ISSA Proceedings 1998 – Argument Theory And The Rhetorical Practices Of The North American 'Central America Movement'

1. Introduction

They loved us when we stood in front of the Galleria and sang "El Salvador's another Viet Nam" to the tune of "Walking in a Winter Wonderland." But the situation in El Salvador was different from Viet Nam, and we knew that the equation was an oversimplification. But we also knew that we needed something that would get the public's attention, something that would help them connect with an issue on which we wanted to change American policy.

"We" here is the group of people who made up the Central America Movement, and most, specifically, the Pledge of Resistance, in Louisville, Kentucky. The goal of that group, and of the movement in general, was to end U.S. government support for repressive right-wing governments in Central America and to end the support of the Reagan administration for the Contras who sought to overthrow the Sandinista government in Nicaragua. The Movement sought to influence policy entirely through democratic means, entirely by using the resources always open to citizens in a democracy: the formation of public opinion and the persuasion of senators and representatives who would be voting on aid bills. Cutting off funding for Reagan administration initiatives was the best procedural way to disable the administration's policy. The only "illegalities" in which the Movement as I know it engaged were acts of very public – the more public the better – civil disobedience. Throughout the 1980s, the issue of Central America policy never became a "determining" one; that is, it was never an issue on which the majority of Americans based their votes and thus one on which the administration was loath to be at odds with a segment of the electorate. The task of the Central America Movement in North America, therefore, was to try to bring

the issue before the public, to persuade the public to oppose administration policy, and to persuade legislators to vote against funding requests.

The success of the Central America movement is difficult to judge. Across the nation, individual senators and representatives came to oppose Contra Aid, and finally the flow of aid was stopped. The Iran-Contra scandal was an embarrassment to the Reagan administration but, to the general disappointment of the Central America Movement, did not precipitate a national revaluation of U.S. Central America policy. Church groups in the North America formed twinning relationships with congregations in Central America, and speaking tours brought activists from the region to audiences all across North America, increasing awareness of the region and familiarity with its issues as seen from a perspective different from that of the administration. It is generally accepted that regimes in Central America are more democratic than was the case in the 1980s. Reconciliation commissions in El Salvador and Guatamala have worked to move those countries beyond armed left/right conflict. Elections in winter of 1990 removed the Sandinista Party from power in Nicaragua and replaced it with a coalition government preferred by the U.S. government. In short, from the perspective of the Central America Movement generally, the news is mixed. It can point to many successes but cannot claim overall to have made Central America policy a key interest of American voters nor to have created popular and legislative support for American policies that would favor the poor or more widely distribute education and health care opportunities among the population in Central America. Contra aid has ended, but a principle of self-determination for the nations of that region has not been enshrined in American foreign policy or American popular opinion.

In looking back at the Central America Movement of the 1980s and attempting an assessment of its rhetoric, we must acknowledge that public and legislative sentiment were strongly influenced by historical events such as the breaking of the Iran-contra scandal and the revelation of atrocities like the mass murders of civilians, the murder of four American churchwomen, and the killing of the Jesuits at the University of Central America in 1990; also by the nationalization of the San Antonio sugar plantation by the Sandinista government and the protest against that government's economic policy by the women of the Eastern Market in Managua. Events like these never entirely "spoke for themselves," however. As soon as they were reported, everyone with a stake in the Central America debate

rushed to offer interpretations. The "rhetorical sphere" of the Central America Movement was therefore quite large. Well-known writers and intellectuals wrote about the region: Joan Didion's *Salvador* and Salman Rushdie's *The Jaguar Smile: A Nicaraguan Journey* were particularly successful in bringing some attention to the issue. But such "professional" analyses as these were always quite separate from the activities of the Movement, and it is only the latter that I will be discussing in this paper.

I was a participant in that Movement from 1986 through the early 1990s, and I am proud of that association. My project in this paper is to analyze the argumentation of the Movement and to reflect, in the context of argument theory, on the rhetorical difficulties such movements confront. I am NOT assuming that everyone in the audience shares my political perspective on Central America; I am assuming that the issues raised here are not specific to this particular political movement but rather that they are likely to arise at any intersection of argumentation theory and political commitment.

I am aware that in the U.S. there are two nearly separate scholarly conversations going on at this time about argument: one in English and one in Communication. They are separate not only because of the accidents of university history but also because one takes place within the framework of the Humanities and one within the Social Sciences. The conversation about argument within the field of English is characterized by a focus on texts, the interpretation of texts, the construction of speakers and readers within texts. The Social Sciences conversation, I glean, is more willing to look empirically at the social effects of arguments. The latter is also, I see, more willing to consider the possibility that argument may not avail much in a particular situation (Willard 1989: 4). Within English and Humanities, however, discussions of argument always proceed without much skepticism. This faith in the power of argument may be attributed, I suspect, to the fact that English departments are charged with teaching Freshman Composition to all new University students, and the course includes instruction in the making of and evaluating of arguments. Perhaps we are simply unwilling to entertain the possibility that something that takes so much of our professional energy and provides so much of our institutional raison d'etre may be powerless in certain situations. Let me say at the outset of this paper that I work within the conversation of English and have drawn on its assumptions, its bibliography, and its methods in writing this paper, but the topic has also led me into the Communications, Social Science literature to a limited degree, seeking to

understand the social consequences of certain rhetorical choices.

2. Framing the debate

The rhetorical task of the Central America Movement was greatly complicated by the fact that the American electorate as a whole never made Central America policy a voting issue. American troops were not being conscripted to fight there, though National Guard units were being sent in as advisers for short periods of time. In Nancy Fraser's terms, the movement never achieved the status of a "subaltern counterpublic," perhaps because participants were not seeking to change the way they themselves were viewed or treated (Fraser 1992: 107). American public life seems to accord some measure of respect to subaltern groups that speak from the subject position of "victim" and demand change. Voices from such subject positions often succeed in creating a public issue. The right of the Movement to speak for the poor in Central America was never obvious or unchallenged, and therein lay one more difficulty in bringing the issue to the fore.

The need to rouse public sentiment pushed the Movement to argument by historical analogy: our national sense of what we must do derives in large part from our interpretation of the present moment as being like some other in our past. We will apply the lessons of history. In the 1990s, the U.S. government's decisions about the level of engagement in Bosnia were defended with the argument that Bosnia would become another Viet Nam, an unwinnable bloodletting in which we should not get involved; opponents of that policy argued that Bosnia was instead like Europe in the late 1930s, when appeasement and non-involvement proved disastrous. So, the first rhetorical struggle of the Central America Movement in the 1980s was to frame the public understanding of events in that region as analogous to Viet Nam, in opposition to the Reagan administration's efforts to evoke World War II and even the American Revolutionary War (Reagan famously referred to the Nicaraguan Contras as "the moral equivalent of our founding fathers").

Analogy with Viet Nam was effective in getting public attention: one could hardly ask for a more painful national experience to reference. Those who opposed that war thought it a moral and personal disaster; those who supported it thought it a military disaster, fraught with political betrayal. No one wanted to relive it. For sheer aversiveness, one could not ask for a stronger analogy. And the Movement felt pushed to employ it to counter the administration analogies with glorious

moments in the past. But the Movement never entirely embraced the Viet Nam analogy. There was considerable debate about its use within the Movement, and it was employed sporadically, not systematically. Resistance to its use sprang from the conviction that it was simply a false analogy. El Salvador was not another Viet Nam. If the temptation of generals is always to be fighting the last war, the need to frame a political debate by historical analogy tempts rhetoricians to do the same, to find an historical analogy that will serve politically, even if the fit is not good.

As the 1980s wore on, it became increasingly clear that the Viet Nam analogy was not apt: U.S. policy in El Salvador would never cause upheaval in the lives of North Americans. Further, the Movement became increasingly convinced that the situation in Central America generally was better described as Low Intensity Warfare. Michael T. Klare and Peter Kornbluh's book by that title, published in 1989, argued that the Reagan administration had learned the lessons of Viet Nam very well indeed and had deliberately developed near -invisible strategies for undermining the Sandinista government in Nicaragua: economic sabotage, paramilitary action, psychological warfare (Klare and Kornbluh 1989: 8).

Convincing the American public that low-intensity warfare was real and was being waged by the Reagan administration against Nicaragua became a goal of at least some segments of the Movement, running counter to the logic of the Viet Nam analogy. But, as the goal became educating the American people about low-intensity warfare, convincing them that something new was being waged in Central America, there was no historical analogy available to draw on in framing the debate. Reference to Viet Nam gained attention, but many believed that it falsified the message of the Movement; low-intensity warfare, however, was largely unknown, pushed no emotional buttons, and garnered little attention.

3. Strategy and ethos

Gaining the attention of the American people was a constant serious problem for the Movement. Unlike other social movements of the last two centuries, it lacked any visible victims and kept slipping into invisibility. It was not so much "Which side are you on?" as "What IS going on?" Leafleting was one way to get the word out. Local groups did generally rely heavily on leafleting, but they discovered that late twentieth-century America has reorganized its social geography in such a way as to make leafleting much more difficult than it was even thirty years ago. The shopping mall has replaced the downtown shopping district; malls are privately owned. Once, groups could leaflet in front of major stores and in the

town square. Now, one must have the permission of the corporate owners of malls to do the same; it is generally not forthcoming. Once, groups could leaflet people entering stores and public buildings. Now, people leave public space in their cars, driving unto private property. One cannot give a leaflet to a moving car, and putting leaflets on parked cars in private lots is a clandestine operation.

Should the Movement engage in such clandestine operations? Doing so generally seemed a necessity. How else to break through the silence? How else to bring the issue into the public's field of vision? How else to say "People's lives are being ruined; a great injustice is taking place; something must be done to stop it!" If one is morally impelled to speak, then one is morally impelled to speak to be heard. Civil disobedience was a common strategy of the Movement, particularly of a group called the Pledge of Resistance, whose members signed a pledge to engage in non-violent civil disobedience, even to the point of being arrested, if the United States invaded Nicaragua. Movement groups staged sit-ins in Congressional offices and in public venues, and some participants were arrested and tried, protesting aid going to the Contras. This tactic is informally credited with having raised the profile of the issue and persuaded some Congressional representatives to oppose Contra aid.

But what of the truly clandestine? What of tactics designed to force the public to confront the issue: guerrilla theatre, for example? A black van pulls up among the lunchtime crowd in the business district; masked men grab movement participants who have been planted in the crowd and hustle them into the van; then more movement participants walk through the crowd handing out a leaflet that begins, "This is an everyday occurrence in San Salvador." What of bannering, of suspending a banner from a highway overpass, denouncing the Death-Squad Government of El Salvador or demanding an end to Contra aid? What of three blood-stained mannequins left by the sides of highways with a sign saying that Death Squads that day dumped the bodies of three Salvadoran citizens by the highway leading from the capital, and giving the names of the dead?

Such tactics certainly succeeded in breaking through the barrier of invisibility, at least for those American citizens who witnessed them first-hand. The willingness of newspaper, TV, and radio to cover such events varied from city to city. Generally, the larger cities gave more coverage, while smaller-city media were more likely to ignore them. What effect did such clandestine "arguments" have on the perceived ethos of the movement, in the eyes of the public in general? The answer to that, based on reports of participants themselves, seems also to vary

with the size of the city and the local political culture. When in 1992, for example, thousands of San Franciscans shut down the Golden Gate Bridge to protest the Gulf War, the action seems not to have generated noticeable resentment on the part of the citizenry as a whole. In Cincinnati, a heartland city of about half a million people, a similar action by the Teachers' Union, dramatizing the urgent need for a school-funding levy, backfired badly and sparked an outpouring of hostility toward the union and toward the levy. So it was with the Central America actions: San Francisans and Chicagoans seem generally to have accepted the actions as legitimate political expressions. In Louisville, Kentucky, a heartland city in the upper south, highway bannering sparked a torrent of abuse and ridicule from morning radio disk jockeys. It would seem impossible, therefore, to judge whether such tactics, such argument moves, are or are not effective in absolute terms. Their meaning seems to vary with the speech-act context, as they are read differently in different local political cultures. This lesson would seem of interest not only to argument theorists who want to see argument always within the frame of the speech-act but also to political groups which fund a national office to coordinate activities, often calling for a national "day of action"; they would be well advised to remember that the persuasive power of an action can vary greatly from city to city.

