ISSA Proceedings 2014 ~ A Formal Perspective On The Pragma-Dialectical Discussion Model

Abstract: For the development of computation tools to support the pragma-dialectical analysis of argumentative texts, a formal approximation of the pragma-dialectical ideal model of a critical discussion theory is required. A basic dialogue game for critical discussion is developed as the foundation for such formal approximation. To this basic dialogue game, which has a restricted complexity, the more complex features of critical discussion can gradually be added.

Keywords: computerisation, critical discussion, dialogue game, formalisation, pragma-dialectics.

1. *Formalisation in preparation of computerisation*

Formalisation is one of the important developments in the field of argumentation theory emphasised by van Eemeren in his keynote address at the 8th ISSA conference. My contribution to the ISSA conference deals with the formalisation of one theory of argumentation: the pragma-dialectical theory (van Eemeren & Grootendorst, 2004; van Eemeren et al., 2014, pp. 517-613). This study is intended to contribute to a more encompassing research project, the overall goal of which is to create a formal foundation for a computational application of the pragma-dialectical theory.

The computational application of argumentation theory in general has developed into several directions, as is evident from, e.g., the overviews by Rahwan and Simari (2009) and van Eemeren et al. (2014, pp. 615-675). Instead of trying to formalise and computerise every possible application of the pragma-dialectical theory at once, the current aim is to create a foundation for computational tools to support the analysis of argumentative discourse. Although fully computerised pragma-dialectical analysis will presumably not be feasible for quite some time, smaller digital tools to assist human analysts in their analytical tasks can be realised on a shorter term.

One area in which such a smaller tool can offer support is the composition of the analytic overview. As the outcome of a (standard) pragma-dialectical analysis of

an argumentative text, the analytic overview "brings together systematically everything that is relevant to the resolution of a difference of opinion" (van Eemeren & Grootendorst, 2004, p. 118).**[i]** In order to arrive at an analytic overview, the analyst applies a two-step method. First, the ideal model of a critical discussion (van Eemeren & Grootendorst, 2004, pp. 42-68) is used as a heuristic to determine which parts of the original text are (or can be considered as) argumentatively relevant. By applying four analytical transformation, the original text is reconstructed in terms of a critical discussion (van Eemeren et al., 1993, pp. 61-62). In the second step, an analytic overview is abstracted from this reconstruction. The composition of the analytic overview is fully determined by the content of the reconstruction in terms of a critical discussion. Based on the discussion moves made by discussants in the analytical reconstruction, the following is determined as part of the analytic overview: the nature of the difference of opinion, the distribution of discussion roles, the starting points, the arguments, the structure of the argumentation and the argument schemes (van Eemeren & Grootendorst, 2004, pp. 118-119).

To develop a computational tool to support analysts in composing an analytic overview on the basis of a reconstruction of the original text in terms of a critical discussion, it is necessary to have a computational representation of the relations between the possible variations in the constitutive parts of the ideal model and those of the analytic overview. Preliminary to these relations, computational representations of the ideal model of a critical discussion, and of the analytic overview themselves are necessary. In the current paper a preparatory step towards the computational representation of the ideal model of a critical discussion is made by formalising part of the ideal model.

2. *A formal approximation of critical discussion*
The formal perspective on the pragma-dialectical ideal model is developed as a dialogue game. This dialogue game can be considered a formal approximation of the ideal model of a critical discussion. As an 'approximation', the dialogue game is not intended to replace the original model in any way – a conclusion that might inadvertently be drawn if it would be called a 'formalisation' proper. Additionally, the term 'approximation' indicates that it is unlikely that all features of the original ideal model can be preserved entirely in the formal dialogue game.

When a discrepancy between the original model and its formal counterpart occurs, this may in some cases indicate a flaw or imprecision in the original. In

other cases it can be the result of the streamlining that is required to conform to the expressiveness of the formalism used. More often than not, a formalism is less expressive than a model expressed in natural language. One reason why this is so, is the requirement in formal models to explicitly and unambiguously define what is included, while excluding everything else. In this respect the formal approximation is stricter than the original ideal model.

The notion of a 'formal approximation' is analogous to that of an 'empirical approximation' of critical discussion introduced by van Eemeren and Houtlosser (2005). Empirical approximations are used in the extended pragma-dialectical theory (van Eemeren, 2010), where the focus is shifted from the idealised case of a critical discussion in the standard theory to studying the intricacies of argumentative discourse in everyday use. Unsurprisingly, interlocutors in ordinary discourse turn out not to behave exactly in accordance with an ideal model of communication. This does however not mean that they abandon all ideals entirely. For argumentative discourse, the ideal of reasonableness is a case in point.

To study the actual practice of argumentative discourse, the pragma-dialectical ideal model can be used as an analytic heuristic to make sense of the conventionalised communicative activities by seeing how they diverge from the ideal model. In this view, the ideal model is realised in terms of its empirical counterparts in ordinary communication. An actual argumentative exchange is then said to be an empirical approximation of the ideal model of a critical discussion.

Although it should be clear that an ideal model does not actually occur in communicative reality**[ii]** – which is why actual argumentative discourse can merely be regarded *empirical* approximations – it may not be so clear why an ideal model could not be *formal*. Indeed, Krabbe and others (Krabbe & Walton, 2011, p. 246; Krabbe, 2012, p. 12; van Eemeren et al., 2014, p. 304) have observed that the pragma-dialectical ideal model can already be said to be formal in the sense of being procedurally regimented (*formal3* in Barth and Krabbe's taxonomy (1982, pp. 14-19; Krabbe, 1982)) and a priori or normative (*formal4*). The formal approximation of critical discussion developed as a dialogue game, is intended to also be formal in the sense of rigorously specifying the linguistically well-formed expressions and the way in which these can be combined and used in a discussion (*formal2*).

3. *Restricting the complexity of the model*
The formal approximation of critical discussion is not developed all at once. Instead, a basic dialogue game is developed to which more complex features of the original ideal model can be gradually introduced. This systematic approach has the practical advantage of decomposing a larger task, so that the smaller components can be developed at different times or by different people. A second, theoretic advantage is that the gradual introduction of complex features provide insight into the model itself because its features can be studied in isolation, without other aspects complicating matters.

The basic dialogue game is developed to fulfil the role of the simplified basis to which more complexity can later be added. To lower the complexity of the dialogue game, three restrictions are in place with respect to the original ideal model, which the dialogue game is a formal approximation of. First, only the dialectical dimension of critical discussion is taken into account, disregarding the realisation of discussion moves in the ideal model through speech acts (van Eemeren & Grootendorst, 1984) and the rhetorical dimension of strategic manoeuvring (van Eemeren, 2010). Second, the dialogue game offers players fewer choices and opportunities compared to the original model. This restriction is most evident in the exclusion of complex argumentation, only allowing an arguer to put forward one single argument for his standpoint. Third, only the argumentation stage of critical discussion is explicitly part of the dialogue game, while of the other three discussion stages a specific (uncomplicating) outcome is assumed.

For the confrontation stage, the assumption is that a single positive standpoint was put forward, which met with doubt. This restricts the dialogue game to single non-mixed differences of opinion about a single positive standpoint, excluding differences of opinion about multiple standpoints or where a negative or opposing standpoint is assumed. The main restriction resulting from the assumed outcome of the opening stage is that only a single argument may be put forward, which may only be challenged by doubt, not by contradiction. Since the concluding stage only comes after the argumentation stage, no assumptions have to be made about that stage.**[iii]** The overall result of the assumed outcomes of the confrontation and opening stages is that the basic dialogue game developed in the next section is a formal approximation of the dialectical dimension of the argumentation stage of non-complex, consistently non-mixed critical discussions about one positive

standpoint which is defended by appealing to a single justificatory reason.

4. *A basic dialogue game for critical discussion*

The dialogue game is introduced by means of five categories of rules. First, there are rules that determine the initial state of the game. Second, the moves that are available to the players are defined. Third, the effect of making moves on players' commitments is made clear. Fourth, the sequential rules determine in which order moves may be made, sanctioning the structure of the dialogue. Fifth, there are rules specifying how the game ends; both when and in whose favour. The rules of the dialogue game are based on the 15 'technical' rules of critical discussion (van Eemeren & Grootendorst, 2004, pp. 135-157). These rules should not be confused with the 'practical' code of conduct consisting of 10 commandments for reasonable discussants (van Eemeren & Grootendorst, 1992, pp. 208-209), which are based on the aforementioned 15 rules and are intended to be used as a rule of thumb in evaluating and conducting actual argumentative discussions. Due to the restrictions introduced in the preceding section, of the 15 rules, in particular rules 6-13 are relevant for the basic dialogue game.**[iv]**

In line with the ideal model, the basic dialogue game for critical discussion is played by two (teams of) players. The constitution of the players is left undetermined. In the ideal model the assumption is that the discussion parties are human interlocutors, but because the development of the dialogue game for critical discussion is intended to form a basis for pragma-dialectically oriented work in artificial settings, the nature of players of the game is left undefined. Eventually the dialogue game should be such that both human and artificial agents can play it.

How players internally represent the current and past states of the dialogue during the game and how they keep track of their own and the other player's commitments is not a concern for the rules of the dialogue game. In the case of human players the internal make-up is a matter for cognitive psychology (van Eemeren & Grootendorst, 1984, p. 6), in the case of artificial agents, for software engineering. For the basic dialogue game it is sufficient to assume there to be some way of modelling the players. The rules of the dialogue game will not refer to, nor take into account, the individual modelling or private belief sets of the players.

A further aspect of the make-up of players which is not addressed in the rules for

the dialogue game, is the matter of strategy. While playing the dialogue game, players have choices to make about their subsequent moves. Players can employ different strategies in playing the game to increase their chances of winning. Similar to the internal constitution of the players, their strategies are left undefined in the dialogue game rules. Rather, these strategies are taken to be part of the ('subjective' or 'internal') make-up (i.e. artificial modelling or psychological constitution) of the players.

The dialogue game rules assume there to be a formal language □ in which the propositions the game is about can be expressed. The nature of □ is not the object of the current study. It is therefore at present sufficient to take □ to consist of the sentences of propositional logic closed under the usual classical operators. All occurrences of φ or ψ in the rules refer to (atomic or molecular) propositions of □.

A second (formal) system is required to represent the inferences appealed to by players in the dialogue game. Because the basic dialogue game is only intended as a simplified foundation, no assumptions are made about the particular reasoning system underpinning the inferences used in the game. The only requirement is that there is some external method of deciding the soundness of inferences. Although more elaborate systems (for example the pragma-dialectical account of argument schemes with critical questions (van Eemeren & Grootendorst, 1992; Garssen, 1997), or non-monotonic systems of defeasible reasoning (e.g., Pollock, 1987; Dung, 1995) can be introduced as part of the gradual addition of complexity to the dialogue game, for the moment classical propositional logic can be taken to provide the inference rules applied by players in the dialogue game. Any reference to $\varphi \Rightarrow \psi$ can then be interpreted as an appeal to a rule of inference from propositional logic on the basis of which the acceptability of φ justifies the acceptability of ψ.

4.1 *Commencement rules*

The commencement rules determine the initial state of the game before the first move has been made. Because both the confrontation and the opening stages of critical discussion are not explicitly modelled, the assumed outcomes of these stages are reflected in the initial state. With respect to the confrontation stage, the result is that the basic dialogue game for critical discussion is played by two players to determine the tenability of a positive standpoint with respect to some proposition $\psi \in \mathcal{L}$.

Based on the assumed outcome of the opening stage, the two players are designated *Prot* and *Ant,* corresponding to the discussion roles of protagonist and antagonist in (the argumentation stage of) a critical discussion. *Prot* is defending a positive standpoint with respect to ψ, while *Ant* critically assesses the defence, having doubt regarding the acceptability of ψ. Another outcome of the opening stage is the agreement upon a set of material and procedural starting points. In the dialogue game the material starting points are represented by a static set *SP* (for Starting Points) of propositions both players accept. Because the players need at least one common starting point to engage in a fruitful discussion (van Eemeren & Grootendorst, 2004, p. 139), *SP* is assumed to be non-empty: $SP \neq \emptyset$.**[v]** The procedural starting points are reflected in the following three assumptions: the players agree to play by the rules of the game; the players conform to a turn-based approach, where a player makes one of the moves defined in the next subsection after which the turn passes to the other player; the players have agreed upon an inferential system and a way to check the acceptability of instantiated inferences.

Finally, the purpose of the dialogue game is for the players to resolve their difference of opinion about ψ, where Prot will defend a positive standpoint with respect to ψ by providing argumentation supporting ψ and Ant critically tests ψ's tenability by challenging the argumentation.

4.2 *Move rules*
Each turn one of the players makes one move. The moves made are of the form *type(φ)*. The function the move fulfils in the context of the dialogue game is designated by type. The propositional content of the move is made up by either an (atomic or molecular) proposition $\varphi \in \mathcal{L}$, or the application of an inference rule *($\Rightarrow$)* on a pair of propositions $\varphi, \psi \in \mathcal{L}.$ Each unique instantiation of a move, i.e. the combination of a type and propositional content, can only be used as a move by a player once per game – in other words, a player may not repeat the exact same move he has already made before.

The basic dialogue game for critical discussion is asymmetrical with respect to the role the two players fulfil. Because of this, there are two separate sets of moves which are available to the two players of the game depending on their role. To defend his standpoint about ψ, *Prot* has the following moves available to him:

(M1) *argue(φ)*: to present φ as an argument for ψ. (Note that $\varphi \neq \psi$, to prevent

circular reasoning).

(M2) *identify(φ)*: to initiate the intersubjective identification procedure, in order to check the mutual acceptability of *φ*, here taken to be decidable by checking whether *φ∈SP.*

(M3) *test(φ⇒ψ)*: to initiate the intersubjective testing procedure, in order to test the acceptability of the justificatory force of *φ* for *ψ*, assumed to be decidable through some external method, by determining whether *φ⇒ψ* is a sound instantiation of an inference rule.

