology depends on the extent that knowledge of this field can be utilized for scholars of argumentation-theory. Our contribution aims at finding room to incorporate novel kind of data into theories of argumentation, and not to develop in detail our position on externalization. The incorporation of empirical data from social psychology into models of argumentation requires further discussion not undertaken here.

[viii] One relevant argument that can be raised against such uses of experimental findings boils down to the general problem of extending generalizations that are invariant under certain interventions in the laboratory. Especially in the special sciences invariant regularities between variables are usually invariant only for certain values of the variables and for certain background conditions the careful investigation of which is carried out only when a research program starts to grow (see: Woodward 2003). So, further empirical support is likely to be acquired as empirical research informed by both social psychology and argumentation theory keeps growing in quantity and significance.

[ix] "All derailments of strategic maneuvering are fallacies in the sense that they violate one or more of the rules for critical discussion and all fallacies can be viewed as derailments of strategic maneuvering." (Eemeren 2010, 198)

[x] In analytical philosophy, the term "dialectical effectiveness" (also referred to as "dialectical power") is used differently: an argument is dialectically effective if it presents the audience with a piece of reasoning they can rationally accept. Our use discussed in Section 5. is not related to the epistemic validity of arguments, just as our use of "rhetorical effectiveness" is not related to certain rhetorical traditions using this term.

[xi] According to the functionalization principle of pragma-dialectics "an adequate description and evaluation of argumentation can only be given if the purpose for which the argumentation is put forward in the interaction is duly taken into account" (Eemeren & Grootendorst 1995, p. 133).

[xii] Consider also Lumer (2010), who argues that: „as long as the feature of argumentation that makes of it a dialectical activity, namely, its recursivity, is the warrant of its legitimacy as a persuasive device, dialectical conditions will happen to be regulative for any piece of discourse as a persuasive device. Finally, I also want to underline that, as a consequence of their recursivity, dialectical procedures are also tools for the evaluation of acts of arguing. Remarkably, on this account, such dialectical procedures amount to nothing but further argumentation."

REFERENCES

Adúriz-Bravo, A., Bonan, L., Galli, L. G., Chion, A. R. & Meinardi, E. (2005). Scientific Argumentation in Pre-Service Biology Teacher Education. *Eurasia Journal of Mathematics, Science and Technology Education 1* (1), 76-83.

Donnelly, J. (2002). Instrumentality, Hermeneutics and the Place of Science in the School Curriculum. *Science & Education 11* (2), 135-153.

Eemeren, F. H. van (2010). *Strategic Maneuvering in Argumentative Discourse*. Amsterdam: John Benjamins

Eemeren, F. H. van & Houtlosser, P. (2009). Strategic maneuvering. In F. H. van Eemeren (Ed.), *Examining Argumentation in Context: Fifteen studies on strategic maneuvering* (pp. 1-23), Amsterdam: John Benjamins

Eemeren, F. H. van & Grootendorst, R. (2004). *A systematic theory of argumentation. The pragma-dialectical approach*. Cambridge University Press

Eemeren, F. H. van, & Houtlosser, P. (2001). Managing disagreement: rhetorical analysis within a dialectical framework. *Argumentation and Advocacy* 37, 150-157.

Eemeren, F. H. van, & Houtlosser, P. (2002). Strategic Maneuvering. Maintaining a Delicate Balance. In F. H. van Eemeren & P. Houtlosser (Eds.), *Dialectic and Rhetoric. The Warp and Woof of Argumentation Analysis* (pp. 131-159), Dordrecht: Kluwer Academic Publishers.

Eemeren, F. H. van & Grootendorst, R. (1995). The Pragma-Dialectical Approach to Fallacies. In H. V. Hansen & R. C. Pinto (Eds.), *Fallacies: Classical and Contemporary Readings* (pp. 130-145), The Pennsylvania State University Press

Garcia-Mila, M. & Andersen, Ch. (2008). Cognitive Foundations of Learning Argumentation. In S. Erduran and M. P. Jiménez-Aleixandre (Eds.), *Argumentation in Science Education: Perspectives from Classroom-Based Research*, Dordrecht: Springer Publishers.

King, P. M., & Kitchener, K. S. (1994). *Developing Reflective Judgment*. San Francisco: Jossey Bass.

Kolsto, S. D. & Ratcliffe, M. (2008). Social Aspects of Argumentation. In S. Erduran and M. P. Jiménez-Aleixandre (Eds.), *Argumentation in Science Education: Perspectives from Classroom-Based Research*, Dordrecht: Springer Publishers.

Kruglanski, A. & Higgins, E.T. (2007). S*ocial Psychology: Handbook of Basic Principles* (2nd edition). New York: Guilford Press

Kuhn, D. (2005). *Education for Thinking*. Cambridge: Harvard University Press.

Lumer, C. (2010). Pragma-dialectics and the function of argumentation.

Argumentation, 24(1), 41-69.
O'Keefe, D. J. (2007). Potential conflicts between normatively-responsible advocacy and successful social influence: Evidence from persuasion effects research. *Argumentation 21*, 151-163.
Shapin, S. (1994). *A social history of truth: civility and science in seventeenth-century England, Science and its conceptual foundations*. Chicago: University of Chicago Press.
Simonneaux, L. (2008). Argumentation in Socio-Scientific Contexts. In S. Erduran and M. P. Jiménez-Aleixandre (Eds.), *Argumentation in Science Education: Perspectives from Classroom-Based Research* (pp. 179-199), Dordrecht: Springer Publishers.
Tversky, A. & Kahneman, D. (1986). Rational choice and the framing of decisions. *Journal of Business* 59, 251-278.
Voss, J. F., Segal, J. W. & D. N. Perkins. (1991). *Informal reasoning and education*. Hillsdale, N.J.: Lawrence Erlbaum Associates.
Woodward, J. (2003). *Making Things Happen: a Theory of Causal Explanation*. Oxford
Zemplén, G. Á. (2007). Conflicting Agendas: Critical Thinking versus Science Education in the International Baccalaureate Theory of Knowledge Course. *Science and Education 16* (2), 167–196.
Zemplén, G. Á. (2008). Scientific controversies and the pragma-dialectical model: Analysing a case study from the 1670s, the published part of the Newton-Lucas correspondence. In F.H. van Eemeren & B. Garssen (Eds.), *Controversy and Confrontation – Relating controversy analysis with argumentation theory* (pp. 249-273), Amsterdam: John Benjamins.
Zohar, A. (2008). Science Teacher Education and Professional Development in Argumentation. In S. Erduran and M. P. Jiménez-Aleixandre (Eds.), *Argumentation in Science Education: Perspectives from Classroom-Based Research*, Dordrecht: Springer Publishers.