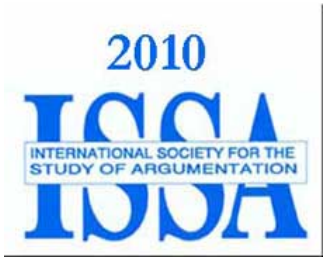
ISSA Proceedings 2010 – The Appeal To Ethos As A Strategic Maneuvering In Political Discourse



1. Introduction

The aim of this paper is to analyze the appeal to *ethos* as a strategic maneuver in political argumentation. In section two I review *ethos* as an Aristotelian persuasive strategy and its two components according to Poggi (2005), i.e. competence and *benevolence*; in section three I focus on two of the possible ways in which one could convince the other of being *competent* and benevolent, i.e. either emphasizing his own qualities or highlighting the differences between himself and the opponent; in the fourth section I introduce the notion of dichotomy (Dascal 2008) and focus on the arguers' possible tactical aims of presenting a mere opposition or contrast as a dichotomy. In the last two sections I briefly introduce the notion of strategic maneuvering and, while providing an example of a case of strategically maneuvering with *ethos*, I show how employing dichotomies can be seen as an aspect of the strategic maneuvering.

2. The appeal to ethos as a persuasive strategy in political discourse

According to Aristotle, the orator in persuading makes use of three different strategies, *logos, pathos* and *ethos*. If the orator tries to persuade the audience by making use of argumentation, then he is employing *logos*. If he manipulates instead the audience's emotions, evoking the possibility for the audience to feel pleasant emotions or to prevent unpleasant ones, he is making use of the strategy of *pathos*. Finally, if the orator tries to persuade the audience by emphasizing his own moral attributes and competences, then he is making appeal to ethos. The appeal to *ethos* is, according to Aristotle, the most efficient strategy: 'the orator's character represents, so to say, the strongest argumentation' (Retorica, I, 1356a). Poggi (2005) distinguishes two aspects of *ethos: ethos-benevolence* (the Persuader's moral reliability – his being well-disposed towards the Persuadee, the fact that he does not want to hurt, to cheat, or to act in his own interest), and

ethos-competence (his intellectual credibility, expertise, and capacity to achieve his goals, including possibly the goals of the Persuadee he wants to take care of). These two aspects are the two necessary components of trust and in order to be persuaded, the Persuadee has to believe that the Persuader possesses these two attributes.

Therefore, in order to elicit the audience's trust the Persuader has to convince them, i.e. make them believe with a high level of certainty, that he is competent and benevolent at the same time. This is an important part of the Persuader's self-presentation. To demonstrate one's competence, one may enumerate one's achievements; while to display benevolence, one may stress how one wants the audience's welfare. For example, as pointed out by Poggi & Vincze (2008), Romano Prodi, the Left Wing candidate at the function of Italian Prime Minister in 2006, in order to bring proofs of his competence, mentions the most important charges he covered (President of the Council of Ministers, President of the European Commission), while at the same time he explicitly states he is not in search of more professional satisfactions as he already had so many in his life, his only desire now being to make better reforms for the new generations.

3. Self presentation and contrast

According to general gestalt laws of cognition (Koffka 1935), people can better understand a belief if it is contrasted to another opposite belief. Therefore a quite effective strategy of self-presentation is to contrast yourself with the opponent and show how, while you have goodwill and proved to be efficient in several situations, the opponent has proved the contrary.

When one makes use of oppositions to emphasize the differences between oneself and the opponent, we say he is employing a distancing strategy. Distancing oneself from the other is a recurrent tactic in political discourse, where the goal is to prove that the arguer indisputably represents the better alternative among the two, while the opponent, which stands at the opposite pole, is precisely the opposite of the right alternative.

Scholars such as Dascal (2008) focused on the tendency arguers have to construct oppositions in a radical manner, with the aim of distancing themselves from the opponent. As Dascal points out, during debates, by their nature agonistic, oppositions are often polarized and led to extremes, resulting into dichotomies.

4. Radicalizing oppositions : from mere oppositions towards dichotomies[i]

Logically speaking a dichotomy is an "operation whereby a concept, A, is divided

into two others, B and C, which exclude each other, while completely covering the domain of the original concept" (Dascal 2008, p. 28). But not every opposition usually regarded as a dichotomy fulfils in fact the necessary condition for being considered as such, i.e. logical exclusion of one term by the other. As pointed out by Dascal, while there are very few pairs of elements that are undisputedly dichotomous, the tendency of presenting simply opposing elements as dichotomous, i.e. as one insurmountably excluding the other, is high, possibly again due to the gestalt laws above. According to the personal interests and aims of the participants within the debate, the arguer may choose to employ dichotomous pairs of adjectives characterizing the self and the opponent in order to distance himself from the other.

According to Dascal, in fact, we can speak of a dichotomization tactic when the arguer is 'radicalizing a polarity by emphasizing the incompatibility of the poles and the inexistence of intermediate alternatives, by stressing in the same time the obvious character of the dichotomy as well as of the pole that ought to be preferred'. (Dascal 2008, p. 34).

If this is the case, dichotomization, as Dascal points out, may lead to a polarization of the debate, where the two parties are presented as representing two views impossible to reconcile and as having opposing characteristics.

5. The concept of Strategic Maneuvering in argumentation

The aim of this paper is to analyze the tactic of dichotomizing oppositions as a strategic maneuver in terms of the extended pragma-dialectical theory of argumentation.

According to van Eemeren (2010), when engaging in an argumentative discussion, arguers have two contrastive goals: the *dialectical goal* which consists in maintaining reasonableness, and the *rhetorical goal* which refers to reaching effectiveness. Normally, the rhetorical goal is the one which tends to take the upper hand, jeopardizing a rational development of the discussion. Therefore, as van Eemeren puts it, people always have to maneuver strategically between the maintenance of reasonableness (if only for the sake of appearing reasonable in front of the others) and pursuing of effectiveness, i.e. having the best from the discussion. It is precisely for this reason of being divided between these two aims to reach that they have to maneuver strategically and don't allow the desire of winning at any cost to take the upper hand.

The strategic maneuvering in argumentative discourse refers therefore to 'the efforts that are made in the discourse to move about between effectiveness and

reasonableness in such a way that the balance – the equilibrium – between the two is maintained'. (van Eemeren 2010, p. 41). If instead the rhetorical aim of reaching effectiveness prevails over the dialectical one, according to van Eemeren (2010), the maneuvering derails and the move results in a fallacy.

In maneuvering between the rhetorical and the dialectical goal, both arguers make some strategic choices according to the situation at hand and according to the stage of the discussion. Van Eemeren & Grootendorst (1992) and van Eemeren et al. (2002) distinguish four different stages of a critical discussion, namely: the *confrontation stage* where it becomes clear that there is a difference of opinion to be solved through critical discussion; the *opening stage* where the two participants in the discussion establish who is the Protagonist (the defendant of a certain thesis or standpoint) and the Antagonist (the attacker) and establish their material and procedural starting points; the *argumentation stage* where the Protagonist attempts to defend his thesis while the Antagonist tries to test the tenability of the Protagonist's standpoint by subjecting it to the strongest criticism possible; and finally, the *concluding stage* where the result of the discussion is assessed.

In the argumentation stage, which is the stage on which I will focus within this paper, strategic maneuvering refers to choosing, from the topical potential at hand, the arguments which best adapt to the audience, while making a choice as to how the argumentative moves are to be presented in the strategically best way. These are according to van Eemeren (2010) the three aspects which coexist in a strategic maneuvring : *topical selection*, i.e. what arguments we choose in order to defend our standpoint; *audience adaptation*, i.e. knowing *to whom* these arguments will be presented in order to adapt them according to the audience's preferences, and finally, *the presentational devices*, i.e. *how* these arguments are to be rendered in front of the audience.
As pointed out by van Eemeren, these three aspects are always intertwined: one cannot manifest itself in absence of the others. When planning an argumentation, the arguer has to choose what to say and how to say it in the strategically best way, while taking into account the listeners in front of him.

6. A case of strategic maneuvering with ethos
In this section I apply the notions of dichotomy and strategic maneuvering to an example of appeal to *ethos* during a political interview. The politician interviewed is Ségolène Royal, the Left Wing candidate (Socialist Party) at the French

presidential elections in 2007 and Nicolas Sarkozy's counter candidate. The interview I focus on was held on the 25th of April 2007 in the studios of the French TV channel France 2, three days after the first electoral tour, when Royal came out second with 25,87% votes against the candidate of the UMP (Union pour un Mouvement Populaire), Nicolas Sarkozy, who obtained 31,18% of the votes.

Before engaging in the analysis of the strategic maneuvering, I first provide the original fragments and the translations of Royal's discourse, fragments which I used in the reconstruction of Royal's standpoint and argumentation.

(1) *"Et d'ailleurs, si je l'ai mis dans mon pacte présidentiel c'est parce que je sais que ça marche, que certaines régions l'ont déjà fait et je suis une femme pratique. Je suis moi-même une présidente de région, je ne parle pas dans le vague, dans le vide. Je suis l'élue d'un territoire rurale, on l'a vu tout à l'heure dans le portrait, depuis 15 ans. Je suis aujourd'hui confrontée en tant que présidente de région aux souffrances, aux difficultés, aux délocalisations, au chômage, à la précarité et je trouve et je cherche des solutions. Donc j'ai pris ce que marchait pour le mettre dans le pacte présidentiel. " […]*

"Voilà, je n'ai aucune revanche à prendre, je n'ai aucune revendication, je n'ai pas d'enjeu personnel dans cette affaire, je ne suis liée à aucune puissance d'argent, je n'ai personne à placer, je ne suis prisonnière d'aucun dogme, et au même temps je sens que les Français ont envie d'un changement extrêmement profond. Et mon projet c'est eux, ce n'est pas moi, mon projet. Mon projet ce sont les Français et aujourd'hui le changement que j'incarne. Le changement, le vrai changement c'est moi. Donc là il y a aujourd'hui un choix très clair entre soit continuer la politique qui vient de montrer son inefficacité, certaines choses ont été réussies, tout n'est pas caricaturé, par exemple le pouvoir sortant a réussi la lutte contre la sécurité routière, par exemple, mais beaucoup de choses ont été dégradées, Arlette Chabot, dans le pays, beaucoup de choses… " […]

And if I put it in my presidential programme, it is because I know that this works, certain regions already made it and I am a practical woman. I am myself a Head of region, I don't talk without having solid grounds. Since 15 years I have been representing a rural territory, I've been elected by its members, as we've just seen in the reportage. I am confronted as a Head of region with the pain, difficulties, displacements, unemployment, precariousness and I find and I look

for solutions. So I took what was working in my region and I put it in my presidential program. […]

I have got no revenge to take, I have got no demand to make, I have got no personal benefice in this affair, I'm not bound to any financial power, I have got no one to place, I'm not prisoner of any dogma, and in the same time, I feel that the French people desire an extremely deep change. And my project is them, my project is not myself. My project is the French people and the change I embody today. The change, real change, is me. So today there is a very clear choice between either continuing the politics which has just shown its inefficacity, some things were well done, not everything is caricaturized, for instance the former party came out successful of the fight for security while driving, for instance, but a lot of things have been degraded in the country, Arlette Chabot, a lot of things. […]

As mentioned by van Eemeren et al. (2002), in analyzing argumentation we first have to identify the standpoints at issue. Even if not explicitly stated, taken into consideration the context in which the discussion takes place, we can assume that Royal's main standpoint is 'I am the best alternative as a president'.
In analysing the strategic choices of the candidate under analysis, we will focus on the three intertwined aspects of the strategic maneuvering.

In the argumentation stage of the discussion, where she has to advance arguments in favour of her standpoint, she addresses the three aspects of the strategic maneuvering by choosing her arguments from the topical potential at her disposal. More precisely, from all the possible available arguments, she decides to emphasize the competence and benevolence side of her *ethos,* adapting this way to the audience's assumed desire of having a competent and benevolent president. As far as the presentational means are concerned, she chooses an antithetical exposition of her own's and of her opponent's qualities, where emphasis is put on the difference between them.
Following the pragma-dialectical model of reconstruction of the argumentation, I reconstructed Royal's argumentation as a coordinative argumentation, supported by two main arguments advanced in defence of her main standpoint 'I am the best alternative'. The two main arguments, none of them explicitly stated, are *I am benevolent* and *I am competent.*

I interpreted them as constituting a coordinative argumentation and not for

instance a multiple one, as, in my opinion, both arguments are needed in order to support the standpoint 'I am the best alternative'. According to van Eemeren et al. (2002), a multiple argumentation "consists of more than one alternative defense of the same standpoint" (van Eemeren et al. 2002, p. 63). Therefore, in case one of the arguments is rejected by the Antagonist, the standpoint may still stand because it is still defended by the remaining argument. This is not the case with coordinative argumentation, where "several arguments taken together constitute the defense of the standpoint" (van Eemeren et al. 2002, p. 63), and where one argument only is not capable of assuring a conclusive defense of the standpoint. In order to gain the audience's trust and persuade them that she is the best alternative, Royal has to make them believe that she is both competent and benevolent, these being, according to Poggi (2005) and Falcone & Castelfranchi (2008), the two necessary components for trust. In fact, the Persuadee only decides to entrust his goals to the Persuader if he believes that the latter is both competent and benevolent, therefore both arguments employed are needed in order to conclusively support the standpoint.

These two main arguments are, in turn, supported by a range of sub-arguments. The first main argument, *I am benevolent*, is supported by the following sub-arguments:

(2) "I have got no revenge to take";
(3) "I have got no demand to make;
(4) "I have got no personal benefit from this affair";
(5) "I am not bound to any financial power" (i.e. I am not supported by any financial power which when I will be elected will expect a favour in return);
(6) "My project is the French people";
(7) "My project is not myself";
(8) "I do not have an ultimate step to reach".

The second main argument, *I am competent* is again not explicitly expressed, even if all the sub-arguments she advances support it. Actually, to explicitly say that she is competent, might even backfire because it could be interpreted as showing off, or worse, as if there were a need for her to specify it, because people do not actually believe it is so. In fact, as mentioned also by van Eemeren et al. (2002), leaving premises or standpoints unexpressed is quite a common thing in argumentative discourse. The addressees of the discourse can nonetheless understand the unexpressed items with the aid of the Communication Principle

(Grice 1975) and communication rules.
The 'competence' argument is supported by two sub-arguments: *I am a practical* woman and *I am experienced*. On the experience side, she decides to support her being experienced by sub-arguments such as:

(9) "I am myself a Head of Region",
(10) "Since 15 years I have been representing a rural territory",
(11) "I have slowly built my carrier step by step".

As far as the practical side is concerned, she appeals to the following sub-arguments:

(12) "I find solutions";
(13) "In my presidential program I only put things which work and which were previously tested";
(14) "I do not speak without having sound grounds for what I say".

6.1. Topical choice and audience adaptation in Royal's argumentation
Every argument advanced to support the standpoint 'I am the best alternative' has a perfectly corresponding argument which emphasizes the opposite trait in the opponent. As she puts it, while she is benevolent and runs for the candidacy of France for the sake of the French people, Sarkozy is doing so for his own interest; while her competence has been proven during the years she was Head of the Poitou-Charentes Region, during the government of the Right Wing politicians (and therefore indirectly of Sarkozy, as the representative of the Right Wing), "a lot of things have been degraded in the country".
In order to prove Sarkozy's self-interest, Royal resorts to arguments available from electoral events. In fact, while mentioning that she is not after revenge ("I have no revenge to take"), she is alluding at the Clearstream issue**[ii]**, indirectly implying that the reason why Sarkozy is running for the presidency is because he wants to acquire power to get even with his enemy, namely Dominique Villepin.

A second argument defending the thesis that Sarkozy has a personal interest – again extracted from the topical potential at hand – concerns the fact that he is doing it for his ego. We learn from Royal that Sarkozy has previously asserted having 'a last step to reach' ("I do not have a last step to reach for myself, as he says"), and this last step consists exactly in becoming the president of France. She exploits his affirmation and turns it against him, by explicitly stating that,

contrary to him, she does not have a last step to reach, emphasizing therefore her disinterest in becoming a president for herself.

I argue that she not only decided to exploit in her favour these events which put Sarkozy in a bad light, but that her choice from the topical potential was mainly influenced by them. Considering the situation at hand, Royal took the opportunity of emphasizing the benevolence side of her *ethos*, again on the basis of an opposition, by alluding to the Clearstream trial and by mentioning Sarkozy's "last step to reach", being certain that the audience would grasp what she implies, namely, that Sarkozy has a personal interest in becoming president. As often happens in adversarial debates, the topical selection of one of the arguers is influenced by the previous arguer's sayings or doings. In this case, Royal picked up from the topical potential at her disposal those events which best supported her standpoint 'I am the best alternative' and which best adapted to the audience's preference of having a president who puts the peoples' interests before his own.

As already mentioned, arguing that the Persuader is benevolent is not enough to persuade the public to vote for him. He must also convince of his competence. These two aspects cannot hold without one another. As you would not entrust your goals to a benevolent but incompetent Persuader, you would not be persuaded by a competent, cunning Persuader but one for whom you are only a tool in achieving his own goals. Therefore both aspects need to be emphasized in order to gain the Persuadee's trust.

Royal in her argumentation focuses on the competence side as well, advancing arguments such as *I am a practical woman* and *I am experienced,* arguments aimed at supporting the sub-standpoint *I am competent*. This sub-standpoint has as well a negative counterpart aiming at discrediting the results obtained by the Right Wing and therefore by Sarkozy, as the representative of the Right Party. While mentioning the politics which has "shown its inefficacy" and the big amount of things which "have been degraded in the country", she refers of course to Right Wing politics. After mentioning the negative results of the opponent's party, she does not refrain from admitting that "some things were well done, not everything is caricaturized, for instance the former party came out successful in the fight for security while driving". In this way she emphasizes again her image of a fair candidate who acknowledges the other party's successes and does not aim at denigrating him at any rate.

6.2. *The dichotomizing strategy as a presentational device*

So far we have seen Royal's choices as far as the topical selection is concerned, more precisely the fact that she chooses her arguments from the events which shed a negative light on Sarkozy during his electoral campaign. We have also seen how she adapts to the audience's preference of having a disinterested and competent president. As far as the third aspect of the strategic maneuvering is concerned, Royal makes extensive use of dichotomies: her personal and moral traits are always contrasted with those of Sarkozy. As we have already seen, Royal's argumentation is antithetically construed: for every positive trait she adopts for herself, there is a negative counterpart which applies to her opponent:

I am competent versus *the Right Wing (and Sarkozy as major representative) is incompetent;*
I don't have a personal interest versus Sarkozy is doing it for revenge and for "reaching the final step".

Her use of polarizing terms can be seen in terms of a dichotomization strategy where the arguer wants to distance herself from the opponent as much as possible.

Her strategy is aimed at emphasizing her image as the best candidate for president, while in the meantime distance herself from the opponent, who is portrayed as the worst option.

Royal defines her position as incompatible with and antithetic to that of the opponent and tries to exploit the dichotomous position in her favour and against the opponent.