(M4) *retract(φ)*: to retract commitment to an argument, where *φ∈CSProt.*

(M5) *conclusive_defence(ψ)*: to claim victory after a successful defence of a positive standpoint with respect to *ψ.*

To critically test *Prot's* argumentation, *Ant* can make use of the following moves:

(M6) *accept(φ)*: to accept *φ* in defence of *ψ.*

(M7) *challenge(φ)*: to cast doubt on the material premise *φ* of an earlier move argue*(φ).*

(M8) *challenge(φ⇒ψ)*: to cast doubt on the justificatory force *φ⇒ψ* of an earlier move argue*(φ).*

(M9) *successful_attack(φ):* to claim the successful challenging of the acceptability of *φ.*

(M10) *successful_attack(φ⇒ψ)*: to claim the successful challenging of the acceptability of *φ⇒ψ.*

(M11) *conclusive_attack(ψ)*: to claim victory after a successful criticism of *Prot's* argumentative defence of *ψ.*

4.3 *Commitment rules*

As a result of making moves, players acquire (and retract) commitments. These commitments are called 'dialectical', referring to their dialectical function in a discussion, and are conceived of in line with Hamblin's (1970) conception. If a player is committed to a certain proposition, this means he should be prepared (or is even obliged) to defend the acceptability of the proposition if prompted to do so, in other words he assumes a potential burden of proof.**[vi]**

Both players are associated with an individual commitment store in which the propositions a player is committed to in the dialogue are kept track of. A player's commitment store is represented by a set of propositions, which is publicly readable (meaning that it is available for all players) and privately writeable

(meaning that a player can only directly update his own commitment store, not that of the other player). At the start of the game, the players' commitment stores are filled with some propositions. Based on the requirements at the start of the game, *Prot's* commitment store contains the common starting points and the standpoint ψ,[vii] while *Ant's* commitment store only contains the common starting points. It is important to note that the respective commitment stores may contain additional propositions than those mentioned here, so long as $\psi \notin CSAnt$ – otherwise Ant would also be committed to the standpoint before starting the game, so that no difference of opinion would arise in the first place. Before any moves are made, the players' commitment stores are as follows:

(C1) *CSProt = SP ∪ {ψ}.*
(C2) *CSAnt = SP.*

As a result of moves during the game, these commitment stores can be updated. The performance of some moves results in the acquisition of new commitments, while other moves retract commitments. There are three moves in the basic dialogue game for critical disussion that result in an update of the player's commitment store (with the affected commitment store before the equals sign, and the resulting updated commitment store after it):

(C3) *argue(φ): CSProt = CSProt ∪ {φ, φ⇒ψ}.*
(C4) *retract(φ): CSProt = CSProt – {φ, φ⇒ψ}.*
(C5) *accept(φ): CSAnt = CSAnt ∪ {φ, φ⇒ψ}.*

4.4 *Sequential rules*

The preceding two subsections presented respectively which moves there are in the basic dialogue game for critical discussion and what the effect is of making these moves in terms of the players' commitments. The sequential rules introduced in this subsection define when moves can be made. The dialogue game is always started by *Prot* making a move argue(φ) to put forward φ in defence of the standpoint at issue, *ψ.* At which moments the other moves can legally be made is dependent on the state of the game at that moment. The relevant aspects of the state of the game in this respect are the move made by the other player in the preceding turn, and in some cases the content of the commitment stores of the players. This results in the following rules:

(S1) *argue(φ): starting move, if ψ is argued for, then φ≠ψ.*

(S2) *identify(φ): may follow challenge(φ), where φ represents an argument's propositional content.*

(S3) *test(φ⇒ψ): may follow challenge(φ⇒ψ), where φ⇒ψ represents an argument's justificatory force.*

(S4) *retract(φ): may follow challenge(φ), challenge(φ⇒ψ), successful_attack(φ), or successful_attack(φ⇒ψ)*[viii].

(S5) *conclusive_defence(ψ): follows accept(φ).*

(S6) *accept(φ): may follow identify(φ) if φ∈SP, test(φ⇒ψ) if φ⇒ψ is sound, or argue(φ).*

(S7) *challenge(φ): may follow argue(φ), or test(φ⇒ψ) if φ⇒ψ is sound.*

(S8) *challenge(φ⇒ψ): may follow argue(φ), or identify(φ) if φ∈SP.*

(S9) *successful_attack(φ): follows identify(φ) if φ∉SP.*

(S10) *successful_attack(φ⇒ψ): follows test(φ⇒ψ) if φ⇒ψ is not sound.*

(S11) *conclusive_attack(ψ): follows retract(φ).*

Figure 1: The sequential structure of the basic dialogue game.

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To clarify the sequential structure of the basic dialogue game, I present Figure 1 as a visualisation of the sanctioned sequences in terms of a tree. The nodes of the tree are the moves of the dialogue game (with the format [Player: type(propositional content)] and the arrows indicate the possible transitions between moves (from one turn to the next).[ix] The node at the top of Figure 1 denotes the start of the game, i.e. the first move. The dialogue game terminates at one of the two nodes at the bottom of Figure 1. The route straight through the middle of the tree is the shortest route where Ant immediately accepts the

argument. In the left and right routes, the acceptability of, respectively, the propositional content and the justificatory force of the argument are challenged.

4.5 *Termination rules*

The concluding stage is not explicitly incorporated in the basic dialogue game for critical discussion. It is nevertheless clear that the winning or losing of the dialogue game can be based on the outcome discussants can obtain in the argumentation stage of the ideal model. The dialogue game terminates if one of the players performs the move *conclusive_attack(ψ)* or *conclusive_defence(ψ)*. Once the game has stopped in this way, the winner is *Prot* if $\varphi \in CSAnt$, (corresponding to the case where the antagonist accepts φ as an argument in defence of *ψ*) and *Ant* otherwise.**[x]**

5. *Conclusion*

I began this paper by discussing the role the basic dialogue game for critical discussion plays in a more encompassing research project. The aim of this project is to lay a formal foundation for the development of digital tools to aid the pragma-dialectical analysis of argumentative discourse. To constrain the scope of the project, the current focus is on tools to computerise the abstraction of an analytic overview from a reconstruction of a text in terms of a critical discussion. In preparation of the development of such an analytical tool, a formal approximation of the ideal model of a critical discussion is necessary, together with the relation between this formal approximation and the elements of an analytic overview.

The formal approximation is started in this paper with a basic dialogue game for critical discussion. The game is defined in terms of rules for commencement, moves, commitments, sequences and termination. By following the rules of the basic dialogue game, two players can play a game by entering in a simple dialogue. One of the players presents an argument in defence of a standpoint that has not been mutually accepted. The other player can respond by challenging the propositional content or justificatory force of the argumentation, or by accepting it. A challenge can be parried by initiating the relevant intersubjective procedure to check the acceptability, or can be followed by a retraction of the argumentation. Depending on the outcomes of the intersubjective procedures and the acceptance or retraction of the argumentation, one of the two players wins the game.

Even though it is obvious from this simple characterisation that there is not much inherent value in the basic dialogue game as a playable game, it does however serve a purpose as a foundation for future work. This goal required the dialogue game to be relatively easy to develop and understand, so that formal approximations of more complex features of the ideal model can be modelled on the basis of this simplified dialogue game, and their effect be investigated systematically and in isolation.

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ISSA Proceedings 2014 ~ The Disguised Ad Baculum Fallacy Empirically Investigated – Strategic Maneuvering With Threats

Ad baculum threats can be seen as a mode of strategic maneuvering which takes on a reasonable appearance in real life situations when it mimics, legitimate pragmatic argumentation. In this paper the hypothesis was tested that ad baculum fallacies are seen as less unreasonable than clear cases when they are presented as if they are well-meant advices in which the speaker cannot be held responsible for the occurrence of the unpleasant consequences if he does not get his way.

1. *The argumentum ad baculum in the standard theory of pragma-dialectics*
Threatening the other discussion party with negative, unpleasant consequences – for instance, by threatening him with physical violence or (more subtly) by threatening him implicitly with sanctions – if that party is not willing to refrain from advancing a particular standpoint or from casting doubt on a particular standpoint, is an outspoken example of a fallacy ("Of course, you can hold that view, but then you should realize that it will very hard for me to control my men in response to you"). Not surprisingly, this particular type of fallacy (conventionally named the *argumentum ad baculum* or the 'fallacy of the stick') has become firmly incorporated in the traditional lists of fallacies presented in introductory textbooks in (informal) logic and argumentation (cf. Walton 2000).

Seen from the perspective of the standard theory of pragma-dialectics (van Eemeren & Grootendorst 1992; 2004), the argumentum ad baculum is an example

of fallacies violating the Freedom Rule (i.e. the rule for governing the first stage of a critical discussion, the confrontation stage, where standpoints are put forward by the protagonist and doubt or criticism are raised by the antagonist, in short: the stage where the difference of opinion is expressed) because, by threatening the other party and putting pressure upon him to silence and to close his mouth, the inalienable right of a discussion party to put freely forward standpoints or cast doubt on standpoints is severely hampered and restricted. As a result, a full-blown discussion hardly gets off the ground, ruling out the possibility of a resolution of the difference of opinion on the merits.

Based on the consistent results of a 13 year-lasting, comprehensive empirical research project concerning the judgments of ordinary arguers of the reasonableness of fallacious and non-fallacious discussion contributions, entitled *Conceptions of Reasonableness*, it can safely be concluded that ordinary arguers deem fallacious contributions as unreasonable moves, while they evaluate sound contributions as reasonable (van Eemeren, Garssen & Meuffels 2009); compared with the unreasonableness of the 24 investigated fallacies in that project (such as the *ad hominem*, the *ad misericordiam*, evading the burden of proof, the *ad populum*, the *ad consequentiam* and so on), the *ad baculum* fallacy – the particular fallacy we will focus on in this paper – was judged as the least reasonable discussion move (cf. van Eemeren, Grootendorst & Meuffels 1999).

From the empirical data collected in the project *Conceptions of Reasonableness* it can be inferred that ordinary arguers know (at least on a pre-theoretical level) where precisely to trace the boundaries of dialectical rationality; thus, at least to a certain extent, ordinary arguers are aware of their dialectical obligations. Moreover, ordinary arguers also expect that their interlocutors apply similar norms and criteria for evaluating the reasonableness of discussion contributions as they themselves do, upholding more or less the same standards of dialectical reasonableness. Last, so can be inferred from the results of our empirical research that formed a sequel of the above mentioned project, ordinary arguers use the concept of 'reasonableness' not only in a descriptive, but also in a normative sense: the discussant who violates one of the rules for critical discussion and thus does not observe the critical ideal of dialectical reasonableness, can be held accountable and reproached for violating commonly shared norms incorporated in the rules for critical discussion (van Eemeren, Garssen & Meuffels 2012).

2. *The argumentum ad baculum in the extended theory of pragma-dialectics*

All these firmly established empirical facts, however, seem at first sight not quite in line with the (supposed) frequency of the ad baculum fallacy in everyday argumentative discourse: why ever would 'rational' discussants use hardly efficient means like the ad baculum fallacy, a discussion move they can know and expect to be denounced by the other discussion party? Why ever would they portray themselves as being unreasonable by openly deviating from the rules of critical discussion, in the knowledge that this will make their discussion move non-persuasive in the end? Part of an answer to this paradox can be found in the so called *extended standard theory of pragma-dialectics,* in which a rhetorical component of effectiveness has been added to and integrated within the dialectical framework of classical, standard pragma-dialectics (van Eemeren 2010).

In their aim to be effective, discussants will maneuver strategically in such a way that they will try to achieve their dialectical goal – keeping to the rules of critical discussion – while simultaneously trying to realize their rhetorical goal: winning the discussion by having their standpoint accepted by the other party. Balancing these two objectives of dialectical resolution-oriented reasonableness and rhetorical effectiveness and trying to reconcile the simultaneous pursuit of these two aims, which may be at times at odds, the arguers make use of what can be called *strategic maneuvering*: a discussant tries to steer and maneuver the discussion to his advantage like a ship maneuvers for the best position in a sea battle (van Eemeren 2010: 40).

In itself there is nothing wrong with wanting to win a discussion, but trying too hard can lead to a derailment: if arguers allow their commitment to having a reasonable exchange be overruled by their eagerness for achieving effectiveness, their strategic maneuvering has been derailed. Viewed from this perspective, fallacies are derailments of strategic maneuvering that involve violations of critical discussion rules. By violating the rules for critical discussion the argumentative move they have made hinders the process of resolving a difference of opinion on the merits and so their strategic maneuvering must be condemned as fallacious.

Derailments of strategic maneuvering may easily escape attention of the interlocutors because deviations of the rules of critical discussion are often hard to detect since none of the parties in the discussion will be keen on portraying

themselves as being unreasonable – if only because this will make their contribution ineffective in the end. So arguers will most likely try to stick to the established dialectical means for achieving rhetorical objectives which are possibly at odds with the dialectical rationale for a certain discussion rule, and "stretch" the use of these means so much that the fallacious maneuvering is also covered (van Eemeren 2010: 140).

As a consequence, derailments of strategic maneuvering can be very similar to sound instances of strategic maneuvering, so that in practice it is not always crystal clear where precisely the boundaries between sound and fallacious strategic maneuvering are to be found: the discrimination between fallacious and sound modes of strategic maneuvering is not a simply black or white issue. The various modes of strategic maneuvering that can be distinguished in argumentative reality can be imagined as representing a continuum ranging from evidently fallacious to evidently sound strategic maneuvering. This also goes for strategic maneuvering with particular variants of the argumentum ad baculum: at the one pool one can distinguish straightforward, clear-cut cases of illegitimate, fallacious ad baculum moves, subsequently a grey zone of argumentative threatening moves whose soundness or fallaciousness is not immediately clear, and at the other pool evidently legitimate, sound uses of threats (for instance, at the breakfast table when one authoritative party (the parents) threatens the other party (the child) with sanctions if she refuses to obey).

In the project *Conceptions of Reasonableness,* purposely, only clear cases of fallacies had to be judged by the participants: after all, the aim of that project was to test the conventional validity of the pragma-dialectical discussion rules (i.e. investigating whether the norms of ordinary arguers when evaluating the soundness of argumentative discourse are in agreement with the critical norms of pragma-dialectics); it was certainly not the aim of that project to investigate the factors that could influence the identification and recognition of fallacious or sound discussion moves. As said before, in everyday argumentative practice discussants maneuver strategically, attempting to hide and mask clearly unreasonable moves – like the ad baculum fallacy – by presenting these moves in such a way that they mimic and look like reasonable moves. We conjecture that one of the ways to disguise the ad baculum fallacy is to present this move as a well-meant advice backed up by legitimate pragmatic argumentation in which the speaker cannot be held responsible for the occurrence of the unpleasant

consequences if he does not get his way. This hypothesis was tested systematically in two experiments.

3. *Pragmatic argumentation, advising and threatening*
The soundness of argumentation depends – among other things – on how it employs one of the possible argument schemes.

In pragmatic argumentation, which is a subtype of causal argumentation, the standpoint recommends a certain course of action (or discourages a certain course of action) and the argumentation consists of summing up the favorable respective unfavorable consequences of adopting that course of action ("You shouldn't drink too much alcohol, because it leads to long-term health problems").

The pragma-dialectical characterization of the argument scheme of pragmatic argumentation is as follows:
1. Standpoint: Action X should be carried out
1.1. Because: Action X will lead to positive result Y
(1.1') And: (Actions of type X [such as X] that lead to positive results of type Y [such as Y] must be carried out)

Pragmatic argumentation can only succeed if the causal relation between the two elements concerned (X is the cause of Y; cf.: "too much alcohol consumption leads to health problems") is evident and if the positive (or negative) value of the consequence Y (i.e. "having health problems is undesirable") speaks for itself or is immediately recognized as such. In case of the ad baculum threat the other party is put under pressure by pointing or hinting at negative consequences for the other party if that party does not give in; pragmatic argumentation and the ad baculum move are thus in argumentation-theoretical respects alike in the sense that in both moves the (un)desirability of the consequences of a cause, event or act are being exploited. However, in contrast with pragmatic argumentation, the (implicit or explicit) consequences of an ad baculum move are without exception negative (in certain circumstances even frightening and fear-inducing).