Looking more closely at the difference in interpretation, we can note that the ethos of the movement seems to have been constructed differently in different locations. Larger cities, especially coastal ones, seem to have regarded clandestine actions as an expected part of the political vocabulary. But in smaller, heartland cities, clandestine action seems to have constructed the Movement as an "Other," an oppositional group with whom many citizens were reluctant to identify. Any anonymous disruption of the norm, carried out under cover of darkness, marked the group as set apart from the mass of the citizenry, if only by its clandestine planning: Movement people were in on the planning; the secret was kept from others. This construct set the Movement apart, created an Us and a Them, and created an ethical gulf that was difficult to breach. At local demonstrations of our group, I cannot remember ever seeing anyone in attendance who was not known to at least one member of the group. It seems a measure of our separateness from the community that we never attracted strangers.

Ironically, such clandestine actions as street theatre and bannering were often the ones that most energized the group itself. Oppositional ACTION seemed to

have an inherent appeal, and the ethical self-representation as outlaw had a positive appeal. In addition, there was for many a felt sense of moral imperative to separate oneself in a public way from Reagan administration policy, "to withdraw consent," as it was often termed. Holly Near, the folk-singer and activist, summed up the motivation of many Movement participants when she wrote the line, "No more genocide in my name." ("No More Genocide": *Journeys*, Redwood Records, 1984). Thus the impetus to separate oneself from the mass of the American citizenry among whom Ronald Reagan was dauntingly popular further served the ethical construction of the Movement as Other.

One element of postmodern argument theory tells us that ethos is the critical element in argumentation, as belief in rational argument erodes (Willard 1989: 4-10). In the absence of societal consensus in which to ground claims and reasons, the ethical standing of the speaker becomes the determining factor in the outcome of argumentation. Ethical self-representation becomes a matter of great political importance. Along with the issues already discussed in that regard, we should again consider the role of historical analogy in the construction of political ethos.

Twentieth-century American political and social history are haunted by the specters of foreign subversives and witch-hunts. Fear of Communist subversion in particular has created a public distrust of clandestine political groups and some suspicion of any organized political interest group (Dietrich 1996: 170-190). One's credibility as a citizen speaking on any issue is complicated if not compromised if one is believed to be speaking the "party line" of an organized group, from the National Organization for Women to the Christian Right. Conversely, political groups revealed to have been targeted for monitoring by governmental agencies often invoke the historical precedent of the McCarthy-era witch-hunts, which are widely perceived as having victimized innocent citizens and violated civil liberties. When it was revealed that an agent of the Federal Bureau of Investigation had infiltrated a local group of Central American activists in Philadelphia, that agency justified its action by asserting that it had reason to believe that the group was planning illegal activity – raising the familiar specter of the subversive cell. The Movement group, always noted as having included members of Catholic religious communities, protested that its civil rights were violated and that the FBI was engaging in a witch-hunt. The same argument dynamic was repeated when members of a Movement group, called Sanctuary, in Texas, including members of religious communities, were arrested for helping Central Americans come to and

remain in the United States illegally. The government pointed up the illegality of their activity and its secret and conspiratorial nature; the group responded with moral arguments about the necessity to save the refugees and with outrage that the government had infiltrated their group. Once again, the ethical high ground was the object, and historical analogy was a prime strategy for attaining it.

4. Creating dissensus
If the guerrilla tactics of the Movement raised public awareness of the issue, they were still limited in their ability to create a dissensus that could lead to political action. If the Movement succeeded in making the public suspicious of administration Central America policy, it still had to make that public informed and articulate enough to withdraw their consent by urging their congressional representatives to vote against contra aid, by speaking in public fora, by writing letters, raising the subject with friends, etc. So the Movement recognized a need to provide explicit arguments – claims and reasons.

In 1987, leading up to a vote on renewal of Contra aid in the fall Congressional session, the Pledge of Resistance waged a campaign it named "Stop the Lies." The newsprint paper it sent to members of the Pledge also included a tear-sheet for new signers of the Pledge to fill out and return; thus the intended audience seems to have been Movement members and non-members. It featured a text box on the front page, with the following content: "They lied about trading arms for hostages. They lied about diverting the money to the Contras. In fact, almost everything they've told us about Central America is a lie. Some of the lies are simple and bald-faced. Like the repeated denial of illegal U.S. funding of the Contras. And some of the lies are big and complex. Like the lie that the U.S. is promoting democracy in Central America. Or that our government is seeking a negotiated peace. These lies fuel the escalating war in Central America – just as they did during Vietnam. To stop the war, we must first stop the lies." The paper then lists seven lies and arguments in support of the thesis that they are indeed lies:
#1 The War in Central America is Not Another Vietnam;
#2 The U.S. has Sought a Peaceful Solution in Central America;
#3 U.S. Economic Aid helps the Poor in Central America;
#4 U.S. Policy in Central America is a Response to a Soviet Threat;
#5 U.S. Actions in Central America are Legal;
#6 U.S. Policy is Improving Human Rights in Central America;

#7 U.S. Actions in Central America Promote Democracy.

The analogy with Viet Nam is, of course, prominently asserted here, and supported with data about the number of military advisors sent to the region and with quotations from administration officials that do not foreclose the possibility of invasion. No reason is given for not wanting to repeat the experience of Viet Nam – none need be. Implicit are the moral and pragmatic concerns that always attend a discussion of that conflict. Reasons given in support of the other six assertions explicitly mix the moral and the pragmatic and construct a reader who believes the following:
– peace in Central America is desirable;
– conditions for the poor must be improved;
– respect for human rights must be strengthened;
– democracy in the region must be restored;
– power should move from military and oligarchic elites to the people;
– the United States should respect decisions of the World Court even when they contravene its perceived self-interest; the U.S. has no moral or strategic interest in opposing leftist movements in Central America or no right or responsibility to intervene.
This profile described the beliefs of a minority during the 1980s. The "Stop the Lies" paper supported its assertions about each of the lies with data (such as numbers of civilians killed in Central America since 1979) and with quotations from government sources ("David MacMichael, former CIA analyst responsible for proving that Nicaragua was arming the Salvadoran rebels: 'There has not been a verified report of arms moving from Nicaragua to El Salvador since April, 1981'.") Data and quotations are footnoted to credible sources like *Time* magazine*, The New York Times, Americas Watch*, and the *Wall Street Journal*, though one does note the absence of engagement with any opposing claims or evidence.
In sum, the "Stop the Lies" publication reinforces a binary choice between a "they" who have lied to "us" and the victimized "us" who have been so deceived. The subject position of duped victim is not one that people rush to occupy. It offers evidence that leftist movements in Central America are not an extension of Soviet threat to America, but it does not engage the deeper American skepticism about leftist movements in general.

5. The epistemology of oppositional movements
Any discussion of argument and the Central America Movement should engage

the question of why that movement was taken off guard by historical events that did not support its interpretation of the dynamic in that region, events such as the La Penca bombing and, most importantly, the electoral defeat of the Sandinista government in the winter of 1990. It may take comfort in the fact that the *New York Times* was similarly surprised by this latter event, having assessed the chances of the UNO coalition at slim to none. But Central America Movement groups derived much of their rationale and their ethical stature from the belief that they had a "true picture" of the situation in Central America, that they had sources of information in religious and health workers, church and union groups, and individual friends who could provide accurate information that the *New York Times* would not print because of its politics, that the Reagan administration would actively suppress. Groups like Witness for Peace existed to arrange for North Americans to travel to Central America and see first-hand what things were like, to talk to a cross-section of citizens. It would probably be fair to say that part of what constituted a Movement group as a group was its belief in its epistemological advantage. Skeptical of mainstream reporting, Movement participants relied on the group for information and interpretation.

If what bound a Movement group together as a group was a set of political commitments and shared oppositional interpretation of events, then any questioning of those commitments or interpretations might be destructive of the group as group (Ice 1987). Such a dynamic renders certain things unspeakable; the group cannot entertain some possibilities without courting its destruction as a group. I have no reason to think that anyone voiced doubt about a Sandinista electoral victory and was silenced; I simply pose the question of whether the possibility of a Sandinista loss was rendered unthinkable by the Movement because considering the possibility opened up to reconsideration so many assumptions that had brought participants together into a movement.

In the 1980's – coeval with the Central America Movement – the rhetorician Peter Elbow was urging professors of Composition and Rhetoric to teach their students the "believing game" and the "doubting game" (Elbow 1986). In the former, a reader reads a text and tries to think of all the ways in which its assertions can be true – one tries to believe. But that exercise, according to Elbow, should be followed by the "doubting game," in which the reader reads the very same text and tries to think of all possible objections that can be made to its assertions. It would seem to have been a healthy exercise for Movement groups to have formally structured into their group process a version of the "doubting game,"

creating a "free space" in which to speculate aloud about the possibility that their information or interpretation might be wrong. Professors of Composition and Rhetoric were not absent from the Central America Movement. In fact, the professional association Conference on College Composition and Communication had a Central America Caucus that met at its annual convention and might communicate between meetings. Why did the pedagogical technique so widely known among this group never enter Movement practice? Put another way, why did our professional knowledge not affect our political practice? Why was our way of arguing unaffected by what we taught about argumentation? I think that the answer to that question is probably complex, including a reluctance of professors to claim an expertise that would give them additional authority in the Movement groups and, perhaps, also the traditional barrier within the discipline of English that prevents our considering the social effects of argumentation as part of our professional horizon. It is this barrier that Ellen Cushman in her article "The Rhetorician as Agent of Social Change" urges us to break down: she writes, "I am asking for a deeper consideration of the civic purpose of our positions in the academy, of what we do with our knowledge, for whom and by what means. I am asking for a shift in our critical focus away from our own navels… " (Cushman 1996: 12).

6. Conclusion

The Central America Movement in the 1980s provided a means for many North Americans to express and act on their moral and political commitments to a just peace in the region. It provided a counterweight to Reagan administration pronunciations and made Central America policy an issue in the United States. It mobilized public protest against Contra aid and mobilized thousands of people who pledged to engage in non-violent civil disobedience if the U.S. invaded Nicaragua. It did not succeed in becoming a mass movement or in stopping Contra aid until the end of the decade. In its attempt to persuade the American public, the Movement was caught between the need to gain attention with brief, emotionally charged slogans and the desire to convince the American people of complex processes (illegal arms transactions; low-intensity warfare). Ingrained in American political argumentation is the use of historical analogy to promote an interpretation of present events and a future course of action. Such analogies may be necessary, but they do not well serve explication of new historical situations and processes, and they can constrain the thinking of political groups so that they are "always fighting the previous war," using tactics that worked in a previous

historical situation but are no longer as effective. Tactics like guerrilla theatre succeeded in gaining public attention but varied in their effectiveness from one locale to another. The ethical self-representation of Movement groups was always problematic because participants were not protesting their own oppression; unable to occupy the subject position of "victim," participants lacked a readily definable warrant for their actions.