It is important to notice the way the dichotomies are stylistically presented. Royal chooses to present the dichotomies tacitly, without any direct reference to her rival and often with merely denying charges (*I have got no revenge to take, I have got no demand to make, I have got no personal benefice in this affair, I am not bound to any financial power*) letting the public infer that while Royal has no revenge to take, no demand to make, no personal benefits in this affair, there is someone who does have a revenge to take, a demand to make, or a personal benefit: namely Sarkozy. If none of the candidates had no personal interest in running for the presidency, there would be no need to emphasize the lack of interest in her case. Therefore, if Royal felt the need to emphasize this, we are dealing with important information for the public, (cf. the Gricean Quantity Maxim). Due to the political backgound, there is no need for Royal to explicitly

state who exactly is the person she refers to, the public is perfectly capable of drawing the correct inference.

Similarly to the example analyzed by Dascal, in fragment (1) as well, Royal presents her opponent as not being a contender worthy of the audience's trust. The dichotomy is therefore presented as unbalanced rather than a problem to be solved: it's already pre-decided in favour of the arguing party.

6.3. Linguistic versus non linguistic presentational devices

Communication and therefore persuasion, as a subfield of communication, are multimodal. Gestures, gaze and facial expression contribute to the persuasion process.

We have seen how Royals employs a dichotomizing strategy in order to distance herself from Sarkozy with the aim of persuading the audience that of the two candidates, she is the best alternative.

We analyzed Royal's appeal to *ethos* from the strategic maneuvering perspective and interpreted the dichotomizing strategy as one of the three aspects of the strategic maneuvering, namely the presentational devices.

I argue that linguistic presentational devices can be reinforced by non verbal strategies.

During the same presidential interview Royal employs hand gestures in a way that is revealing of her aim of distancing herself from her opponent. I interpreted these gestures as non linguistic presentational devices employed in order to reinforce the distance between herself and her opponent, a distance, as we have seen, already highlighted by a dichotomous characterization of the moral traits of the two parties. By making use of gestures as presentational devices, Royal helps the audience to clearly distinguish and differentiate between one candidate and the other. In most of the cases where she mentions the Right Wing and Sarkozy, she gestures with the right hand, while when mentioning her own party (Left Wing), she employs the left hand. Interestingly enough, the right hand is used also when negative concepts associated to the Right Wing are mentioned, such as: people who became rich because of real estate speculation, rich people who prefer not to work because they support themselves thanks to private incomes, and rich people in general, as opposed to the poor who are signalled instead by the left hand. Left hand gestures are also used when speaking about the working class and about work in general.

In Royal's use, the right hand is therefore associated to the Right Wing and to the rich people and in general to negative concepts such as speculation, while the left hand generally stands for her own party and positive concepts such as work.
Royal encourages the audience to draw these correlations by helping them to reach the desired inference through the use of hands. Gestures in this case are not only a presentational device which reinforces the distance between the two candidates, by assuring the two participants a well delimitated and fixed spot in the audience's mind, but fulfil a substitutive function as well. What is not explicitly stated (i.e. that voting for the Right Wing candidate equals to favouring the rich people who get richer and richer from real estate speculation and not by honest work) is nonetheless expressed by means of gestures.

Here are a few examples(3) from the interview in which Royal uses gestures to draw a line between the two parties and the values they defend. (an asterisk followed by R or L follows the word corresponding to a gesture of the Right (R) or Left (L) hand.

(15) *Je ne veux plus de cette injustice-là. Il y a trop de riches (*R) d'un côté et trop de pauvres (*L) de l'autre.*
I don't want this injustice anymore. There are too many rich (*R) people on one side and too many poor people (*L) on the other side.

(16) *Alors que quand j'entends le candidat de la droite (*R) dire qu'il va faire un bouclier fiscal…mais où va aller cet argent ? dans l'immobilier (*R), dans la spéculation (*R).*
When I hear the candidate of the Right (*R) saying that he is going to make a tax measure to limit tax paid by taxpayers… But where is that money going? In the real estate (*R), in the speculation (*R).

(17) *Faire revenir qui ? De toute façon tous ce qui veulent partir (*R), tous ces riches***[iv]***(*R) […] La promesse du bouclier fiscal n'as pas empêché certain d'entre eux à partir (*R), alors qu'il promet le bouclier fiscal. Mais où va cet argent ? (*R) Il va dans la spéculation immobilière, c'est-à-dire que les catégories moyennes (*L) ont de plus en plus mal (*L) à se loger, parce qu'il y a de la spéculation (*R). Des gens très riches (*R) qui sont de plus en plus riches, avec le pouvoir actuellement en place (*R) […] Et c'est ça qui détruit l'économie (*R). Parce que à partir du moment où la rente (*R) est avantagée par rapport au travail (*R comes towards L), comme c'est le cas aujourd'hui (*R comes to the*

*center) et comme c'est le cas dans le programme du candidat de la droite (*R returns to initial position to the Right), à ce moment-là, c'est l'économie qui est sapée (*R). Parce que si la rente est d'avantage récompensée que le travail, comment voulez-vous motiver les gens pour travailler, comment voulez-vous motiver les petites entreprises, si elles gagnent plus d'argent (*R) par la spéculation immobilière, qu'on créant des activités industrielles (*R comes towards L) dont la France a besoin?*

Who to come back ? Anyway, all those who wanted to leave (*R), all those rich people (*R) […] The promise of a tax measure to limit taxes didn't stop some of them to leave (*R) when he promised them the tax measure. But where is that money going? (*R) It's going into the real estate speculation, that is, the middle class has difficulties to buy a house, because there is speculation (*R). Rich people (*R) who become even richer, because of the party on power at the present time (*R) […] And that's what destroys economy (*R). Because if having a private income is more rewarding than working (*R comes towards L), which is the case today (*R comes towards center), and which is the case in the programme of the candidate of the Right, (*R goes back to intial position, to R), then economy is ruined (*R) Because if the private income is more rewarding than work, how do you want to motivate people to work, how do you want to motivate the small enterprises, if they earn more money by real estate speculation, then by creating the industrial activities (*R comes to the L) which France needs**[v]**?

A similar use of hands has been observed already by Calbris (2003) concerning Lionel Jospin's gestures: "The Left in politics is situated at the locutor's left. Jospin refers to the Left by systematically exploiting his left hand. Every allusion to the left government, such as the Left's objectives, the Left's political programme, are represented by the left hand. […] In a general way, the Leftist government is mentally situated on the left." (Calbris 2003, p. 67, my translation).

We can say that in both cases but especially in Royal's case, gestures have an active role in reinforcing the polarized positions of the two candidates, supporting therefore the dichotomy and emphasizing the distance between them, distance which cannot be bridged in any possible way.

7. *Conclusion*

In this paper I presented a case of appeal to *ethos* as a strategic maneuvering in political discourse. I showed how the candidate under analysis chooses her

arguments while taking into account the intertwined aspects of the strategic maneuvering: topical potential, audience adaptation and presentational devices. As far as the third aspect is concerned, I showed how Royal's arguments are subservient to a dichotomizing strategy. I argued that the linguistic dichotomization strategy is reinforced by a non verbal presentational device having the same goal of delimiting and distancing the two parties. Moreover, I showed how gestures not only reinforce the verbal component, but also have a substitutive role, helping the audience to infer what has not been explicitly stated in the verbal discourse.

My tentative hypothesis is that one of the reasons why Ségolène Royal lost the elections is precisely because of this permanent reference to the other party. Either through verbal or through non verbal means she always used to mention her opponent or his party. Besides the fact that mentioning the negative qualities of the opponent while not present could be interpreted by the audience as speaking bad of the other behind his back and therefore perceived as an unfair tactic, permanently mentioning Sarkozy – whether positively or negatively – allows him to be somehow permanently 'present' in the audience's minds, even if not in the studio at the time being. Because as Lakoff puts it, the very mention of a thing or character irresistibly activates a frame in which that thing or character is dominant, and therefore makes it salient and powerful in the Receiver's mind.

NOTES

[i] I am indebted to Bart Garssen for the suggestion about dichotomization tactics.

[ii] The Clearstream issue refers to an accusation of having obtained illegal kickbacks from arms sales, accusation directed at Nicolas Sarkozy by Dominique Villepin, the previous French First Minister. The list brought to Villepin's attention, containing 89 French politicians, businesspeople and public figures involved in the illegal kickback money from arms sales and containing Sarkozy's name as well, later proved to be a fake. Sarkozy accused Villepin of having used the forged list in order to derail his presidential bid and of having continued to use it even when he knew that it was fraudulent. Villepin denies any such accusations and says Sarkozy is using his influence in order to pursue a personal vendetta.

[iii] The examples were already mentioned in a previous paper (Poggi & Vincze 2009)

[iv] For this paper's purpose a standard transcription is not necessary, therefore I developed a transcription method in order to signal the precise moments when right (*R) or left hand (*L) are employed by the speaker.
[v] All the translations from French into English were made by the author.

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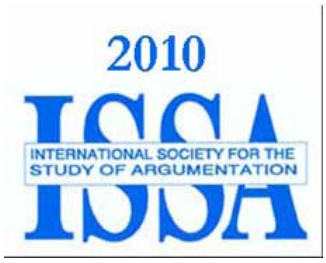
ISSA Proceedings 2010 – Argument Schemes, Topoi, And Laws Of Logic



1. *Introduction*

For the reconstruction of implicit elements in argumentative discourse, the pragma-dialectical account of "argument schemes" serves as an important heuristic tool**[i]** Consisting of a description of the various ways in which an arguer may transfer the acceptability of the argument to that of the standpoint, the account enables the analyst to reconstruct the "unexpressed premise"**[ii]**. However, in reconstructing implicit elements, the analyst may also benefit from other accounts of the transfer of acceptability of the argument to that of the standpoint, such as *topoi* and laws of logic. These alternative accounts are especially helpful in the reconstruction of academic argumentation – scholarly, scientific, philosophical argumentation – in which the notion "necessity" plays a pivotal role.

In this paper, I will present a formal framework that encompasses the three theoretical accounts of acceptability transfer principles just mentioned (argument schemes, *topoi*, and laws of logic)**[iii]**. First, I will discuss some insights from speech act theory that underlie the pragma-dialectical account of argument schemes and that will serve as a starting point for the development of the framework (§2). Next, I will introduce the notion "acceptability transfer principle" (ATP) and describe the four types of this principle that make up the framework (§3). Finally, I will briefly indicate how the existing accounts of argument schemes, *topoi*, and laws of logic fit into the framework (§4).

2. *Standpoints and arguments*

In the pragma-dialectical view, statements are reconstructed as standpoints when the speaker or writer (henceforth: the "arguer") meets or anticipates doubt of the listener or reader (henceforth: the "addressee") with regard to that statement. Among the felicity conditions of putting forward a standpoint are the condition (I)

that the arguer believes that the standpoint is acceptable and (II) that the arguer believes that the addressee does not already deem the standpoint acceptable.

In the same view, statements are reconstructed as arguments when they may be assumed to contribute to the realization of the aim of the arguer to render the standpoint acceptable to the addressee. The felicity conditions for putting forward an argument can be derived from this assumption. Among these are the condition (I) that the arguer believes that the argument is acceptable and (II) that the arguer believes that the argument has justificatory force – that is, that accepting the argument renders the standpoint acceptable. The second condition can be further differentiated in the condition (IIa) that the arguer believes that the argument is relevant and (IIb) that the arguer believes that the argument is sufficient. In this way, the felicity conditions correspond to the three criteria that are generally used in order to evaluate the soundness of arguments: An argument has the potential of realizing the aim of the arguer when it is acceptable (A), relevant (R), and sufficient (S)**[iv]**.

In actual argumentative discourse, it is often the case that elements that are relevant for the evaluation remain implicit. In order to make these elements more explicit, the account of the felicity conditions for putting forward standpoints and arguments may serve as a heuristic device. The account is especially helpful for the reconstruction of the so-called "unexpressed premise". From the felicity conditions it can be derived that an arguer, having put forward a standpoint and an argument, is not only committed to the acceptability of both the standpoint and the argument, but also to the justificatory force of the argument. By expressing the latter commitment in the form of a statement, the analyst has provided a theoretically motivated reconstruction of the unexpressed premise in the form of what I will call the "acceptability transfer principle" (ATP)**[v]**:

Accepting the argument renders the standpoint acceptable.

Abbreviating the standpoint as STP and the argument as ARG, a fully explicit reconstruction of a standpoint and an argument then consists of the following elements (*Figure 1*):

1 STP
1.1 ARG
1.1' ATP (1.1→1)

Figure 1

Apart from serving as a heuristic device for the reconstruction of the unexpressed premise, the account of the felicity conditions for putting forward standpoints and arguments may also be helpful for the reconstruction of other elements of the discourse. From a theoretical point of view, the addressee is assumed not to already accept the standpoint, but to accept it after (I) having deemed the argument acceptable and (II) having deemed the argument to have justificatory force. Of course, the addressee is not obliged to act accordingly. He is entitled to doubt or criticize the acceptability and/or the justificatory force of the argument or – in terms of the reconstruction above – the explicit argument (1.1) and/or the acceptability transfer principle (1.1'). These theoretical insights can be used in order to reconstruct the attempts of the arguer to meet the real or anticipated response of the addressee. Such an attempt can either be reconstructed as an argument in support of the original explicit argument (1.1.1) or as an argument in support of the acceptability transfer principle (1.1'.1). Any of these two types of arguments come with new acceptability transfer principles, so that a fully explicit reconstruction consists of the following elements (*Figure 2*):

1 STP
1.1 ARG
1.1.1 ARG
1.1.1' ATP (1.1.1→1.1)
1.1' ATP (1.1→1)
1.1'.1 ARG
1.1'.1' ATP (1.1'.1→1.1')

Figure 2

Of course, all the arguments may be further supported by other arguments, thereby repeating the same pattern.

3. *Acceptability transfer principles*

Having spelled out the theoretical insights that form the basis for the development of the framework, I will continue with a closer analysis of the

content of the acceptability transfer principle. Standpoints and arguments express an attitude (positive or negative) with respect to a proposition, consisting of two elements: a referent (R) and a predicate (P). The referent of the standpoint may either differ from the referent in the argument or be the same, and the same applies to the predicates. So, from a formal linguistic point of view, there are exactly four possible combinations of a standpoint and an argument *(figure 3):*

	(I)	(II)	(III)	(IV)
standpoint	P is true of R	P is true of R	P is true of R	P is true of R
argument	Q is true of S	Q is true of R	P is true of S	P is true of R

Figure 3

In line with these possibilities, the general acceptability transfer principle formulated in the previous section can be further specified by substituting "standpoint" and "argument" by the propositions mentioned above. This amounts to a description of four different acceptability transfer principles:

(I) PROPOSITION TRANSFER
In this case, the acceptability of the argument is transferred to that of the standpoint while the propositional content of the argument differs completely from that of the standpoint. This principle reads as follows: "Accepting that Q is true of S renders acceptable that P is true of R."

(II) PREDICATE TRANSFER
In this case, the acceptability of the argument is transferred to that of the standpoint while the propositional content of the argument only differs from that of the standpoint with respect to the predicate. This principle reads as follows: "Accepting that Q is true of R renders acceptable that P is true of R."

(III) REFERENT TRANSFER
In this case, the acceptability of the argument is transferred to that of the standpoint while the propositional content of the argument only differs from that of the standpoint with respect to the referent. This principle reads as follows: "Accepting that P is true of S renders acceptable that P is true of R."

(IV) REPETITION TRANSFER
In this case, the acceptability of the argument is transferred to that of the standpoint while the propositional content of the argument is exactly the same as

that of the standpoint. This principle reads as follows: “Accepting that P is true of R renders acceptable that P is true of R.”

In figure 1 below, the four acceptability transfer principles are presented in terms of the reconstructions in the previous section.

	different referent	same referent
different predicate	**(I) PROPOSITION TRANSFER**	**(II) PREDICATE TRANSFER**
	1 P is true of R 1.1 Q is true of S 1.1’ Q is true of S à P is true of R	1 P is true of R 1.1 Q is true of R 1.1’ Q is true of R à P is true of R
same predicate	**(III) REFERENT TRANSFER**	**(IV) REPETITION TRANSFER**
	1 P is true of R 1.1 P is true of S 1.1’ P is true of S à P is true of R	1 P is true of R 1.1 P is true of R 1.1’ P is true of R à P is true of R

4. Conclusion

Having presented the framework, I will briefly indicate how the pragma-dialectical argument schemes, topoi, and laws of logic might fit in to it. I will do that by giving some examples of each of the four possibilities.

Proposition transfer seems to occur very rarely in the mentioned accounts of acceptability transfer principles. A reason for this might be that in this type of transfer, the argument does not share one of its terms with the standpoint and that this feature has traditionally been deemed necessary in order for the transfer of acceptability to take place. However, if there is a specific relation between the referent of the argument and that of the standpoint, and there is a relation of the same kind between the predicates, a transfer of acceptability in fact does take place. An example of a standpoint and an argument in which such a relation occurs is mentioned in Aristotle’s list of general *topoi*: “Temperance is beneficial, for licentiousness is hurtful.” (*Rhetorica* 1397a). The *topos* involved is called “from opposites” and functions as an argument supporting the acceptability transfer principle – or, more specifically, the relevance – of the original argument:

1 Being beneficial (P) is true of temperance (R).
1.1 Being hurtful (Q) is true of licentiousness (S).
1.1’ Accepting that licentiousness is hurtful renders acceptable temperance is beneficial (Q is true of S **->** P is true of R).
1.1’.1 The *topos* “from opposites” applies.

As far as laws of logic are concerned, in the example below, an instantiation of the law of the excluded middle functions as an argument supporting the relevance of the original argument *(Figure 4)*:

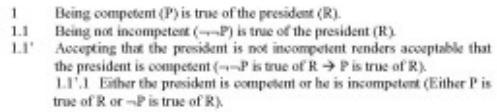


Figure 4

Predicate transfer corresponds with two of the argument schemes described in pragma-dialectics – symptomatic argumentation and causal argumentation. The statement that something is a symptom or a cause for something else functions as an argument supporting the relevance of the original argument:

1 P is true of R
1.1 Q is true of R
1.1’ Q is true of R à P is true of R
1.1’.1 Q is a sign of P (symptomatic) / Q leads to P (causal)
The most famous example of reasoning can also be subsumed under the heading of predicate transfer. In this case, the *topos* functions as an argument supporting the relevance of the original argument:

1 Being an animal (P) is true of Socrates (R).
1.1 Being a man (Q) is true of Socrates (R).
1.1’ Accepting that Socrates is a man renders acceptable that Socrates is an animal (Q is true of R -> P is true of R).
1.1’.1 The *topos* “What belongs to a species, also belongs to the genus” applies.

Referent transfer corresponds with the argumentation scheme that completes the pragma-dialectical typology – argumentation based on a comparison. The statement that something is similar to something else functions as an argument supporting the relevance of the original argument:

1 P is true of R
1.1 P is true of T
1.1’ P is true of T -> P is true of R
1.1’.1 R is similar to T

Finally, repetition transfer is included in logical approaches (one may derive p from p) but not the pragma-dialectical typology (it is evaluated as a fallacy of circular reasoning / begging the question / *petitio principii*). Nevertheless, since the evaluation should always be preceded by a reconstruction, an analysis in terms of acceptability transfer principles might still be of help. Consider the following example (van Eemeren, Grootendorst & Snoeck Henkemans 2002, p. 130):

1 Being a punishable offense (P) is true of racial discrimination (R).
1.1 Being against the law (Q) is true of racial discrimination (R).
1.1’ Accepting that racial discrimination is against the law renders acceptable that it is a punishable offense
(Q is true of R -> P is true of R).
1.1’.1 Being against the law implies being a punishable offense.