Pragmatic argumentation is by convention associated with the speech act of advising (or warning) (cf. van Poppel 2013): in order to make an advice or warning acceptable for an audience ("You should do…" or "You shouldn't do …"), pragmatic argumentation is characteristically adduced. Both the act of advising and the act of threatening are speech acts that can be classified – looking at their

(primary) illocutionary goal – as directives; moreover, both speech acts have felicity conditions in common (such as the preparatory condition concerning the authoritative status of the source of the advice/threat).

Mimicking the ad baculum as a well-meant advice that is in the interest of the hearer would certainly not be sufficient – as we conjecture – for the persuasiveness of such disguised form of threat. Despite all the similarities and resemblances between the uses of the pragmatic argument scheme adduced in advises and threats, there is one crucial difference between these two speech acts: in case of an advice or warning ("You shouldn't drive so speedy, darling. It's raining!") the other party in the discussion has full freedom and responsibility for the occurrence (or non-occurrence) of the effect Y (in the causal relation: If X, then Y); however, in case of a threat the party who advances the threat can be completely held responsible for the occurrence of the negative outcome ("If you still persist in that awful behavior, I have to dismiss you"). The secondary illocutionary goal of a threat can thus be conceived as that of a commissive (i.e. a commitment undertaken by the speaker *vis-à-vis* the listener to do something and act according to what is explicitly said or implied by what is said).

In order to disguise the ad baculum in a strategically effective way and to make this fallacious move look like a legitimate discussion move, it is vital for the speaker to suggest/hint that evidently not he or she, but another party or event outside the discussion can be held accountable for the occurrence of the undesirable, negative outcome. Expressed differently: the causal relation in the pragmatic argument scheme (X is the cause of the effect Y, or: the act of X is leading to the consequence Y) is deceitfully represented and treacherously exploited in such a way that the arguer (the person who advances the threat) cannot be held accountable for the occurrence of the negative effect Y: it is after all not the arguer but a party outside the current discussion that can be blamed.

To illustrate these points, take the following two examples (the first is an example of an openly, straightforward clear-cut case of an argumentum ad baculum, the second an example of a disguised ad baculum – disguised according to the conjectural ideas above). Suppose two neighbors (Sally and John) argue about the annoying barking of John's dog. Sally is completely fed up with that barking, especially in the night.

Sally: *You should learn that dog not to bark at night; every night I wake up*

because of that terrible noise.
John: *What nonsense, he really doesn't bark that m*uch at all.
Sally: *If you keep saying that, I'll harm him.*

Sally's last move is forthright ad baculum: she explicitly commits herself to 'kill' the dog if John refuses to take any measures. But Sally could have chosen to present her last move in a strategically, perhaps more effective way – more effective as we predict –, namely as a well-meant advice, disguising the threat but without undoing it:

Sally: *You should learn that dog not to bark at night; every night I wake up because of that terrible noise.*
John: *What nonsense, he really doesn't bark that much at all.*
Sally: *I would strongly advise you to take effective measures to stop that awful barking. You wouldn't like it if somebody would harm your beloved dog, wouldn't you?*

In the two experiments reported in this paper, the crucial contrast is that between the (perceived) unreasonableness of straightforward ad baculum moves and the unreasonableness of disguised ad baculum moves. In all cases we present instantiations of the disguised fallacy as a well-meant advice that is in the interest of the addressee, making use of indicators of the speech act of 'advising' such as: "I would advise you…"; "It would be wise if you…."; "If I were you, I would…"; "If I were in your position, I would…"; "I would recommend you …", If you are asking me, I would I think …."

The arguer, however, has still various other – perhaps strategically effective – presentational devices at his disposal to mask other aspects of the threat, for instance devices to undo the inherent, annoying pressure of the ad baculum move, which is at odds with someone's personal freedom. To guarantee that it is absolutely not his intention to threaten the opponent and to put pressure on him, the arguer can strategically emphasize that the other party is "totally free to decide whatever she wants": "Of course you are absolutely free to decide whatever you want, but if I were in your position …"; "It's totally up to you, but I would advise you…". In the two experiments we conducted, we presented (hypothetical) discussion fragments to the participants in which – in case of the disguised ad baculum – only indicators of the speech act of 'advising' were used.

4. *The experiment*
In the current study we tested the following main hypothesis:

Ad baculum fallacies are judged as less unreasonable than clear-cut, straightforward cases of ad baculum moves when they are presented as if they are well-meant advices in which the speaker can't be held responsible for the occurrence of the unpleasant consequences if he does not get his way.

The experimental (Dutch) subjects (Ss) were exposed to 42 discussion fragments; some contained fallacious moves, others did not. In each dialogue, the Ss had to rate the (un)reasonableness of the last contribution to the discussion on a 7-point Likert type of scale, ranging from 'very unreasonable' (= 1) to 'very reasonable' (= 7).

4.1 *Material*
42 discussion fragments were constructed, in which 7 different types of fallacious and non-fallacious discussion contributions occurred; each type was represented by 6 instantiations:

(1) straightforward, clear-cut cases of *ad baculum* moves,
(2) disguised *ad baculum* moves,
(3) sound, i.e. reasonable moves (not based on a pragmatic argument scheme),
(4) sound, i.e. reasonable moves (based on a pragmatic argumentation scheme),
(5) the *circumstantial* variant of the *ad hominem* fallacy,
(6) the *tu quoque* variant of the *ad hominem* fallacy,
(7) the *abusive* variant of the *ad hominem* fallacy.

The general structure of these discussion fragments was fixed: all fragments consisted of 3 turn dialogues between two discussants; each fragment was preceded by a short contextual description to ensure that the Ss interpreted the fragment in a more or less homogeneous way. Just like in our previous studies we did not include loaded topics; we tried to keep the dialogues as simple as we could and avoided humorous situations or elements that could otherwise distract our respondents.

In the first turn, the protagonist put forward a standpoint, supported by an argument. In the second turn, the antagonist made explicitly or implicitly clear not to accept that standpoint, backed up by an argument. In the last turn (in case of a straightforward ad baculum), the protagonist implicitly and indirectly

threatened the other party by pointing at negative consequences if he does not get his way, like this:

(1) *Straightforward ad baculum*
Employer and employee during a performance interview

Employee: *I think it is time for a promotion. My work really improved much and I receive a lot compliments from my colleagues.*
Employer: *I don't agree, there are a lot of points for improvement.*
Employee: *Well, you may maintain that point of view, but I know about your creative way of making your tax returns and you do not want that out in the open.*

Notice that in the example above, as in all the other 5 instantiations of the straightforward ad baculum move, the protagonist threatens the other party implicitly with non-physical consequences that are indirectly put forward, i.e. not explicitly spelled out. Making use of such indirect, non-physical consequences in spelling out the negative consequences makes it much harder for us to confirm our main hypothesis, compared with physical, direct ad baculum moves.**[i]** The following is an example of a disguised ad baculum, constructed according to the theoretical insights outlined above:

(2) *Disguised ad baculum*
The stage-manager and the key actress are discussing the suitability of her costume.

Stage-manager: *This costume is really splendid, it does perfectly fit with the role.*
Actress: *I hate it!! That dress makes me look awfully fat!*
Stage manager: *I would advise you just to put it on, it's really a nuisance if another main actress has to be looked for.*

Once again, in the current experiment the disguised ad baculum is always presented (in the 6 instantiations) as an explicit advice which is in the interests of the addressee, accompanied by an explicit indicator of the speech act 'advising'.

For the purpose of constructing a *base line* for comparisons and contrasts between fallacious and non-fallacious moves, in 6 dialogues 'normal' non-fallacious reactions were included (reactions, however, in which no pragmatic argumentation was used, but other argument schemes). For an example of this type of dialogue, see (3):

(3) *Sound argumentation* (*in which the pragmatic argument scheme is not used*)
A young couple discusses their opinions after seeing the stage play.

Alissa: *What a wonderful play! The actors had a very professional mimic and attitude.*
Mark: *I didn't like the play at all, the topic was very boring.*
Alissa: *No, on the contrary, that topic wasn't boring at all! It covered all the facets of real life and it was highly instructive.*

In (4), an example of sound argumentation in which pragmatic argumentation is used, is presented. Evidently, such examples are relevant for an appropriate contrast between the (perceived) (un) reasonableness of the fallacious use of pragmatic argumentation (as is the case in disguised ad baculum moves) and the (perceived) (un) reasonableness of sound, non-fallacious use of pragmatic argumentation:

(4) *Sound argumentation* (*in which the pragmatic argument scheme is used*)
Pim and Anke in their car on the highway, discussing the speed limits:

Anke: *Please slow down! The upper limit here is 100 km.*
Pim: *Don't be so nervous, everybody is driving faster so it doesn't really matter.*
Anke: *If I were you, I would keep up to the maximum speed; soon you will be caught and get a ticket.*

Three types of filler items were included as well: 6 dialogues containing a *tu quoque fallacy*, 6 dialogues containing a circumstantial *ad hominem fallacy*, and 6 dialogues containing an *abusive ad hominem fallacy* (for concrete examples, see van Eemeren, Garssen & Meuffels 2009). These fillers acted as 'gate keepers': we included these kinds of fallacies in the questionnaire because, given the consistent results reported in the *Conceptions of Reasonableness* project, we know exactly what to expect when it comes to reasonableness judgments about these fallacies (namely, the *abusive attack* is judged as a very unreasonable move, whereas the *circumstantial* as well as the *you too*-variants tend to be judged as reasonable moves).**[ii]** If these expectations would not be met in the current study, this would imply a serious threat to the validity of the present investigation. A second reason for including these fillers was to mask the precise aim of our research focusing on ad baculum fallacies. Varying the type of fallacy made it more difficult for our respondents to infer a pattern in the material and to

guess what our experiment was aimed at.

4.2 *Participants*

A total of 93 secondary school students (pre-university level, ranging in age from 14 to 18; $M = 15.94$; $SD = .75$; 41% male, 59% female) took part in the pencil-and-paper test during regular class hours. Some of them knew the term fallacy, but none of them had received any systematic education regarding argumentation.

4.3 *Statistical analysis*

The data were analyzed by means of a multivariate analysis of variance ('mixed model' approach for repeated measurements), with 'subject' and 'instantiation' as *random* factors and the variable 'type of fallacy' as a fixed factor. The *random* factor 'instantiation' is nested within the levels of the fixed factor 'type of fallacy', whereas the random factor 'subject' is fully crossed with the random factor 'instantiation' and the fixed factor 'type of fallacy.' The statistical consequence of this design is that – instead of ordinary F-ratio's – so-called *quasi* F-ratios have to be computed (denoted as F'), while the degrees of freedom have to be approximated (see Clark 1973).

	M	SD
Clear-cut case ad baculum (k = 6)	2.81	0.70
Abusive ad hominem (k = 6)	2.74	0.77
Circumstantial ad hominem (k = 6)	4.33	0.77

Table 1: Average reasonableness score for the fillers, ad baculum moves and sound moves; n = 93 (k = number of instantiations)

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4.4 *Results*

Looking first at the fillers (Table 1), it is evident that the present results are in line with the results we found in our previous studies conducted in the project *Conceptions of Reasonableness.* The *abusive* fallacy is again judged to be most unreasonable, next the circumstantial attack and last the *tu quoque* fallacy, both of which tend again to be viewed as reasonable moves. Moreover, the perceived unreasonableness of the straightforward ad baculum fallacy as well as the judged reasonableness of sound argumentation is equally well in accordance with the empirical findings in of *Conceptions of Reasonableness*. In sum, the

reasonableness scores depicted in Table 1 are a positive indication for the validity of the data.

Do the respondents – as predicted in our hypothesis – regard 'hidden' ad baculum moves which mirror well-meant advices supported by pragmatic argumentation indeed less unreasonable as straightforward, clear-cut cases of ad baculum? In Table 2 the relevant data are presented.

	M	SD
Clear-cut case *ad baculum* ($k = 6$)	2.81	0.70
Disguised *ad baculum* ($k = 6$)	4.39	0.86
Sound (non-pragmatic) argumentation ($k = 6$)	5.17	0.60
Sound (pragmatic) argumentation ($k = 6$)	5.74	0.66

Table 2: Average reasonableness score for four types of moves; $n = 93$ (k = number of instantiations)

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The average reasonableness scores pertaining to the four types of moves in Table 2 proved to differ statistically from each other: F' (3,22) = 14.27, $p <$ .01; $\eta2$ = .36. By means of three orthogonal *post hoc* comparisons we contrasted, first, sound non-pragmatic argumentation with sound (pragmatic) argumentation, but no statistical difference could be found (F' (1,22) = 1.43, n.s.). Second: the disguised ad baculum differed significantly from the average of the sound non-pragmatic argumentation and the sound pragmatic argumentation: F' (1,22) = 6.64, $p <$ .07; $\eta2$ = .03. Last, and most important for our hypothesis, the disguised ad baculum was indeed found to be less unreasonable than the straightforward ad baculum: F' (1,22) = 10.97, $p <$ .01, $\eta2$ = .10. The difference between these two fallacious threats (1.58) is considerable, given the range of a 7-point scale. Our respondents clearly judged the straightforward ad baculum threat as an unreasonable argumentative move, but when it comes to judging the disguised form of this fallacy they are clearly in doubt: overall this fallacious move is judged as neither unreasonable nor reasonable.

5. *Replication*
In order to be able to generalize the results with more confidence, a replication was carried out, making use of different messages and different subjects. 128 students (high vocational education; age range 17-31 (M = 20.59; SD = 2.66)) were exposed to 42 different, but equivalent messages as in the experimental study above. Instead of the *circumstantial* variant of the *ad hominem*, we now

used the fallacy of *shifting the burden of proof* and – once again – the *tu quoque* variant of the *ad hominem* as "gatekeepers" of the validity. This time each type of fallacy and sound argumentation was represented not by 6, but by 7 instantiations.

	M	*SD*
Clear-cut case *ad baculum* ($k = 7$)	2.74	0.65
Disguised *ad baculum* ($k = 7$)	3.76	0.66
Sound (non-pragmatic) argumentation ($k = 7$)	5.59	0.59
Sound (*pragmatic*) argumentation ($k = 7$)	5.58	0.74

Table 3: Average reasonableness score for different types of moves; $n = 128$ (experiment 2: replication); k = number of instantiations

Table 3: Average reasonableness score for different types of moves; n = 128 (experiment 2: replication); k = number of instantiations

The average reasonableness scores for the gatekeepers were again in line with the expectations, derived from the consistent results in the *Conceptions of Reasonableness* project (clear case ad baculum: $M = 2.74$; $SD = 0.65$; *shifting the burden of proof: M = 3.06; SD = 1.05; tu quoque: M = 4.12; SD = 0.84*; sound (non-pragmatic) argumentation: $M = 5.59$; $SD = 0.59$). The statistical results of the replication are also in accordance with those of the original experiment. Once again, there were statistically significant differences between the four types of reactions depicted in Table 3: $F'(3, 25) = 16.65$, $p < .001$, $\eta2 = .40$.