The long shadow of history provides interpretive frameworks for political groups, their actions, and their treatment by the government; the Central America Movement was thus associated with Communist subversive groups, and it protested government infiltration as a witch-hunt. When the Movement provided claims and reasons, it appealed to morality and to pragmatism and constructed a reader who was committed to fairness, legality, and the good of the whole population in Central America, but it did not engage the American public's inherent distrust of any faction termed "leftist." Unlike the anti-war movement of the 1960s, the Central America Movement was largely unable to break through that barrier because there existed no counter-balancing threat to the American public, such as conscription and American combat deaths had been.

Finally, a sense of epistemological privilege which was common among Movement groups made it difficult for them to foresee events which their interpretations of events did not predict (e.g., the Sandinista electoral loss). The maintenance of solidarity within groups worked against skepticism about information that came through movement channels. Although pedagogical techniques for encouraging healthy dissensus were widely known among professors of Rhetoric and Composition at the time, these did not make their way into Movement practice.

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ISSA Proceedings 1998 – Methods For Evaluating Legal Argumentation

1. Introduction: Description and evaluation of legal argumentation

Descriptive studies of legal argumentation attempt to recognize and classify specific patterns, categories or topics of arguments in different contexts and to relate their occurrence to the different contexts. The aim of descriptive methods is to generate a morphologically true picture of the argumentation as evidenced by means of methodological criteria, or to "reconstruct" argumentation by means of such methodological tools (Schroth 1980: 122/123).

Methods of critical evaluation, on the other hand, attempt to assess the quality of argumentation, i.e. to generate a judgement based on the compliance of that argumentation with standards of a given kind, such as standards for rational discussion, logical, linguistic, scientific or other (cf. Feteris1995: 42). It is the aim of the present paper to discuss some of the numerous standards proposed for

evaluating legal argumentation. The only common starting point for such an investigation consists in the fact that the standards to be investigated should be perceived as such by the audience of the legal argumentation.

With regard to their data basis evaluation of argumentation can be staged either on individual patterns of argumentation found in a specific legal text, or on the argumentative "style" in a sample accumulated from an appropriate number of individual patterns of argumentation selected by adequate sampling techniques, e.g. a sample of texts of a specific court, time period, or legal specialty (Dolder/Buser 1989: 382/383, Dolder 1991: 126, 128). Investigations staged on accumulated samples offer the advantage that the parameters observed can be evaluated by quantitative methods.

2. Materials and methods
Empirical investigations have been staged on the published text of "decisions" (Urteilsbegründungen) of the Federal Court of Switzerland and some lower Swiss courts in the field of civil and commercial law. These legal texts represent the justification of the ruling of the court and are the final, most formal and solemn stage of the argumentation process taking place in judicial proceedings. As such they are supposed to take into account all arguments raised by the parties in the course of the procedure, insofar as they are held relevant by the court. These justifications are submitted to an audience consisting not only of the parties to the procedure, but, at least if the decisions are published, also of other courts and the professional legal community. On the basis of these properties they offer an interesting material for argumentation studies (Perelman 1979: 209 with reference to T. Sauvel). Our investigation focussed on the second and third stage of the justification process: the second stage consisting of the discussion of the legal basis applied in the case and the third stage containing the reasoning why a specific legal sanction has been imposed on a participant of the litigation (cf. Feteris 1995: 48). We were not interested in the reasoning used to establish the factual basis of the specific case, e.g. the problems raised with the different kinds of evidence and the conclusions drawn from specific kinds of evidence.

The sample evaluated by quantitative methods (below 5.2 and 6.1) consisted of 68 patterns of argumentation from Urteilsbegründungen of the Federal Court in the field of the law of contracts, law of tort and company law 1971 to 1980 containing in total 188 individual arguments, which were classified in 13 classes. The sample used for calculating the ratio of negative references (below 6.3) contained a total of 1611 references collected from Urteilsbegründungen of the Federal Court from

the same legal specialties and the same time period (Dolder/Buser 1989: 382/383). The methods of classification used for quantitative evaluation have been slightly adapted from the Münchner Projekt Rechtsprechungsänderungen (Schroth 1980: 122/123).

3. Empirical and non-empirical propositions

If staged on individual patterns of legal argumentation evaluation has to take into account that legal argumentation consists of empirical and non-empirical propositions. In the context of legal argumentation, the latter are mainly normative and can be either statutory rules or non-statutory rules commonly known as "canones" of interpretation (Alexy 1983: 283/4, 288). Different methods have to be used to evaluate the quality of these two different classes of propositions. As an example, the widely described *argumentum ad absurdum* frequently used in legal argumentation consists of the
following three propositions:

(1) $O\neg\ Z$	or, alternatively:	(1) OZ
(2) $R' \rightarrow Z$		(2) $R' \rightarrow \neg Z$
(3) $\neg R'$		(3) $\neg R'$

The premise (1) OZ ("state Z shall be avoided", or: "state Z is desired") is normative, while the premise (2) R2 $\tilde{O}$ ¬Z ("interpretation R2 leads to state Z", or: "interpretation R' prevents state Z") is empirical, and the conclusion: (3) ¬R2 ("interpretation R2 shall be avoided") is again normative. Analysis of the argumentation of an example taken from an Urteilsbegründung of the Swiss Federal Court (Federal Court 1995: 255) shows the following logical steps: In the determination of the amount due for compensation of *tort moral* the cost of living of the plaintiff at his foreign residence has to be neglected. The amount has to be determined according to the law of the location of the Court not taking into account where the plaintiff lives and what he intends to do with the money.
The opposite opinion would have the consequence that a reduction of the amount would have to be examined not only in case of a foreign residence, but also in case of a domestic residence with lower cost of living. It would be difficult to rule ("nachvollziehbar") that the amount of the compensation for tort moral should vary depending on whether the plaintiff lives in a great city, or in a rural region with lower cost of living. The opposite opinion … would also have the consequence that a plaintiff with foreign residence could claim more, if he was living in a foreign capital with higher living costs than Switzerland.

The opposite opinion … would also limit the freedom of the plaintiff to choose his place of residence. Thus the plaintiffs [in the instant case] could live again in Switzerland [recte: in Kosovo] only if they were prepared to lose half of their compensation fee. (translated from German)

Table 1 Frequency distribution of classes/topics or argumentation (Lorenz curves)

classes/topics	frequencies calculated cumulated (%)	frequencies found		
		n	%	cumulated (%)
B non-statutory rules	7.69	61	32.44	
Z logical canons	15.38	23	12.23	44.67
F consequences	23.07	15	7.98	52.65
A another statutory rules	30.76	14	7.44	60.09
W clear wording of the statute	38.45	13	6.91	67.00
T purposive function of rule	46.14	12	6.38	73.38
I balancing of interest	53.83	12	6.38	79.76
G fair justice	61.50	8	4.26	84.02
R reproducibility	69.21	8	4.26	88.28
Pr practicability of statute	76.90	8	4.26	92.54
S protection of rights	84.59	8	4.26	96.80
P principles: constitutional	92.28	4	2.13	98.93
X change of time	99.97	2	1.06	99.99
Total		188	100.00	

The sample was described in Dolder/Hauser 1989:382/383. The classes of arguments have been adapted from the Münchener Projekt Rechtsprechungsänderungen (Schroth 1980: 122/123). Explanation of different classes of arguments:
A (another statutory rules) refers to another statutory contexts; B (non-statutory rules) contain preliminary legislative material (Gesetzesmaterialien); foreign statutory rules, and opinions of legal doctrines; Z (logical canons) refers to analogy, a fortiori, subsumption, in maiore minus, classification (class/subclass) etc.; G (fair justice) refers to the equitable exchange of goods in the law of contracts etc.; P (principles) refers to constitutional rights; X (change of time) argues that times and therefore values have changed.

Table 1: Frequency distribution of classes/topics or argumentation (Lorenz curves)

(1) OZ
Application of the law should not be too difficult/ should be practical.
Individuals should not be hindered to choose their place of residence.
Normative

(2) R2, Õ ¬Z
Interpretation R2 causes practical difficulties in the application of the law.
Interpretation R2 limits the freedom of individuals to choose their place of residence.
Empirical

(3) ¬R2
Interpretation R2 is to be rejected.
Normative

4. Evaluation of empirical propositions: Correspondence and reproducibility
The quality of empirical propositions can be evaluated on the basis of correspondence criteria: An empirical proposition is correct (or: true), if and to the extent that the facts referred to in the proposition *correspond* with the real facts. This correspondence has to be established through a process of verification / falsification, which can be reduced in the present context to answering the

question, whether the facts referred to in the proposition are *reproducible*. As a general rule, verification/ falsification of empirical statements is performed by empirical methods; empirical propositions in legal argumentation can usually be verified/falsified on the basis of "everyday knowledge" (Alexy 1983: 284: "Maximen vernünftigen Vermutens"). Only in extraordinary situations verification has to be performed on the basis of expert (economic, sociological, scientific, engineering etc) knowledge; if no such expert knowledge exists, or if expert knowledge is controversial, recourse has to be made to experimentation The consequences Z or ¬Z can be of a general nature or can be limited to the specific case. They may have been realized in the past, or would be realized in the future, if interpretation R' would be applied. This reasoning on hypothetical facts is frequently used in legal argumentation. It represents a hypothetical forecast of empirical facts and causal links between them and is based on probability statements and estimations, which are less reliable than empirical statements of facts of the past.

In our example of an argumentum ad absurdum, the proposition (2) that interpretation R2, of rule R would lead, or not lead to practical consequences Z or ¬Z, is hypothetical and could be verified/falsified by investigating whether it "corresponds" with common experience or, as the case may be, expert knowledge. If the practicability (practical difficulties) of the application of statutory rules is the desired/avoided state Z, premise (2) R2Õ ¬Z is a forecast that fact A (interpretation R') will/will not lead in the future to fact B ("practical difficulties in the application of the statute"). This forecast seems to be at least questionable, since living costs are frequently taken into account in other legal contexts without causing excessive practical difficulties, e.g. in the law of taxation and social insurance. To predict "difficulties" in the application of the statute *pro futuro* seems to reflect a specific "insider" aversion against difficulties in the application of statutes and not objective difficulties.

Our example shows another deficit of empirical argumentation:
In forecasts of hypothetical causal links usually only one (or a few) consequences Zi of interpretation R2 are selected for argumentation, in our example two (practicability, freedom of residence). This selection should be defended by argumentation, unless it should be obvious that the selected consequence Z1 is the only one relevant in a given situation. In our example, it is well conceivable that interpretation R' will *inter alia* improve the protection of individual rights,

which would be an additional and relevant consequence Zi of interpretation R'.

Table 2 Negative references (rejecting literature opinions) in decisions of Swiss courts

5. Evaluation of non-empirical propositions

5.1 Coherence and saturation

In legal argumentation normative propositions are the most widespread and interesting class of non-empirical propositions. Their quality can be evaluated on the basis of their *coherence* with other normative propositions: A normative proposition is correct (or: true), if and to the extent that it is coherent (or: consistent / not in contradiction) with the sum of other normative propositions. Therefore, normative propositions used in legal argumentation should be defended or "saturated" by means of other normative propositions, unless there are specific reasons, why such saturation is not necessary or can be refused in the given case. In legal argumentation statutory rules usually do not need further saturation, unless their formal validity is questioned in a specific case. All other classes of normative propositions need further argumentative defense, as has been claimed for the "canones" of interpretation (rule J.6), and for the "special forms of legal argumentation" (rule J.18), of which the argumentum ad absurdum forms part (Alexy 1983: 239, 302, and 346). In particular, a specific interpretation R2 of a statutory rule R has to be saturated by means of a combination of the statutory rule R with other statutory or non-statutory rules.