This example of circular reasoning is reconstructed as a predicate transfer in which the identity of the predicates P and Q is revealed by 1.1’.1, thus resulting in a repetition transfer. One could imagine that are also examples that can be reconstructed as referent transfers in which the identity of the referents R and S can be revealed in the same way. And also examples in which the identity of both the predicates and the referents can be made more explicit. In fact, the analysis shows that there are three types of referent transfer, one of each of the other types of acceptability transfer principles proposed in this paper.
By reconstructing these examples and, in some cases, abstract schemata, I have indicated that the framework developed is in principle capable of hosting other accounts of acceptability transfer principles, notably those developed in the pragma-dialectical typology of argument schemes, the traditional lists of *topoi*, and the laws of logic. It might therefore be a fruitful starting point for further research concerning types of argumentation and the critical questions that are associated with these types (e.g. sign argumentation, definitions, analogy argumentation, pragmatic argumentation).

NOTES

[i] I would like to thank two anonymous referees for their helpful comments on a previous version of this paper.

[ii] For an explanation of the pragma-dialectical insights mentioned and used in this paper see van Eemeren, Grootendorst, and Snoeck Henkemans (2002).

[iii] The present paper is an extended and refined version of Wagemans (2008).

[iv] Cf. Johnson and Blair (1977). Since their definition of "argument" includes the conclusion or standpoint, they would not say that an argument is or is not A, R, and S, but rather that an argument passes or fails the conditions of A, R, and S. For a "dialectification" of the criteria A, R, and S and their relation to argumentation structures see Snoeck Henkemans (1994, ch. 4).

[v] The ATP differs from other formulations of the "unexpressed premise" (like Toulmin's "warrant", the pragma-dialectical "pragmatic optimum", etc.) in that the ATP is a general expression of the speaker's commitment with regard to the justificatory force of any explicit argument. Cf. Toulmin (2003, ch. 3); Van Eemeren and Grootendorst (1992, ch.6); Govier (1987, ch. 5), Garssen (2001).

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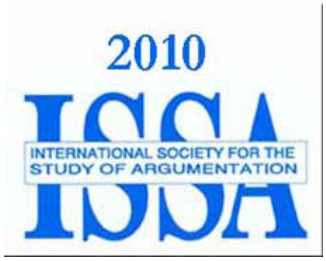
ISSA Proceedings 2010 – Burdens Of Persuasion And Proof In Everyday Argumentation



The concept of burden of proof is fundamentally important in argumentation studies. We know, for example, that it is very closely related to, and necessary for the study of informal fallacies, like the fallacy of argument from ignorance. But procedural methods for dealing with issues of burden of proof in argumentation have been worked out and applied in most detail in the field of law. There is controversy, however, concerning the extent to which legal methods for defining and determining burdens of proof can be applied to the study of problems of burden of proof arising in everyday conversational argumentation, and other context like forensic debate **[i]**.

In the recent literature doubts have been expressed about whether the model of burden of proof in law can be transferred to the study of how burden of proof operates in everyday conversational argumentation. In this paper we argue that the two different settings of argument use share an underlying dialectical structure that brings out some common elements that are useful to know about with regard to studying burden of proof. We argue that knowledge of these common elements enables us to derive many important lessons for argumentation theory as applied to nonlegal settings

Even in law, burden of proof is a slippery and ambiguous concept. Law is divided on how precisely to define burden of proof. Some experts in law distinguish between two types of burden of proof, whereas others take the view that there are three types. We are not in a position in this paper to attempt to give any answer to the question of how burden of proof should be defined or ruled on in law. Still, we think that some of the ways law has worked out for dealing with issues of burden of proof, over a long tradition of practical experience, are useful for

building a model of burden of proof can be useful for helping us to analyze and evaluate everyday conversational argumentation outside the legal setting. In this paper we present such a model, and argue that it is structurally similar to the concept of burden of proof used in law in some interesting and important ways, but also different in certain ways.

1. *Doubts about Transference from Legal Argumentation*

Hahn and Oaksford (2007) have argued that the notion of burden of proof has been inappropriately extended into argumentation studies from its proper domain of application in law. They describe this extension as a "hasty transference" of legal concepts to less structured contexts of everyday conversational argumentation, citing Gaskins (1992) and Kauffeld (1998) as supporting their view (2007, p. 40). Kauffeld (1998, p. 246) argues that the procedural formality of courtroom argumentation has been responsible for the lack of progress in investigating burden of proof in everyday conversational argumentation outside the legal setting.

On Hahn and Oaksford's description of the historical background, Whately is accused of being the culprit who first carried out the attempted transference of the legal notion of burden of proof through his introduction of the notion of burden of proof in his writings on rhetoric. They cite difficulties and confusions in the way burden of proof is understood and operates in law. Among the chief items of evidence for their view, Hahn and Oaksford cite the historical analysis of Gaskins (1992) to show how the US Supreme Court of the Warren era used creative shifting of burden of proof as a vehicle for progressive social change (p. 42). Gaskins (1992, p. 3), sees the argument from ignorance as forming the tacit structure of an increasingly common style of public argument: "I am right, because you cannot prove that I am wrong". He links the argument from ignorance to the way burden of proof is used as a device in law, characterizing burden of proof as "the law's response to ignorance, a decision rule for drawing inferences from lack of knowledge"(p. 4). Gaskins claims that burden of proof works in law as a shadowy device used by skillful advocates in legal battles to direct arguments from ignorance against each other. On his view, public argumentation is deteriorating badly through the use of shadowy devices of burden-shifting and arguments from ignorance.

In a rebuttal of Gaskins views about burden of proof, however, Allen (1994) showed through many examples of cases how American evidence scholars have

studied burden of proof in depth and have built a body of knowledge about how it works in legal reasoning about evidence. Allen showed (1994, p. 629) that in the common law system, burden of proof is the tool for structuring the orderly presentation of the evidence, and that since the defining trait of litigation is the problem of arriving at a decision under conditions of uncertain knowledge (p. 633), argument from ignorance is a legitimate form of argument in that setting. Arguments are evaluated by standards of proof, like preponderance of the evidence, that are not shadowy but precise. He argues that standards of proof are well articulated and made known in advance to all participants in a trial, and that they work in a trial in a precise way to moderate the argumentation on both sides in a way that is fair to the litigants and that allows the evidence on both sides to be presented.

2. *Wigmore's Example*

Wigmore (1981, p. 285) has a simple example of burden of proof in everyday conversational argumentation. It is interesting to note that the example is a three party dialogue. The two opposed parties A and B are at issue on any subject of controversy, not necessarily a legal one, and M is a third-party audience or trier who is to decide the issue between A and B.

Suppose that A has property in which he would like to have M invest money and that B is opposed to having M invest money; M will invest in A's property if he can learn that it is a profitable object and not otherwise. Here it is seen that the advantage is with B and the disadvantage with A; for unless A succeeds in persuading M up to the point of action, A will fail and B will remain victorious; the "burden of proof", or in other words the *risk of nonpersuasion*, is upon A.

This example is used by Wigmore to show that the situation of the two parties is very different. The risk of failure is on A, because M will fail to carry out the action that A is trying to persuade him to carry out if M remains in doubt. Moreover, M will remain in doubt unless A brings forward some argument that will persuade him that investing in A's property is a profitable object. In other words, B will win the dispute unless A does something. However, as Wigmore points out (p. 285), this does not mean that B is "absolutely safe" if he does nothing. For B cannot tell how strong an argument A needs to win. It may be that only a very weak argument might suffice. Therefore to describe burden of proof in this example, Wigmore calls it the risk of nonpersuasion, describing it as "the risk of M's nonaction because of doubt". The example shows that the burden of proof

is this risk that falls on one side or the other in the dispute. In this example, it falls on A. This example is a very good one to help us grasp in outline basically how burden of proof works in everyday conversational argumentation: "this is the situation common to all cases of attempted persuasion, whether in the market, home, or the forum."(Wigmore, 1981, p. 285). However, there are several problems with it that need to be examined.

The first problem with Wigmore's example with respect to studying burden of proof in it is to classify the type of dialogue that it is supposed to represent. To determine whether Wigmore's example best fits the framework of a deliberation dialogue or persuasion dialogue, we have to look at the characteristics of each of these two types of dialogue and perhaps also contrast them with other types of dialogue of the basic types described in (Walton & Krabbe, 1995). The six basic types of dialogue recognized there are persuasion dialogue, inquiry, negotiation dialogue, information-seeking dialogue, deliberation, and eristic dialogue.

The kind of legal argumentation found in a trial would most likely best fit the framework of the persuasion type of dialogue. But there is also evidence that the example could be seen as a deliberation, because the argumentation in it is supposed to lead to a decision about action, namely the action of M investing the money. But burden of proof works differently in persuasion dialogue than in deliberation dialogue. Deliberation dialogue arises from the need for action, as expressed in a governing question formulated at the opening stage, for example 'Where shall we go for dinner tonight?'. Proposals for action arise only at a later stage in the dialogue (McBurney *et al*., 2007, p. 99), and are grounded on personal preferences or practical reasoning. There is no burden of proof set for any of the parties in a deliberation at the opening stage. However, at the later argumentation stage, once a proposal has been put forward by a particular party, it will be reasonably assumed by the other participants that this party will be prepared to defend his proposal. One participant can ask another to justify a proposition that the second party has become committed to. But when the second party offers the justification attempt, the dialogue shifts into an embedded persuasion dialogue in which the second party tries to persuade the first party to become committed to this proposition by using an argument.

A key factor that is vitally important for persuasion dialogue is that the participants agree on the issue to be discussed at the opening stage. Each party must have a thesis to be proved. This setting of the issue is vitally important for

preventing the discussion from wandering off and never concluding, or by shifting the burden of proof back and forth and never concluding. In deliberation dialogue however, the proposals are not formulated until a later stage (Walton, 2009). It makes no sense to attempt to fix the proposals at the opening stage, because they need to arise out of the brainstorming discussions that take place after the opening stage. Burden of proof is only operative during the argumentation stage in relation to specific kinds of moves made during that stage, and when it does come into play there is a shift of persuasion dialogue which allows the appropriate notion of burden of proof to be brought in from the persuasion dialogue.

Wigmore tells us in the example that A would like to have M invest money in his property, and that B is opposed to having M invest money. This seems to make the argumentation in the example fit a deliberation type of dialogue, where A is making a proposal to M invest money in his property, while B is making the alternative proposal that M not invest money in this property. On the other hand, there are three significant pieces of evidence that persuasion dialogue is involved. The first piece of evidence for this interpretation is Wigmore's statement that M will invest in A's property "if he can learn that it is a profitable object and not otherwise". This suggests a persuasion dialogue in which there is a conflict of opinions concerning whether a proposition is true (acceptable) or not. The proposition at issue is whether investing money in the property will be profitable or not. The proper type the dialogue for resolving such conflicts of opinions is the critical discussion, or persuasion type of dialogue. A second piece of evidence that the example is a persuasion dialogue is Wigmore' description of the example when he tells us (p. 285) that the desire of A and B "is to persuade M as to their contention". A third piece of evidence is that Wigmore equates the burden of proof in his example with the risk of nonpersuasion, suggesting perhaps that the persuasion type of dialogue better represents the setting he has in mind.

There is also evidence of a dialectical shift in the example from deliberation dialogue to persuasion dialogue. This type of shift is quite common in situations where two parties are having a deliberation dialogue and each party has put forward a proposal it is advocating is representing the best choice on what to do. But as each side puts forward its proposal, it gives all kinds of reasons for accepting this proposal as a good idea, based on factual considerations. For example supposing two parties are on a bicycle path are deliberating about which

bike path to take next at a fork in the road, and one party says there is construction along the path leading from the left side of the fork, while the other claims there is no construction along that path. The discussion started out as a deliberation, but then shifted to a persuasion dialogue concerning the factual issue of whether there is construction on that path or not.

The issue of which type of dialogue Wigmore's example can best be seen as fitting is highly controversial. Exponents of the deliberation model of dialogue as the most important setting for burden of proof in everyday conversational argumentation (Kauffeld, 1998) are likely to portray it as an instance of deliberation, because basically it is about taking a decision for action in a situation requiring choice. On the other hand, as we have seen, there is evidence that Wigmore would see it as being of the same type of dialogue is the kind of argumentation used a legal trial, namely persuasion dialogue. The best analysis is to see it as a shift from deliberation to persuasion.

3. *Continuation of the Example*

The problem with trying to use the example to derive any lessons from it about burden of proof in everyday conversational argument as opposed to legal argument is that the example itself is too short. To study burden of proof in a legal case, we would need a more detailed example in which arguments are put forward on one side and critically questioned or counterattacked by the other side. To remedy this defect, let's extend the example by putting some argumentation that might be used in it in the form of a dialogue.

A: I have heard from an expert town planner that the value of property in that area will increase.
B: This expert town planner is a biased source. He is your brother-in-law.
A: Yes that's true, but what he's saying is right because many other experts agree with him.

We can imagine this dialogue carrying on with each side taking its turn to present arguments and counter-arguments, but even this much of the dialogue is enough to bring out some features of burden of proof of interest.

The first thing to note is that this part of the dialogue looks like a typical persuasion dialogue in which there is a conflict of opinions about whether the investment will be profitable or not, and each side offers reasons to support its

viewpoint. At his first move, A puts forward an argument from expert opinion, and B attacks this argument using argument from bias. The attack is based on the implicit premise that somebody's brother-in-law is a biased source. In this instance, the assumption is a plausible one, and hence the counterargument from bias casts doubt on the preceding argument from expert opinion. At the next move, A concedes the allegation of bias, but argues that even so the argument from expert opinion is sustainable because other experts agree with the one cited in the argument. This extension of the argumentation in Wigmore's example looks very much like a typical persuasion dialogue, or critical discussion type of argumentation. If that interpretation of it is justified, it would be evidence for the dialectical shift interpretation.

In (Walton 1988) global burden of proof that applies over all three stages of a dialogue was distinguished form local burden of proof that applies only during the argumentation stage. The second thing to note is that there is a global burden of proof distribution that is set in place at the opening stage of the dialogue that is necessary to know about in order to evaluate the argumentation that takes place in the dialogue. This global burden of proof could be found in our example in the following way. A has a positive thesis to prove, namely the proposition that investing in this property will be profitable. A has to overcome M's doubts about this proposition before he will take the action of investing in the property. B, on the other hand, has no positive thesis to be proved in order to win the dialogue. He doesn't have to prove that the proposition that investing in this property will be profitable is false, although if he did prove that proposition, he would win the dialogue. But what he needs to do is less than that. All he has to do is create some doubts on whether the investment will be profitable. More precisely, he needs to do even less than that.

Wigmore (1981, p. 286) did pose the question of what the differences are between burden of proof in litigation and burden of proof "in affairs at large" outside the legal setting. His answer was that the procedures and penalties are different in litigation, but these differences are minor compared to what he called a single "radical difference". He called this difference (p. 286) "the mode of determining the propositions of persuasion which are a prerequisite" to the actions of the third-party trier (audience). What did he mean by this? Basically he meant that there are laws of pleading and procedure which subdivide groups of data and assign these subgroups to one or the other party as prerequisites for getting a

favorable outcome from the trier. For example the law defines what needs to be proved (the elements) in order for the prosecution to win in a murder trial, usually killing and guilty intent. The law also specifies what needs to be shown by the defense in order to persuade the tribunal to reverse its action, that is, the law specifies exceptions that constitute an excuse or justification. In other words, on Wigmore's view, burden of proof works basically the same way in law as in arguments on practical affairs outside of law, except that law narrows the groups of propositions that need to be proved for one side to obtain a favorable ruling of the trier, and kinds of arguments that the other side can use to reverse a favorable ruling.

According to Wigmore's description of the example, M will remain in doubt unless A brings forward some argument that will persuade him that investing in his property is profitable. In other words, according to the example, B doesn't have to do anything at all in order to win the dialogue. In short, the argumentation in this example has the same structure of burden of persuasion as a legal trial, where burden of persuasion is set at the opening stage, and determines what each party needs to do in order to win when the dialogue reaches the closing stage.

4. *Kinds of Burden of Proof in Law*

According to *McCormick on Evidence* (Strong, 1992, p. 425), the term 'burden of proof' is ambiguous, covering two different notions, burden of persuasion and burden of production. The latter is sometimes also called the burden of producing evidence or the burden of going forward with evidence. The burden of persuasion can be described as an obligation that remains on a party to a dispute for the duration of the dispute, and that once discharged, enables the party to succeed in proving his claim, resolving the dispute. According to Wigmore (p. 284), "The risk of non-persuasion operates when the case has come into the hands of the jury, while the duty of producing evidence implies a liability to a ruling by the judge disposing of the issue without leaving the question open to the jury's deliberations." The burden of persuasion never shifts from one side to the other during a trial. It appears, however, that he burden of production can shift back and forth as the trial proceeds.

Fleming (1961) has carefully drawn the distinction between the burden of persuasion, and the burden of production of evidence. The usual requirement of burden of persuasion in civil cases is that there must be a preponderance of evidence in favor of the party making the claim, that is, the proponent, before he

is entitled to a verdict (Fleming, 1961, p. 53). This requirement is usually explained as referring not to the quantity of evidence or the number of witnesses but to the convincing force of the evidence (Fleming, 1961, p. 53). In criminal cases (p. 54), the burden is to show the guilt of the accused beyond reasonable doubt. This test is very rare as applied to civil cases, but there is an intermediate test (54) that calls for clear and convincing evidence. The burden of production first comes into play at the beginning of the trial. If neither party offers any evidence at the trial, the outcome is that one party will lose. To use Wigmore's phrase, this party may be said to bear the risk of non-production of evidence.

Williams (2003, 168) contrasts the burden of production with tactical burden of proof, which refers to the burden resting on a party who, if he does not produce further evidence, runs the risk of ultimately losing on that issue. According to Williams (2003, p. 168) ruling on the burden of production involves a question of law, whereas the tactical burden of proof is "merely a tactical evaluation of who is winning at a particular point in time". According to Prakken and Sartor (2009, p. 227), the distinction between burden of production and tactical burden of proof is usually not clearly made in common law, and is usually not explicitly considered in civil law countries, but is relevant for both systems because it is induced by the logic of the reasoning process.

Prakken and Sartor (2009, p. 228) have built a logical model of burden of proof in law, and their clarification is helpful. The burden of persuasion specifies which party has to prove some proposition that represents the ultimate *probandum* in the case, and also specifies to what proof standard has to be met. The burden of production specifies which party has to offer evidence on some specific issue that arises during a particular point during the argumentation in the trial itself as it proceeds. Both the burden of persuasion and the burden of production are assigned by law. The tactical burden of proof, on the other hand is decided by the party putting forward an argument at some stage during the proceedings.

It is a familiar aspect of burden of persuasion that various different levels are set for successful persuasion, depending on the nature of the dispute that is to be resolved by rational argument. Here we have the familiar standards so often cited in connection with burden of persuasion: scintilla of evidence represents a weak standard, preponderance of evidence a stronger one, clear and convincing evidence still a stronger one, and proving something beyond a reasonable doubt represents the highest standard. In a criminal prosecution, the party who has the

burden of persuasion of the fact must prove it according to the standard of beyond a reasonable doubt. In the general run of issues in civil cases the burden of persuasion is fulfilled by a preponderance of evidence, but in some exceptional civil cases it is fulfilled by clear strong and convincing evidence (Strong, 1992, p. 437). There is some controversy about how these standards should be precisely defined. For example, what it means to say that the proof standard is one of preponderance of the evidence, or greater weight of the evidence is open to dispute. According to *McCormick on Evidence* (Strong, 1992, p. 438) preponderance of evidence means that the argument offered is more convincing to the trier then the opposing evidence. One other standard deserves mention here. Probable cause is a standard of proof used in the U.S. to determine whether a search is warranted, or whether a grand jury can issue an indictment.