The orthogonal *post hoc* contrast between sound non-pragmatic argumentation and sound *pragmatic* argumentation was once again found to be statistically not significant: $F'(1,25) = 0.00$, p = .99. Just as in the previous experiment, the disguised *ad baculum* fallacy differed significantly from the average of the two types of reasonable argumentation: $F'(1,25) = 18,49$, $p < .001$. Last, the disguised *ad baculum* was once again found to be substantially less unreasonable than the explicit variant of the *ad baculum* fallacy: $F'(1,25) = 4.33$, $p < .05$.

6. *Conclusion*
The empirical results of the original experiment and those of the replication are quite similar and in line with our theoretical expectations: Ordinary arguers clearly reject straightforward ad baculum moves; disguised forms of such moves are judged substantially less unreasonable by our experimental subjects, since these moves take on a reasonable (but treacherous) appearance – indeed, the Latin word *fallax* means deceptive or deceitful – when they are presented as if

they are well-meant advices backed up by *pragmatic* argumentation in which the speaker cannot be held responsible for the occurrence of the unpleasant consequences if he does not get his way.

In earlier empirical studies in which we investigated strategic maneuvering with *abusive ad hominem attacks,* we showed that direct attacks are judged as less unreasonable when they are presented as if they are critical questions pertaining to the argument scheme for *authority* argumentation (van Eemeren, Garssen & Meuffels 2010); we coined that strategic effect the *mimetic effect*. Given the current empirical findings concerning *ad baculum* fallacies it can be concluded that this mimetic effect is not specifically bound to strategic maneuvering with *ad hominem* fallacies, but can be generalized to other types of fallacies.

Another remarkable empirical finding that is strikingly similar in both studies is the size of this mimetic effect: the disguised forms of both fallacies (i.e. the ad hominem as well as the ad baculum) are evidently not judged as fully or fairly reasonable moves; the judgments center around the neutral midpoint of 4 on the 7-point scale. So, ordinary arguers are clearly in doubt and are quite uncertain when it comes to judging the reasonableness of these disguised forms. The appearance of a certain, modest degree of reasonableness is presumably sufficient for arguers to get away with such treacherous moves in argumentative discussions.

NOTES
i. In the experiments pertaining to the unreasonableness of different forms of ad baculum fallacies (such as threatening with physical consequences vs. threatening with non-physical consequences; and threatening in a direct way vs. threatening in an indirect way) it was found that threatening with physical consequences was judged most strictly, while indirect threatening was deemed to be the least unreasonable move (see van Eemeren, Grootendorst & Meuffels 1999). So, by making use of only indirect forms of straightforward ad baculum fallacies in the present experiment, a far too easy confirmation of our hypothesis is avoided.
ii. That the circumstantial as well as the you too variants tend to be judged as reasonable moves is only the case when participants have to judge the reasonableness of these fallacies presented in unspecified contexts. When these two types of fallacies are presented in a scientific context, these variants of ad hominem are deemed to be unreasonable, like the abusive variant.

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ISSA Proceedings 2014 ~ The Argumentative Role Of Visual Metaphor And Visual Antithesis In 'Fly-On-The-Wall' Documentary

Abstract: In this paper, we explore the argumentative role of visual metaphor and visual antithesis in the so-called 'fly-on-the-wall' documentary. In this subtype of documentary, which emphatically renounces voice-over narration, the filmmakers guide their viewers into reaching certain conclusions by making choices regarding the editing as well as the cinematography. We analyse a number of scenes from two films by one major representative of the Direct Cinema or 'fly-on-the-wall' documentary, Frederick Wiseman.

1. *Introduction*

While a number of argumentation scholars would probably still maintain that argumentation is essentially a verbal activity, there has been substantial work in the last two decades arguing for the possibility and actuality of conveying argumentation by means of other modes than the verbal one (Groarke, 1996; Kjeldsen, 2012; Roque, 2012; Tseronis, submitted; Van den Hoven & Yang, 2013). It is to this line of research within argumentation studies that we want to contribute by discussing the possible argumentative functions of metaphor and antithesis conveyed visually or multimodally in a specific genre of documentary film, the fly-on-the-wall documentary. To identify the verbal and visual cues that may be combined in order to convey a certain figure constitutes the first step. To explain their use and effect as having to do with argumentation is the next one. For the latter task, the analyst needs to have systematic recourse to the properties of the modes used, their interaction, as well as to the broader context (consideration of the narrative, the genre as well as the cultural context and background knowledge).

By taking a broad understanding of argumentation as a procedure, not merely as

a product consisting of premises that support the acceptability of a conclusion, we seek to identify the function of such figures as metaphor and antithesis, when conveyed multimodally, in the process of arguing for one's position. Such functions are not merely decorative but, as explained by Fahnestock (1999), can be understood as epitomizing the line of reasoning of the filmmaker. Kjeldsen (2012, p. 239) makes a similar point with regard to the use of pictures in advertisements, namely that figures "are not only ornamental, but also support the creation of arguments". According to him, "rhetorical figures direct the audience to read arguments" (ibidem) by delimiting the possible interpretations of the pictures used, and thereby evoking the intended arguments.

Among the various rhetorical figures, metaphor has received substantial attention within the Cognitive Metaphor Theory (Lakoff & Johnson, 1980). Lakoff and Johnson's central idea is that humans think metaphorically rather than just use metaphorical language. Acceptance of this idea means that, in principle, metaphor can have visual manifestations as well. Indeed, the past two decades have witnessed a series of studies (see for example, Forceville, 1996, 2008; Forceville & Urios-Aparisi, 2009; El Refaie, 2003) that analyse visual and multimodal metaphors in genres including advertising and political cartoons, wherein verbal elements interact mainly with static images. Steps have also been taken to analyse visual metaphors in other genres of argumentative communication centrally involving *moving* images, and to investigate how tropes other than metaphor can be cued non-verbally or multimodally (Forceville, 2009; Teng & Sun, 2002). The argumentative effect that the use of metaphor and other tropes may have is an area that needs to be yet further explored.

The fly-on-the-wall documentary[i] constitutes an object of study that allows us to explore the potential of combining insights from argumentation studies and metaphor theory and to illustrate their usefulness for the multimodal analysis of moving images. As this type of documentary is a genre that leaves the drawing of conclusions largely to the viewer, due to the fact that it lacks voice-over narration and staging of events, it becomes even more important to study the visual (and audio) means by which the filmmaker guides the audience's inference process. To show the direction this kind of research could take, we analyse the argumentative use of metaphors and antitheses in a number of scenes from two documentary films by one representative of the fly-on-the-wall cinema, Frederick Wiseman.

2. *On metaphor and antithesis*

2.1 *Metaphor*

Metaphor is traditionally studied under the banner of 'tropes,' together with synecdoche, metonymy and irony, among others. It has received extensive attention from both rhetoricians and cognitive linguists. While the former have been sensitive to the fact that metaphor is not the only figure of speech, Lakoff and Johnson take metaphor to underlie much, if not all, of our thinking. In the first chapter of her book, Fahnestock takes issue with this 'dominance of metaphor'. She writes (1999, pp. 5-6):

The tight focus on metaphor in science studies, like the fixation on metaphor and allied tropes in textual studies, has taken attention away from other possible conceptual and heuristic resources that are also identifiable formal features in texts and that also come from the same tradition that produced metaphor, the rhetorical tradition of the figures of speech.

According to Aristotle, metaphor plays an important role for prose style, since it contributes clarity as well as the unfamiliar, surprising effect that avoids banality and tediousness. While in the later tradition the use of metaphors has been seen as a matter of mere decoration, which has to delight the hearer, Aristotle stresses the cognitive function of metaphors. In order to understand a metaphor, the hearer has to find something common between the metaphor and the thing the metaphor refers to (Rapp, 2010).

Perelman and Olbrechts-Tyteca (1969) discuss metaphor under their third type of argumentative techniques, namely those establishing the structure of reality. Within this technique, two subcategories are identified, namely those arguments that establish the structure of reality through a particular case (by example or illustration) and those whereby one reasons by analogy. They write (p. 399):

In our view, the role of metaphor will appear most clearly when seen in the context of the argumentative theory of analogy. ... In the context of argumentation, at least, we cannot better describe a metaphor than by conceiving it as a condensed analogy, resulting from the fusion of an element from the phoros with an element from the theme.

Forceville (1996) has combined insights from Lakoff and Johnson (1980) and from Black (1979) in order to propose a way for extending the cognitive account of metaphor into the field of visual communication. He formulates the following three questions for identifying a pictorial metaphor of the creative variety in static advertisements:

(1) Which are the two terms of the metaphor, and how do we know?

(2) Which is the target and which is the source, and how do we know?

(3) Which are the features that are mapped from source to target, and how do we decide on these features?

These questions remain pertinent in the analysis of visual metaphor in moving advertisements, that is, commercials – although the latter can draw on a wider variety of techniques than static advertisements that help answer these three questions. Moving images can for instance make use of specific camera movements and montage to create metaphors. What makes the identification of metaphors in advertising (whether in static or in moving images) relatively easy, is the genre convention, namely that advertisements always want to make a positive claim about a product or service. This means that usually the target of the metaphor coincides with the product, which is then presented in terms of a source domain from which appropriate positive features are mapped onto the target/product. As we will see later on, in the absence of such clear-cut genre conventions, identifying metaphors and other tropes in fly-on-the-wall documentaries is less easy.

2.2 *Antithesis*

Fahnestock (1999, pp. 46-47), following Aristotle, defines antithesis as a verbal structure that places contrasted or opposed terms in parallel or balanced cola or phrases. She writes:

[*Parallel phrasing without opposed terms does not produce an antithesis, nor do opposed terms alone without strategic positioning in symmetrical phrasing. Instead, the figure antithesis, according to Aristotle, must meet both syntactic and semantic requirements.***[ii]**

The opposed terms may be contraries (both terms can be true of an object depending on the perspective one adopts: good vs evil; cold vs hot), contradictories (pairs that form exhaustive either/or alternatives: clean -/- unclean; polite -/- impolite), or correlatives (pairs that convey reciprocal or complementary relationships: buying and selling; cause and effect; lead and follow) (see Fahnestock, 1999, p. 48). When it comes to identifying the various contrasting relations in the visual mode, it may be difficult to identify exhaustive either/or alternatives. Based on the viewer's knowledge of what is being depicted and on such formal cues as the use of colour (or the use of sounds when it comes to the audio mode), it may be possible to identify contraries or correlatives.

As regards the syntactic requirement, the opposed terms need to be placed in some parallel structure. This syntactic requirement is also typical of the figure parallelism. Antithesis, however, contains only two parallel clauses, featuring pairs of antonyms and cannot be used to deliver more than two examples, while parallelism does not use antonyms and typically presents three things before an audience (see Fahnestock, 2003, p. 128). In film, such a parallel structure can be conveyed first and foremost by the mere sequencing of the scenes but also within the shot by means of composition and mise-en-scène.

Questions one can ask for identifying an antithesis and distinguishing it from mere contrast (following Forceville's questions for the identification of a pictorial metaphor) would be:
(1) Which are the two terms of the antithesis, and how do we know?
(2) How are these two terms opposed (contraries – contradictories – correlatives), and how do we know?
(3) What are the differences being stressed?

In antithesis, unlike metaphor, the direction (identifying which is target and which is source) of opposition between the two elements does not play a role. Moreover (as in metaphor), the two elements of the antithesis may be conveyed each in a different mode, verbal, visual, or audio, for example. As we have pointed out above, the contrasting relation between the two elements can be conveyed not only in what is being depicted but also in *how* something is being depicted.

Both metaphor and antithesis seem to rely on a certain comparative/parallel structure, whereby in the first case likeness is stressed (or differences are backgrounded) while in the second case it is difference that is stressed (or likeness that is backgrounded). Clifton (1983), who provides an inventory of rhetorical figures found in films, notes the following with respect to simile, a figure that is usually seen as related to metaphor (p.72):
It is clear then that in every simile there is present both difference and likeness, and both are a part of its effect. By ignoring differences, we find a simile and may perhaps find an antithesis in the same event, by ignoring likeness.

Fahnestock, too, observes that both a simile and an antithesis are based on a parallelism structure, that invites comparison. The question then arises: how do the similarities become salient in one case and how do the differences stand out in the other? It seems that audiovisual cues as such can be used to trigger

different tropes; we need to take into consideration genre-conventions and contextual information within a specific scene to make an appropriate assessment which trope, if any, is at stake.

2.3 *Possible argumentative functions*
As has been suggested above, metaphor can be related to the use of analogy in argumentation. The distinctive argumentative work of metaphor, according to Fahnestock (2011, p. 105) is that it "creates new links, allowing the rhetor to illuminate one term (or concept) by features or senses borrowed from another". For Fahnestock then, metaphor, like other figures, does not merely have a decorative role, accompanying an argument, but constitutes
a verbal summary that epitomizes the argument. It is a condensed or even diagram-like rendering of the relationship among a set of terms, a relationship that constitutes the argument and that could be expressed at greater length. (1999, p. 24)

Whether metaphor is to be identified exclusively with a scheme of arguing from analogy, however, is an issue that requires further study. According to Garssen (2009), for example, the argumentative relevance of the use of figurative analogy in argumentation should not to be related to the analogy argument scheme. Instead, Garssen maintains that figurative analogy functions as a presentational device used to put forward other (symptomatic or causal) types of argumentation. Moreover, Garssen and Kienpointner (2011, p. 40) stress the fact that not all metaphors are to be analysed as argument by analogy:
utterances containing metaphors can only be classified as arguments from figurative analogies if they are used as argumentative utterances and the speaker wants to prove a controversial standpoint by making a comparison based on relevant similarities between entities from different domains of reality.

Garssen and Kienpointner (2011, p. 46) mention, among others, the following functions of figurative analogies: creative function (used as a creative means of opening the argumentative space),**[iii]** persuasive function (a means of shifting the burden of proof by choosing highly persuasive types of *phoros*), didactic function (a pedagogical device for illustrating and clarifying complicated issues), refutative function (as ironical *reductio ad absurdum*), and competitive function (as provocative attack at the opponent).

When it comes to antithesis, a distinction can be drawn between antithesis of

words and antithesis of thought, the former being a purely stylistic one, while the latter provides a premise-conclusion pair, according to Fahnestock (1999). Within the latter type of antithesis, three cases can be distinguished, depending on the status of the opposed terms. In the first case, the antithesis employs two opposing terms that are already known to the audience. In this way, the arguer exploits the audience's prior recognition of the contrast as well as the values attached to the opposed terms. In the second case, the antithesis pushes the two terms apart, creating thus an opposition between them that the audience was not necessarily previously aware of. In the last case, the antithesis reconfigures an existing opposition by changing or reinforcing the relation between the two terms in order to change the audience's conception of a known antithetical pair.