In our example, the alternatives Zi of premise (1), i.e. "practicability of law", and "choice of residence not hindered by economic difficulties" have been introduced more or less implicitly in the argumentation. Neither of them has been defended by other propositions, although neither constitutes a statutory rule, or would seem uncontested for other reasons. The implied use of Zi as normative premise (1) therefore constitutes an infraction of Rule 6 of general argumentation (van Eemeren / Grootendorst 1992: 151-154, cf. Kienpointner 1996: 48): The normative

proposition "practicability" or "choice of residence not hindered" has been falsely promoted to the status of a common starting point and has thus been prevented from being questioned and from requiring an argumentative defense.

From an epistemological standpoint, the coherence approach reveals another deficit: There is no reason that there should be only *one* consistent system of normative propositions. The finding, therefore, that a normative proposition R2 (interpretation of R) is coherent/consistent with another set of normative propositions X does not *per se* exclude the alternative that it is in conflict/contradiction with another set of normative propositions Y (Rescher 1973: 370, 377). Therefore, in a given situation, there is usually competition between different propositions offering argumentative saturation for normative proposition R2. In the average situation, it can be anticipated, that at least some of these competitive propositions are in contradiction with others and that their selection influences the practical result of the argumentation. Therefore justification should be supplied, why in a given situation coherence or consistency of R' is based on normative proposition X, and *not* on competitive normative proposition Y offering a alternative basis for saturation.

Returning to our example: Why have "practicability of the statute", or "unhindered choice of residence" and not *other* premises been selected as a basis for proposition (3) ["Living costs at a foreign residence should be disregarded"] ? In other words: In the the proposition (1) OZ the choice of Zi "practicability" as a premise should be defended against other premises equally relevant on a *prima facie* basis, e.g. the argument of "fair justice", "fair compensation for tort", or "protection of individual rights". Using one of these alternative aspects would probably lead to the opposite result, namely to the practical ruling that the amount of the compensation fee for *tort moral* should be calculated on the basis of the living costs of the plaintiff at his residence.

5.2 Consensus

The normative proposition X or the system of propositions X, to which coherence is to be established in legal argumentation, can be either a rule of "reasonable thinking", a statutory rule, or a non-statutory rule. This approach is considerably broadened, if opinions of experts are admitted as reference standards This is usually the case, if the opinion has been commonly accepted by its audience and hence forms the "consensus" opinion of the legal community. A normative proposition is correct (or: true), insofar as it is coherent (or consistent) with the

consensus of the professional community. Correct (or: true) is, what is accepted by the experts (Ayer 1963: 293); legal reasoning is replaced by legal reasoning of others.

From an epistemological standpoint the difficulty of this pragmatic approach consists in that it is based on the empirical fact of "consensus", which implies that the evaluation of a non-empirical proposition depends on an empirical fact (Skirbekk 1992: 21). Moreover, the technical difficulties of using consensus as a reference standard are remarkable: In many situations, such a consensus does not exist with regard to a specific legal issue, or is difficult, or even impossible to determine since controversial opinions co-exist in the community. In addition, the "true" meaning of the "consensus" can be ambiguous and cause additional controversies.

5.2.1 Pragmatic standards 1

In view of the difficulties encountered with the discussed methods of evaluation recourse can be made to more pragmatic standards: A normative proposition (or: combination of empirical and normative propositions) is correct (or: true), if and to the extent that it "functions", which means in the case of legal argumentation: that it "persuades its audience". Correct (or: true) is what persuades. One type of a pragmatic standard could be found in the *relative argumentative force* of individual classes of arguments contained in the pattern of argumentation investigated. High persuasion can be expected, if elements of high argumentative force are gathered in a pattern of argumentation.

It has been attempted for a number of years to define methods for measuring the argumentative force of typical classes or topics of argumentation. An interesting attempt suggested to differentiate between Wettbewerbskriterien (competitive criteria) and Tabellenkriterien (ranking criteria). While Wettbewerbskriterien confront winning and losing classes of arguments in a given argumentational situation, the argumentative force of all classes or topics under investigation are ranked simultaneously in a Tabellenkriterium (Eicke von Savigny 1976: 62 and 79, Grewendorf 1978: 29, 32 – 39).

While it is technically difficult to find sufficient empirical data for the study of Wettbewerbskriterien (Grewendorf 1978: 32, Schroth 1980: 124), it is conceivable to create a suitable Tabellenkriterium for the purposes of legal argumentation by relating the argumentative force of individual classes or topics to their relative frequencies of occurrence in a selected sample of argumentation: It would seem a sound assumption that some classes of arguments occur more frequently than

others, *because* they are perceived to dispose of higher persuasive force than the classes used less frequently. This is emphasized by the fact that there are no legally binding statutory rules governing the use and selection of individual classes of arguments.

It should be emphasized, however, that such relative frequency counts do not supply absolute figures, since definition and "size" of the different classes or topics applied are at least to some extent arbitrary. This can be partly overcome, if different research groups base their investigations on the same operational set of classes, like e.g. the set of classes used in the Münchener Projekt Rechtsprechungsänderungen (Schroth 1980: 122/3). At any rate, the figures obtained through relative frequency counts can be used for comparative studies, i.e. for comparison of different sources of argumentation (countries, courts etc.), different time periods, or different specialties of law under investigation.

In our sample of Urteilsbegründungen of the Federal Court in civil and commercial law of 1971 to 1980 the argumentum ad absurdum was found to rank third highest in frequency and to account for nearly 8 % of the individual classes used in argumentation (table 1). This is the more remarkable, since the highest ranking class (B) contains "non-statutory rules", mainly the so-called travaux préparatoires, which should already on the basis of their semi-official status dispose of high persuasion. On the other hand, the argumentum ranks higher than class (A) containing "other statutory rules" and representing the widely accepted "systematic" method of interpretation. The argumentum can therefore be said to be one of the highly successful classes of arguments found in the context of our investigation. This finding would be in keeping with the almost enthusiastic praise of the persuasive qualities of this class of argumentation by Perelmann and Olbrechts-Tyteca (1976: 278):

Dire d'un auteur que ses opinions sont inadmissibles, parce que les
conséquences en seraient ridicules, est une des plus fortes objections
que l'on puisse présenter dans l'argumentation.

It is not excluded that classes of arguments of established questionable quality as judged by one of the criteria outlined above can still be highly persuasive on a pragmatic basis, and therefore achieve high frequency counts. As an example, the argumentum ad absurdum, as it is commonly used in legal argumentation, is of questionable quality because of its chronic deficit of argumentative saturation and still achieves high rank in terms of pragmatic standards.

5.2.2 Pragmatic standards 2

One step further in the pragmatic evaluation of the quality of legal argumentation can be made by measuring its "over-all" and unstructured persuasiveness. Such "over-all" persuasion of a specific audience can be established through appropriate experimentation taking into account that the audience in legal argumentation consists not only of legal experts, lower courts, etc., but also of the parties to the litigation and of a variety of interested laypeople, such as trade union officials in labor law, bankers and their customers in commercial law, taxpayers in taxation. The experimental audience has therefore to be carefully chosen for each occasion. It is suggested to use the following experimental procedure: An alternative argumentation [if possible: opposite] to the argumentation of the court is drafted artificially and the two patterns of argumentation are submitted to the simnultaneous preferential choice of an audience selected for the occasion (e.g. trained lawyers, students, laypeople). If the argumentation of the lower court is known, it can be used as the competitive experimental argumentation in this experimental setting instead of an artificially drafted alternative. If the two patterns of argumentation are submitted to the audience without indications of the practical result of the litigation, a fair experimental setting is offered, since both argumentations have the same persuasive task in the same specific situation and have equal opportunities of being chosen by the audience, unless the issue at stake were of an obvious or trivial nature. Already the fact that a controversy has reached the Federal Court implies that obviousness is excluded, and that a lower court has already ruled in the case.

Preliminary experiments were staged on an *argumentum a simili* (analogy) of the Federal Court on the issue of analogous application of article 691 of the Swiss Civil Code of 1907/12:
Every owner of real property shall be obliged to allow the transfer of fountains, draining pipes, gas tubes and the like, as well as of electrical connection lines above or under the surface of the soil against previous full compensation of the damage caused thereby, insofar as the transfer cannot be achieved without using the property or only at disproportional cost.

The question the court had to answer was: Should article 691 be extended to cable cars (rope railways, téléfériques) ? In other words: Are cable cars and water pipes similar or not similar in the given context ? Should the *arg. a simili* or the

arg. a contrario be applied ? The court held:

It is quite different with cable cars which should enable a permanent traffic of persons and goods. What disturbs the owner of the ground in this case is not primarily the equipment as such, but its activity, i.e. the transfer of transport cabins in both directions suspended on the steel rope.

Consequently, the Court held that difference overweighed similarity and therefore the arg. a contrario applied (Federal Court 1945: 84). The "artificial" opposite argumentation suggesting similarity of the two means of transportation ran as follows:

The pipes mentioned in the statute as well as cable cars are equally characterized by the fact, that the owner of the ground has to tolerate not only a permanent installation, but also its service including periodical maintenance and repair causing invariably noisy construction work. What disturbs the owner of the ground in case of water pipes and cable cars equally, is not only the installation as such, but its activity.

The two opinions were submitted to a panel of students of economics (N = 24) for simultaneous selection, and 75 % of the participants found the argumentation of the Federal Court more persuasive than the "artificial" argumentation suggesting functional analogy of cable cars and water pipes. It is surprising that the Federal Court scored only a low .75 persuasion ratio, even against a hastily drafted artificial argumentation.

6. Evaluation of accumulated samples of argumentation

Although evaluation of legal argumentation focusses almost by definition and nature on individual patterns of reasoning, investigations staged on accumulated samples consisting of a large number of individual patterns of argumentation selected by appropriate sampling techniques can supply interesting information. Accumulated samples can *inter alia* be evaluated on the basis of a formal reconstruction ("coding") by means of a number of individual classes of argumentation ("topics"). In our investigations we used 13 classes indicated in Table 1, which were slightly adapted from the Münchener Projekt Rechtsprechungsänderungen (Schroth 1980: 122/123).

6.1 Diversity of argumentation

Diversity of the classes of arguments used in a large sample may be regarded as an indicator of over-all-quality of argumentation. It would seem preferable to

achieve a homogeneous distribution of the over-all argumentation into different classes of argumentation instead of concentrating argumentation on a few stereotypic classes with high frequencies. The distribution of the argumentation among different classes was determined in our sample (above 5.2) by the usual statistical methods and the double cumulated Lorenz curves shown in table 1 offer an immediate indication of the diversity of the argumentation. A sound indication of diversity would be the frequency achieved by 50 % of the classes: In our investigation, the seven classes (53.83 %) scoring highest in frequency counts accounted for 79.76% of the over-all argumentation. It should be emphasized again that such distribution studies do not produce absolute figures, since the definition and the "size" of the different classes or topics applied are to some extent arbitrary. However, the figures obtained can be compared with figures of different sources of argumentation (countries, courts etc.), time periods, or specialties of law.