Farley and Freeman (1995) presented a computational model of dialectical argumentation under conditions where knowledge is incomplete and uncertain. This model has the notion of burden of proof as a key element, where it is defined as the level of support that must be achieved by one side to win an argument. Under this account, burden of proof has two functions (Farley & Freeman, 1995, p. 156). One is to act as a move filter, and the other is that to act as a termination criterion during argumentation that determines the eventual winner of the dialogue. The move filter function relates to the sequence of intertwined moves put forward by the two parties, often called speech acts, over the sequence of dialectical argumentation. When one party puts forward what Farley and Freeman call an input claim (p. 158), there is a search for support for that claim from the input data. This process has been completed when the claim is supported by propositions from the input data. If no support can be found, the argument ends with a loss for the side (p. 158). Thus on their analysis, fulfilling any burden of proof requires at least one supporting argument for an input claim. If side one is able to find support for the claim it made, control either passes to other side, which then tries to refute the argument for the claim using both rebutting or undercutting arguments. If an undercutting move is successful, it may result in a change to the qualification of the claim originally made, or even to the withdrawal of the supporting argument. Put in terms of the theory of van Eemeren and Houtlosser (2002), this back and forth argumentation is characteristic of the speech acts and rejoinders made by both sides during the argumentation stage. The goal of the proponent is to generate the strongest possible arguments for its side, and the goal of the opposing side is to respond to

those arguments by making appropriate critical moves, like undercutters and rebuttals.

On the analysis of Farley and Freeman (1995, p. 160) burden of proof always has two elements: which side of the argument bears the burden, and what level of support is required by that side to fulfill that burden.

5. *Burdens of Proof and Stages of Dialogue*

The distinction between burden of production and the tactical burden is important in law because there are three parties involved in the typical kind of argumentation found in a legal trial, or perhaps even four in some cases, where there is a jury in addition to the judge. As noted above, the burden of production comes into play because of the possibility of a ruling by the judge disposing of the issue without leaving the question open to the jury to decide. This is a complication which does not appear to arise in matters of burden of proof in everyday conversation argumentation. Indeed, in many examples of argumentation in everyday conversation argumentation there only seem to be two parties involved, the proponent puts forward some argument and a respondent who questions or criticizes it. In a persuasion dialogue of the type used to model this kind of everyday conversational argumentation, there are only two participants, the proponent and the respondent, although consideration has been given to including a third-party audience in models of persuasion dialogue (Perelman & Olbrechts-Tyteca, 1989; Bench-Capon, Doutre & Dunne, 2007). Hence the distinction between the burden of production and tactical burden of proof, although it may be very important in law, may not be so significant, or even significant at all when it comes to dealing with problems of burden of proof in everyday conversational argumentation. However, there is a fundamental distinction between two main species of burden of proof that is clearly important in law and that can be, and should be, applied to the study of burden of proof in everyday conversational argumentation. This distinction can be explained by defining some formal characteristics of argumentation in dialogue that are, we argue, common to both legal argumentation and everyday conversational argumentation.

A dialogue is formally defined as an ordered 3-tuple (O, A, C) where O is the opening stage, A is the argumentation stage, and C is the closing stage (Gordon & Walton, 2009, p. 5). Dialogue rules (protocols) define what types of moves are allowed by the parties during the argumentation stage (Walton & Krabbe, 1995).

At the opening stage, the participants agree to take part in some type of dialogue that has a collective goal. Each party has an individual goal and the dialogue itself has a collective goal. The initial situation is framed at the opening stage, and the dialogue moves through the opening stage toward the closing stage.

The distinction between global and local burden of proof (Walton, 1988) can now be defined more precisely. The global burden of proof refers to what has to be proved to remove the doubt that originated a dialogue, thus winning the dialogue. Global burden of proof is defined as a 3-tuple (P, T, S) where P is a set of participants, T is the thesis to be proved or cast into doubt by a participant and S is the standard of proof required to make a proof successful at the closing stage. The local burden of proof defines what requirement has to be fulfilled for a speech act, or move like making a claim, to be successful. The global burden of proof is set at the opening stage, but during the argumentation stage, as particular arguments are put forward and replied to, there is a local burden of proof for each argument that can change. This local burden of proof can shift from one side to the other during the argumentation stage as arguments are put forward and critically questioned. Once the argumentation has reached the closing stage, the outcome is determined by judging whether one side or the other has met its global burden of proof, according to the requirements set at the opening stage.

The type of dialogue that has been studied most intensively so far is the persuasion dialogue. The two participants are called the proponent and the respondent. There are two types of persuasion dialogue. In a dispute, the proponent has as her thesis a designated statement T and the respondent has as his thesis the opposite statement ~T. In a dissent, only the proponent has a thesis, and the respondent has the goal of casting sufficient doubt on the proponent's thesis so that her efforts to prove it will fail. In the dissent, the proponent's goal is to prove A, while the goal of the respondent is merely to show that the proponent's attempt is not successful. In the dissent, the respondent's goal is merely one of critical questioning rather proving. In a dispute, each side has what is called in law an ultimate *probandum*. It is this that will determine global burden of proof. Local burden of proof arises with respect to a move (speech act) made during the argumentation stage.

In the general theory of argumentation in dialogue, burden of proof is important at the global level of a dialogue as well as at the local level. At the global level,

burden of proof pertains to a participant's goal (sometimes referred to as his or her obligation) in a dialogue. But it does not necessarily apply to all kinds of dialogue in which there is argumentation. For example, in a negotiation, there seems to be nothing corresponding to global burden of *proof*, as such, whereas in other types of dialogue, a participant's goal is to prove (or disprove) something. The investigation of burden of proof can only proceed by clearly distinguishing between local level burden of proof and global level burden of proof.

Finally, we briefly respond to the objection that arguments are often put forward in everyday conversational settings in a situation in which there has been no agreement beforehand on what the global issue of the dialogue is. Many examples might be cited of ordinary conversational exchanges that are brief and fragmentary, where there is no evidence at all that the participants have agreed to debate a particular issue, or have made any agreement on what standard of proof should be required for a successful argument. We might infer from such observations that trying to apply the distinction between global and local burden of proof in such cases is useless. The general issue is how we can apply abstract normative models that have a global as well as a local level.

The best counterargument is to say that analyzing informal fallacies requires both levels. Argument from ignorance is a case in point, and fallacies of relevance might also be cited. Whether an argument should rightly be considered relevant depends on the assumption that there is some issue set at the global level that it is supposedly relevant to. If we are examining an instance of an alleged fallacy of relevance, and there is no evidence of global level data, we have no basis for determining whether the argument in question really is fallacious or not. It might be said that in such case also its purpose and reasonableness are unclear. We would say that the existence of such common cases in short examples is not a good reason for rejecting the usefulness of applying normative models of dialogue to such cases, in which the goal and therefore relevance is determined by means of implicatures (Grice. 1975), which are drawn from other factors different from dialogical moves, such as context and dialogical roles.

6. *Conclusions*

In this paper we have argued that in law there is an important distinction between global burden of persuasion that applies over the whole course of the trial, and local evidential burdens that apply during the argumentation stage of the trial. We have argued that this fundamental distinction applies also to

everyday conversational argumentation. We distinguished different types of dialogue. Burden of proof is not a global factor in some of these types, like negotiation dialogue. We concentrated on the persuasion or critical discussion type of dialogue. We argued that although there are differences in the way burden of proof is managed in legal argumentation and everyday conversational argumentation, the distinction between global and local burden of proof is fundamental to both.

NOTE

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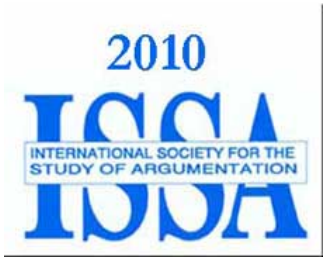
ISSA Proceedings 2010 – Engineering Argumentation In Marriage: Pragma-dialectics, Strategic Maneuvering, And The "Fair Fight For Change" In

Marriage Education



1. *Introduction*

One of the more important innovations in communication and argumentation theory is the recognition of communication research as a design enterprise (e.g., Aakhus & Jackson, 2005; Jackson, 1998; Weger & Aakhus, 2003). Treating argumentation research as a design enterprise highlights the importance of understanding the reflexive nature between practices and processes – often the quality of argumentation reflects the conditions (individual, situational, social, etc.) under which the interaction occurs. Marital argument constitutes an ideal subject for studying communication design properties because, like most other naturally occurring conversation, it is regulated only by cultural norms and routinized practices developed by the speakers themselves. Interpersonal argumentation generally lacks purposeful design in terms of formal procedures, referees, or rules for appropriate contributions to the dialogue. These starting conditions result in participant-regulated interaction that are sometimes fraught with potential obstacles to productive argumentation. Two of the obstacles which pose particular problems for handling marital arguments are the "hot initiation problem," and the "coherence problem." Although these obstacles can get in the way of resolving any interpersonal argument, research suggests that they are particularly associated with dysfunctional conflict in marriage (e.g, Sillars & Wilmot, 1994; Retzinger, 1991).

An approach to marital argumentation that emphasizes the possibilities of designed interventions aimed at alleviating the most common stumbling blocks to successful conflict management would aid in developing theories of interpersonal argumentation as well as helping people caught in patterns of unproductive argumentation. The practical significance of a successful argument intervention system is huge considering that the consequences of poorly handled marital argumentation potentially impact the mental and physical well being of both married couples (e.g., Roloff & Reznik, 2008) and their children (e.g., Keller, Cummings, Peterson, & Davies, 2009). The "Fair Fight for Change" (e.g., Bach & Wyden, 1969) represents one attempt at communication design that aims to reduce dysfunctional marital argument. In this essay, I intend to examine the

problems of hot initiation and lack of coherence, describe the Fair Fight for Change, and import concepts from strategic maneuvering and pragma-dialectics as an example of how argumentation theory can be directly applied to marital intervention strategies.

2. *Two Obstacles to Successful Marital Arguments*

Before I continue I should briefly explain what I mean by "successful" marital argumentation. Communication theory generally recognizes that messages tend to be organized around simultaneously satisfying three inter-related interpersonal goals (e.g., Clark & Delia, 1979). Firstly, people want to accomplish some task from communicating, such as gaining assistance, receiving/providing emotional support, settling a disagreement, and so on. Secondly, people use communication to present and maintain a desired identity. Thirdly, people use communication to manage their relationships with other people. The success of a marital argument, therefore, can be judged based on the same three criteria. First, does the argument result in settling the disagreement? Second, in the course of arguing, do both people emerge from the discussion able to claim a desired identity? And third, during the course of the argument, do people engage in behaviors known to corrode the relationship? Success is not taken to be a matter of either/or but one of degree since marital arguments can be more or less successful depending on the extent to which these three criteria are met.

One obstacle to successful marital argument is "hot initiation." Hot initiation refers to arguments instigated under the influence of negative emotional experiences such as anger, shame, frustration, and so forth. For the most part, interpersonal arguments arise in the natural flow conversation, rather than as a planned or pre-scheduled activity (e.g. , Newell & Stutman, 1991; Vuchinich, 1990), and function as conversational, identity, or relationship repair mechanisms (e.g., Jackson & Jacobs, 1980). Arguments between married partners often get smuggled in with other topics that then elicit disagreement. Simple disagreements become problematic when one partner believes that the other is intentionally denying some desired outcome, resulting in feelings of anger, frustration, and rage (Clore, Ortony, Dienes, & Fujita, 1993; Retzinger, 1991). The source of hot initiation need not occur in the current interaction, however. Research suggests that experiencing stressful interactions earlier in the day at work (e.g., Bolger, DeLongis, Kessler, & Wethington, 1989) or with one's spouse (Gottman & Driver, 2005) can result in hot initiation later in the day. Emotions

like stress, anger, and frustration influence cognition and message production by increasing the likelihood that messages reflect negative affective states instantiated in personal attacks, threats, and other types of belligerence (e.g., Guerrero & La Valley, 2006). Gottman's extensive research on marital interaction points to the importance of initiating arguments in nonaggressive ways. Since partners (especially distressed couples) tend to reciprocate their partner's behavior, hostility at start up strongly predicts a hostile response and the escalation of negative behaviors (e.g., Gottman, 1994; Gottman, Coan, Carrere, & Swanson, 1998; Gottman & Driver, 2005). Over time, serial hostile interactions erode married couples' love and admiration for each other thereby putting their marriage in jeopardy (Gottman, 1994; Markman, Rhoades, Stanley, Ragan, & Whitton, 2010).

Although somewhat counterintuitive, hot initiation can also result in arguers withholding arguments or refusing to defend standpoints (e.g., Johnson & Roloff, 2000). Gottman (1994) explains that unpleasant physiological responses might be to blame for the tendency of males to withdraw from arguments at a slightly higher rate than females. High physiological arousal experienced during marital arguments results in people wanting to escape the painful stimulus by withdrawing either physically or psychologically from the discussion. To the extent that males experience somewhat higher physiological arousal at the beginning of marital arguments (e.g., Gottman, Coan, Carrere, & Swanson, 1998), males are somewhat more likely to withdraw from arguing by refusing to continue engagement once an argument has begun. The anticipation of negative affect results in some people from withholding disagreement (Johnson & Roloff, 2000). Hot initiation, therefore, is an obstacle to successful argumentation because it increases the likelihood of damaged relationships, personal identities, and resolution of the disagreement. Any designed intervention strategy that interrupts, or at least helps couples manage, hot initiation of marital arguments would represent a giant leap forward.

A second obstacle to successful marital argument involves accidental drifting, or purposely shifting, away from the point at issue in the discussion (i.e., the "coherence problem"). In more institutionalized contexts, rules exist for the kinds of contributions people can make in a turn at talk. In every day interpersonal interaction, however, people make these decisions in response to the unfolding discussion. The couple's ability to stay on topic through to resolution, in part,

determines whether a marital argument is successful. Although the exact "topic" under discussion cannot always be clearly identified (Schegloff, 1990), under most conditions, people seem to orient more to the general issue or point of a conversation partner's message (i.e., issue/global coherence, Tracy, 1984). In arguments, issue/global coherence involves making contributions germane to the general point at issue whereas event/local contributions take up issues related to details of a partner's message but which remain peripheral to the general point at issue. Each message in a disagreement opens up multiple "disagreement spaces" (e.g., Jackson, 1992) only some of which pertain to the problem under discussion. Topic drift, or digressions, can occur when people take up disagreement over side issues with limited, or no, relevance to the point at issue. Focusing on irrelevant or insignificant details can come about in many ways. For example, Tracy (1984) suggests that difficulty with comprehending a message elevates the probability that a contribution to a conversation relates to some local point rather than to the main issue. Retzinger (1991) and others find (e.g., Zillman, 1993) "hot" emotions, like anger and rage, reduce people's attentional capacity and ability to comprehend complex messages. Likewise, Jacobs, Jackson, Stearns, and Hall (1991) demonstrate how personal criticism result in digressions by shifting arguers' attention from the discussion problem to repairing a damaged identity.

Besides focusing too narrowly, argument coherence can also suffer from focusing on the general issue but ignoring an opponent's specific argumentation in support of a standpoint. Jacobs and I (Weger & Jacobs, 1995) identify the "drop and shift" tactic as an example. The drop and shift is a pattern in which both arguers offer examples in support of their standpoint in which the examples fail to compete with each other in terms of their impact in deciding the issue. Neither offers argumentation directly relevant to the other person's defense of the standpoint although each person's examples bear somewhat on the overall topic. Research suggests that a lack of topic coherence during conflict is one of several dysfunctional conflict patterns and associates with dissatisfying marital relationships because couples who fail to tackle one issue from beginning to end are less likely to resolve marital disagreements. (e.g., Sillars & Wilmot, 1994). Failing to resolve an issue can result in serial arguing in which couples rehash the same topic over and over leading to more and more hostility in interactions (e.g., Johnson & Roloff, 2000) We can see, therefore, that lack of coherence constitutes an obstacle to successful marital argument.

The example below illustrates topic drift in an argument between a husband and wife. The argument begins with the wife attempting to negotiate an agreement with her husband regarding the chore of cooking. In turn 2, the husband suggests that he is unwilling to make a deal because he considers cooking meals to be her responsibility. The argument begins to drift almost immediately when the wife takes up the issue of whether she has a responsibility to cook for a person who is sixteen years old by questioning his definition of the word "kid." Again in turn 5, the wife drifts further by questioning whether he actually cooks "all the time," and then tries to get the conversation back on track by attempting to get back to the problem. The husband in turn 6 then digresses by introducing a new issue by asserting that she does not shop for groceries. The next three turns of the excerpt deal mostly with the new issue until the wife, at the end of turn 9, reintroduces the issue of cooking by questioning the husband's motive for wanting her to be responsible for doing the cooking. In turn 10, the husband shifts strategies and suggests his expectations for meals are not being met by his wife. The wife responds in turns 11 and 13 with another digression by teasing her husband about his weight by suggesting he needs to be eating less. The example demonstrates how digressions reduce the probability that initial issue under discussion will get resolved. The wife is offering to negotiate the husband's initial request but the discussion gets off track quickly and by the time the example closes, we can see a potentially productive negotiation ends with a personal criticism of the husband's weight.

1	W	Would you like me to make the meals? Then I want something back. That's all, I'll make you a deal.
2	H	No, I think you just *do* it because it's your responsibility. You've got kids to feed and stuff.
3	W	Why do you say that "kids to feed" thing? We have *one* kid, he's a grown up. He can cook for himself.
4	H	He is sixteen. He cooks for himself all the time.
5	W	He doesn't *all the time*. Anyway, we are supposed to discuss our problem so I . . .
6	H	At least you could go grocery shopping.
7	W	I buy lots of ready to eat things that people don't eat.
8	H	Like, *what*? Like corn in a *bag*.

9	W	That is not true. There is T.V. dinners in there. There's pot pies. There's burritos. There's plenty of sandwich meat and stuff. There's *lots* of things that people if they take 10 minutes they can make their own meal. Nobody is starving here. I think you just need to see me *cook* for some reason.
10	H	I just, it's just that I grew up eating nice full healthy well balanced meals.
11	W	You don't need full meals anymore, BURT. You need little bitty meals.
12	H	Don't say my name! This is going to be broadcast on the internet (laughs).
13	W	You don't need big meals. You need little meals. You need to have salads for dinner. That's it – I'll make a salthe cooking. In turn 10, the husband shifts strategies and suggests his expectations for meals are not being met by his wife. The wife responds in turns 11 and 13 with another digression by teasing her husband about his weight by suggesting he needs to be eating less. The example demonstrates how digressions reduce the probability that initial issue under discussion will get resolved. The wife is offering to negotiate the husband's initial request but the discussion gets off track quickly and by the time the example closes, we can see a potentially productive negotiation ends with a personal criticism of the husband's weight.