Following Garssen and Kienpointner (2011), who take metaphor to constitute a presentational device for conveying a number of argumentative functions, we believe that antithesis, too, can be shown to contribute in a number of ways to the argumentative activity. To begin with, it needs to be acknowledged that not all antitheses have an argumentative role, just as is the case with metaphors. Contrasting two elements in order to win the viewer's attention or merely claiming that two elements are opposed, without making it explicit that the stated opposition contributes in a direct or indirect way to an act of convincing an audience about the tenability of a standpoint, do not count as an argumentative use of antithesis. In a clearly defined argumentative situation, antithesis can be said to contribute directly to the argumentation when it is used to convey the claim for which further support is advanced. In this case, the antithesis is either used to push two terms apart or to reconfigure an existing opposition. Antithesis may also be used to convey the argument in support of a contested claim. In this case, the arguer would be making use of an antithesis that contains opposed terms already accepted as such by the audience. Finally, another direct contribution of antithesis to an argumentative discussion would be its use to refute or anticipate counter-arguments advanced by the audience. When antithesis contributes in an indirect way to the argumentative discussion, its role is to draw attention to the argument or to assist the audience in testing the case in dispute, as Tindale (2009) suggests.

In general, the rhetorical effect of the use of metaphor or antithesis – or of any other figure for that matter – can be explained in terms of the inference process that the audience is invited to follow in order to determine the meaning of the

similarities or contrasts that each of these two figures conveys. The audience confronted with a metaphor or antithesis is invited to participate in the construction of the meaning, adding the second term of the antithesis or identifying the properties that are mapped in the metaphor, for example, or attaching their own values and norms to the terms involved in either figure. Once the audience understands the metaphor or the antithesis, it may be more prone to accept the mappings proposed by the figure as premises for a certain conclusion. In what way exactly the different nature of metaphor and antithesis can be exploited so as to contribute accordingly to the possible argumentative functions named in the previous paragraph remains a subject for further study. Moreover, the effect achieved by conveying either of these figures verbally, visually or multimodally deserves further attention. Kjeldsen (2013, p. 437) explains the effect of conveying figures visually or multimodally instead of using exclusively the verbal mode in the following way:

In order to make meaning of the multimodal presentation, the viewer has to actively transform a main line of reasoning. In this way, the images contribute to making the viewer himself construct the arguments meant to persuade him.

When it comes to the argumentative role these figures may play in a film, in particular, it is important not to over-interpret their presence and their use. Clifton (1983) has inventoried a great number of figures found in scenes from a number of films; but even if one takes the identification of these figures to be correct, it is another matter whether these figures have an argumentative function in all of the scenes described. In addition, it is important to consider whether their role is to contribute to an argument identified at a local level, within a sequence or scene of the film, or to an argument that can be said to run through the whole film.**[iv]** In order to be justified in searching for the argumentative function of these figures in film, one needs to specify an argumentative situation in which a contested claim is being supported and in which a figure may play a role other than a purely aesthetic one. One needs therefore to have recourse to the specific genre of the film as well as to background knowledge concerning the theme of the film and the filmmaker's own interests. Assuming that the documentary is a genre that seeks to communicate a message to its audience more than simply to please them, we can be justified in searching for the argumentative function of metaphor and antithesis when we have identified these figures in a documentary film.

3. *On documentary film and fly on the wall documentary*

As Nichols (2010, p. 104) puts it, in his Introduction to Documentary:

Documentary work does not appeal exclusively to our aesthetic sensibility: it may entertain or please, but does so in relation to a rhetorical or persuasive effort aimed at the existing social world.

Compared to fiction films and experimental films, the subject matter of documentaries is real life itself.**[v]** It is from this reality that filmmakers extract their material to use as evidence in support of the assertive stance they take towards what is being filmed (see Plantinga, 1997). In the various typologies of documentary film that exist, three main forms can be identified namely narrative, categorical and rhetorical (Bordwell & Thompson, 2013, p. 355). But even when a documentary represents historical events as they occurred in time (narrative form), or when it conveys categorized information about a given topic mostly from a synchronic perspective (categorical form), it is safe to expect that it still employs rhetorical techniques to address an audience so that they eventually accept that information as valid or endorse the filmmaker's perspective. After all, as Plantinga (1997, p. 105) remarks, it is rarely the case that each of these forms appears independent of the others and does not mix in the course of a documentary film.

An extensive typology of documentary films has been proposed by Nichols (2010), based on the "voice" that is predominant throughout the film. He identifies the following six modes: the expository, the observational, the interactive (also called participatory), the reflexive, the performative and the poetic. Of these, it is the expository mode, the mode that most people associate with documentary in general, that emphasises verbal commentary and has a clear argumentative logic. The Direct Cinema documentary (also known as fly-on-the-wall) falls under the observational mode.

Documentary films of the observational mode have no voice-over commentary, no supplementary music or sound effects, no inter-titles, no historical re-enactments, no behaviour repeated for the camera, and do not make use of interviews (Nichols, 2010, pp. 172ff). Editing and cinematography in the fly-on-the-wall documentary avoid directing the viewer along a clear path of meaning, as Plantinga (1997, pp. 153-155) observes. The viewer is therefore invited to take a more active role in determining the significance of what is said and done, as Nichols (2010, p. 174) also remarks. It is thus not without a reason that we focus

on the use of rhetorical figures such as metaphor and antithesis, which may be construed by choices made regarding the editing and the cinematography, as an alternative means employed by the filmmaker to guide the viewers through a path of meaning.

4. *Frederick Wiseman's documentaries*

Frederick Wiseman began making films in the 1960s, working at the same time as Richard Leacock, D.A. Pennebaker and David and Albert Maysles, who are all considered as representatives of the fly on the wall documentary (see Aitken, 2013). His films focus on American institutions, such as the school, the court, the hospital, the army, and the prison, among others; they thus become "studies of the exercise of power in American society", as Barnouw (1993, p. 244) puts it.

Nevertheless, as Plantinga writes (1997, p. 195), Wiseman has always distanced himself from direct cinema, even though his films are considered prototypical examples of the observational mode of documentary film. Wiseman calls his cinema 'reality fiction' and acknowledges the creative manipulation in his films, whereby he makes use of editing in order to restructure his material according to principles other than chronology and narrative (see Benson & Anderson, 2002, pp. 1-2). Nichols (1981, p. 211) notes that while the individual sequences are organized by narrative codes of construction, aiming for a smooth flow of time and space, the relations between these sequences are organized by principles that are more rhetorical. The sequences may thus relate, for example, in terms of comparison, contrast, parallelism, inversion, irony, evidence, summation and so on. Benson (1980, 1985), who has analysed *High School* (1968) and *Primate* (1974), from the perspective of rhetorical criticism, concludes that Wiseman's films are characterized by a dialectical structure that invites the audience to construct meaning and grasp the film's logic.

Wiseman acknowledges that he began making films out of an urge for social reform and awareness (Grant, 1998). At the same time, he refrains from dictating his own point of view to the audience. In an interview cited in Nichols (1981, p. 218), he says:

One of the things that intrigues me in all the films is how to make a more abstract, general statement about the issues, not through the use of a narrator, but through the relationship of events to each other through editing.

While it is true that Wisemans's films, like other documentary films of the

observational mode, leave it up to the audience to interpret the film and discover the director's position, it does not mean that the director himself does not have a point of view. It is then up to a close examination of his films to show how such a view can be reconstructed.

4.1 *Titicut Follies (1967)*

Titicut Follies is Wiseman's first documentary. It was filmed at Massachusetts Correctional Institution at Bridgewater, a prison hospital for the mentally ill. Due to a legal ban by the state of Massachusetts on the presentation of the film in public, it was only in 1991 that the film became widely known.**[vi]** The title of the film refers to the title of the musical show that the inmates put on.

The film's opening sequence shows eight inmates lined up in two rows and dressed up in parade costumes singing George Gershwin's song 'Strike up the band'. The camera is placed among the audience giving a view of the stage on which the inmates perform, before it zooms in to the face of each inmate singing in the front row. The light comes from below, illuminating their faces in a horror-like manner. At the end of the act, the director of the institution appears, saying "It keeps getting better" and goes on to tell a joke to the audience who is applauding. The opening scene contrasts with the following sequence that shows the guards at the institution inspecting the new inmates and asking them to take their clothes off. In this scene, the director appears again, wearing his uniform this time, instead of the black costume of the master of ceremonies he was wearing in the opening scene. In the rest of the film, there are at least two other moments where the inmates and the director of the institution are shown singing. Nevertheless, the majority of the film depicts moments in which the inmates are being treated rather disrespectfully and as less than human by the staff.

Wiseman makes thus a salient choice from his material by not only opening the film with a scene from the inmates' musical show but also by ending it with the final act of the same show. Grant (1998, p. 243) remarks that by framing the film in this way Wiseman suggests that "the inmates are forever 'on stage', as they are always under observation by the staff". The director of the institution is thus presented as the ringmaster and the patients as attractions in a theatre of curiosities, where they are being inspected, undressed, washed, put into their cells, entertained, fed etc. A metaphor could thus be construed whereby the mental institution is associated with a theatre of curiosities and freaks. The close-ups of the faces of the inmates performing on stage as well as their body language

do not suggest that they are particularly enjoying it – unlike the director of the institution – but rather that this is just one other chore they are asked to perform.

In the rest of the film, Wiseman creates contrasts between the inmates' world and the outside world, doctors and patients, sanity and insanity inviting the audience to think over these boundaries. Even if Wiseman does not stage the events or directs the inmates and controls their positions, he nevertheless succeeds in conveying these antitheses not only be means of editing the material in the post-production but also by means of composition within the frame, while filming.

One such moment is the scene where an inmate is singing a popular song from the 1920s called 'Chinatown, my Chinatown' in front of the camera, while in the background a TV screen shows Nana Mouskouri singing a love-song called 'Johnny'. The contrast is cued not only in the audio mode, with the inmate's cacophonous voice juxtaposed with Mouskouri's melodious voice, but also by the posture: the inmate is facing the audience directly while Mouskouri is facing the side (see Figure 1).
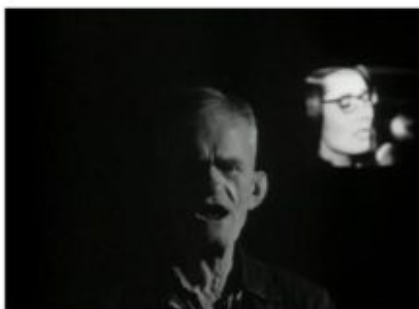
Figure 1. Still from *Titicut Follies* (1967), scene starting at app.18:44.
© 1967 Bridgewater Film Company, Inc. - Photo provided courtesy of Zipporah Films, Inc.

Figure 1. Still from Titicut Follies (1967), scene starting at app.18:44.
© 1967 Bridgewater Film Company, Inc. – Photo provided courtesy of Zipporah Films, Inc.

Another moment is the scene where inmate Vladimir is arguing with dr. Ross about his wish to leave the institution and return to prison where he believes he belongs, since he claims that he is not mentally insane. For the most part of the scene the two interlocutors are filmed in medium long shot facing each other against the background of the bricked wall of the institution's courtyard.

Wiseman spots the water pipeline going down the wall and slightly reframes the camera so as to let the pipeline appear in the background, thereby dividing the two interlocutors, the one representing the institution and the other the patients (see Figure 2).**[vii]**

These antitheses, and others conveyed by the editing of the scenes, can be considered as putting forward evidence for Wiseman's claim about the internal contradictions of the mental institution or as opening up the space for discussion on what is (in)sanity and who decides on the boundaries.

Figure 2. Still from Titicut Follies (1967), scene starting at app.34:01. © 1967 Bridgewater Film Company, Inc. – Photo provided courtesy of Zipporah Films, Inc.

The sequence which crowns the film, and in which Wiseman's critique of the staff becomes most apparent, is the one which depicts the forced tubefeeding of an aged and starving patient, Mr. Malinowski, by dr. Ross (see also Aitken, 2013, p. 914). It is part of a larger sequence which lasts for almost ten minutes, starting with the scene where dr. Ross visits the patient in his cell and asks him whether he has eaten, and ending with the scene of a staff member pushing a tray with a dead body inside the mortuary refrigerator. The whole sequence is placed almost in the middle of the film. The scene of Mr. Malinowski's tubefeeding is cross-cut with shots from another scene in which the dead body of an inmate, probably Mr. Malinowski himself, is being shaved and perfumed. While there is a certain parallelism between the two scenes (there is a match on action between the shot where the doctor removes the towel from the patient's face and the shot where a staff member is airing a towel on the corpse's face, as well as between the shot

where the guards shut the door of Mr. Malinowski's cell and the shot where the guard is pushing the tray with the dead body in the refrigerator), overall a stark contrast is created both through the visual and the audio mode. In the shots of the tubefeeding scene, one hears the dialogue between the staff involved in the action as well as the surrounding sounds from the room. The shots of the embalming scene, however, have no sound whatsoever. Moreover, a great contrast exists between the way the patient in the two scenes is treated. While in the tubefeeding scene the live Mr. Malinowski is kept tied and treated disrespectfully, the dead body of Mr. Malinowski receives the careful attention of the staff.

With the last shot of the whole Malinowski sequence being the pushing of the tray with the dead body into the refrigerator, Wiseman lets the audience see the paradoxical consequences of the doctor's act of feeding that patient. By creating a parallel between the two events, Wiseman lets the inconsistencies in the behaviour of the staff members come to the fore. At the same time, the acts carried out by the staff members in both scenes underlie the passivity of the patient who is treated as a lifeless object (in the second scene this is literally the case). As a whole, the sequence can be understood as evidence in support of Wiseman's critique of the institution and its staff for acting upon and treating the patients in ways that counter the patients' own dignity and needs, if not put their lives in danger.

4.2 *Primate (1974)*

Primate is Wiseman's eighth film and the first of a trilogy of films, produced over a period of three years, expressing how far life has become objectified and commodified (see Aitken, 2013, p. 988).**[viii]** As the title suggests, the film is about a federally funded research institute on primates, the Yerkes Primate Research Centre in Atlanta. Grant (1998, p. 251) notes that this is the only other Wiseman documentary, next to *Titicut Follies*, to have caused substantial controversy, not only about its disturbing scenes of vivisection experiments carried out on gibbons, chimpanzees and gorillas, but also on the questions it raises on the ethics and goals of medical research involving animals.

The opening sequence of the film establishes an analogy between apes and humans. This is how Benson (1985, p. 208) describes it:
The film opens with a long series of shots in which we may first notice the ambiguity of the film's title, which applies equally well to men and apes. We see a large composite photograph, with portraits of eminent scientists, hanging,

presumably, on a wall at the Yerkes Center. Wiseman cuts from the composite portrait to a series of eight individual portraits, in series, then to a sign, an exterior shot of the Center, and then a series of four shots of apes in their cages. The comparison is obvious, though not particularly forceful, and it depends for its meaning both upon the structure Wiseman has chosen to use – at least he does not intercut the apes and the portraits – and upon our own predictable surprise at noticing how human the apes look.