6.2 Discursiveness of argumentation

A well reasoned Urteilsbegründung should take into account all controversial standpoints of the parties and of legal doctrine on a given legal issue, at least insofar as they are held to be relevant in the case by the court (Perelmann 1979: 212 with reference to T. Sauvel). It has been criticized therefore that some German courts are consistently argumenting on the basis of the principle of *consonant argumentation*: Only propositions supporting the decision of the court are mentioned, propositions rejecting the decision or supporting alternative decisions are systematically eliminated, although they might have been discussed by the judges in the making of the decision (Lautmann 1973 : 162-166). It seems to be a sound assumption, therefore, that the amount of controversial propositions found in argumentation, the *discursiveness* of argumentation varies depending on the court, the time period, or the legal system it comes from. Discursiveness can be assessed – at least in the continental law system containing references (citations) to legal doctrine – by determining the proportion of negative references, i.e. the ratio of references in favour and against the doctrinal opinion they refer to. It seems to be a sound approach to extrapolate from the critical attitude of argumentation with regard to references to the general discursiveness of argumentation in a specific context.

It was found that in published decisions of Swiss courts the percentage of negative references (rejecting doctrinal opinions) does in the long term not exceed 7.5 % of the total amount of references (table 2). It is an interesting

feature that lower courts are found to be significantly less discursive than the argumentation of the Federal Court and that lower courts of urban regions such as Zurich and Basel with their universities and law faculties are found to be more discursive in their argumentation than lower courts of rural regions without universities, such as the Valais or the Grisons. It would seem, therefore, that in these rural regions, legal doctrine apparently enjoys higher authority than in the urban regions or with the Federal Court. Legal periodicals achieve a discursiveness ratio similar to that of the Federal Court, while publications in periodicals of science (different specialties of physics) command a significantly higher discursiveness ratio than legal argumentation. In one sample obtained from periodicals of theoretical physics this ratio (13.58 %) of discursiveness of scientific argumentation attained almost twice the value of the argumentation of the Federal Court (7.57 %).

7. Conclusions

Legal argumentation combines empirical and non-empirical, mainly normative propositions and different methods have to be used to evaluate the quality of these two classes. Empirical propositions are tested on the basis of their correspondence with real facts, while normative propositions are evaluated on the basis of their coherence with other normative propositions. In view of the practical difficulties encountered with these methods evaluation can be completed by pragmatic methods, such as measuring empirically based argumentative forces of typical classes of arguments, or experimental assessment of the "over-all" unstructured persuasion of patterns of argumentation. As an alternative to evaluation of individual patterns accumulated samples of argumentation can be assessed by quantitative methods measuring e.g. the diversity or discursive properties of argumentation in a specific context.

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ISSA Proceedings 1998 – Towards A Proposition Of The Argumentative Square

1. Introduction

In his semantic description of language, Ducrot puts forward a rather provocative thesis, with respect to traditional semantic theory, namely, that words do not mean anything if meaning is understood in terms of vocabulary, by which he defies the primacy of the informative in the account of meaning. The informative is said to be derived from and subordinated to the argumentative, which is, in turn, presented as inscribed in language and defined in terms of argumentative orientation, topoi and enunciators (viewpoints). The notion of lexical enunciator unfolds the argumentative potential in a word (lexeme), i.e., points of view formulated according to four basic topical forms. It is tempting to imagine the four topical forms as a taxonomy of viewpoints and present them in a square model.

The square model has already been used in logic and narrative semiology, and there were attempts to see Ducrot's work related to and even explicable by them, especially, since the names of some relations (e.g. contradiction and contrariety) repeat in some or all of the theoretical frameworks. Ducrot has explicitly drawn a line of separation between, on the one hand, the semiotic square and the logical square, and, on the other hand, his own theoretical path**[i]**. On a closer inspection – which is impossible to be deployed here due to the limitations of time and space – one could indeed realize there is no direct theoretical import between them. The logical and semiotic squares differ from the one that could be reconstructed from Ducrot's work to a great extent in their fundamental elements, function and nature, definitions of relations and treatment of meaning and truth.

As the four-angled form itself has nothing to do with the incompatibilities between Aristotle, Greimas and Ducrot, it is possible to attempt and arrange the four topical forms in a square model. However, the structural relations in – what let it

for the purpose of this paper be called the argumentative square – must, accordingly, be defined and understood differently than in the logical or semiotic squares.

2. Ducrot – Theory of argumentation in the language-system – TAL

The general thesis of TAL is that "the argumentative function of a discourse segment is at least partly determined by its linguistic structure, and irrespective of the information which that segment conveys about the outer world" (Ducrot 1996: 104). Let me summarize Ducrot's explanation of the main concepts introduced by the general thesis of TAL on a single example. Suppose two people are considering how to get back to their hotel:

1.

A: "Would you like us to walk?"

B*: "*It's *far away."*

An *argumentative function* is actually an *argumentative orientation* of an enunciator's viewpoint, which means that a certain viewpoint is "represented as being able to justify a certain conclusion, or make that conclusion acceptable." (Ducrot 1996: 104) In the example provided, the answer would by most of us be understood as oriented towards a refusal of the suggestion. Representing a certain distance by terms 'far away' functions as an argument for not walking. A special stress is put on the expression represented as being able to justify instead of simply saying it justifies a certain conclusion. It means that it is not a question of what cause or factor leads effectively to a certain conclusion, but rather what argument is represented as having such a strength within a particular discourse.

It is important, though, that our answer does not convey information about the (f)actual distance. The term 'far' can be used fairly irrespective of the actual quantity of metres/kilometres, and is, therefore, not a description of reality. I am fairly sure there is no consensus over how much is 'near' and from which point on a distance is considered to be 'far'. Instead, the term rather conveys our attitude towards a distance and our company. Namely, if, for example, B would favour a walk with A, he/she would probably find the same distance less bothering and, in a certain sense, even too short, and might accordingly answer:

1.

(A: "Would you like us to walk?")

B: "Of course, it's *nearby*,"

which would, in turn, be oriented towards accepting the proposal. We can see that an argumentative function is dependent on the choice of words we used, which led Ducrot to conclude that an argumentative function is at least partly determined by the linguistic structure. Basically this thesis is understood in terms of enunciators, whose argumentatively oriented viewpoints are said to be intrinsic to the very language system. By different enunciators**[ii]**, found within a single utterance, Ducrot understands the sources of different points of view, or better, viewpoints with different argumentative orientation. Ducrot uses the term borrowed from Aristotle and refers to the viewpoints of nunciators as topoi. Topos is the element of an argumentative string that bridges the gap from an argument to a conclusion by relating the properties of the former and the latter. It is a shared belief, common knowledge accepted beforehand by a certain community and rarely doubted about. We can analyse the following argumentative string:

2.

"It is far, so let's take a cab"

into an argument A: "It is far"

a conclusion C: "let's take a cab"

and topos T: If the distance is great, one should take a means of transport.

Within this paper I would like to concentrate on the concept of lexical enunciator. Lexical enunciator stands for the idea that argumentatively oriented viewpoints are a constitutive part of lexicon items – words. The explanation of lexical enunciators requires a few more theoretical concepts. Topos has three characteristics: it is general, common and scalar. Scalarity of a topos is understood as the scalarity of the relationship between the property of an argument and the property of a conclusion. The properties themselves are scalar – they are properties you can have more or less of. The degree of one property implies the degree of the other. The four possible combinations of degrees of involved properties are called topical forms. Referring to our last example (2), the following topical form was used:

FT: The greater the distance, the more one should rely on a means of transport.

Let me now demonstrate in detail how it is possible to analytically reconstruct topical forms as constitutive parts of lexemes. Ducrot considers the following four adjectives that seem to have common informative content: 'courageous', 'timorous', 'prudent', and 'rash'. In principle they all relate to confronting danger, to the fact of taking risks, but differ to a great extent in argumentative sense (see Scheme 1). Regarding the two properties P (taking risks) and Q (quality) that

support the argument and the conclusion, we can distinguish two contrary topoi: T1, which relates the notion of risk to the notion of goodness, and T2, which relates the notion of risk to the notion of badness. Each contrary topos can, according to the notion of scalarity, be understood in terms of a scale with two converse topical forms (FT1' – FT1'' and FT2' – FT2'') standing for the converse argumentative orientations. Thus we get the following scheme:

Scheme 1

The four topical forms can be formed as follows:

T1: taking risks (P) is a good thing (Q)

FT1': the more one takes risks, the worthier one is (+P,+Q)

FT1'': the less one takes risks, the less worthy one is (-P,-Q)

T2: taking risks (P) is a bad thing (Q)

FT2': the more one takes risks, the less worthy one is (+P, -Q)

FT2'': the less one takes risks, the worthier one is (-P,+Q)

The converse topical forms are the two directions of the same topical scale composed of many degrees. A point of conversion presents a problem, namely, a person either performs or does not perform an act. That is why the line in the model presenting the converse relation is disconnected.

We can now see how the scheme explains the points argued by Ducrot.

The meaning of lexical enunciators can be analytically translated into topical forms that have different argumentative orientation. Lexical enunciators are units of the lexicon and topical forms are understood as constitutive of their intrinsic meaning (which is primarily argumentative). This is one of the arguments, according to Ducrot, for his thesis that argumentative orientation is inscribed into the very language-system.

Although it seems to be analytically possible to distinguish the objective objective (informative) content from the subjective (argumentative) orientation, Ducrot tries to prove that they are actually amalgamated, and that the common objective component observed in the two contrary topoi is merely illusory. The smallest denoted component is already seen from opposing points of view that build up into two different notions – in Ducrot's example one perspective deals with risks that are worth taking (P1), while the other, in fact, considers the risks as unreasonable to be taken (P2). By this Ducrot proves that tempting as it might be to consider that the argumentative is merely added on top of the informative, the two are actually amalgamated to the extent that what is perceived as the

informative is derived from and dependent on the argumentative (P1 and P2 instead of P). In the case of lexical enunciators the viewpoint contained in a lexical unit contains the idea of quality**[iii]**, namely, conclusion seems to be a judgement, an attribution of value to what is observed. It seems, therefore, that by communicating we, contrary to our belief, do not so much convey the information of what happened, but at the same time place a much greater stress on our attitude towards the occurrence and persons involved.

In accordance with his already mentioned belief that viewpoints are represented as being able to justify a certain conclusion, Ducrot claims that we choose (not necessarily consciously or strategically) the appropriate lexical item (that is, item with appropriate argumentative orientation) with respect to the attitude we adopt towards the person spoken to**[iv]** or our discursive intentions**[v]** to create our version of what is happening.

3. *A proposition of the argumentative square*

A proposition of the argumentative square is derived from Ducrot's oppositions between topical forms. As the analysis of lexical enunciators showed, an important factor in the definition of relations is also the quality attributed to an entity, which reflects our attitude towards an entity and/or our communicative intentions. The terms that will be used in the explanation of the following scheme are taken from articles reporting on a particular football match. It is my belief that the distribution of terms into their relational slots of the square model is highly dependent on an actual discourse, therefore, let me first give an outline of the context within which articles were written and published. On 2nd April, 1997, national football teams of Slovenia and Croatia met in the qualifications for the World Cup in France, 1998. Before the match the Croatian team was, by both sides, considered to be the favourite. Still, they were under pressure, because they badly needed to win and score three points to get qualified. The score was a draw – 3:3, which is important to remember and compare to interpretations it underwent in reports. A draw meant that each of the teams got one point. For the Slovenian team this was the first point ever scored in the qualifications for the world championship. A draw for them was a success, although this point was not enough for them to participate in the World Cup. For the Croatian team, on the other hand, there was still a chance to get qualified, but their next opponent was expected to be much tougher and this chance seemed rather meagre. The terms used in the example were collected from several articles published in the Slovenian as well as Croatian newspapers.