3. *The "Fair Fight For Change"*

Marriage counselors and family therapists have long recognized the contribution of dysfunctional argumentation to marital discord and divorce. Over the last few decades, marriage and family therapists have developed a variety of intervention strategies designed to create more structured procedures for resolving disagreements. The focus of this paper is the *Fair Fight for Change* (FFFC) developed by Bach and his colleagues (Bach, 1965; Bach & Goldberg, 1974; Bach & Wyden, 1969). I was introduced to the FFFC when I received training in the PAIRS® (Practical Application of Intimate Relationship Skills) curriculum. I received this training to qualify as marriage education facilitator for the PAIRS® curriculum as part of a large national grant project investigating the effectiveness

of marital education programs for low-income couples (i.e., the Supporting Healthy Marriage project funded by the U.S. Department of Health and Human Services). Over two years, I worked with over 70 couples using the FFFC procedure. Overall, research indicates that couples can be trained to use the FFFC and that the PAIRS curriculum as a whole seems to improve marital functioning, at least in the short run (e.g., PAIRS Foundation, Inc., 2010, May).
The version of the FFFC used in the PAIRS curriculum (Gordon, 2008) includes ten steps (see Table 1). The FFFC begins with one spouse inviting the other to engage in a FFFC. This "invitation rule" is designed to minimize the hot initiation problem by making sure each person is mentally and emotionally ready to enter a problem discussion. After thinking for a moment about how to phrase the complaint in a non-aggressive way, the initiator states the complaint in terms of a single problematic behavior. This step is designed to deal with both the hot initiation problem and the coherence problem. Stating the complaint in behavioral terms decreases the chances that the person will respond in a defensive and hostile way because the complaint doe not directly attack an aspect of the person's identity. Limiting the discussion to a single behavior also reduces the likelihood of digression to other issues since only one issue may be discussed at a time.

The next step requires the spouse hearing the complaint to paraphrase the initiator's message out loud. This step accomplishes two goals. First, a spoken aloud paraphrase of the complaint helps insure that the spouse understands the complaint. On many occasions couples practicing this step for the first time respond with inaccurate and often defensive paraphrases of the complaint. Often the spouse hears the complaint as a broader personal attack even when the spouse states the complaint in behavioral terms. The paraphrase provides the initiating spouse an opportunity to clarify and/or correct these misunderstandings. The second goal of the paraphrase is to create a feeling that one's complaint has been acknowledged and understood. This helps maintain a low intensity argument and increases understanding between spouses about their perceptions of the relationship.

Next, the initiator clearly states a request for a different behavior on the part of the spouse. Again, the initiator is limited to a single behavior or course of behaviors that would replace the behavior in the original complaint. This step helps maintain coherence

Step	Behavior
1.	Invite spouse to use FFFC.
2.	Initiator takes a moment to think about complaint.
3.	State one specific behavioral complaint.
4.	Partner repeats/paraphrases the complaint.
5.	Initiator shows appreciation for partner accurately hearing the complaint.
6.	Initiator specifically requests a behavior that is preferred to the behavior identified in the complaint.
7.	Partner paraphrases the requested behavior.
8.	Initiator shows appreciation for partner's accurate understanding of request.
9.	Partner responds by a) accepting the request unconditionally, b) stating conditions under which s/he will accept request, or c) rejects requested behavior. Initiator paraphrases partner's response and may then begin negotiations over conditions.
10.	Continue negotiation and paraphrasing until resolution is reached. Express appreciation for each other's willingness to fight fairly.

Ten steps to a fair fight for change

Note: Adapted from Gordon, 2008.

by focusing on a single behavior throughout the discussion. In the second to last step, the spouse hearing the complaint and request for change can decide to accept the request without condition, accept the request with conditions, or simply reject the request. The last step will be discussed further below.

Three other features of the PAIRS approach to the FFFC are important to its design. First, when learning the FFFC, either instructors or fellow students act as coaches to help the couple avoid "dirty fighting" strategies by stopping the discussion when one or both partners engage in personal criticism, sarcasm, stonewalling, and so forth (all of these behaviors are referred to as "dirty fighting" in the curriculum). The coaches also help couples formulate complaints and responses in straightforward and behavioral terms. A second feature of the FFFC instruction involves an evaluation of the "fight" based on the couple's

ability to avoid digressions, avoid hostile communication (both verbal and nonverbal) and to come to a mutually agreeable solution. Although the couple may or may not have access to coaches outside of class (couples are actually encouraged to call another couple on the phone to help coach if they are having trouble following the FFFC at home), the initial coaching helps couples learn the discussion procedures. A third feature of the FFFC within the PAIRS curriculum involves the timing of its introduction. Built up hostility and a lack of goodwill between spouses can present a major challenge to successfully completing a FFFC. The PAIRS curriculum, therefore, introduces several intimacy and goodwill building exercises before couples are taught the FFFC procedure.

The FFFC is a useful tool for helping couples learn to negotiate mutually acceptable solutions to their relationship problems. The procedures outlined in the FFFC are straightforward and encourage assertive and rational participation in the resolution of interpersonal disagreements. The FFFC helps to avoid both the hot initiation and the coherence problems by reducing the amount of personal attacks and by providing a structure the couple can follow to stay on task. Additionally, it is designed to increase trust by producing mutually agreeable solutions in which each partner has an equal say in the outcome. In my experience, the FFFC is a well designed tool for marital argumentation.

4. *Potential for Re-design: FFFC and Pragma-Dialectics*

Although the FFFC as taught in the PAIRS curriculum is helpful, it is not without problems, especially from an argumentation point of view. In my limited experience teaching this structured argumentation activity, the final two steps in the process become a sticking point for many couples. Addressing two related stumbling points could help to improve the effectiveness of the FFFC. The first obstacle can be located in step 9 of the FFFC. If the spouse accepts the initiator's request, the FFFC ends uneventfully and the couple expresses their appreciation for each other in handling the problem well. However, if the spouse being asked to change their behavior rejects the request or states conditions for agreement, problems often arise because the FFFC does not include a clear conversational structure for negotiation or dealing with rejection. Although the coaches can help suggest strategies for negotiating an agreement, frustration and old habits can derail the discussion. Step 10 simply suggests that the couple continue to communicate with empathy and understanding until an agreement is reached, but other than prohibiting dirty fighting, little help is provided to structure the spouses' conversation from this point on.

The second, broader, problem from an argumentation theory perspective concerns the lack of any discussion regarding the role of argumentation in support of standpoints. Requiring each spouse to support her/his standpoint could be beneficial in at least two ways. First, the requirement to extend an argument past rebuttal is a key procedure for moving disagreements past the initial standpoints and argumentation offered by each party (e.g., Weger & Jacobs, 1995). By requiring participants to either offer a rebuttal with new evidence/reasoning or surrender a standpoint, arguments are less likely to get bogged down by stonewalling or endless repetition of each person's position. Second, research suggests that couples who offer support for assertions enjoy the conversation more and are more satisfied with the relationship (e.g. Weger & Canary, 2010). Given these shortcomings, two main improvements to the FFFC can be facilitated by incorporating principles from pragma-dialectics.

By now many articles and books regarding about pragma-dialectics exist (e.g., van Eemeren & Grootendorst, 1992) making a fresh explanation here seem redundant. Briefly, pragma-dialectics is a theory of argumentation that introduces an ideal model of argumentation procedures. As the name suggests, the theory combines elements of discourse pragmatics, primarily speech act theory, with classical and modern theories of dialectic, rhetoric, and informal logic resulting in a set of procedural guidelines for conducting a "critical discussion." Unlike the FFFC, the critical discussion model is a critical tool for the analysis and reconstruction of argumentative dialogue and not considered a prescription for actual behavior. Strategic maneuvering, introduced by van Eemeren and Houtlosser (1999), offers as an additional tool for reconstructing argumentation. From a theoretical standpoint, the concept of strategic maneuvering adds to the critical discussion concept by identifying rhetorical strategies people use to resolve a disagreement in their own favor. In reconstructing argumentation, analysts examine arguers' methods of strategic maneuvering to gain insight into how and why some arguments fair better than others. In addition, analysts examine the balance between an arguer's effectiveness (as indicated by strategic maneuvers) with their reasonableness (as instantiated by the arguer's adherence to the ten rules for critical discussion).

In recent work, van Eemeren (2010) introduces the concept of "activity type" to the analysis of strategic maneuvering, "Communicative activity types are conventionalized communicative practices whose conventionalization serves

through the implementation of certain 'genres' of communicative activity the institutional needs prevailing in a certain domain of communicative activity" (pp. 144-145). Each activity type has its own set of conventionalized norms and practices that both constrain and enable certain kinds of messages. Understanding strategic maneuvers as rational responses to the affordances of an activity type help the analyst make sense of the moves made by arguers in context. Situational affordances that shape the possibilities for critical discussion via strategic maneuvering depend on the constellation of three components working to balance effectiveness with reasonableness. These three elements include *topical potential, audience demand*, and *presentational devices* (van Eemeren, 2010). Topical potential refers to the choices available to an arguer for constructing a line of defense for a standpoint. For example, a husband might defend his standpoint that his wife should make dinner by arguing that it is her turn since he made dinner the night before, or that his wife should make dinner because he had a rough day at work and he is too tired, or that his wife should make dinner because he believes meal preparation is women's work. Audience demand refers finding arguments that will resonate with the audience and is consistent with the audience's beliefs, attitudes, and values. Continuing the example above, appealing to the wife's sense of fairness by suggesting it is her turn to prepare dinner would certainly be more effective with more women in the Unites States compared to the argument that meal preparation is somehow women's work. Presentational devices represent stylistic choices for presenting standpoints and argumentation. Here we are talking about the exact wording, phrasing, and tone of the message (which includes nonverbal cues that accompany the message, such as facial expression, posture, tone of voice, and so forth). Assuming the husband in the example above chooses to use the fairness strategy, his success could depend on whether he whines, talks in "baby-talk," speaks in an even tone of voice, shouts, or communicates his message in some other way. Besides the nonverbal vocalic dimension of the message, his success could also depend on whether he uses some negative or positive politeness strategy, states his case in a plain and straightforward way, states his argument in the form of a haiku, or if he uses some other linguistic presentational device. In his conceptualization of strategic maneuvering, van Eemeren explains that each of these three components are interdependent and reflexive. Each choice made by an arguer about one component creates implications for choices about the other components.

Through this lens, I want to briefly lay out the standpoint that marital argument can be considered a kind argumentative activity type. Conventionalized interpersonal associations (such as friendships, clubs, sororities, etc.) constitute cultural institutions that carry with them identifying labels and rules for membership. Marriage is perhaps one of the most formal interpersonal associations as it is usually publically recognized, legally sanctioned, and regulated by the state. People in each culture can identify shared norms and values associated with this institution. Argumentation (or conflictual interaction) is an important regulatory activity in interpersonal associations. Interpersonal associations are, in part, defined by the degree of interdependence between or among the parties (e.g., Kelley, 1979). Because people associate with each other to meet their interpersonal needs (e.g., Schutz, 1966), and because people sometimes differ in their needs, argumentation plays an important role in the relationship by communicating these differences so that the partners can change their behaviors, attitudes, and/or beliefs to better meet the needs of the other. Furthermore, at least in the United States, research suggests that people can identify commonly understood rules for conducting arguments in personal relationships (e.g., Jones & Gallois, 1989). Perhaps the most relevant genres of communication activity within this activity type would be negotiation, conflict (defined here as the attempted resolution of perceived incompatible goals, see Wilmot & Hocker, 2000), quarreling (see Walton, 2008) and complaining (e.g., Drew, 1998). Certainly marital argument has many overlapping qualities with other contexts for interpersonal argument, but the unique requirements that arguments not only solve problems but also strengthen (or at least do no damage to) the marital union adds an important twist to this genre of argumentation.

Although strategic maneuvering and critical discussion are not meant to be prescriptions for behavior in real interactions, I want to make the case that these concepts can be useful in the design of argumentation interventions for marital arguments. Perhaps the best place to begin is to reconstruct the FFFC in terms of strategic maneuvering. I will do this by laying out the FFFC using the stages of critical discussion as an organizing principle and examining how the FFFC fits into these stages. The first stage in a critical discussion is the confrontation stage in which the protagonist communicates the potential disagreement and both parties attempt to clarify the issue at hand (e.g., van Eemeren , 2010). This stage maps on well to the first step in the FFFC in which the initiator communicates her/his desire to discuss a potential problem and invites spouse to engage in the

discussion. In the FFFC, topical potential, audience demand, and presentational device are constrained by the requirement that the initiator invite the spouse. The initiator is not allowed to demand or cajole because the responding spouse must freely chose to engage in the FFFC so any presentational device that appears coercive is off-limits.

The opening stage follows the confrontation stage in a critical discussion. In the opening stage, the two parties "…establish an unambiguous point of departure for the discussion. The point of departure consists of mutually accepted procedural starting points regarding the division of the burden of proof and other agreements regarding the conduct of the discussion and material starting points regarding the premises of the discussion, which can be viewed as 'concessions' that may be built upon in the discussion" (van Eemeren, 2010, p. 45). As van Eemeren (2010) recognizes, many of the tasks in each stage are accomplished implicitly or are prescribed ahead of time by precedent or by reference to a formal procedural rule.

In terms of the FFFC, steps three through eight seem to most neatly (but not perfectly) fit into the opening stage of a critical discussion. This is stage at which the initiator (i.e., protagonist) clearly states her/his complaint, where the partner (potential antagonist) communicates her/his understanding of the complaint via paraphrase, and so on up until the point in which the initiator requests a specific change to the partner's behavior. In terms of strategic maneuvering, FFFC constrains topical potential by requiring the complaint refer to a particular behavior, eliminating criticism of personality characteristics as line of argumentation. The FFFC also limits presentational devices to straight forward complaints with one specific behavior identified. Couples are further encouraged to think carefully about how to present the complaint so that there negative implications for the partner's identity are limited. Couiples must also face each other and make eye contact. Expressing criticism or contempt through pained facial expressions are also off limits as a presentational device.

As a way to facilitate and streamline the discussion it might be helpful to add one step to the FFFC at this stage of the discussion so it more closely resembles the opening stage of a critical discussion. After the partner (i.e., antagonist) reflects the initiator's complaint using a paraphrase in step four, it would be helpful for the partner to respond to the complaint in some way. The partner can offer an explanation, justification, and/or apology for the behavior and the initiator should

then reply with a paraphrased understanding of the partner's response. This step would allow the spouses a moment to talk about the problem and their feelings about it before arguing for a particular solution. In Stanley, Markman, Jenkins, and Blumberg's (2008) Prevention and Relationship Enhancement Program (PREP®), couples are encouraged to do problem talk before they engage in talk about solutions to the problem. Stanley et al. suggest this approach allows couples to connect with each other and also helps to prevent couples from taking up positions and arguing for those positions rather than searching for mutually agreeable solutions as a team. As discussed below, it would also present the couple an opportunity to decide whether argumentation about the complaint is necessary. Although each partner voices his/her feelings about the issue, no argumentation takes place at this point. The initiator and partner do not challenge each other's feelings, they simply listen and respond with paraphrasing to communicate each person's understanding of the other as well as establishing common ground for potential argumentation. By the end of the opening stage, the couple can proceed in at least four different ways:

Possibility 1: The couple decides there they do not disagree, the complaint is taken to heart by the antagonist and the couple moves to the concluding stage where the antagonist offers to accept a change in his/her behavior without further discussion.
Possibility 2: The initiator (i.e., potential protagonist), after discussion with the partner, decides that the complaint is actually a statement of grievance about some past behavior that does not require any change on the part of the partner. In this case, the couple skips the argumentation stage all together and move straight to the concluding stage.
Possibility 3: The couple agrees to enter the argumentation stage to resolve a disagreement regarding the legitimacy of, or over facts underlying, the complaint…
Possibility 4: The partner agrees that a change in his/her behavior would benefit the initiator, the relationship, or both and the couple enters the argumentation stage with the goal of using arguments to choose a solution. For example, the couple might disagree about what sort of change in one (or possibly both) spouse's behavior would be most effective in solving the problem identified in the opening stage. The fourth possibility might follow a resolution in favor of the protagonist regarding the legitimacy of the complaint.

So far, we can see how the FFFC can be seen as a special set of guidelines in response to topical constraints, audience demands, and acceptable presentational devices. The most significant contribution pragma-dialectics makes to redesign of the FFFC involves conceiving of step ten in the FFFC (in which the couple argues/negotiates a solution) as an analog to the argumentation stage. In my experience, this is where the couples' FFFC conversations often flounder. The couples are not offered any procedural guidance for testing competing arguments. As a strategic maneuvering activity, the topical potential is generally open to any line of attack or defense as long as the argument does not threaten the partner's motives or character (i.e., audience demands) and as long as the message is delivered respectfully (presentational devices). Importing the rules for critical discussion into step 10 of the FFFC can help couples resolve issues in a more effective, efficient, and rational way because it provides some structure to this step. Critical discussion rules might also help to reduce other problems as well, such as stonewalling or simple repetition of the same argument with more volume since these behaviors would constitute rule violations and be called out of bounds by a coach or therapist assisting a couple learn the procedure. The critical discussion rules help transform the FFFC from a purely socio-emotional model of discussion to one that blends the emotional needs of the partners with a more rational approach to problem solving.

Although adding elements from pragma-dialectics to the FFFC can have some practical advantages, training couples to produce logically sound arguments and filter out misapplied argumentation schemes or other fallacies of reasoning could prove very challenging for marital education teachers. The FFFC as it is usually requires several practice attempts for the couples to understand and feel comfortable with the procedure. Adding a layer consisting of training in argumentation would be a complicating factor. Perhaps it would be enough to first teach couples something like a "because" rule in which any statement for or against a complaint or proposed behavior change be accompanied by a "because" statement that supports it. Already some versions of the FFFC require the initiator to phrase the complaint by saying, "When you (enact some behavior), I feel (angry, sad, frustrated, etc.), because (an explanation for the link between behavior and feeling)." For example, a husband might say, "When you call our daughter lazy when she is late for school I feel sad because I can remember how much it hurt my feelings when my mother called me lazy when I was Julie's age." Without explicitly teaching argumentation theory, the couples are being taught to

provide support for the substance of their complaints. The because rule usually does not appear in other steps of the FFFC so perhaps a similar formulation of this rule in the argumentation stage could help couples argumentation in support of standpoints. Of course, couples need coaching on the "because rule" since some couples will simply link "because" to some dirty fighting strategy such as, "You should make dinner tonight *because you are so lazy that I have to do everything around here.*

It might also be helpful to use some version of the pragma-dialectics discussion rules presented in an abbreviated and plain language way. Table 2 provides a list of potential rules stated in plain language. Here I have eliminated some of the rules for brevity others for practical reasons. For example, unless the marriage education program wants to include a short course on logic, it seems impractical to ask couples to submit their arguments to tests for logical fallacies. Research suggests average people can see obvious logical fallacies (van Eemeren, Garssen, & Meuffels, 2009), so hopefully couples will see problems inherent in fallacious arguments and call them out during discussion. At this point, this list is tentative at best. The development of clear and easily understood discussion rules for couples working out marital disagreements would mark an important advance in marriage education.

1. No arguments attacking the other person's character or personality.
2. Let the other person have his/her say.
3. Stay on topic by directly addressing the points made by your spouse.
4. Don't base your argument on your interpretation of the other person's behavior unless the other person agrees with your interpretation
5. All statements for or against change must be use the "because rule."
6. Only agree when you truly agree but when you are wrong, you must admit it.

Table 2
Proposed discussion rules for step 10 in the Fair Fight for Change

1. No arguments attacking the other person's character or personality.
2. Let the other person have his/her say.
3. Stay on topic by directly addressing the points made by your spouse.
4. Don't base your argument on your interpretation of the other person's behavior

unless the other person agrees with your interpretation
5. All statements for or against change must be use the “because rule.”
6. Only agree when you truly agree but when you are wrong, you must admit it.