While the analogy could indeed be read in either direction, humans are like apes or apes are like humans, we think it is important for understanding the way the rest of the film builds up to consider that Wiseman takes apes to be the source not the target of the metaphor. The assumption that humans are like apes is used to justify the research carried out on primates with the aim of discovering more about humans, by conducting experiments that otherwise could not have been carried out on humans. Framing the film's topic in this way, it becomes even more gruesome for the viewer to imagine that the vivisection experiments shown later in the film could have actually been carried out on humans. Moreover, the analogy between humans and apes, underscored in a number of sequences throughout the film, succeeds in making even stronger the contrasts that Wiseman's camera captures between the words and deeds of the scientists. As Benson (1985, p. 209) observes:

comparison both justifies and condemns the research, and Wiseman exploits that comparison not simply to attack vivisection, or scientific research in general, but also to engage us in actively considering the paradoxes of our institutions and ourselves.

Figure 3. Still from *Primate* (1976), scene starting at app.56:38.
© 1974 Zipporah Films, Inc. – Photo provided courtesy of Zipporah Films, Inc.

Figure 3. Still from Primate (1976),
scene starting at app.56:38.

The metaphor is thereby used to open the space for the discussion, in a similar way that the various antitheses discussed in *Titicut Follies* do.

One interesting moment, in which Wiseman employs antithesis as a means for countering possible refutations of the analogy he has established between humans and apes, is the sequence in which a researcher explains his view about the differences between the great apes on the one hand and humans on the other. The sequence starts with a number of shots where the researcher is shown interacting with a chimpanzee in a laboratory room, inciting the animal to grab fruits hanging from a rope and to hang from a swing. At one moment, the researcher is shown being suspended from the swing in an attempt to make the chimpanzee imitate him (see Figure 3).

Then comes a shot of the researcher in close-up against a background of electronic equipment explaining how the experiment is conducted and what its rationale is (see Figure 4). From then on, there is intercutting between the researcher and shots of the actual experiment carried out by himself and an Afro-American assistant. Wiseman lets the researcher's voice run over the shots from the laboratory experiment, functioning, in a certain way, as a voice-over commentary of what is being depicted.

When the researcher utters the sentence: "I do not subscribe to the theory that the living apes, chimpanzee and gorilla, closely resemble the ancestry of man", a shot from the laboratory experiment is shown in which the researcher is running around, jumping from one corner of the room to the other inviting the chimpanzee to chase him (see Figure 5).

Figure 4. Still from Primate (1976),
scene starting at app.57:01.
© 1974 Zipporah Films, Inc. – Photo
provided courtesy of Zipporah Films,
Inc.

Wiseman lets the image of the researcher defeat the content of the latter's own words. He thereby exploits editing and voice-over to refute any possible objection to the idea that humans are like apes, that one may put forward in order to suggest that violence to apes is not the same as violence to humans. By similarly contrasting the filmed actions of the researchers with their own words, Wiseman shows that the increasingly violent and ultimately mortal experiments carried out on gibbons and gorillas are not necessarily justified by the significance of the findings. After the climactic sequence in which a researcher is shown cutting the head of a living gibbon, a scene in a laboratory is edited, where two colleagues looking through a microscope at tissues from presumably the same dead gibbon's brain have difficulty in specifying what it is they are looking at and what its significance is (see Benson, 1985, p. 211).

Figure 5. Still from Primate (1976),

scene starting at app. 58:04.
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Inc.

5. *Conclusion*

In this paper, we have only begun to tease out the valuable contributions that the combination of insights from metaphor theory, argumentation studies and film analysis can make to the argumentative analysis of multimodal communication. By extending Fahnestock's (1999) view of rhetorical figures as epitomes of a line of reasoning to the visual and the audio modes we have tried to describe the possible argumentative functions of such tropes as metaphor and antithesis. In order to illustrate the usefulness of the distinctions we propose, we have analysed a number of scenes from two documentaries by Frederick Wiseman, a representative of the so-called fly-on-the-wall documentary. Despite the lack of a voice-over commentary that could have made explicit the filmmaker's own position on the depicted material, the identification of metaphors and antitheses construed visually or multimodally has allowed us, in connection with our knowledge of the specific genre and of the specific director's work, to propose an interpretation of the contribution these figures make to the argument of the film.

A more systematic identification of the various metaphors and antitheses used in the two films as well as in other films by Wiseman is still required in order to show how these figures may combine in order to contribute to the overall argument that is built throughout the film. Moreover, a comparative study involving films by other representatives of the fly-on-the-wall genre would help support our view that these figures – and possibly others – can help guide the viewer's interpretation of the filmmaker's stance, despite the characteristic lack of voice-over and of other techniques that would explicitly mark the director's presence. Finally, further study is required for developing criteria to identify the various visual and multimodal tropes as well as to specify their argumentative relevance in a given situation.

Zipporah Films is the distribution company of the Frederick Wiseman films. For more information visit http://www.zipporah.com/.

NOTES
i. See Aitken (2013) under the term 'direct cinema'

ii. Tindale (2009), on the other hand, maintains that the figure antithesis does not require that two cola contain opposites, stressing the syntactical rather than the semantic property of this figure.

iii. Interestingly, this function of figurative analogy is similar to the one that Tindale (2009) describes for antithesis, namely to assist an audience in testing or weighing a case.

iv. Clifton (1983) remarks that antithesis or metaphor can be conveyed within one single shot and that the most extended form of antithesis or metaphor is when either is used to condense the meaning of the whole film. See the examples he discusses on pages 121 and 125 for antithesis, and on page 100 for metaphor.

v. Nichols (2010, pp. 7-17) summarizes the three commonsense assumptions about documentaries thus: "documentaries are about reality; documentaries are about real people; documentaries tell stories about what happens in the real world".

vi. The film was banned for reasons pertaining to the issue of the patients' informed consent and the of the prison authorities in it. See chapter 2 in Benson and Anderson (2002) for a detailed chronicle of the production of the film and the ensuing trials and controversy.

vii. Interestingly, when one also follows the content of the dialogue between Vladimir and dr. Ross, it becomes clear that it is Vladimir who builds a clear and strong argument in support of his request to be transferred to a prison, while the doctor's responses seem dogmatic and unconvincing. This provides an ironic view of who is the sane and who is the mad one of the two.

viii. The other two films are Welfare (1975) and Meat (1976).

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ISSA Proceedings 2014 ~ A Formal Model Of Conductive Reasoning

Abstract: I propose a formal model of representation and numerical evaluation of conductive arguments. Such arguments consist not only of pro-premises supporting a claim, but also of contra-premises denying this claim. Offering a simple and intuitive alternative to accounts developed in the area of computational models of argument, the proposed model recognizes internal structure of arguments, allows infinitely many degrees of acceptability, reflects the cumulative nature of convergent reasoning, and enables to interpret attack relation.

Keywords: argument evaluation, argument structure, attack relation, conductive reasoning, logical force of argument, rebuttal.

1. *Introduction*
According to Wellman's original definition (1971) the conclusion of any conductive argument is drawn inconclusively from its premises. Moreover, the premises and the conclusion are about one and the same individual case, i.e. the conclusion is drawn without appeal to any other case. Wellman also gave three

leading examples of conductive arguments, which determine three patterns of conduction:

(1) *You ought to help him for he has been very kind to you.*
(2) *You ought to take your son to the movie because you promised, and you have nothing better to do this afternoon.*
(3) *Although your lawn needs cutting, you want to take your son to the movies because the picture is ideal for children and will be gone by tomorrow.*

Wellman's definition was an object of many interesting views, opinions and interpretations, mostly surveyed in (Blair & Johnson 2011). However, we do not discuss this issue here, but we simply follow these authors who, as Walton & Gordon (2013), focus on the third pattern and propose to take *conductive arguments* to be the same as pro-contra arguments. Such arguments, except of a normal pro-premise or premises (*The picture is ideal for children; It will be gone by tomorrow*), have also a con-premise or premises (*Your lawn needs cutting*).

In the next two chapters we analyze conductive arguments from the logical point of view. The conduction is regarded here as one act of reasoning, in which a conclusion is drawn by the same time from both types of premises. In Chapter 2 we describe the structure and in Chapter 3 – a method of evaluation of conductive arguments. This method is based on the model of argument proposed in (Selinger 2014). In Chapter 4 we introduce a dialectical component of the analysis. Namely, by means of our model, we discuss definition of attack relation holding between arguments.

2. *Structure of conductive arguments*
There are many ways of expressing conductive arguments in natural language. Some of them are the following:

– *Since A, even though B, therefore C.*
– *A, therefore C, although B.*
– *Although B, C because A.*
– *B, but (on the other hand) A, therefore C.*
– *Despite B, (we know that) A, therefore C.*

Figure 1

In the above schemes the letter A represents a pro-premise (or pro-premises), *B* – a con-premise (or con-premises) and *C* – a conclusion. It is worth to note that pro-premises are presented as overcoming con-premises, so that an argument can be accepted if they really do. There are two types of inference in conductive arguments: pro-premises *support* and con-premises *deny* (*contradict, attack*) conclusions. They can be represented using the standard diagramming method. Figure 1 shows the diagram of Wellman's third example.

Relation of support is represented by the solid and relation of contradiction – by the dashed line.**[i]** In order to reflect this duality in our formal model we follow Walton & Gordon's idea involving the assignment of Boolean values to these two types of inference, however, we propose to use simpler formal structures than the so-called argument graphs (cf. Walton & Gordon 2013).

Let L be a language, i.e. a set of sentences. *Sequents* are all the tuples of the form *<P, c, d>*, where $P \subseteq L$ is a non-empty, finite set of sentences (*premises*), $c \in L$ is a single sentence (*conclusion*), and *d* is a Boolean value (1 in pro-sequents and *0* in con-sequents). An *argument* is simply any finite, non-empty set of sequents. If an argument consists of only one sequent then it will be called an *atomic argument*.

The *premises* of an argument are all the premises of all its sequents. The *conclusions* of an argument are all the conclusions of all its sequents. The *first premises* are those premises, which are not the conclusions, and the *final conclusions* are those conclusions, which are not the premises. Finally, the *intermediate conclusions* are those sentences, which are both the conclusions and the premises. A typical (abstract) argument structure is presented in Figure 2 by the diagram corresponding to the set: *{<{α1}, α5, 1>, <{α2}, α5, 0>, <{α3}, α5, 0>, <{α4}, α9, 1>, <{α5}, α13, 1>, <{α6}, α15, 1>, <{α7}, α15, 1>, <{α8}, α15, 0>, <{α9}, α16, 1>, <{α10}, α18, 1>, <{α11}, α18, 0>, <{α12, α13, α14}, α20, 1>, <{α15, α16}, α, 1>, <{α17}, α, 1>, <{α18, α19}, α, 0>, <{α20}, α, 0>}.* This argument consists of 16 different sequents (10 of them are pro- and 6

are con-sequents), so it is the sum of the same number of atomic arguments. The premises are all the sentences in the diagram except of α, which is the final conclusion; the conclusions are: $\alpha5$, $\alpha9$, $\alpha13$, $\alpha15$, $\alpha16$, $\alpha18$, $\alpha20$, α; the first premises: $\alpha1$, $\alpha2$, $\alpha3$, $\alpha4$, $\alpha6$, $\alpha7$, $\alpha8$, $\alpha10$, $\alpha11$, $\alpha12$, $\alpha14$, $\alpha17$, $\alpha19$; the intermediate conclusions: $\alpha5$, $\alpha9$, $\alpha13$, $\alpha15$, $\alpha16$, $\alpha18$, $\alpha20$.
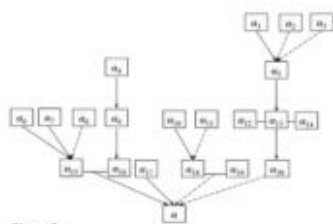
Figure 2

Figure 3

By the means of our formalism also atypical structures can be distinguished (cf. Selinger 2014). Some of them are illustrated by Figure 3. Circular arguments can have no first premises and/or no final conclusion (two examples in Figure 3 have neither the first premises nor the final conclusion). They are interesting argument structures, e.g. for those who deal with antinomies, however, we do not discuss them, since they are mostly regarded as faulty. On the other hand, divergent arguments and incoherent arguments can have more than one final conclusion. They are not faulty (unless from some purely pragmatic point of view), but they can be represented as the sums of non-divergent and coherent arguments. Therefore, when discussing evaluation of conductive arguments in the next chapter, we focus on typical argument structures like that shown in Figure 2.

3. *Evaluation of conductive arguments*
The central question to be considered in this section is: how to transform the values of first premises into the value of final conclusion? We answer this question in three steps concerning evaluation of atomic, convergent and, finally,

conductive arguments.

First we introduce some basic notions. Each partial function v: $L' \to [0, 1]$, where $L' \subseteq L$, is an *evaluation function.* The value $v(p)$ is the (*degree of*) *acceptability of p.* We consider also a predefined function w: $L \chi L \to [0, 1]$. The value $w(c/p)$ is the acceptability of c under the condition that $v(p) = 1$, so that the function w will be called *conditional acceptability.*

We assume that L contains the negation connective. If the premises of some sequent deny its conclusion c then evaluation of c will be based on evaluation of the sentence $\neg c$ in the corresponding pro-sequent, in which the same premises support $\neg c$. Let us note that for a perfectly rational agent the condition $v(\neg c) = 1 - v(c)$ should be satisfied. This postulate will be useful to evaluate con-sequents.

Let v be a given evaluation function (we assume that v is fixed in the following part of our exposition). By $\wedge P$ we denote the conjunction of all the sentences belonging to a finite, non-empty set P (if P is a singleton then $\wedge P$ is the sole element of P). We assume that L contains the conjunction connective, and if $P \subseteq dom(v)$ then $\wedge P \in dom(v)$.**[ii]** The value $w(c/\wedge P)$ will be called the internal strength of a pro-sequent $<P, c, 1>$, and the value $w(\neg c/\wedge P)$ – the internal strength of a con-sequent $<P, c, 0>$.

Let A = $\{<P, c, d>\}$ be an atomic argument, where $P \in dom(v)$, $c \notin dom(v)$, and d is a Boolean value. The function vA is the following extension of v to the set $dom(v) \cup \{c\}$:

(4) If d = 1 then $vA(c) = v(\wedge P) \cdot w(c/\wedge P)$;
(5) If $d = 0$ then $vA(c) = 1 - v(\wedge P) \cdot w(\neg c/\wedge P)$.

Thus the acceptability of the conclusion of an atomic argument under condition that its premises are fully acceptable is reduced proportionally to the actual acceptability of the premises. The value $vA(c)$ will be called the *(logical) strength (or force) of an argument A*. We will say that a pro-argument is *acceptable* iff its strength is greater than ½, and a con-argument is *acceptable* iff its strength is smaller than ½.

In the next step we consider evaluation of convergent reasoning. Since convergent argumentation is used to cumulate the forces of different reasons supporting (or denying) a claim we have to add these forces in a way adapted to

our scale. Strengths of pro- and con-components will be added separately in each of both groups, independently of the other. Let $A = A1 \cup A2$, where both A1 and A2 are acceptable arguments and they either consist of only pro- or of only con-sequents having the same conclusion c. Let $vA1(c) = a1$ and $vA2(c) = a2$.