The argumentative square comparing definitions of the result could be formed in the following way (the reconstructed topical forms are included in the explanations of the respective relations):

Scheme 2

Contrariety is primarily the relation between topoi, that is, between two contrary perspectives and evaluations of seemingly the same occurrence (P). However, the occurrence is far from being the same. The first topos presupposes the match to be a true reflection of skills (P1), and the second, on the contrary, presupposes the match not to be indicative of the real quality of the teams (P2). The reporters seem to be reporting on two distinct matches – P1 and P2 – and, accordingly, applying two contrary topoi:

T1: Success (in P1) is to be attribsuted a positive value.
T2: Success (in P2) is to be attributed a negative value.

Although reporters are all referring to the same match, the readership is actually offered two contrary accounts that, at the level of social signification, construct two different pictures and form opposing attitudes. That is why definitions can be very important, especially, when they serve as a basis for decision-making and entail social or political (re)actions**[vi]**.

Conversity is the relation between the two opposing topical forms of the same topos. They both agree in seeing the occurrence in the same way, for example, they both deny that the match was a true reflection of skills (P2) and consequently apply topos T2. According to whether the result in such a match was considered a success or a failure, they differ in evaluation of the teams:

FT2': The more you succeed (in P2), the less appreciation you get.
FT2'': The less you succeed (in P2), the more appreciation you get.

Calling their performance a 'stroke of luck' (FT2') attributes the team, which is represented as being successful, a negative value. I believe you would agree that a 'stroke of luck' implies that their success is to be attributed to good fortune or even an inexplicable coincidence, and not to their skills and capabilities. Conversely, calling their performance 'bad luck' (FT2'') attributes the team, which is represented as being unsuccessful, a positive value. Again, I believe you would agree that 'bad luck' implies that something beyond their qualities prevented their otherwise good skills from realizing their potential.

The two crossing relations (FT1' – FT2' and FT1'' – FT2'') deserve most of our

attention. It seems they would well conform to the name of joking relations. The name is taken from Mauss (Mauss 1928) and Radcliffe-Brown's (Radcliffe-Brown 1940, 1949) texts, where they, from the anthropological point of view, examine the ways in which people within a society (they mainly focused on families) take effort to avoid conflict and thereby maintain social order. Social structure and especially structural changes, conjunction and disjunction, as in the case of marriage that draws closer two social groups that were up to then clearly distinguished, set the members of those groups into positions where there is an increased possibility of interest clash. Chances of conflict between the newly related members can be avoided in two ways: by exaggerated politeness (between son in law and mother in law) or joking (between brothers and sisters in law). Joking is understood as an avoidance of conflict and not the cause of it – the proof for that is found in Radcliffe-Brown's substitute term permitted disrespect. It refers to the conventionalized uses of disrespect, or better, disrespect found between those members of a family, where it does not endanger communication, but is moreover a sign of social intimacy, directness and relaxed attitude. Within a social group or society, it can be quite rigidly set which of the two forms is appropriate between which members. But their precise distribution is not universal to all societies. What seems to be universal, though, is the presence of both ways of avoiding conflict and the balance of their distribution.

By introducing joking relations Radcliffe-Brown and Mauss established an important link between social structure and social interaction, which is a combination that is today becoming increasingly important in the research of the interactional basis of social life. Joking relations therefore prove to be a very important principle also for the research into contemporary societies, where family might not be recognized as the most important social group any more. The following quotations should testify to the topicality of this view today. Gumperz in his foreword to Brown and Levinson's book (Politeness 1978) describes politeness to be "basic to the production of social order, and a precondition of human co-operation, so that any theory which provides an understanding of this phenomenon at the same time goes to the foundations of human social life." (Foreword: XIII) Later on in the book the authors wrote: "We believe that patterns of message construction, or 'ways of putting things', or simply language usage, are part of the very stuff that social relationships are made of (or, as some would prefer, crucial parts of the expressions of social relations). Discovering the principles of language usage may be largely coincident with discovering the

principles out of which social relationships, in their unteractional aspect, are constructed: dimensions by which individuals manage to relate to others in particular ways, " (Brown, Levinson 1978: 55)

Reconsiderations of Mauss and Radcliff-Brown's theories today necessarily include many concepts from contemporary anthropology, sociology and interactional studies that were not used by them. I would herewith again refer to Brown and Levinson's study of politeness, where they enumerate the following context dependent social factors that contribute to the overall weight of a potentially offensive act and through its estimation influence the choice of higher-ordered politeness strategy: social distance[vii], power[viii] and ranking of imposition[ix]. Within this paper provisional and most simplified correlation will be adopted only to indicate a basic model against which variations in use can be observed and studied – respectful patterns of behaviour are typically (but not only!) found in situations of social distance, power difference and high rank of imposition, while joking might be most commonly (and with least risk of causing conflict) applied in relations of social intimacy, equality in power and low rank of imposition.

Joking relation could, in accordance with Ducrot's four topical forms, be defined as the relation between those two topical forms of the contrary topoi that take up different attitudes towards the subject involved. One point of view ascribes the subject a positive value, while the other presents him in a negative manner. What connects them is, extralinguistically, the performance (or lack of performance) of seemingly the same action. However, as explained,the representation of the action involved is, intralinguistically, not the same.

For example, joking relation is the relation between 'victory' (FT1') and 'a stroke of luck' (FT2') that can in our case be reconstructed as follows:
FT1': The more you succeed (in P1), the more appreciation you get.
FT2': The more you succeed (in P2), the less appreciation you get.

By 'victory' one approves of the result, even if one does not like it, since it presupposes the match to be a true reflection of skills, while by a 'stroke of luck' one reveals that one considers the result inadmissible, since the term presupposes the match not to be indicative of the real quality of the teams, and actually implies that the result should be different if the skills were the decisive factor. Either ways, though, one team is represented as being more successful

than the other, although the result was, technically speaking, a draw! The argumentative potential might be so much more obvious in the following examples. The reporter supporting the home team, which was represented as more successful, actually talked of 'a historical victory', 'sensational draw' and 'lethal stroke', while the reporter supporting the less successful team confirmed his definition of the result – 'a stroke of luck' – by calling the more successful team 'second-class players'.

One point of view pays respect to the subject of the action, and even upgrades its qualities, which is typical of a politeness strategy, the other can be considered joking, or rude, since it downplays the exhibited value of the subject and the action it performed. The choice of either of them is dependent on the relation between the two interactants in our case reporter towards the team (or even worse, the state the team represents) and/or reporter's intentions. With Radcliff-Brown and Mauss joking should be understood as permitted disrespect. But since communication break-down is a constitutive part of interaction, the concept of rudeness and offence should nevertheless not be neglected. The argumentative square should include both interactional functions for the purpose of explaining why and where communication went wrong.

The orientation followed throughout this explanation of the argumentative square can be summarized as follows: what we say is as important as its wording – the actual choice of words, and the word-choice is influenced by the identification of the relation between the speakers. We can, therefore, conclude that what we communicate is to a high degree dependent on who we are communicating with. This is similar to Ducrot's statement, in which he claims that we choose lexical units with regard to our attitude towards the person spoken to and our discursive intentions – that argumentative orientation determines the informative.

Let us take another example. A student comes out of an examination room and is asked by his fellow students how demanding the lecturer was. The student might call the lecturer 'detailed' or 'hairsplitting', depending on whether he/she wants to attribute him/her positive or negative value, and whether he/she considers the lecturer's comments appropriate or inappropriate. The argumentative square and the respective topical forms could be formed like this:
Scheme 3
T1: Accuracy is respected.
FT1': The more one is accurate, the more one is respected.

FT1'':.The less one is accurate, the less one is respected.
T2: Accuracy is not respected.
FT2'': The less one is accurate, the more one is respected.
FT2': The more one is accurate, the less one is respected.

'Detailed' attributes the lecturer a positive value, since it presupposes that such strictness is reasonable and as such respected. Calling a lecturer 'hairsplitting', on the other hand, presents him/her in a negative manner, since it presupposes that the strictness involved is unnecessary or even ill-intentional. Since we all were students once, we probably all remember that such definitions of lecturers are highly subjective, depending on our own likeness of a lecturer and/or especially the grade we received.

By calling a person 'hairsplitting', we might run a risk of a conflict. The most impressing thing is that we can, and I think we actually do mostly (although not necessarily strategically or consciously), change our opinion of the action and person (fake or even lie) for the purpose of keeping our relation towards the person concerned. It seems that we somehow tend to perceive the actions of some people as worth of appreciation and tend to express a higher view of their action sometimes solely for the purpose of maintaining our relation. Let us suppose a third party was present at the exam, a young assistant. After the student has left the room, the lecturer might inquire about his/her own methods, asking his/her assistant whether he/she was not too demanding. The assistant's answer:

3. "You were quite detailed, true, but that's what an examination is all about," might be understood in terms of presenting the senior as reasonable in order to maintain hierarchical relation, especially, if to his/her friends the same assistant would talk of his mentor as 'hairsplitting'. Yet, maintaining a relation might not always be one's intention.

We must now briefly focus on the nature of the correlation between interactional and social patterns. Although social relations and, accordingly, expected interactional patterns seem fairly rigidly imposed upon us, this is only one aspect of the relation between social order and people living it, where interactional patterns can be understood as reproducing the established social relations. This is the so called conservative or passive aspect. The other is dynamic. Here the adoption of a certain interactional pattern contributes to the creation or establishment of a certain relation between interactants – it functions as a proposal of a certain relation that can be accepted or rejected. Even towards our

closest friends we can take on both kinds of attitude – respectful and joking.

Let us imagine a person A tells a person B some confidential information. Person B reveals this information to his/her partner – person C. When A finds out, he/she just might accuse B of 'babbling out' the secret. This definition presupposes that secrets need to be kept secret, and since B revealed it to another person, he is attributed a negative value, namely, is considered to be unreliable. C, on the other hand, wants to protect his partner saying B was 'frank'. This is a characteristic that is respected and what it implies is that such a person does not hide anything, but is always straightforward, open and honest. Person C, therefore, in spite of the same social rank, expresses respect towards B. Does not thereby C actually stress B's exceptionality and raise him from the average? Does not C establish a distance between B and all the others, and empower B in that respect?

Equally, one can adopt a joking relation with one's boss, for example, by saying something like:
4. "Haven't you *babbled* it *out* the other day?"

If one's boss accepts it, which means, he/she does not get insulted nor does he take any revengeful actions, does not they actually set the common grounds? In principle the provisional correlation still holds. What changes is that the new social relation gets constructed, although only temporarily. With Brown and Levinson this tendency is called reranking of social variables. Situation is an important factor in this respect. As in our previous example of young assistant, one might adopt a polite attitude towards one's boss when he/she is present, or in the presence of his/her colleagues, while report in a joking manner about the same occurrence when reporting it to the people of one's own rank.

4. Conclusion
Let me briefly sum up what has been said about the argumentative square. The four topical forms stand for four argumentatively oriented viewpoints or enunciating positions. They are social viewpoints in two senses. In most cases they are common-sense beliefs acknowledged by a community. They can also be more personal (private) beliefs, but as such negotiable: accepted or rejectable within a stretch of communication, which is a good enough reason to call them social.

The four viewpoints seem to have something in common. They seem to establish a

relation between the "same" properties. One of the most important Ducrot's achievements included in this square is that it points to the illusory common nature of these characteristics. This is illustrated already by the contrariety of topoi, but the best illustration is provided by the joking relation. In case of lexical enunciators (that were the primary study case), the two terms of the joking relation can refer to materially the same person and situation. Still, what is seen is not the same at all – one's attitude towards the person is different as well as is one's interpretation and understanding of the action performed by him/her. This is possible, because material and social worlds with their respective meanings are not the same. The argumentative square is meant to contribute to the understanding of the latter only. There is another set of terms that is usually associated with the introduced issues, namely truth/falseness. There is no place for this opposition within the argumentative square either. Language usage is about presenting something as true and real, it is about social reality that is necessarily relative to perspectives, enunciating positions, viewpoints. This is a perspective common to constructivistic line of argument. I refer here to Jonathan Potter's book Representing Reality (1996), where descriptions are seen as human practices and that they could have been otherwise. The relevance is put on "what counts as factual rather than what is actually factual" (Potter 1996: 7).