Finally, once the couple has exhausted their tests of each other’s standpoint, the couple moves from the argumentation stage to the concluding stage. At the concluding stage, the couple can determine whether the protagonist’s (initiator) complaint and request for change stands up to the antagonist’s argumentation against them. If the discussion results in protagonist’s favor the topics for discussion at this point in the concluding stage should focus on setting the conditions under which the change will occur as well as how the couple will decide whether the enacted change has indeed resulted in a mutually agreeable solution.

5. *Conclusion*

Engaging communication as a design enterprise can help scholars integrate practical and theoretical issues in useful ways. In the case of the FFFC, a clear attempt is being made to engineer the way married couples argue. Of course, not all couples need to use artificial procedures for resolving their problems. For the couples who desire to maintain life-long marital relations but cannot seem to find a way to resolve their problems without inflicting mortal damage to the relationship, procedures like the FFFC have proven to be both practical and beneficial (e.g., Halford & Moore, 2002). Designing ideally rational procedures for marital argument, however, pose some challenges that will require special attention in terms of extending and refining the nature of specialized activity types as well as posing challenges in the practical application of these activity types in everyday arguments between intimates.

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ISSA Proceedings 2010 – Assuring Cooperation: From Prisoner's Dilemmas To Assurance Games To Mutual Cooperation

1. Introduction

How humans should collectively provide for public (and near public) goods – such as, national defense, environmental protection, infectious disease control, and shared moral values – and common pool resources is a topic to which argumentation theorists have paid little attention. Game theorists have usually modeled the problems of providing such goods as a multi-person prisoner's dilemma. Here I will argue that argumentation theorists need to contribute to the understanding of how to deal with both apparent prisoner's dilemmas and with assurance games. I will use classic hypothetical accounts of Thomas Hobbes and Jean Jacques Rousseau to illustrate the problems and the areas to which argumentation theorists should contribute.

2. Prisoner's dilemmas and assurance games

The prisoner's dilemma derives its name from the following story. Row and Column have been accused of some crime. They have agreed with each other not to confess to the crime. But the prosecuting attorney tells Row that if she confesses to the crime and Column remains silent, Row will not be punished. If both confess, both will go to jail for a medium length of time. If both remain silent, both will go to jail for a short time. Of course, since the prosecutor is offering the same deal to Column as she is offering to Row, if Row remains silent and Column confesses, then Row will go to jail for a long time and Column will not

be punished. Row must decide whether she should cooperate with Column and remain silent, or defect and confess to the prosecutor. Column also faces this choice.

It would seem that it is most rational for Row to defect from her arrangement with Column and confess to the prosecutor, for if Row defects, she is better off no matter what Column does. That is, if Column defects, Row is better off defecting (she'll get a medium-length sentence) than she is cooperating (she'll get a long sentence). And if Column cooperates, Row is still better off defecting (she'll receive no time in jail) than she is cooperating (she'll get a short time in jail). The same is true for Column. So if each wants to minimize her jail time, both should defect. But if both defect, both will get a medium-length sentence in jail. If, instead, both had cooperated, both would have had to spend only a short time in jail. The dilemma is simply that by doing what appears to be the rational thing for each to do, both will spend more time in jail than if both had acted irrationally.

		Column	
		cooperate	defect
Row	cooperate	***1***,1	***3***,0
	defect	***0***,3	***2***,2

The prisoner's dilemma in terms of years in jail

If Row wants to stay out of jail, she will defect. If Column wants to avoid jail, she will defect. But if both defect, each will spend two years in jail and collectively they will spend four years. If they both cooperate, they will each spend only one year in jail and collectively only two years. So, if each does that which would appear to keep her out of jail, they (collectively) will actually end up in jail for the longest period of time. (Call such prisoner's dilemmas productive prisoner's dilemmas. The contrast is with destructive prisoner's dilemmas where either cooperate/defect or defect/cooperate outcome is the collectively worst.)

The prisoner's dilemma in terms of the players' preferences:

		Column	
		cooperate	defect

Row	cooperate	***2***,2	***4***,1
	defect	***1***,4	***3***,3

A prisoner's dilemma is any situation in which defect/cooperate, cooperate/cooperate, defect/defect, and cooperate/defect are, in descending order, each player's preference ranking of the outcomes.

The collective action problem of providing for many public goods takes the form of a prisoner's dilemma. Thus peace, either within a society or between societies, refraining from polluting the environment, and having one's children get vaccinated against a potential epidemic all take the form of prisoner's dilemmas. (My refraining from polluting will not, by itself, save the environment and will only cost me extra effort. And my polluting if most others make the extra effort to avoid polluting will not ruin the environment. But that is true for you and for everyone else. So we all pollute and are worse off than if none of us had polluted.)

Game theorists have offered a variety of solutions to prisoner's dilemmas. Hobbes held (in effect) that, without fear of punishment to ensure the existence of devices for creating social cooperation, life for humans would be intolerable. Accordingly, he advanced an authority solution; we should collectively hire someone to institute a system of rules and measures (punishments, primarily) to change the payoffs so that we avoid the undesirable outcome of mutual defection. David Gauthier, the most eloquent and sophisticated of contemporary neo-Hobbesians, has argued that rational individuals seeing that instrumental rationality will lead them to sub-optimal outcomes whenever they face a prisoner's dilemma should change their conception of rationality and become constrained maximizers. Others have offered alternative solutions to the problems posed by prisoner's dilemmas; see, for example, the works of Cave, Danielson, MacIntosh, and Mintoff. But in the real world all the standard solutions to prisoner's dilemmas lead to assurance games. And, in the real world (as opposed to decision theory textbooks), coordinating in assurance games is difficult.

Assurance games are games in which both parties' best outcome is mutual cooperation (cooperate/cooperate). The second-best outcome is lone defection (defect/cooperate). Mutual defection (defect/defect) is ranked third, and lone cooperation (cooperate/defect) is the least-preferred outcome. Thus we get the

following matrix.

An assurance game in terms of the players' preferences:

		Column	
		cooperate	defect
Row	cooperate	***1***,1	***4***,2
	defect	***2***,4	***3***,3

Again, the numbers represent the preferences for Row and Column. If we think of mutual cooperation (cooperate/cooperate) as representing going along with the proposed solution to the prisoner's dilemma being faced by our group, universal cooperation (or as near universal cooperation as is practicable for human beings) is the best outcome for each. But being the only person to go along with the proposed solution is the worst outcome for each. While, in prisoner's dilemmas, individual instrumental rationality argues for defection, in an assurance game it argues both for cooperation (that way may yield the best outcome) and against it (that way may yield the worst outcome).

3. Hobbes's account of the foundation of civil society

In Leviathan, Hobbes tells us of the interaction of a group of individuals, roughly equal in their powers and degrees of vulnerability, who find themselves in circumstances where there is neither law nor morality, circumstances which have come to be called the state of nature. Being thrown together, the individuals are forced to interact, although they are by nature not inclined to cooperate. Hobbes argues that in such circumstances each person will be concerned primarily with his or her own survival. He further argues that, given this concern and the nature of the circumstances and certain general facts about human vulnerability to being harmed by others, each person will find it prudent to attack others before being attacked by them. The unhappy result is that their interaction leads to a condition Hobbes called war, and consequently life for each of them is "solitary, poor, nasty, brutish, and short" (*Leviathan*, Book I, Chapter 13). Hobbes then argues that it would be most rational for each to contract with every other to give his or her allegiance to an authoritarian sovereign in order to end the warfare of the state of nature and improve his or her life.

The circumstances in which Hobbes's contractors find themselves is a prisoner's dilemma, and Hobbes advocates that they adopt an authority solution to that dilemma. In this case it is best for each person individually to defect from paying

the costs of a joint project to construct a peaceful civil society and to let others cooperate in paying for that project. This is because the defecting individual gains the benefits of a peaceful civil society without bearing any of the costs. Her second-best outcome is one where she and the others cooperate. In such a case, each person gets the benefits of social cooperation but has to pay some of the costs. The third-best outcome is for each and every one to defect from the project of social cooperation. In this case the defector gets no social benefits, since social cooperation does not occur, but at least she does not pay any costs. Finally, her worst outcome is to be the lone contributor in trying to produce the benefits which social cooperation can bring and to do so while everyone else defects. In this case, no social cooperation comes into existence because only our lone co-operator has contributed in the attempt to bring it about and one person's cooperation is insufficient to create a cooperative civil society. So she bears the costs of this failed venture and gets no benefits. Since it is the case for every individual that she will be better off not contributing whether the others contribute or not, everyone rationally will choose not to contribute (or, in game-theoretic terms, to defect), and consequently no social cooperation will occur.

An authority solution to a prisoner's dilemma changes the payoff structure so that it becomes more rational to cooperate than to defect. As we have seen in a prisoner's dilemma, each agent realizes that she will be better off defecting than cooperating, no matter what the others do, and this fact leads to universal defection and the state of nature. To achieve the benefits of social cooperation, Hobbes proposes a Sovereign who has the nearly absolute power to alter the circumstances of each member of society so that it is in each person's interest to cooperate with the Hobbesian state. Hobbes's Sovereign, through threats of severe punishment for any defection from the cooperative project to build and maintain a peaceful civil society, changes the payoff structure so that it becomes most rational to cooperate in doing one's part to bring about and maintain civil society.

4. David Gauthier's account

The best neo-Hobbesian account of the rational foundations for morality and civil society is the one provided by David Gauthier in *Morals by Agreement*. Gauthier revises Hobbes's account in two ways. First he holds, in effect, that Hobbes was mistaken in characterizing his contractors as having an overriding concern with ensuring their own survival. Obviously, in order for the contractarian justification

for our political arrangements to apply to all rational agents, it must take people as they are, regardless of their preferences. Hobbes's contractors, being primarily concerned with their own survival, are inordinately risk-averse. One can put a smaller premium on personal survival than Hobbes did and still be perfectly rational. Second, Gauthier holds that no external solution to the prisoner's dilemma is adequate. For the contractarian theorist to show that it is rational to accept the constraints of morality, it must be shown not just that it would be rational, in effect, to appoint or hire someone to make the world such that it would be in our interest to cooperate; rather, the contractarian must show that it actually *is* in our rational self-interest to be moral. That is to say, Gauthier holds that any legitimate solution to the problem posed by the prisoner's dilemma-like structure of human interaction in the state of nature must be an *internal* solution, one that shows that it is rational to be, or to become, moral. Hobbes's solution is *external*, showing only that it is rational to create circumstances where, out of fear of the Sovereign, it is rational to behave *as though* one were a moral person.

Gauthier begins by arguing that instrumentally rational individuals will always defect in prisoner's dilemma situations. He calls such individuals straightforward maximizers. He notes that if individuals could jointly cooperate in prisoner's dilemmas, it would be in the individual interest of each to do so, but that this course of action is not going to be chosen because, for each actor, defecting when others cooperate is still better. Gauthier then argues – and this is his most important contribution to decision theory – that fully rational individuals who foresee that they will be in prisoner's dilemmas with others will change their conception of rationality. Seeing that they are frequently going to be in prisoner's dilemmas and seeing that they will continually get the third-best (second-worst) outcome if they remain straightforward maximizers, they rationally ought to change their conception of rationality and adopt the principle of constrained maximization. A constrained maximizer, as Gauthier calls those who adopt this conception of rationality, is one who maximizes expected utility when in individual choice situations and who, when in prisoner's dilemma games, defects unless she is playing with another constrained maximizer, in which case she cooperates. Thus, a group of constrained maximizers will cooperate to produce socially beneficial outcomes for themselves and they will do so entirely because of considerations internal to instrumental rationality. Consequently, the need for a Hobbesian Sovereign is removed.

From the point of view of game theory, perhaps the most important aspect of Gauthier's argument is that it reveals that the instrumental conception of rationality is far richer than had initially been thought. It may be that the conception of rationality which, on the surface, only tells one how to get what one wants also tells one what the limits of what one can rationally want actually are. This is a Hobbesian result which Hobbes himself never realized.

5. *Hobbesian contractarianism*

We can sum up neo-Hobbesian contractarianism as follows.

(1) We should not presume that morality exists prior to human interaction.

(2) The function of morality is to constrain human interaction to make that interaction more likely to further the interests of those involved.

(3) Individuals in a state of nature are in a prisoner's dilemma.

(4) Such individuals take no interest in the interests of others but seek only to further their own interests (they measure their well-being solely in terms of their own utility).

(5) Such individuals are able to follow long and complex arguments about what to do in the state of nature. In Hobbes's case, the arguments show them that they should pre-emptively attack others and, realizing that this is true for everyone, that they should appoint an authority to impose law and morality upon them. In Gauthier's case, the arguments lead them to change their conception of rationality to make themselves into more cooperative individuals. (6) The chosen social arrangements favour bourgeois stability. (For a more developed statement of these characteristics, see Wein 1986.)

6. Rousseau's critique

In Part II of his *Discourse on Inequality*, Rousseau mounts an insightful critique of bourgeois society. He tries to show that bourgeois social arrangements are attractive, stable, and nevertheless the principal sources of our misery. In the midst of this critique, Rousseau tells what has come to be known as the stag hunt story, a story of a group of hunters who go out into the forest to hunt for game. If each hunts on his own, he will be able to catch a few rabbits and survive. Alternatively, the hunters can cooperate and together hunt for a stag, surround it, kill it, and then eat very well. But if even one hunter abandons the cooperative stag hunt to catch rabbits, the stag will escape through the "hole" that the hunter who has gone after a rabbit has left in the "fence". It is rational for each to continue to cooperate in the stag hunt rather than to defect to hunt for rabbits if,

and only if, each hunter has adequate assurance that all others will also continue to cooperate. If any hunter lacks the assurance that all the others will continue to cooperate in the stag hunt, then she should abandon the stage hunt and go chase rabbits. This assurance that the other hunters will hunt the stag rather than chasing a rabbit is something every hunter needs and something that every hunter knows every other hunter needs.

The hunters are in an assurance game. The best outcome for each is for joint cooperation resulting in lots of venison for everyone. The next-best outcome is to hunt rabbits on one's own. The worst outcome is to continue the stag hunt when even one other hunter has abandoned it to chase rabbits.

So far as the circumstances of the state of nature, and the character of individuals in it, go, Rousseau is actually more hard-nosed than either Hobbes or Gauthier is. About the individual hunter who goes after a passing rabbit, Rousseau says, "there can be no doubt that he pursued it without scruple, and that having obtained his prey, he cared very little about having caused his Companions to miss theirs". So Rousseau's noble savages are completely free of scruples and of guilt or remorse for knowingly doing things that harm others. (The others are harmed in one of two ways. Those who continue the now-futile stag hunt miss their chance to eat. Those who go rabbit hunting are also harmed in that a successful stag hunt is not a real option for them, so their negative liberty is decreased.) Hobbes utilizes emotions (especially fear) to motivate his contractors. Rousseau avoids reliance on this crutch.

In addition, Rousseau thinks that, by nature, humans in such a situation will not cooperate. This is because, unlike Hobbes's and Gauthier's contractors, they are unwilling to follow long trains of reasoning about what is in their individual best interest and thus are such utter strangers to foresight that "far from being concerned about a distant future, they did not even think of the next day". By contrast, Hobbes's natural humans do so much thinking about the future that they work themselves through difficult chains of reasoning to conclude that each should launch a pre-emptive strike against others, a conclusion which leads them collectively into a "war of all against all" in which each of them lives a life that is "solitary, poor, nasty, brutish, and short".

Furthermore, unlike Hobbes's contractors, Rousseau's hunters have no strong emotions to motivate them: "having obtained his prey, he cared very little about

having caused his fellows to miss their opportunity". Thus, even though Rousseau's hunters are in a situation in which the cooperative outcome would seem to be easier to attain than it is for either Hobbes's or Gauthier's rational maximizers, Rousseau's hunters do not cooperate. Given this, the common portrayal of Hobbes as tough-minded and Rousseau as soft-minded simply does not wash. We cannot dismiss Rousseau as not being realistic enough – or as being overly optimistic – about the nature of pre-social humans.

From the hard-nosed perspective of contemporary neo-Hobbesian contractarian theory, there is much to admire in Rousseau's argument. If it is correct, it shows that accounts like Hobbes's and Gauthier's (which are frequently criticized for portraying human nature in an unkind light) are, if anything, overly optimistic. They succeed in showing that cooperation is rational *only if* they imbue their contractors either with strong emotions (as Hobbes does with fear of death) or with a level of prudence which is far beyond our natural capacities. Scholars who have studied the arguments are still divided over what Hobbes's and Gauthier's arguments actually are and whether they succeed. Yet Hobbes's and Gauthier's contractors have to have the ability to follow long trains of reasoning and see that somewhere – perhaps far down the road – it is in their interest to cooperate with each other (whether by appointing a Sovereign to make them afraid not to cooperate, as Hobbes suggests, or by changing their conception of rationality to come to develop commitments to cooperation, as Gauthier suggests). Rousseau shows that, given how humans *actually are*, rationality conceived of as maximization of one's self-interest will not lead to mutually beneficial cooperation even in simple assurance games, let alone in prisoner's dilemmas. So, Rousseau's simple stag hunt story provides the basis for a devastating critique of the entire Hobbesian contractarian project.

7. *Rousseau's assurance*

There is at least one respect in which Rousseau's way of looking at the problem of how to characterize our collective-action problems is deeper than the Hobbesian approach is. Of course, both thinkers set up the state of nature in such a way that there is good reason both for us all to cooperate and for each of us not to cooperate with others. Thus, both capture the core issue confronting those who would offer a rigorous account of human sociability. But Rousseau's account goes deeper in just this respect: every solution to a prisoner's dilemma really just moves one from a prisoner's dilemma into an assurance game. (Of course, no

theoretical *solution* turns a prisoner's dilemma into an assurance game, since the term "solution" is a success term, and something that moves people from one game where they will reach a sub-optimal outcome to another where they will also reach a sub-optimal outcome is not a success and hence not a "solution".) But, in practical terms, all the real-life practices that would most closely mimic the various theoretical solutions to the problem of ending up with a sub-optimal outcome in a prisoner's dilemma do lead to problems that are, in effect, best modeled as assurance games. Thus, in practical terms, one always needs to know whether, as a matter of fact (rather than of rational decision theory) enough other people (or nations, religious groups, organizations, *et cetera*) are swayed by the alleged solution to the problem of the prisoner's dilemma to actually act on that solution and avoid the sub-optimal outcome which occurs when people are ignorant of the solution.

We can see this if we consider the sort of solution offered by Hobbes – namely, an authority solution. If I find myself in a collection of people who are in a multi-person prisoner's dilemma and the possibility of an authority solution arises, I need to ask myself whether enough other people are going to take the authority seriously enough for it to really be an authority. Dealing with this question puts one in an assurance game. I should fear the "authority" if and only if I think enough others will fear it. Otherwise it will not be an authority and, hence, I would be foolish to be the only one to obey it in the current circumstances. Of course, everyone else faces the same question, and so we are collectively in an assurance game.