(6) If A1 and A2 are independent pro-arguments, and $a1, a2 > ½$, then $vA(c) = a1 \oplus a2$;

(7) If A1 and A2 are independent con-arguments, and $a1, a2 < ½$, then $vA(c) = 1 - (1-a1) \oplus (1-a2)$, where $x \oplus y = 2 \cdot x + 2 \cdot y - 2 \cdot x \cdot y \neg - 1$.

In (Selinger 2014) we provide a justification of this algorithm, deriving it from the principle (satisfied also by the algorithms given in (4) and (5)) that can be called *the principle of proportionality*, according to which the strength of argument should vary proportionally to the values assigned to its components. We also discuss properties of the operation $\oplus$ (here let us only mention that it is both commutative and associative, therefore the strengths of any number of converging, independent arguments can be added in any order).

Finally, we consider conductive reasoning. In order to compute the final value of a conductive argument we will subtract the strength of its con- from the strength of its pro-components in a way adapted to our scale. Let $A = Apro \ \square \ Acon$, where Apro consists only of pro-sequents and Acon only of con-sequents having the same conclusion c. We assume that both groups of arguments are acceptable, i.e. $vApro(c) > ½$ and $vAcon(c) < ½$.

(8) If $vApro(c) < 1$, and $vAcon(c) > 0$, then $vA(c) = vApro(c) + vAcon(c) \neg - ½$;

The idea of this algorithm is illustrated by Figure 4. Since we want to know how much pro-arguments outweigh con-arguments (or vice versa), we subtract the value $½ \neg - vAcon(c)$ represented by the interval $[vAcon(c), ½]$ in this figure from the value $vApro(c) - ½$ represented by the interval $[½, vApro(c)]$. In order to finally receive the acceptability of c we add this differential to ½. Let us note that the considered value is directly proportional to the acceptability of pro- and reversely proportional to the acceptability of con-arguments, so that the algorithm satisfies the principle of proportionality.

Figure 4

Figure 4

The algorithm given by (8) assumes that both pro- and con-arguments are, as defined by Wellman, inconclusive. However in real-life argumentation it happens, for example in mathematical practice, that initial considerations concerning some hypothesis, which are based on subjective premonitions, analogies, incomplete calculations etc., are finally overcame by a mathematical proof. Then all the objections raised originally are no longer significant, and the hypothesis becomes a theorem. Therefore, if either pro- or con-arguments are conclusive, then so the whole conductive argument is.

(9) If vApro(c) = 1, and vAcon(c) ≠ 0, then vA(c) = 1;
(10) If vApro(c) ≠ 1, and vAcon(c) = 0, then vA(c) = 0.

If both pro- and con-arguments happen to be conclusive then it is an evidence of a contradiction in underlying knowledge, and the initial evaluation function requires revision. Therefore we claim that the values of such *strongly antinomian arguments* cannot be found.

(11) If vApro(c) = 1, and vAcon(c) = 0, then vA(c) is not computable.

Otherwise, the strength of *weakly antinomian arguments*, which consist of equal inconclusive components, can be computed as ½ using the algorithm given by (8).

In order to complete this section let us add that the acceptability of the conclusions of complex, multilevel argument structures, as the one represented by Figure 3, can be calculated level by level using the algorithms (4) – (10). An analogous process concerning only pro-arguments is described in (Selinger 2014).

4. *Attack relation*
Our goal is to define attack relation, which holds between arguments. For the sake of simplicity we consider only attack relation restricted to the set of atomic arguments. There are three components of atomic arguments that can be an object of a possible attack: premises, inferences and conclusions. The latter is the case of conduction. If we take into account a pro- and a con-argument, which have the same conclusion, then the stronger of them attacks the weaker one (in the

case of an antinomy both arguments attack each other, so that it can be called the *mutual attack* case).

(12) An argument A *attacks (the conclusion of)* an argument B iff $A = \{<P1, c, d>\}$, $B = \{<P2, c, 1 - d>\}$, and either $d = 0$ and $1 - vA(c) \leq vB(c)$, or $d = 1$ and $1 - vA(c) \leq vB(c)$.

The second kind of attack is the attack on a premise. Obviously, it is effective if (i) some premise of an attacked argument is shown to be not acceptable on the basis of the remaining knowledge.

(13) An argument A attacks (a premise of) an argument B iff $A = \{<P1, c1, 0>\}$, $B = \{<P2, c2, d>\}$, $c1 < P2$, and $v'A(c1) \leq \frac{1}{2}$, where v' is the function obtained from v by deleting c1 from its domain, i.e. $\text{dom}(v') = \text{dom}(v) - \{c1\}$.

However, with respect to the proposed method of evaluation, two further situations are possible: (ii) the premises of an attacked argument considered separately are acceptable, however their conjunction is not; (iii) the conjunction of the premises of an attacked argument is acceptable and the internal strength of its constituent (pro- or con-) sequent is greater than $\frac{1}{2}$, but the product of these values is not. Thus, in view of the evaluation method proposed here, merely weakening a premise can cause an effective attack, and the definition (13) should be replaced by the following broader one.

(13') An argument A *attacks (a premise of)* an argument *B iff A = $\{<P1, c1, 0>\}$, $B = \{<P2, c2, d>\}$, $c1 \notin P2$, $v'A(c1) \leq v(c1)$*, and either $d = 1$ and $v'A(\land P2) \land w(c2/\land P2) \land \frac{1}{2}$, or $d = 0$ and $v'A(\land P2) w(\sim c2/\land P2) \subseteq \frac{1}{2}$, where v' is the function obtained from v by deleting c1 from its domain.

In order to consider attack on the relationship between the premises and the conclusion of an attacked argument, let us take into account the following Pollock's example of an undercutting defeater:

(14) *The object looks red, thus it is red unless it is illuminated by a red light.*
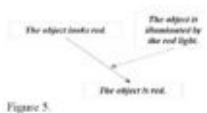
Figure 5.

Figure 5

Following Toulmin's terminology, the sentence *The object is illuminated by a red light* will be called *rebuttal.* Let us note, that rebuttals are not con-premises, since they do not entail the negation of the conclusion (the fact that the object is illuminated by a red light does not imply that the object is not red). Thus Pollock's example cannot be diagrammed like conductive arguments. Since it is an arrow that represents the inference, which is denied by the rebuttal, rather the diagram shown by Figure 5 seems to be relevant here.

However, structures such as the one in Figure 5 have no direct representation within the formalism introduced in this paper to examine conductive reasoning. In order to fill this gap we propose to add the fourth element, namely the set of rebuttals, to the sequents considered so far. Such extended sequents will have the form *<P, c, d, R>*, where *R* is the set of (linked) rebuttals.

Since our goal is to define attack relation as holding between arguments, we propose to take an argument without rebuttals (i.e. with the empty set of rebuttals) as being attacked by the argument with the same premises and conclusion, but with a rebuttal added. For example (14) can be regarded as an attacker of the simple argument

(15) *The object looks red, thus it is red.*

This argument (15) has the following representation: *{<{The object looks red}, The object is red, 1, ⬜>}*, and its attacker (14): *{<{The object looks red}, The object is red, 1, {The object is illuminated by a red light}>}*. In general, an argument of the form *{<P, c, d,⬜>}* can be attacked by any argument of the form *{<P, c, d, R>}*. Effectiveness of this sort of attack depends on evaluation of such arguments. It is not the aim of this paper to develop an evaluation method for arguments with rebuttals systematically, however, let us note that the strength of an argument *{<P, c, d, R>}*, where *R ≠⬜*, seems to be strictly connected with the strength of the corresponding argument *{<P∪{∼∧R}, c, d, ⬜>}*, which has an empty set of rebuttals. For example, the strength of (14) depends on the strength of the argument:

(16) *The object looks red, and it is not illuminated by a red light, thus it is red.*

If this argument is acceptable then so is its second premise (The object is not

illuminated by a red light), which is the negation of the rebuttal in (14). By the same the rebuttal is not acceptable so that the attack on (15) cannot be effective. Thus (16) cannot be acceptable if (14) attacks the inference of (15). In general, if $A = \{<P, c, d, R>\}$ attacks (the inference of) $B = \{<P, c, d, \square>\}$, then $R \neq \square$ and $A' = \{<P \cup \{\sim \wedge R\}, c, d, \square>\}$ is not acceptable. Obviously, the converse does not hold, because not any acceptable set of sentences can be a good rebuttal. If the attack is to be effective the set R must be relevant to deny the inference in B. A test of relevance that we propose is based on an observation concerning (15) and (16). Intuitively, the inference in (16) is stronger than the inference in (15), i.e. the internal strength of the sequent in (16) is greater than the internal strength of the sequent in (15). This is because (16) assumes that a possible objection against the inference in (15) has been overcome. Thus, the condition $w(c/\wedge P \wedge \sim \wedge R) > w(c/\wedge P)$ can be proposed to determine the relevance of the rebuttal in A. Following these intuitions we recognize arguments overcoming rebuttals as hybrid arguments in the sense defined by Vorobej (1995). Such arguments contain a premise that strengthens them, but this premise does not work alone so that it cannot be taken as the premise of a separate convergent reasoning (in (16) such a premise is the sentence *The object is not illuminated by a red light)*.

Summing up, we claim that (a) non-acceptability of the hybrid counterparts corresponding to arguments having rebuttals and (b) relevance of rebuttals are necessary for attack on inference to be effective. However, we leave open the question whether they are sufficient.

5. *Conclusion*
We showed how the model of representation and evaluation of arguments elaborated in (Selinger 2014) can be enriched in order to cover the case of conductive reasoning. The extended model allowed us to define in formal terms two kinds of attack relation, namely attack on conclusion and attack on premise. However, the definition of attack on inference requires further extension of the model. In order to initiate more profound studies, we outlined a possible direction of making such an extension.

NOTES

i. Let us note that Walton & Gordon (2013) interpret both pro-premises as supporting the claim independently of each other, and they draw separate arrows connecting each pro-premise with the conclusion, which represent convergent reasoning. However, it seems to be problematic whether the premise The picture will be gone tomorrow alone (i.e. without any further information about the movie) actually supports the conclusion.

ii. In order to avoid this assumption the acceptability of an independent set of sentences can be calculated as the product of the values of its elements. Thus the acceptability of a conjunction can be smaller than the acceptability of its components considered separately (cf. Selinger 2014).

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ISSA Proceedings 2014 ~ Think Twice: Fallacies And Dual-Process Accounts Of Reasoning

Abstract: This paper presents some ideas of how to conceptualize thinking errors from a cognitive point of view. First, it describes the basic ideas of dual-process theories, as they are discussed in cognitive psychology. Next, it traces the sources

of thinking errors within a dual-process framework and shows how these ideas might be useful to explain the occurrence of traditional fallacies. Finally, it demonstrates how this account captures thinking errors beyond the traditional paradigm of fallacies.

Keywords: fallacies, thinking errors, dual process theories, cognitive processes

1. *Introduction*

The last three decades have seen a rapid growth of research on fallacies in argumentation theory, on the one hand, and on heuristics and biases in cognitive psychology, on the other hand. Although the domains of these two lines of research strongly overlap, there are only scarce attempts to integrate insights from cognitive psychology into argumentation theory and vice versa (Jackson, 1995; Mercier & Sperber, 2011; O'Keefe, 1995; Walton, 2010). This paper contributes an idea on how to theorize about traditional fallacies on the basis of dual-process accounts of cognition.

2. *Dual-process accounts of cognition*

The basic idea of dual process theories is that there are at least two different types of cognitive processes or cognitive systems (Evans & Stanovich, 2013; Kahneman, 2011; Stanovich, 2011). System 1 consists of cognitive processes that are fast, automatic and effortless. System 1 is driven by intuitions, associations, stereotypes, and emotions. Here are some examples: When you associate the picture of the Eiffel Tower with 'Paris', when you give the result of '1+1', or when you are driving on an empty highway, then System 1 is at work. System 2, in contrast, consists of processes that are rather slow, controlled and effortful. System 2 is able to think critically, to follow rules, to analyse exceptions, and to make sense of abstract ideas. Some examples include: backing into a parking space, calculating the result of '24×37', and finding a guy with glasses, red-and-white striped shirt, and a bobble hat in a highly detailed panorama illustration. These processes take effort and concentration.

System 1	System 2
Parallel	Sequential
Holistic	Analytic
Unconscious (preconscious)	Conscious
Independent of working memory	Limited by working memory capacity
Independent of general intelligence	Linked to general intelligence
Universal	Heritable

Table 1 Characteristics of System 1 vs. System 2 processing

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vs. System 2 processing

In what follows, I'm going to use processing speed as the main criterion for distinguishing between System 1 and System 2 (Kahneman, 2011). As System 1 is the fast cognitive system, its responses are always first. System 1 responses are there, long before System 2 finishes its processing. Table 1 lists some characteristics that are commonly associated with System 1 and System 2 in the literature (cf. Evans, 2008, p. 257 for further attributes associated with dual systems of thinking).

The central idea of dual-process theories is that these two cognitive systems interact with one another and that these interactions may be felicitous or infelicitous. When comparing the vertical lines in figure 1 and figure 2, one gets the impression that the shafts of the arrows differ in length. This is a response of the fast and automatic System 1. As long as one doesn't take the effort of measuring lengths, one accepts this impression as provisionally true.

Figure 1 and Figure 2 of the Müller-Lyer Illusion (Müller-Lyer, 1896, p. 1)

Figure 1 and Figure 2 of the Müller-Lyer Illusion (Müller-Lyer, 1896, p. 1)

By using a ruler, one finds that–contrary to the first impression–the shafts of the arrows are of equal length. Although one knows that the shafts are of equal length, one still sees them as differing in length. One cannot switch off System 1, but one can override its impressions and tell oneself that this is an optical illusion and that one must not trust one's sensations.

3. *Felicitous interactions and sources of error*
How may one apply this framework to the domain of argumentation? Consider the following argument.

Animals must be given more respect. Monkeys at the circus are dressed like

pygmies in a zoo. Sheep are auctioned like on a slave market. Chickens are slaughtered like in a Nazi extermination camp.
(Adapted from the fallacyfiles.org, cf. Curtis, 2008)

System 1 might give a first response, that there is something odd about this argument, though it cannot tell straight away what exactly is wrong with it. So System 2 gets alert for checking the argument. Reflecting on the line of reasoning, System 2 may find that the argument begs the question of whether animals are morally equal to humans and that the standard view holds the reverse, i.e. humans should not be treated like animals. And therefore slave auctions, pygmy zoos, and extermination camps are morally wrong. One cannot shift the burden of proof by simply comparing animals to humans, because according to current moral standards, Pygmies, slaves and Nazi victims have more moral rights than monkeys, sheep and chickens.

This is how the interaction of System 1 and System 2 should work. System 1 produces the intuition that there is something wrong about an argument, but cannot tell what exactly it is. System 2 starts scrutinizing the argument and comes up with analytical reasons for why this is an unhappy argument.