The model is dynamic in two ways. Every topical form has its argumentative orientation towards a certain conclusion. Since in the case of lexical enunciators the conclusion seems to be the attribution of quality to the person spoken to or about, the chosen topical form can either maintain or attempt to construct a certain type of social relation. Word-choice, understood in this way, plays a vital role in day-to-day stretches of talk, where accounts get constructed.

It was said that topical forms stand for argumentatively oriented viewpoints or enunciating positions. It should now be stressed that the argumentative square primarily illustrates the argumentative orientations of the four topical forms pertaining to two contrary topoi. Each of them can be more or less strongly supported by more then one actual terms or argumentative strings understood, therefore, as degrees on topical scales. For example, the following terms share the same argumentative orientation, but differ in the strength of quality attribution: 'failure', 'defeat', 'fiasco', 'national tragedy'. The meaning of actual terms is relative to communities and furthermore changes in time and place. Further difficulty with terms is that every term can not so easily be classified as a lexical enunciator, and sometimes an argumentative orientation of what other times the problem proves to be finding different terms for all four orientations.

The argumentative square should be understood as a structural analytical model, irrespective of the concrete terms and applicable to any existing topoi. Its shortest definition would therefore read: the argumentative taxonomy of social viewpoints. It serves best for the analysis and demonstration of relativity of those definitions that express contrary accounts of what, extralinguistically, appears to be the "same" situation.

NOTES

i. "Those who work within Greimas' semiotic perspective say that those four adjectives are the four angles of a square the Greimas square being a sort of adaptation of Aristotle's logical square. I am not going to go into criticism of those conceptions: I prefer to give you my own way of describing those four adjectives." (Ducrot 1996: 188)

ii. Polyphonyis a concept that within seemingly uniform notion of a speaker distinguishes three agents, which do not necessarily coincide with one single person: the producer, the locutor and the enunciator.

iii. "it seems to me that in the word itself, as an item of the lexicon, there is a sort of justification of 'elegance', – a justification which is like a fragment of discourse written into the word 'elegant' I do not think one can understand even the meaning of the word 'elegant' without representing elegance as a quality to oneself." (Ducrot 1996: 88 and 94)

iv. "It is not at all on the grounds of the information provided that you can distinguish the thrifty from the avaricious, it seems to me. The difference is in the attitude you adopt towards the person you are speaking about" (Ducrot 1996: 132)

v. "at times, depending on our discursive intentions, we represent a risk as worth taking and we have consideration for the person who takes it and at others, on the contrary, in our discourse, we represent the fact of taking risks as a bad thing." (Ducrot 1996: 188)

vi. The point argued might get its full importance with the following example. We can daily read about the so called 'crises' around the world, where opposing forces are described in two contrary ways. Since we are not physically or otherwise directly present, our understanding depends solely on articles we read or news we hear. Let me stress that even more important than our own understanding is the understanding of those who decide on the quality and quantity of help or sanctions. Rough categorizations would be as follows: 'defensive forces' vs. 'rebellions' or 'repressive forces' vs. 'liberators'. The first

pair of terms presupposes a justified regime and accordingly portrays those who are against it as unreasonable, while the second pair of terms presupposes the regime to be unfair and, accordingly, considers it to be reasonable and even liberating to act against it. The selection of terms applied is based on reporters' point of view, their pre-existing attitude towards the regime in question and not actual happenings.

vii. Social distance is 'a symmetric social dimension of similarity/difference within which S(peaker) and H(earer) stand for the purpose of this act. In many cases (but not all), it is based on an assessment of the frequency of interaction and the kinds of material or non-material goods (including face) exchanged between S and H'. (Brown and Levinson 1978: 76)

viii. Social power is 'an asymmetric social dimension of relative power, roughly in Weber's sense. That is, P(H,S) is the degree to which H can impose his own plans and his own self-evaluation (face) at the expense of S's plans and self-evaluation.' (Brown and Levinson 1978: 77)

ix. Ranking of imposition is 'a culturally and situationally defined ranking of imposition by the degree to which they are considered to interfere with agent's wants of self-determination or of approval'. (Brown and Levinson 1978: 77)

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ISSA Proceedings 1998 – Does The Hedgehog Climb Trees?: The Neurological Basis For 'Theoretical' And 'Empirical' Reasoning Patterns

1. Introduction

Human beings use two contrasting patterns of reasoning, often called the "empirical" ("pre-logical", "traditional") mode and the "theoretical" ("logical", "formal") mode. The contrast between these two modes is most marked in discourse when the demands of logical patterns contradict common-sense attitudes and the ability to establish the reliability of premises. Thus, the following syllogism (Scribner 1976: 485):

1. All people who own houses pay house tax. Boima does not pay a house tax. Does he own a house? can have in actual discourse two different answers. One exemplifies the theoretical mode of reasoning, and is assumed to be the correct one:

1.1 a. No, he does not.

The second answer is:

1.1 b. Yes, he has a house.

with further elaboration (if asked): "But he does not pay the tax, because he has no money." This mode is called the empirical mode. In discourse, referring to the situation described in the cited syllogism, it is the "incorrect" traditional pattern of reasoning, and not the logical one, that is correct. Similarly, syllogisms with false premises like (2):

2. All monkeys climb trees. The hedgehog is a monkey. Does the hedgehog climb trees, or not?

also can be given two different answers: one theoretical, but false (which deductively follows from the premises):

2.1 a. Yes, he does.

the other an empirical, inductively oriented one, with the claim that either the second premise is false:

2.1 b. The hedgehog is not a monkey, or that one does not know what it is all about or whether it is true at all:

2.1 c. I have not seen hedgehogs, I do not know whether they climb trees or not .

According to cross-cultural and educational studies people in pre-literate cultures invariably respond empirically to such questions; in fact, they seem unable to comprehend a request to say what follows from a set of premises when they do not have first-hand knowledge that they are true. Pre-school and very early school-age children in all cultures likewise respond empirically, according to educational and developmental studies. These findings have prompted a number of questions. What causes the transition from the pre-logical to the logical mode? Is it an ontogenetic development, or is it culturally conditioned? If the latter, is the determining factor literacy alone, or a specific kind of schooling? When children (or pre-literate adults) acquire the logical mode, do they still use the pre-logical mode? How is the ability to use these modes grounded in the brain? In particular, what contribution does each hemisphere of the brain make to each mode? In what follows I aim to synthesize the results of twentieth century research into these patterns of reasoning. In particular, I will describe some unique but little known neurological research which shows that, contrary to Piaget's and others' claims, the empirical, pre-logical mode remains a part of the discursive repertoire of adults in literate European-type civilizations. It is located in the right hemisphere of right-handed people, whereas the logical mode is located in the left hemisphere.

2. Developmental research

Piaget (Piaget 1954, 1971; Piaget and Inhelder 1951) proposed a hypothesis of stages of cognitive development, and asked at which stage formal operations appear. Piaget claimed that they appear at a later, fourth stage (between 12 and 15 years[i], when interpropositional and intrapropositional connections are acquired, and that they involve abilities of two types – to deal with the inner structure of a proposition and to understand causal, inferential and other connections between propositions. Later, Piaget and his followers rejected Chomsky's "predetermination" position of the inborn nature of cognitive stages,

including reasoning abilities (Green 1971, Piattelli-Palmarini 1979). Some participants in the polemics between Chomskian "innatism" and Piagetian "constructivism" – Cellérier, Fodor, Toulmin, et al. -maintained, however, that the two approaches are compatible.

3. Cross-cultural research

Cross-cultural studies started with Lévy-Bruhl's (1923) claim that the mode of thinking in a "primitive" society follows its own laws and differs from that of an "advanced" society**[ii]**. He called this mode "prelogical", as opposed to the advanced "logical" mode. As was pointed out later by Luria (1976: 7), Lévy-Bruhl was the first to state that there were qualitative differences in the primitive way of thinking and to treat logical processes as the product of sociohistorical development.**[iii]**

The first experiments in checking differences in patterns of reasoning with usage of syllogisms were undertaken by a Soviet psychologist, Alexander Luria, as part of a wider investigation of cognitive development in the context of cultural and social changes**[iv]**. The research was undertaken in the early thirties in remote areas of Uzbekistan and Kirghizia at the period when traditional, preliterate populations "met" with the new contemporary social and economic conditions. The results were presented in Luria's monograph, *Cognitive Development: Its cultural and Social Foundations* (1977).**[v]** They defined the form (work with syllogisms) of further research in this area in different parts of the world (Cole, Gay, Glick & Sharp 1971; Cole & Scribner 1974; Scribner 1976; Sharp, Cole & Lave 1979; etc.).

3.1 Luria's experiments

Luria's experiments involved two groups of people. One included illiterate men and women from remote villages who were not involved in any modern social activities -"non-schooled" individuals. The other group included men and women with some literacy training (from very basic to more advanced) who were participating in modern activities (running the collective farms in different capacities, education of children in kindergartens and in primary schools) – "schooled" individuals. The subjects were presented with two types of syllogisms – one type with content related to the subjects' own practical experience, the other with content not related to such experiences. The syllogisms consisted of major and minor premises and of a question, to which the subjects were asked to provide an answer. Testing aimed at the following abilities:

1. Ability to repeat the whole syllogism**[vi]**. The goal was to see whether the subjects perceived a syllogism as a whole logical schema, or only as isolated statements.

2. Ability to make deductions in two types of syllogisms:

a. those with familiar content in the premises and

b. those with unfamiliar content. The goal was to see what type of mode they follow. In both cases subjects were asked to explain how they arrived at their answer, in order to see where they used their practical experience and where the answer was obtained by logical deduction. The results were as follows:

1. *Repetition of syllogisms*: Schooled subjects saw the overall structure of the syllogism, and repeated it easily. Non-schooled subjects saw the syllogism not as one unit, but as a number of unconnected statements. Here are some examples (Luria 1976: 102-117):

3. Precious metals do not rust. Gold is a precious metal. Does it rust or not?

The repetitions of the non-schooled subjects were like the following:

3.1

a. Do precious metals rust or not? Does gold rust or not?

b. Precious metals rust. Do precious metals rust or not?

c. Precious metals rust. Precious gold rusts. Does precious gold rust or not? Do precious metals rust or not?

4. The white bears exist only where it is very cold and there is snow. Silk cocoons exist only where it is very hot. Are there places where there are both white bears and cocoons? Repetitions:

4.1

a. There is a country where there are white bears and white snow. Can there be such a thing? Can white silk grow there?

b. Where there is white snow, there are bears, where it is hot, are there cocoons or not?

2. *Deduction*

a. Syllogisms with familiar content related to everyday experiences, but transferred to new conditions, as in:

5. Cotton grows where it is hot and dry. England is cold and damp. Can cotton grow there or not?

Responses: Non-schooled subjects refused to make any deductions even from this

type of syllogism. The major reason for refusals was reference to lack of personal experience (5.1. a, b); only when they were asked to take the words for truth did they sometimes agree to answer (5.1.c). Often if they agreed to answer, the answer ignored the premises, and reasoning was carried out within another framework of conditions (5.1.d):

5.1

a. I have only been in the Kashgar country. I do not know beyond that.

b. I do not know, I've heard of England, but I do not know if cotton grows there.

c. From your words I would have to say that cotton shouldn't grow there...

d. If the land is good, the cotton will grow there, but if it is damp and poor it won't grow. If it's like Kashgar country, it will grow there too. If the soil is loose, it can grow there too, of course.

b. Syllogisms with unfamiliar content, where inferences can be made only in the theoretical mode:

6. In the Far North where there is snow, all bears are white. Novaya Zemlya is in the Far North. What colour are the bears there?