Similarly, on H.L.A. Hart's account of what it is to be a legal system, there has to be a sufficient number of officials who accept the (potential) rule of recognition as binding before it will actually become the legal system's rule of recognition. But each (potential) official needs sufficient assurance that other (potential) officials will take the (potential) rule of recognition to be binding on them in order for it (the potential rule of recognition) to, in fact, be binding and, hence, for there to be a legal system. Each official is in an assurance game with the other potential legal officials. Of course, Hart's legal theory does not claim that "authority solutions" (in the sense used in game theory) are the only solutions to assurance games. Indeed, Hart devotes much of *The Concept of Law* to showing that authority solutions such as that offered by John Austin are not the only solutions – and, indeed are not adequate solutions – to the problem of the true nature of legal

authority. Hart's theory is almost universally understood (by both legal positivists and its critics) as a great legal positivist theory about the concept of law. It is better read as an account of the nature (or concept) of the rule of law. We have an authority if, and only if, enough of us take it to be the case that we have an authority. I should cooperate with others if, but only if, I think enough others will cooperate also. If there are enough others cooperating, cooperating becomes my best outcome. But if an insufficient number of others take as an authority what I think to be an authority, I will be worse off obeying the (supposed) authority and better off to simply ignore it (defect). That is, I am in an assurance game, and so is everyone else. Similar, though, more complex considerations apply to the splendid planning-based theory of law advanced by Scott Shapiro in *Legality*. A society has a legal system if, but only if, enough members of the society engage in the shared cooperative activity needed to instantiate the complex plan that creates, sustains, and is its legal system.

Roughly the same considerations apply to Gauthier's solution to prisoner's dilemmas. Assume that I find myself in a community of straightforward maximizers who have discovered both the wisdom and the capacity to become constrained maximizers. I need to know that enough others really are constrained maximizers (or are about to become such) before it is rational for me to change my conception of rationality from straightforward maximization to constrained maximization, and I need to be sufficiently confident of being able to correctly sort constrained maximizers from straightforward maximizers. Because everyone else is in the same situation, we collectively face an assurance game.

In practice, communities which find themselves in prisoner's dilemmas where there is a game-theoretic solution to their problem, are always moved into an assurance game. Thus, if in real-life, we are going to solve prisoner's dilemmas, we need to solve the assurance problems that (partial game-theoretic) solutions to them always involve. If a group of us finds ourselves in a prisoner's dilemma where some internal solution is open to us – say, we all come to feel there is a moral duty to cooperate whenever such circumstances arise – then in the real world, where there inevitably are going to be some defectors, each reflective person who finds herself in such a situation must ask herself whether she has sufficient assurance that the number of non-defectors – the number of people who are, as a matter of fact, going to do their duty – is great enough to achieve the benefits of collective cooperation. When she lacks such assurance, she benefits

both herself and her society if, like Rousseau's hunter, she refuses without scruple to waste her efforts on what she judges to be a futile collectivist project. Since this is true for all reflective persons in the wake of any internal solution to a productive prisoner's dilemma, we all face an assurance problem whenever we develop a would-be solution to a prisoner's dilemma.

As David Lewis shows in *Convention*, some assurance problems can be overcome through the natural development of appropriate conventions, usually those based on focal point solutions. The connections between Lewis's work and argumentation theory have been usefully explored in Eemeren and Grootendorst (1984). But, as Joseph Heath suggests in *Following the Rules*, "the theory convention provides, at best, only a solution to the problem of coordination. Focal point solutions, at least of the type . . . Lewis consider[s], have absolutely no bite when it comes to resolving cooperation problems" (page, 58). While Heath's criticism is too strong, as can be seen by examining the work done by Andrei Marmor in *Social Conventions: From Language to Law*, the sorts of conventions Lewis discusses can only do limited work in helping humans avoid or overcome cooperation problems. Furthermore, whatever the role of conventions in helping us overcome some *repeated* situations where sub-optimal outcomes threaten to undermine attempts at cooperation, they play at most a secondary role in dealing with one-shot dilemma games. And, as Hobbes and Gauthier both recognize, rational individuals face quite different problems when confronting one-time prisoner's dilemma games than they do in *iterated* prisoner's dilemmas.

Rousseau both sees the problem of how to explain and justify cooperative interaction among humans more clearly than does Hobbes and starts us on the process of offering a deeper, more satisfying account of how to both explain and justify civil society. This is because, unlike Hobbes and Gauthier, whose thoughts on these matters were always put in terms of individual utility maximization, Rousseau thought about things in terms of basic goods. He pondered such issues in terms of what constraints each person would be willing to impose on herself and would want imposed on those with whom she was interacting, realizing both that it is only through self-imposed constraints that we attain full freedom and that society and civilization depend on the reciprocal acceptance of such basic goods.

8. Basic goods

Rousseau, like Kant, held that true freedom consists not simply in the liberty to do

what one wants but in the power to act according to rules or principles one has given oneself. Rousseau thinks of social cooperation not (as Hobbes, Gauthier, and most decision theorists do) simply in terms of how to best further the pre-interaction interests of rational individuals but in terms of what constraints it would be rational to impose on oneself (given that others were going to impose the same constraints on themselves) in order for us all to live in civil society. Basic goods, being those characteristics one would be willing to have in oneself and would want in those one expects to be interacting with, are not discussed explicitly by Rousseau. Yet it is clear that Rousseau's approach most closely mirrors the basic goods approach. He approaches issues about the value of civil society not by asking whether the proposed social arrangements provide more of what is valued in a state of nature but by asking what arrangements can best serve those of us destined to live among others. In so doing, he sees that civilization needs to be viewed from many angles and that its virtues and vices will not be adequately understood if we simply consider – as Hobbes and Gauthier do – whether joining such a society would be a good deal. In this, he anticipates the idea that a developed society is not simply a wealthy society; rather it is a society where each person has the best opportunity to become as fully civilized as is possible, given the resources available to that society. He wants us to evaluate civil society not by a simplistic metric but by having each of us reflect upon how it can best serve to enrich our very existence. While Hobbesians evaluate society by asking if, when living in society, one has more of what one wanted outside society, Rousseau wants us to reflect on how to arrange our mutual interaction so that it enables us to become fully rational and fully civilized.

Put in terms of the stag hunt story, Rousseau envisages a civil society which not only provides us with more meat but which also ensures that our coming to acquire that meat is – and is understood by all as being – the result of a cooperative endeavour among true natural equals. For the noble stag hunters, rumours that the rabbits are but skin and bones would act as an assurance amplifier, giving each person more reason to continue with the stag hunt than to go off hunting rabbits. By contrast, discovery that the other hunters were buying copies of *501 Ways to Stew a Rabbit* would act as an assurance damper, giving each hunter less assurance that others would continue to hunt deer rather than go off to chase rabbits. While Hobbes employs an external Sovereign to introduce a system of punishment to ensure our cooperation (employing fear *within* civil society much as he employed it in his argument that we should *form* civil society),

Rousseau sees development of the capacity to cooperate as constitutive of being a fully civilized person. He also helps us see that we need to design our social arrangements so that they are themselves assurance amplifiers, structures which make us willing co-operators not because we fear what will happen if we fail to cooperate but because cooperating with others best expresses what it is to be a civilized person who is truly free.

9. Progress in social theory

Ideas from both Hobbes and Rousseau can be conjoined to help us see the way to solving many of our increasingly more pressing global collective-action problems. The old attitude that Hobbesians are so conservative and authoritarian that they have little to contribute to contemporary problems, or that Rousseau's insights are too collectivist for contemporary problems, is both simplistic and untenable. While Hobbes held many very conservative political positions, and while many conservatives have been attracted to Hobbes's approach to grounding political obligation, there is nothing inherently conservative about economic contractarianism. (Not all Hobbes's views were conservative. He was one of the first to hold that the state has an obligation to provide welfare payments to the poor; see *Leviathan*, Part 2, Chapter 30, the section titled *Publique Charity*. For an argument for welfare-state liberalism based on neo-Hobbesian ideas, see Wein 1994.)

Furthermore, with so much of the world's economic activity now embodying the neo-liberal ideology of Hobbesian possessive individualism, those who seek to ensure that civil society retains realms where cooperative, caring enterprises are sustained and nurtured need to look to Rousseau's insights for guidance on how best to amplify the assurance each of us may properly have regarding the cooperative capacities and inclinations of her fellows. It is to our detriment that we neglect either Hobbes or Rousseau. (For an argument that, with the demise of deconstructionism and the plunge in popularity of postmodernism, those who seek to develop a rigorous feminist theory of justice should turn to a combination of the insights of Hobbes and Rousseau, see Wein 1997.)

Of course what actually is an assurance damper or an assurance amplifier is an ultimately an empirical question. But to know what data we need to answer that question, a great deal of very careful conceptual analysis – on matters like the distinction between destructive and productive prisoner's dilemmas, the forms and nature of various basic goods, and the limits of human cooperation – is

needed. (How else can we in find the relevant data and ascertain how to read those data?) Just as game theorists need to do more work to figure out how best to model the various collective action problems we now face, it is incumbent upon argumentation theorists to develop the conceptual tools for dealing with that information before can we ascertain which things really are assurance dampers (and how to prevent them from arising) and which things actually serve to act as assurance amplifiers (and how we can best go about nurturing them). It is only after we better understand the nature of the parametric choices that confront us that will we be in a position to go about dealing with these complex empirical issues**[i]**.

NOTE

[i] I benefited from extremely helpful discussion when I presented these ideas at the International Society for the Study of Argumentation conference in Amsterdam on July 1st 2010. I am grateful for helpful comments from two anonymous referees, and for discussion with Wm. Barthelemy, Duncan, MacIntosh, Malcolm Murray, and especially with Thea E. Smith.

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ISSA Proceedings 2010 – Arguing Towards Truth: The Case Of The Periodic Table

1. Preliminaries

For over a decade I have been presenting papers that include a theory of emerging truth that I feel is contribution towards understanding the relation of substantive arguments to their evaluation (Weinstein, 2009, 2007, 2006, 2006a, 2002, 1999). Substantive arguments address crucial issues of concern and so, invariably in the modern context, rely on the fruits of inquiry for their substance. This raises deep epistemological issues; for inquiry is ultimately evaluated on its epistemological adequacy and basic epistemological concepts are none to easy to exemplify in the musings of human beings. The traditional poles are knowledge and belief; in modern argumentation theory this is reflected in the distinction been acceptance and truth (Johnson, 2000). Crudely put, the rhetorical concern of acceptance is contrasted to the logical concern for truth with acceptability being a bridge between them in much of informal logic and argumentation theory.

It seems to me that the legacy of formal logic, embedded without much notice, in

much of informal logic and argumentation theory creates a problem for an account of the logic of substantive inquiry and a muscular identification of acceptability with truth. The root problem is the model of argument as premise conclusion relations and argumentation seen as a series of such. In a recursive model, so natural in formal systems, evaluation works from the bottom up, in the standard case, by assigning truth to propositions. But ascertaining the truth of elements, except in relatively trivial circumstances, points away from the particulars and towards the context. This is particularly true of inquiry, and so is essentially true of substantive arguments that rely on the fruits of inquiry. For if we take the best of the fruits of inquiry available we find that truth of elements, although frequently a pressing local issue, is rarely the issue that ultimately drives the inquiry. Truth of elements is superseded by what one might call, network concerns. And it is upon network relations that an adequate notion of truth in inquiry can be constructed. My ultimate goal is to defend a model of emerging truth as a bridge between acceptability and truth. That is, to indicate a logical structure for acceptability that, at the limit, is as true as we can ever hope for. In this paper I want to show that the model of emerging truth captures the large structure of the inquiry that supports the acceptance of the Periodic Table, about as true a thing as we can expect.

My model of emerging truth (abbreviated in the technical appendix) relies on three intuitive network principles, concilience that is the increasing adequacy of empirical description over time, breadth, the scope of a set of theoretic constructs in application to a range of empirical descriptions and depth, a measure of levels of theoretic redefinitions each one of which results in increasing breadth and higher levels of concilience.
A theory of truth that relies on the satisfaction of these three constraints creates immediate problems if we are to accept standard logical relations. The most pressing within inquiry is the relation of a generalization and its consequences to counter examples. Without going into detail here, the model of truth supports a principled description of the relation of counter-examples to warranted claims that permits a comparative evaluation to be made rather than a forced rejection of one or the other as in the standard account (technical appendix, Part II). Such a radical departure from standard logic requires strong support and although my theory of truth offers a theoretic framework, without a clear empirical model my views are easily overlooked as fanciful.

2. Why the periodic table?

If you ask any sane relatively well-educated person what the world is really made of, the response is likely to be something about atoms for molecules. Why is this so? Why is the prevailing ontology of the age based on modern physical science? What prompted this ontological revision away from ordinary objects as primary and to the exclusion of the host of alternative culturally embedded views especially those supported by religion and a variety of traditional explanatory frameworks, whether lumped together as folklore or more positively as common sense? The obvious explanation is the growing conviction that science yields truth.

There is no doubt that the shift is a result of the amazing practical advances of the last few centuries, the entire range of scientific marvels put at our disposal, from cyclotrons, to computers, from the amazing results of material science and the creation of synthetics to the understanding of the very stuff of genetic coding in the cell. It seem equally obvious to me that the one object that anchors this enormous array of understanding and accomplishment is the Periodic Table of Elements.

The concern for truth that disputation reflected as the Periodic Table advanced dialectically in light of changing evidence and competing theoretic visions mirrors the three main considerations that form the standard accounts of truth in the philosophical literature. The over-arching consideration is the immediate pragmatic advantage in terms of the goals of inquiry, that is an increasing empirical adequacy and the depth of cogency of theoretic understanding. These pragmatic considerations, along practical effectiveness in relation to applications of inquiry in engineering and other scientific endeavors, point to the major epistemological considerations that practical success reflects, that is, higher conformity to expectations, empirical adequacy, the basic metaphor for correspondence in the standard theory of truth, and increasing inferential adequacy and computational accuracy, coherence in the standard account. The relation between these and my trio, concilience, breadth and depth, can only be hinted at in the abbreviated version. Roughly, each of my three contributes in a different way to the standard three. But I hold my account liable to these standard desiderata as well as to the demand of descriptive adequacy. So if my theory of truth in inquiry is adequate, it must be proved against the Periodic Table.

My original conviction was based on a rather informal reading of Chemistry and

its history. Despite the relative superficiality of my engagement, it seemed apparent that the salient aspects of truth that my model identified were readily seen within the history of chemical advancement and its gradual uncovering of the keystone around which the explanatory framework of physical science was to be built. It was not until recently that I was able to test my intuition against an available and expert account of the development of the Periodic Table. Such an account now exists in the thoughtful and well-researched philosophical history of the table by philosopher and historian of chemistry Erik Scerri (2007). I rely heavily on his account for specifics.

But first, a brief comment about arguments. It seems safe to say that for scientifically oriented argumentation theorists exploring the literature still available in actual records of argumentation among the Chemists involved would be fascinating. Eavesdropping on their discussions would even be more fascinating for those who see the study of argumentation as involving rhetorical details and actual argumentative exchanges between interlocutors. Such an approach is natural within conceptions of argument seen as debates and dialogue games. But in inquiry, so it seems to me the perspective needs to be broader than 'persuasion dialogues.' An alternative looks at argumentation in the large, that is, seeing how the dispute evolves around the key poles that drive the actual developing positions in response to the activities, both verbal and material, of the discussants. Such a perspective in the theory of argument permits a more logical turn, exposing the shifting epistemological structure that undergirds the dialogue in so far as it is reasonable. It enables the epistemological core to be seen. For in this larger sense the rationality of the enterprise can be seen not merely in terms of individuals and their beliefs, but in the gradual exposure of the warrants underlying the points at issue. In what follows I will indicate the participants as points of reference for those who might want to see to what extent the actual dialogues among chemists reflect the epistemological warrants. Scerri in has marvelous and detailed account presents the details of the competing positions and their shifts as the evidence and theories change. My purpose here is to identify the large epistemological structures that, in so far as I am correct, ultimately warrant the present consensus.

3. The Periodic Table

The first realization that sets the stage for a renegotiation of the theory of truth is that there is no clear candidate for what the Periodic Table of Elements is. That is

not to say that the choices are random or wide spread, but rather that even after more than a century, the debate as to the most adequate format for the Periodic Table of Elements is ongoing (among other things, the placement of the rare earths remains a point of contention, pp. 21-24). For now and for the foreseeable future both the organization and details of the Periodic Table are open to revision in light of the ends for which it is constructed. To account for this we require some details.

The work of John Dalton at the beginning of the 19th century is a convenient starting place for the discussion of the Periodic Table since he postulated that 'the weights of atoms would serve as a kind of bridge between the realm of microscopic unobservable atoms and the world of observable properties' (p. 34). This was no purely metaphysical position, but rather reflected the revolution in Chemistry that included two key ideas. Lavoisier took weighing residual elements after chemical decomposition as the primary source of data and Dalton maintained that such decomposition resulted in identifiable atoms. This was Dalton's reconstitution of the ancient idea of elements, now transformed from ordinary substances to elements that were the result of chemical decomposition. Studies of a range of gases, by 1805, yielded a table of atomic and molecular weights that supported the 'long recognized law of constant proportions…when any two elements combine together, for example, hydrogen and oxygen, they always do so in a constant ratio of their masses (pp. 35-36). Scerri epitomizes this period, begun as early as the last decade of the 18th century by Benjamin Richter who published a table of equivalent weights, as that of finding meaningful quantitative relationships among the elements. A period that yielded both the possibility of precision and opened theoretic descriptions to all of the vagaries of empirical measurements: open to the full problematic of weakly supported theories, new and developing procedures of measurement, and the complex nature of the measurement process itself, measures that were open to change and refinement as techniques were improved and experimenters gained more experience.

In hindsight many the problems that confronted the chemists reflected a conceptual issue expressed in empirical incongruities: atomic weight is not invariably reflected in equivalent weight and so the underlying structure was not readily ascertained by finding equivalent weights, the core empirical tool. For without knowing the correct chemical formula, there is no way to coordinate the

correct proportions against the observed measurements of the weight of component elements in ordinary occurring chemical compounds. And as it turns out , “the question of finding the right formula for compounds was only conclusively resolved a good deal later when the concept of valency, the combining power of particular elements was clarified by chemists in the decade that followed by Edward Frankland and Auguste Kekule working separately’ (p. 37).