However, the interactions of System 1 and System 2 are prone to error. There are at least four different sources of such errors (Stanovich, 2011; Stanovich, Toplak, & West, 2008). The first three errors are initiated by an incorrect response of System 1, i.e. System 1 uses a heuristic rule of thumb that works well in most every-day contexts, but not in the given context. It would be the task of System 2 to detect the error and to correct it. However, System 2 does not perform these tasks. The fourth error originates in System 2, when System 2 uses inappropriate rules or strategies for analysing a problem. The details are explained in the following paragraphs.

The first kind of error: System 2 might fail to check the intuitive response of System 1. The bat-and-ball problem is a classic example.

A bat and a ball cost $1.10. The bat costs $1.00 more than the ball.
How much does the ball cost? ____ cents
(Frederick, 2005, p. 26)

The intuitive answer is '10 cents', which is wrong. If the ball costs 10 cents and the bat costs $1 more than the ball, then the bat costs $1.10. The sum of bat and

ball thus equals $1.20. Many intelligent people, nonetheless, give the intuitive answer without checking for arithmetic correctness. '10 cents' is the answer to an easy question, namely the question: 'What is the difference of $1.10 and $1?' This is a task for System 1. But that is not the original question. The original question is a hard one and cannot be answered by intuition.

It is a task for System 2
The second kind of error: System 2 might detect an error in the response of System 1, but fail to override this response.

A small bowl contains 10 jelly beans, 1 of which is red.
A large bowl contains 100 jelly beans, 8 of which are red.
Red wins, white loses. Which bowl do you choose?
(Denes-Raj & Epstein, 1994, pp. 820ff.)

The majority of participants (82%) chose the large bowl in at least 1 out of 5 draws. This problem can be understood as the substitution of an easy question for a hard question, too. The easy question reads: 'Which bowl contains more of the red jelly beans?' And it is answered immediately by System 1: 'The large bowl.' The original question is a hard one: 'Which bowl contains a higher percentage of red jelly beans?' To answer this question, one needs to calculate a ratio. It is a task for System 2.

The third kind of error: System 2 might lack knowledge of appropriate rules for checking the correctness of System 1 responses. Statistical illiterateness is a classic example. Physicians were given the following task.

If a test to detect a disease whose prevalence is 1/1000 has a false positive rate of 5%, what is the chance that a person found to have a positive result actually has the disease, assuming you know nothing about the persons symptoms or signs?
(Casscells, Schoenberger, & Graboys, 1978)

Only 18% of medical staff and students gave the correct answer. If you don't know, how the false positive rate is calculated, then you give an intuitive answer which is provided by System 1. That is, you're answering an easy question, for example: 'What is the difference of 100% and 5%?' You were originally asked a hard question. If you do the calculation properly, you get the correct answer, which is 'a chance of about 2%'.

The fourth kind of error: Even if System 2 checks the intuitive response of System 1, it might happen that System 2 uses what has been called 'contaminated mindware' Perkins, 1995, p. 13; Stanovich, 2011, pp. 102–104; Stanovich et al., 2008). System 2 might use faulty rules, misleading information, inappropriate procedures, and deficient strategies. Consider the illusion of skill in share trading.

Overconfident investors overestimate the precision of their information and thereby the expected gains of trading. They may even trade when the true expected net gains are negative.
(Barber & Odean, 2001, p. 289)

Again this can be considered the substitution of questions. One question is: 'Do I have information that suggests selling share A and buying share B?' You can think about it using your System 2. The more you do so, the more you become confident in your decision, which is now rationally justified. But the most important question to answer is somewhat different: 'On balance, do I expect positive net gains from selling share A and buying share B?' System 2 sometimes answers the wrong questions, too.

In summary, we get a picture of different levels at which errors might occur (cf. Stanovich, 2011, pp. 95–119): System 1 uses a heuristics rule of thumb in an inapt environment, System 2 fails to check System 1, System 2 fails to override System 1, System 2 lacks rules or strategies to check System 1, or System 2 uses flawed rules or strategies. All these errors can be described as substitutions of questions. Either System 1 answers an easy question instead of a hard question, or System 2 answers a hard question with unsuitable means.

4. *Application to fallacies*
Now that I have traced the sources of thinking errors form a dual-process perspective, let me demonstrate how this idea can be applied to traditional fallacies.

Fallacies are substitutions of easy questions for hard questions. The easy questions are answered by System 1 in an intuitive way. The hard questions require some effort and analytical thinking by System 2. A fallacy occurs when System 2 is not alert enough or when System 2 applies faulty rules and strategies. Consider 'Affirming the consequent' as an example.

(1)

Affirming the consequent

If it rains, the streets are wet.
The streets are wet.
————————————-
Therefore, it rains.

Hard question: Is the argument logically valid?
Easy question: Is there a strong correlation between rain and wet streets?

System 1 can answer the easy question immediately: 'Is there a strong correlation between rain and wet streets?' It is part of our daily experience that if the streets are wet, it usually is because of the rain and not because someone spilt out water on the streets. Thus, System 1 gives an intuitive answer based on experience. And indeed, answers like these help us in our daily lives. It's sensible to take an umbrella with you, when the streets are wet. Even if the streets might theoretically be wet for other reasons than rain.

But the original question was, whether the argument is logically valid. In order to answer this question, one needs to know the definition of 'logically valid' and apply it to the logical structure of this argument. Only then, after some mild effort, one arrives at the answer that it is not logically valid. The logical fallacy of affirming the consequent consists in not answering the hard question: 'Is the argument logically valid?' There are two main sources of error here. Either System 2 fails to check the intuitive answer of System 1 (lack of awareness), or System 2 does not know the meaning of 'logical validity' and, therefore, is not able to correct the intuitive answer (lack of knowledge).

(2)
Argumentum ad misericordiam

'Could you please grant me an extension to complete my thesis?
My dog just died and I didn't make it in time.'

Hard question: Does the student meet general criteria for granting the extension.
Easy question: Do I feel pity for the student (or the dog)?

Some students are very good at finding heart-breaking reasons for not being able to meet deadlines. Whatever triggers strong emotions, is likely to trigger a

substitution of questions. The feeling of pity strikes one without effort. Emotions are a part of System 1. One can easily answer the question: 'Do I feel pity for the student (or the dog)?' In contrast, it is hard work for System 2 to establish general criteria for granting an extension. And it takes some effort to check whether the student really meets those criteria. Thus, the hard question is: 'Does the student meet general criteria for granting the extension?' It is much easier to grant an extension on the basis of pity than on the basis of general criteria. The argumentum ad misericordiam usually exploits a lack of willpower. In the light of heart-breaking reasons, one may find it inappropriate to insist on a list of criteria, despite the fact that one thinks extensions cannot be granted on the basis of pity.

(3)
Post hoc, ergo propter hoc

The computer worked fine until I installed the latest Windows update.
The update crashed my computer.

Hard question: Is there a causal link between the update and the crash?
Easy question: Is there a temporal link between the update and the crash?

It is very hard to establish a causal relation between two events. In order to answer the first question, one would have to run an experiment and show that this update always crashes any comparable computer. It is a task for System 2. Yet a causal relation implies a temporal relation: First update, then crash. Consecutiveness is a necessary but not a sufficient condition for causality. However, it is easy to perceive consecutiveness. Thus the second question can be answered swiftly by System 1: 'Is there a temporal link between the update and the crash?'–'Yes.'

The fallacy occurs when the answer to the easy question is mistaken for an answer to the hard question. This might happen if one is stressed about the crash and does not have the time to think analytically about the issue (lack of awareness), or if one does not know how to proof a causal relation between update and crash (lack of knowledge), or if one has a prejudice against Microsoft (contaminated mindware).

5. *Conclusion*
Traditional fallacies, such as affirming the consequent, argumentum ad misericordiam, or post hoc, ergo propter hoc, can be viewed as substitutions of

questions. A fallacy occurs whenever one substitutes an easy question for a hard question without good reason. Easy questions can be answered fast and without effort; hard questions are characterized by them being answered slowly and with effort.

Conceptualizing fallacies this way opens a venue for applying dual-process accounts of reasoning to traditional fallacies. Cognitive processes in System 1 are fast, automatic, and effortless; cognitive processes in System 2 are slow, controlled, and effortful. This results in System 1 answering the easy question first. System 2 should check and correct the easy answer, where necessary. However, it may fail to do so for quite different reasons: (a) System 2 might fail to check the first response because of a lack of awareness, (2) it might detect an error but fail to override this response, or (c) it might not know how to check and correct the first response, and (d) sometimes it uses flawed rules and strategies to fulfil this task. All four kinds of thinking errors result in fallacies.

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ISSA Proceedings 2014 ~ Changes In The Use Of The Question When Teaching To Argue In Sciences

Abtract : This study shows the changes identified in the type of questions used by an elementary school teacher, who participated in a process of critical reflection on the teaching of argumentation in science class. In this study, three classes were recorded (before, during and after the process), and after discourse analysis realized to information collected, the results show how the teacher understands the importance of combining different kinds of questions: descriptive, causal and evaluative, questions.

1. *Introduction*

The importance of argumentation in the science class is supported by numerous studies. On the one hand, some research shows that students involved in argumentative activities can better understand how science is produced and validated (Driver et al. 2000, Osborne et al. 2004), while improving their communication skills (Kuhn & Udell, 2003). These findings justify giving a priority to discourse practices and, specifically, argumentative processes in school settings. On the other hand, despite the fact that there are many studies highlighting how teachers' thinking influences classroom practices (Benarroch & Marin, 2011; Ireland, Watters, Brownlee & Lupton, 2011; Gunstone et al, 1993; Lebak & Tinsley, 2010 , Milner, Sondergeld, Demir, Johnson & Czerniak, 2012; Porlan et al., 2010, Smart & Marsall, 2012), few studies try to identify how teachers promote classroom argumentation and understand how the teachers' thinking, related to what it is supposed to be argued in science, influences the way to promote classroom argumentation.

Also, we know that the argumentation as a social practice demands that the teaching of the sciences must be focus in the importance and relevance at least of two components. First, the epistemic; the acknowledgement of the role of the argumentation in the construction of the science is taken as a central element. The second component: the social, requires offering spaces to promote debate

and work in small groups to give the possibility to listen to the other and to establish their own ideas.

In this sense, the question becomes one of the possible tools to support these previous aspects: the epistemic and the social. The first one because the scientific knowledge advances when it asks questions which establish a dialogue about theory and observable phenomenon, allowing to explain, to structure and to change the condition of a theory, (Kuhn, 2010; McDonald & McRobbie, 2012; Milne 2012; Osborne, Erduran & Simon, 2004; Sardà & Sanmartí, 2000). The second one; because in order to try to rebuild scholar scientific knowledge; it is mandatory to provide classroom social interactive moments (Mercer, 1997), to foster in the students not only the interest but also the motivation to establish their own questions, problems and basic actions of the "to do science" (Márquez & Roca, 2006).

From this perspective, the research tries to identify the changes in the kinds of questions worked by an elementary school teacher who participates in a critical reflexive process about the teaching of the argumentation in the science class.

2. *Methodology*

The study was focused in the process developed by a teacher who Works with children from nine to ten years old. They belong to a public elementary school institution from Manizales city (Colombia) Called Fe y Alegría. To obtain the stated goal, during seven months of work there were programmed three critical reflexive meetings, – which included several surveys, questionnaires and interviews, to discuss topics related to the argumentation and to the teachers performance inside the classroom. On the other hand, there were three classes recorded by audio and video, coded and analyzed during three moments of the process. These classes were transcribed using the note taking proposed by Candela (1999) and systematized with the software Atlas-ti help. The analysis developed to this information was comprehensive-qualitative from which was identified the communicative interaction between the teacher and the students, as consequence of identifying and analyzing the argumentative episodes (EA) in each one of these three classes. The episodes, in this research are assumed as the sequences of interactions between students-teacher, in which these communicative interactions are recognized and supported by the dialogic inquiry, or the use of questions that besides of working an specific content (conceptual, procedural or attitudinal) foster dialogues and debates among the subjects with

the final goal to promote the argumentation in an implicit or explicit form.

Figure 1. Argumentative episodes registered in classes

3. *Analysis of the results*

Two important aspects of the teacher´s performance can be identified in the exhibited results in the figure 1 and 2.

The first one, related with the increasing in the number of EA registered in the developed classes by the teacher (one in the first class, four in the second one and seven in the third one). This shows the advance and consolidation of the dialogic inquiry, as a mechanism of communicative interaction teacher-students and the unforgettable tool for the development of the argumentation.

The second aspect refers to the increasing incorporation, of new kinds of questions. It was noticed how the teacher used to ask generalization questions in the first class (87.5%, e.g.: the water is?) and rational questions (12.5%: why do the trees belong to the plant kingdom?). With the first ones, it is stated the relationship between the theoretical content and the studied situation; with the second ones it is asked to the student to expose the why of an action, or the participation, forcing
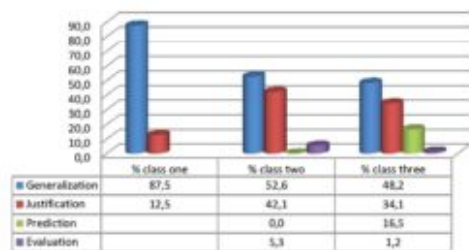
	% class one	% class two	% class three
■ Generalization	87,5	52,6	48,2
■ Justification	12,5	42,1	34,1
■ Prediction		0,0	16,5
■ Evaluation		5,3	1,2

Figure 2. Types of questions identified in clasroom

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him/her to present evidences or justifications that support their affirmations. In the second class, besides the decrease of the percentage of the generalization questions (52,6%) and the rising in the percentage of the justification questions (42,1%: why could they have the reason, they that 500 they that 100 or they that 80?), the teacher uses also the evaluative questions (5,3%: ...let´s see what do you think?), those which promote reflection about the implicit contents in their participation and foster confrontations that affect positively the development of argumentative processes in the classroom. In the third one, we could notice the presence of a new kind of questions, the predictive (16,5%: do you believe that the violin will be heard under the water? Now from what we have seen, you are going to tell me why yes or why not, Emanuel, do you feel OK? Do you think that the violin will be heard the same way under the water?); with those questions the student is invited to establish hypothesis and to ask questions about possible behaviors, facts or phenomena, which are very important actions to the development of argumentative processes.

4. *Conclusions and educative implications*

The teacher provides better and larger communicative interactive spaces supported by the dialogic inquiry. Two indicators show this advance in the developed process by the teacher. First, the incorporation of questions from different nature and the confident environment created by the teacher, in order to engage the students in the discussions. Second indicator the increasing of the quantity of argumentative episodes identified in the three classes developed by the teacher: one in the first one, four in the second one and seven in the third one.

Finally, the results ratify two things: The first one, the value that the question has; and the combination of different kinds of questions, as a device to foster the

debate and the development of very important competences as the quality to hear and respect others opinion to argue in a proper way. The second one; the relevance to involve to the teachers in critical reflexive space about their own performance, as an opportunity to help to the improvement of the sciences teaching processes.

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