The initial problems, including Dalton’s infamous mistaken formula for water, were the result of empirical incongruities seen in light of a core integrating hypothesis: the law of definite proportion by volume, expressed in 1809 by Guy Lusac as: ‘The volume of gases entering into a chemical reaction and the gaseous products are in a ratio of small integers’ (p. 37). Held as almost a regulative principle the law was confronted with countless counterexamples, recalcitrant, yet often roughly accurate, measurements the reflected the lack of knowledge of the time. A common occurrence throughout the history of science, early chemistry reflects the competing pull of empirical adequacy and theoretic clarity. Not one to the exclusion of the other, but both in an uneasy balance. This reflected many disputes but the one that reflects the deepest thread that runs through the history of the Table is Prout’s Hypothesis. Scerri identifies the key insight: the rather remarkable fact that ‘many of the equivalent weights and atomic weights appeared to be approximately whole number multiples of the weights of hydrogen’ (p. 38). This was based on the increasing numbers of tables of atomic weights available in the first decades of the 19th century. But it was not merely increasing data that drove the science. The two poles, not surprisingly, were the attempts to offer empirically adequate descriptions that demonstrate sufficient structural integrity in light of underlying theoretic assumptions exemplified in the law of definite proportions. Prout’s hypothesis, that elements are composed of hydrogen, first indicated in an anonymous publication in 1819 offered a deeply unifying insight, if everything was composed of one element the law of definite proportions was an immediate corollary. The bold hypothesis was based on ‘rounding off’ empirical values of the of the comparative weights of elements as an index of the atomic weights, to whole number multiples of 1, the presumed atomic weight of hydrogen. Available data created roadblocks. In 1825, the noted chemist Jacob Berzelius ‘compiled a set of improved atomic weights the disproved Prout’s hypothesis (p. 40). Prout’s hypothesis, however, whatever its empirical difficulties ‘proved to be very fruitful because it encouraged the determination of

accurate atomic weights by numerous chemists who were trying to either confirm or refute it' (p.42)

But there was more to the story. Quantitative relationships have an essential yield beyond the increased ability to offer precise descriptions that may be subjected to increasingly stringent empirical testing. That is, they open themselves to structural interpretations. Available data quickly afforded systematization as a prelude to eventual theoretic adequacy. The first effort to systematize known empirical results can be attributed to the German chemist Johann Dobreiner who in 1817 constructed triples of elements which showed chemical similarities and most essentially showed 'an important numerical relationship, namely, that the equivalent weight, or atomic weight 'of the middle is the approximate mean of the values of the two flanking elements in the triad' (p. 42). This moved the focus from constructing tables of atomic weights to looking more closely at the relationships among known values. It led to an initial structural unification of the table of elements through the identification of more triad, triples of elements that show clear ratios between their equivalent weights and therefore their presumed atomic weights. Other chemists, notably Max Pettenkofer and Peter Kremers, worked with similar constructions, which culminated in Ernst Lensser fitting all 58 known elements into a structure of 20 triads. But the problem of ascertaining atomic weights still resulted in competing values and contrasting constructions. By 1843 a precursor to the periodic table was published by Leopold Gmelin, a system that combined some 53 elements in an array that reflected the chemical and mathematical properties, accurately organized most known elements in groups that would later be reflected the underlying principles in the periodic table.

Scerri concludes. 'It is rather surprising that both Prout's hypothesis and the notion of triads are essentially correct and appeared problematic only because the early researchers were working with the wrong data' (p. 61). Prout is, of course, correct in seeing hydrogen as the basis the elements, since hydrogen with one proton serves as the basis as we move across the Periodic Table, each element adding protons in whole number ratios based on hydrogen with one proton. The number of protons yielding the final organizational principle of the table, once atomic number, distinguished from atomic weight which includes the contribution from neutrons unknown until the mid-20th century. And similarly for earlier structural models based on triads. It was only after the famous hypothesis of

Amadeo Avogadro of 1811 was championed by Stanislao Cannizzaro in the midcentury that chemists had a firm enough footing to develop increasingly adequate measurements of atomic weight and began to see the shape of the underlying relationships.

The increase in triads is an example of the most basic of the requirements for sustaining a generalization against counterexamples. The empirical evidence, its models, form a model chain, technically, there is a function that maps the hypothesis onto a set of models (or near models) and the model chain is progressive, that is, the set of models in increasing over time (technical appendix, Part I, 1.1). The dialectical force of counterexamples, rather than requiring rejection of either pair requires an adjudication of the power of the counterexample against the weight of the model chain that it confutes. That is not to reject the counterexample, rather to moderate its dialectical force (technical appendix, Part II). This requires a number of assumptions about the models. The first is the assumption that models can be ordered, and the second that approximation relationships can be defined that support the ordering. The latter is crucial, approximation relations (technically neighborhood relations on a field of sets) enable complex relationships among evidence of all sorts to be defined. Intuitively, approximation relations are afforded indices of the goodness of fit between the evidence and the model in respect to the terms and relationships expressed in a generalization. This has a deep affinity to the notion of acceptability in argument theory, since how narrowly the acceptable approximations need to be is determined a posteriori in light of the practice in the field. This is subject to debate but is no mere sociological construct, since there is an additional requirement. The model chain must prove to be progressive, that is the chain of models must be increasing and be an increasingly better approximations over time (technical appendix, Part I, 1.2).

This is evident in the history of the Periodic Table. By the 1860's the discovery of triads had moved further into the beginnings of the periodic system. By the 1880's a number of individuals could be credited with beginning a systematization of the elements. Scerri, in addition to Dimitri Mendeleev and Julius Lothar Meyer, credits Alexendre De Chancourtois and John Newlands, William Odling and Gustavus Hinrichs.
Systematization was made possible by the improved methods for determining atomic weights by, among others, Stanislao Cannizzaro and a clear distinction

between molecular and atomic weight. As Scerri puts it 'the relative weight of the known elements could be compare in a reliable manner, although a number of these values were still incorrect and would be corrected only by the discovery of the periodic system' (p. 67). Systematization was supported by the discovery of a number of new elements that fit within the preliminary organizing structures and the focus was moved towards experimental outcomes without much concern for the theoretic pressure of Prout's hypothesis which fell out of favor as an organizing principle as the idea of simple arithmetic relationships among the elements proved harder to sustain in the light of growing body of empirical evidence.

From the point of view of my construction what was persuasive was the availability of model chains that in and of themselves were progressive (technical appendix, Part I, 1.3). That is, series of models could be connected though approximation relations despite the lack of an underlying and unifying hypotheses. And whatever the details of goodness of fit, the structure itself took precedence over both deep theory (Prout's hypothesis) in the name of network of models connected by reasonably clear if evolving, quantitative and chemical relationships.
The hasty rejection of Prout's hypothesis at this juncture, despite its role as encapsulating the fundamental intuition behind the search of quantitative relationships, offers window into what a theory of emerging truth requires. In the standard model of, for example, Karl Popper, counterexamples force the rejection of the underlying hypothesis. But as often, the counterexample is accepted, but the hypothesis persists, continuing as the basis for the search for theoretic relationships. The intuition that prompted the search for a unifying structure in terms of which the mathematical and chemical properties of the elements could be organized and displayed was sustained in the light of countervailing empirical evidence. Making sense of this requires a more flexible logic, one that permits of a temporary focus on a subset of the properties and relations within of a model while sustaining the set of models deemed adequate in the larger sense exhibited by the connections among models in a unifying theoretical structure. And as the century progressed the search for such a structure began to bear fruit.

By the turn of the century the core intuition, combining chemical affinities and mathematical measurements resulted in a number of proposals that pointed towards the Periodic Table. John Newland introduced the idea of structural level

with his ‘law of octaves’, the geologist, Alexander De Chancourtois, and chemists William Odling and Gustavus Hinrichs offered structural accounts of know elements. All this culminated in the work of Lothar Meyer and most famously Dimitri Mendeleev who are credited as the key progenitors of the periodic table. The proliferation of structured arrays of models reflected the key epistemic property I call ‘model chain progressive’ (technical appendix, Part I, 1.3). That is model chains were themselves being linked in an expanding array such that the set of model chains was itself increasing both in number and in empirical adequacy. The culmination was a series of publications by Mendeleev beginning in 1869, which codified and refined the Periodic Table in various editions of his textbook, The Principles of Chemistry, which by 1891 was available in French, German and English.

Mendeleev encapsulated his findings in eight points:
‘1: The elements if arranged according to their atomic weights, exhibit *periodicity* of properties
2. Elements which are similar as regards their chemical properties have atomic weights, which are either of nearly the same values…
3. The arrangements of the elements, or of groups of elements, the order of their atomic weights corresponds to their so-called *valences*…
4. The elements which are most widely diffused have *small* atomic weights.
5. The magnitude of the atomic weight determines the character of the elements, just as the *magnitude* of the molecule determines the character of the compound body.
6. We must expect the discovery of many yet *unknown* elements, for example elements analogous to aluminium and silicon whose weights should be between 65 and 71.
7. The atomic weight of an element may be sometimes be amended by a knowledge of those contiguous elements…
8. Certain characteristic properties of the elements can be foretold from their atomic weights’ (all italics original, pp. 109-110).

As is well known Mendeleev’s conjectures led to a number of compelling predications of unknown elements based on gaps in the table (item 6). This is generally thought to be the most significant factor in its acceptance. Scerri maintains, and I concur, that of equal importance was the accommodations to accepted data that the system afforded (item 7). A major contribution is the

correction of atomic weights due to the realization of the importance of valence (item 3). Atomic weight was not identical with equivalent weight only but rather reflected the product of equivalent weight and valence (p. 126). This was reflected by the increase in accuracy as the power of the notion of period in guiding subsequent empirical research proved invaluable (item 1) as well as in the emerging connections between chemical and mathematical properties (items 2, 5 and 8). Even more important to the development of physical chemistry was the effect of the system on later developments in the microphysics, which developed, in part, as an explanatory platform upon which the table could stand. These are all powerful considerations in accounting for the general acceptance of the periodic table in the 20th century. The last of these, indicated almost in passing in item 4, points us back to the ultimate reinterpretation and vindication of Prout's hypotheses. For it is hydrogen with an atomic weight of 1.00794 that that moves us to the next stage in my model, the role of reduction as the harbinger of truth in science.

Beginning with the discovery of the electron by J.J. Thompson in 1897, the early decades of the 20th century showed enormous progress in the elaboration and understanding of the nature of atoms. Ernest Rutherford, Wilhelm Rontgen, Henri Poincare, Henri Becquerel, Marie Curie, Anton van den Broek, Alfred Mayer and Henry Moseley all contributed empirical and theoretical insights that led of a deeper understanding of atomic structure and its relation to the chemical and mathematical properties of the known elements as well as the discovery of additional elements all within the structure that the periodic table provided.

The availability of a micro theory that explained and predicted made the periodic table available for reduction. That is, the chemical elements could be reinterpreted in terms of a theoretic domain of objects based on the developing notions of the atom and especially of the electron (technical appendix, Part I, 2). Early accounts of the elements in terms of electron configurations where constructed by Gilbert Lewis, Irving Langmuir, Charles Bury and John Main Smith. That is to say, the micro theory became reduction progressive (technical appendix, Part I, 2.1). All of these early efforts were the objects of contention and none was adequate to available empirical evidence, but the power of the theoretic idea prevailed despite empirical difficulties and despite the lack of a firm grounding in a clear theoretic account of the underlying physics. This was to be changed by the seminal work of Neil Bohr and Max Plank along with many others

including most notably Wolfgang Pauli, which led to quantum mechanics based on the matrix mathematics of Werner Heisenberg, the empirical and theoretical work of Douglass Hartree and Vladimer Fock and the essential work of Louis de Broglie, Erwin Schrodinger and Wolfgang Pauling. In my terms the periodic table had become reduction chain progressive (technical appendix, Part I, 2 .2.). That is the elaboration of the underlying theory was itself becoming in increasingly adequate both in terms of its empirical yield as reflected in better measurements and in a more comprehensive understanding of the phenomena that it reduced, that is, the chemical and mathematical properties identified in the Periodic Table. And as always the theoretic advance was in the face of empirical difficulties. At no time in the development of quantum theory was there an easy accommodation between empirical fact and theoretic coherence. The various theories all worked against anomalous facts and theoretic inconsistencies. And although this was the subject of the ongoing debate the larger issue was driven by the coherence of the project as evidenced by the increasing availability of partially adequate models and intellectually satisfying accounts that initiated the enormous increase of chemical knowledge that characterizes the last century.

The power of the periodic table was not fully displayed until the reduction to a reasonably clear micro theory led to the enormous increase in breadth that characterized the chemical explanations for the vast array of substances and processes ranging from the electro-chemistry of the cell, to crystallography, from transistors to cosmology. This is indicated in my model by the notion of a branching reducer (technical appendix, Part I, 2.3). It is simple fact, although seemingly hyperbolic, that the entire mastery of the physical world evidenced by the breadth of practical applications in modern times rests on the periodic table. That is quantum physics through its application to the periodic table is a progressively branching reducer (technical appendix, Part I, 2.4).
But the scope of the periodic table, resting upon an increasingly elaborate microphysics is still not the whole theory. For quantum mechanics itself has been deepened with the increasingly profound theories of particle physics. This is an area of deep theoretical and even philosophical contention and so it is possible, although extremely unlikely, that the whole apparatus could collapse. But this would require that a new and more adequate microphysics be invented that could replace the total array of integrated physical science with an equally effective alternative. Such a daunting prospect is what underlies my gloss on truth seen as the very best that we can hope for.

4. Technical Appendix

Part I:

1. A scientific structure, TT = <T, FF, RR> (physical chemistry is the paradigmatic example) where T is a set of sentences that constitute the linguistic statement of TT closed under some appropriate consequence relation and where FF is a set of functions F, such that for each F in FF, there is a map f in F, such that f(T) = m, for some model or near model of T. And where RR is a field of sets of representing functions, R, such that for all R in RR and every r in R, there is some theory T* and r represents T in T*, in respect of some subset of T.

A scientific structure is first of all, a set of nomic generalizations, the theoretic commitments of the members of the field in respect of a given body of inquiry. We then include distinguishable sets of possible models (or appropriately approximate models) and a set of reducing theories (or near reducers). What we will be interested in is a realization of TT, that is to say a triple <T, F, R> where F and R represent choices from FF and RR, respectively. What we look at is the history of realizations, that is an ordered n-tuple: <<T,F1,R1>,...,<T,Fn,Rn>> ordered in time. The claim is that the adequacy of TT as a scientific structure is a complex function of the set of realizations.

1.1. Let T' be a subtheory of T in the sense that T' is the restriction of the relational symbols of T to some sub-set of these. Let f' be subset of some f in F, in some realization of TT. Let <T'1,...,T'n> be an ordered n-tuple such that for each i,j (i<j,) T'i reflects a subset of T modeled under some f' at some time earlier than T'j. We say the T is *model progressive under* f' iff:

a) T'k is identical to T for all indices k, or

b) the ordered n-tuple <T'1,...,T'n> is well ordered in time by the subset relation. That is to say, for each T'i, T'j in <T'1,...T'n> (i2), if T'i is earlier in time than T'j, T'i is a proper subset of T'j.

1. 2 We define a *model chain* C, for theory, T, as an ordered n-tuple <m1,...,mn>, such that for each mi in the chain mi = <di, fi,> for some domain di, and assignment function fi, and where for each di and dj in any mi, di = dj; and where for each i and j (i<j), mi is an earlier realization (in time) of T then mj.

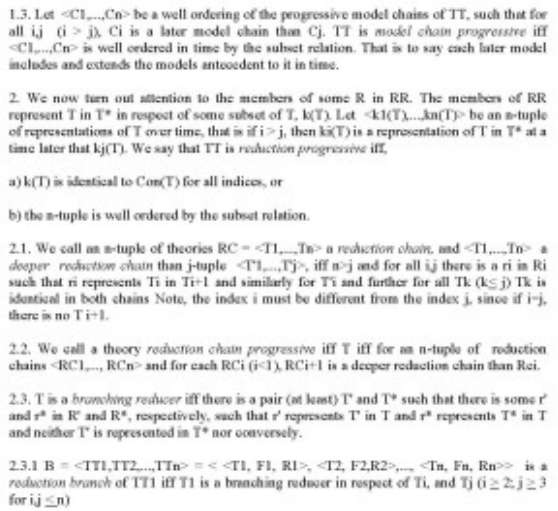
Let M be an intended model of T, making sure that f(T) = M for some f in F (for some realization <T, F, R>) and T is model progressive under f. We then say that

C is a *progressive model chain* iff:

a) for every mi in C, mi is isomorphic to M, or

b) there is an ordering of models in C such that for most pairs mi, mj (j > i) in C, mj is a nearer isomorph to M than mi.

This last condition is an idealization, as are all similar conditions that follow. We cannot assume that all theoretic advances are progressive. Frequently, theories move backwards without being, thereby, rejected. We are looking for a preponderance of evidence or where possible, a statistic. Nor can we define this a priori. What counts as an advance is a judgment in respect of a particular enterprise over time best made pragmatically by members of the field (*To avoid browserproblems figure 1 shows part of the scheme 1.3 – 2.3.1*).



1.3. Let <C1,...,Cn> be a well ordering of the progressive model chains of TT, such that for all i,j (i > j), Ci is a later model chain than Cj. TT is *model chain progressive* iff <C1,...,Cn> is well ordered in time by the subset relation. That is to say each later model includes and extends the models antecedent to it in time.

2. We now turn out attention to the members of some R in RR. The members of RR represent T in T* in respect of some subset of T, k(T). Let <k1(T),...,kn(T)> be an n-tuple of representations of T over time, that is if i > j, then ki(T) is a representation of T in T* at a time later that kj(T). We say that TT is *reduction progressive* iff,

a) k(T) is identical to Con(T) for all indices, or

b) the n-tuple is well ordered by the subset relation.

2.1. We call an n-tuple of theories RC = <T1,...,Tn> a *reduction chain*, and <T1,...,Tn> a *deeper reduction chain* than j-tuple <T'1,...,T'j>, iff n>j and for all i,j there is a ri in Ri such that ri represents Ti in Ti+1 and similarly for T'i and further for all Tk (k≤ j) Tk is identical in both chains Note, the index i must be different from the index j, since if i=j, there is no T i+1.

2.2. We call a theory *reduction chain progressive* iff T iff for an n-tuple of reduction chains <RC1,..., RCn> and for each RCi (i<1), RCi+1 is a deeper reduction chain than Rci.

2.3. T is a *branching reducer* iff there is a pair (at least) T' and T* such that there is some r' and r* in R' and R*, respectively, such that r' represents T' in T and r* represents T* in T and neither T' is represented in T* nor conversely.

2.3.1 B = <TT1,TT2,...,TTn> = < <T1, F1, R1>, <T2, F2,R2>,..., <Tn, Fn, Rn>> is a *reduction branch* of TT1 iff T1 is a branching reducer in respect of Ti, and Tj (i ≥ 2; j ≥ 3 for i,j ≤n)

Figure 1

2.4. We say that a branching reducer , T is a *progressively branching reducer* iff the n-tuple of reduction branches <B1,...,Bn> is well ordered in time by the subset relation, that is, for each pair i,j (i>j) Bi is a later branch than Bj, that is, the number of branching reducers has been increasing in breadth as inquiry persists.

Part II:
The core construction is where a theory T is confronted with a counterexample, a specific model of a data set inconsistent with T. The interesting case is where T has prima facie credibility, that is, where T is at least model progressive, that is,

is increasingly confirmed over time (Part I, 1).

A. The basic notion is that a model, cm, is a *confirming model* of theory T in TT, a model of data, of some experimental set-up or a set of systematic observations interpreted in light of the prevailing theory that warrants the data being used. And where

1. cm. is either a model of T or
2. cm is an approximation to a model of T and is the nth member of a sequence of models ordered in time and T is model progressive (1.1).

B. A model interpretable in T, but not a confirming model of T is an *anomalous model*.

The definitions of warrant strength from the previous section reflect a natural hierarchy of theoretic embeddedness: model progressive, (1.1), model chain progressive (1.3) reduction progressive (2), reduction chain progressive (2.2), branching reducers (2.3) and progressively branching reducers (2.4). A/O opposition varies with the strength of the theory. So, if T is merely model progressive, an anomalous model is type-1 anomalous, if in addition, model chain progressive, type-2 anomalous etc. up to type-6 anomalous for theories that are progressively branching reducers.

P1. The strength of the anomaly is inversely proportional to dialectical resistance, that is, counter-evidence afforded by an anomaly will be considered as a refutation of T as a function of strength of T in relation to TT. In terms of dialectical obligation, a claimant is dialectically responsible to account for type 1 anomalies or reject T and less so as the type of the anomalies increases.

P2: Strength of an anomaly is directly proportional to dialectical advantage, that is, the anomalous evidence will be considered as refuting as a function of the power of the explanatory structure within which it sits.

P*: The dialectical use of refutation is rational to the extent that it is an additive function of P1 and P2

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