Responses: Non-schooled subjects more strongly refused to deal with such syllogisms, often on ethical grounds (6.1.a), or in case they agreed (under special request) to speak, premises were either missing or ignored (6.1.b, c, d), since the subjects made use only of personal experience:

6.1

a. We always speak only of what we see; we don't talk about what we haven't seen.

b. There are different sorts of bears.

c. There are different kinds of bears, if one was born red, he will stay red.

d. I do not know, I've seen a black bear, I have never seen any other. Each locality has its own animals. If it is white, it will be white, if it's yellow, it will stay yellow.

In contrast, schooled participants were able in both tasks to solve all the problems: recognize a syllogism, accept the premises, and reason on their basis.

Luria's conclusions were as follows. Non-schooled subjects reason and make deductions perfectly well when the information is part of their practical experience; they make excellent judgements, draw the implied conclusions, and reveal "worldly intelligence". But their responses are different when they work with unfamiliar content and must shift to the theoretical mode: they do not recognize a syllogism as a unit (its disintegration into separate propositions

without logical connection) and mistrust the premise with content outside their personal experience.

Luria interpreted these differences in reasoning performance within Vygotsky's theoretical position that "higher cognitive activities remain sociohistorical in nature and… change in the course of historical developments" (Luria 1976, 8), and that sociohistorical development is similar to the development of a child's cognitive abilities.

3.2. Post-Luria research

Luria's observations were confirmed in diverse cross-cultural[vii] and education-related researches on the cognitive development of students of different ages/level of education (Scribner 1977; Sharp, Cole & Lave 1979; Scribner & Cole 1981; Tversky & Kahneman 1977; etc.). All studies confirmed that there is a profound difference in the way syllogisms are solved by different groups of people: by educated /literate vs. non-educated /illiterate in cross-cultural tests, and by students of different levels in American schools and universities.

The phenomena described by Luria have been interpreted[viii] by scholars of different specialties (see discussion in Kess 1992, Foley 1997, and Ennis 1998). Some tried to give an account of the phenomena from the point of view of the input of literacy, education and the social environment in development of reasoning processes. Others directly or indirectly connected this issue with developmental problems or with psychological studies of inference in general.

4. Literacy, social changes and education

Cross-cultural and educational studies demonstrated that there is a correlation between literacy, social environment and education on the one hand, and the students' ability to treat logical problems in a theoretical or empirical mode on the other. It was stated that after a certain level of education individuals are ready to accept a syllogism as a self-contained unit of information which can be dealt with in its own right "as a logical puzzle" (Sharp, Cole & Lave 1979: 75), whereas less-educated individuals "assimilate" the content of the premises to previous experience. The controversy was whether it is education (formal schooling, of which literacy is an obligatory component), or just literacy on its own which is responsible for the cognitive development involving syllogism solving.

Olson (Olson, Torrance, Hidyard 1982; Olson 1994) claims that literacy is sufficient for the formation of syllogism-solving abilities, since literates think in a

different way than illiterates, because literacy transforms the nature of thinking: thinking about the world vs. thinking about the representation of the world (Foley 1997: 422). The "literacy" position, though, is not supported by empirical work in education. Scribner and Cole (1981) established in studies among Vai, who have an indigenous vernacular script and are literate in it, that literacy without modernized Western-type schooling does not lead to usage of formal syllogistic reasoning. They see the source of reasoning in literacy in English in the Vai society, which is inseparable from western-type schooling, which includes some specific social practices. Evidently all western-type literacies, which go back to the Greek tradition of reasoning, have this effect on cognitive development.

4.1. "Discourse" theory

Observations in cross-cultural and educational studies gave rise to a "discourse theory" to account for the differences between usage of formal syllogistic reasoning and usage of empirical reasoning. According to this theory, semantic decoding of any text is based on knowledge of the genre (which are actualized in "scripts" or "scenarios" – terms introduced in studies in artificial intelligence – Schank and Abelson 1977, Minsky 1986). Recognition of the genre, and of the script, provides all the implied semantic connections and implicit inferences in the text. Empirical reasoning, used by non-educated people who lack Western-style literacy, relies on traditional oral genres, such as folktales, riddles, myths, legends, narratives, etc. (Scribner 1977, Olson et al. 1982), a list which does not include such a genre as syllogism. So non-schooled people cannot make use of the genre which they do not possess. If they are asked to use it (as in Luria's and other cases), they simply do not see any sense in doing this, since the syllogism is not a way of reasoning in everyday life. In contrast, for schooled individuals the syllogistic form is a special genre/script with its own laws, a kind of a "game" with familiar rules, a fixed, boxed-in, isolated entity (Ong 1982). The semantic resolution of this script is fully dependent on its inner content and the rules for relating the premises. One is not supposed to check the accuracy of the content in the outside real world. When an individual learns how to use this genre, there is no difficulty in using it, especially in the setting of an experiment where its usage is expected. The syllogistic pattern of reasoning is a part of Western-type schooling, and it is easily acquired in its simple form.

The discourse theory explanation looks highly plausible. If it is correct, it gives rise to another problem: Do schooled subjects completely switch from the empirical way of reasoning to the formal one, or are they using both strategies.

Many authors in cross-cultural research mention in passing that usually individuals use both strategies. This issue will be discussed in more detail in connection with neurological experiments.

4.2. Reconsideration of a developmental interpretation

The data of cross-cultural and educational age-dependent research on operational thinking calls for reinterpretation of Piagetian developmental position. Piaget stated that a) there are four obligatory stages of cognitive development, b) they appear and succeed one another at a certain age, and c) there are qualitative differences in mental processes between the stages.

Cross-cultural studies do not support the idea that the fourth stage, when formal thinking develops, is ontogenetically obligatory, because in pre-literate cultures individuals do not automatically develop it. Piaget is right that this ability appears at a certain age. But it is evident, that it appears not in the course of ontogenesis, but only in the course of certain cultural needs in the society which puts forward certain cognitive tasks. Thus, differences in operational thinking do not constitute part of the "normal" course of development, but are the outcome of schooling and differences in social environment (Brown 1977, Tulviste 1979, Ong 1982), which provide a special type of genre – the syllogism. The question still remains open, however, whether after developing formal, logical ways of thinking individuals still preserve and use "pre-logical'' empirical modes.

This question is known as a problem of "thought heterogeneity", and it was much discussed since Lévi-Strauss (1966) from many points of view. Cognitive psychological research has contributed a lot to discussing this problem.

5. Psychological basis of reasoning modes

Cognitive psychological research (in connection with cross-cultural evidence and on its own) is interested in how reasoning, particularly syllogistic reasoning, is represented in the mind, that is, in what is the psychological nature of inference. A major question is whether formal logical reasoning is represented in the mind as a special component, or not.

5.1. Johnson-Laird's "reasoning without logic"

Johnson-Laird since his early publications (Wason and Johnson-Laird 1972; Johnson-Laird 1983, 1986; Johnson-Laird and Byrne 1991) has addressed the problem of what he calls "inferential competence" and "inferential performance" (1986: 13). He denies the existence of "mental logic", that is, of mental

representations of inference-rule schemata reflecting logical formulae in the brain. Instead he proposes an alternative theory – "theory of mental models" – of deductive reasoning based on a "semantic principle of validity". He claims that a psychologically plausible hypothesis is "reasoning without logic", when solving syllogisms is based not on the use of logical rules but only on the content and truth of the premises. He suggests that reasoning without logic includes three steps:

a. interpretation of the premises by constructing a model which is based on truth conditions [that is on creation of a model which incorporates the information in the premises in a plausible way – I.D.],

b. formulation on its grounds of a semantically relevant conclusion, and

c. search for an alternative model which can prove the conclusion false.

If there is no alternative model which disqualifies the truth of the original conclusion, this conclusion is correct and can be accepted; if there is an alternative model, we proceed with selecting the most adequate model.

5.2. Deductive or inductive reasoning?
Another important aspect of the discussion about modes of reasoning in natural language concerns the question whether such reasoning is carried out in an inductive or in a deductive way. Moore (1986) claims the absolute priority of inductive over deductive reasoning, because deductive reasoning involves only the form of the argument, whereas inductive reasoning does not separate form from content, and content is dominant. From this position, he re-examines the conclusions of cross-cultural research (Luria, Scribner & Cole, etc.) He argues that "inability" of non-schooled villagers to deal with syllogisms is only apparent: they simply refuse to restrict inference to form only, and go with content, that is with their knowledge of the world. So, when they say that they cannot answer a question posed by a syllogism, this refusal implies a valid conditional argument (Moore 1986, 57): (7) If I could tell, I would have seen. I did not see. Therefore, I could not tell.

With the scheme: If p, then q. Not-q. Therefore, not-p. So, though the informant does not give an answer for the syllogism, it is due to his refusal to play logical games, a refusal which in itself gives no evidence for Luria's claim that the individual cannot think deductively. Since there is no formal technique for description of inductive reasoning, it only looks that it has no rules. But such rules of inference exist; they include checking the content of a syllogism through

worldly experience and [due to their cultural conventions of "politeness"-I.D.] not discussing issues outside their competence. This conclusion is very similar to Johnson-Laird's position about creating a relevant model. In this case a model cannot be created because of the absence of reliable information.

In contrast to this inductive approach, Wilson and Sperber (1986) advocate the dominance of the deductive resolution of inference and relevance. They regard deductive inference by formal schemata as crucial for working with certain types of information, namely when the amount of explicitly presented information is deliberately reduced in communication. This position is compatible with the assumption that the deductive form of reasoning is not only part of mental representation, but is a dominant strategy in certain types of tasks.

So cognitive psychology, recognizing the existence of two modes of reasoning, still does not give a uniform answer on the question of "heterogeneity of thought". Neurological experiments, however, help to shed light on this problem.

6. Neurological research: brain hemispheres and mode preferences
The abilities of literate adults to use both reasoning patterns were tested in unique experiments in the Sechenov Institute of Evolutionary Physiology, St. Petersburg, Russian Academy of Sciences, by Professor V.L. Deglin, a distinguished scholar in the area of functional differences of the hemispheres of the brain, and author of numerous books devoted to different aspects of the brain's functions. This research was started by his supervisor, colleague and co-author, Professor L.Y. Balonov.

The experiments on syllogism-solving were part of a larger program of investigation of the contributions of the hemispheres to language production. The goal of the experiments presented here was to discover the contribution of the left and right hemispheres to solving syllogisms, by testing subjects' performance when either their left or right brain is temporarily not functioning because of transitory suppression (Chernigovskaja and Deglin 1990, Deglin 1995). The group included 14 right-handed individuals of both sexes, all with secondary and some with university education. Each person was tested three times: before electroshocks (control investigation), after right hemisphere suppression, and after left hemisphere suppression. The study tested solving of two types of syllogisms (including motivation for the reply):

a. those with true premises (with both familiar and unfamiliar content – experiment 1), and

b. syllogisms with false premises (experiment 2).

6.1. Experiment 1: solving true syllogisms

The types of syllogisms are presented in Table 1, and the types of responses in Table 2.

Table 1. Types of syllogisms used in Experiment 1

Major premise	Minor premise	Question
1. There are fish in all the rivers where people put nets	People put nets on the Neva River	Are there fish in the Neva River, or not?
2. Every state has a flag	Zambia is a state	Has Zambia a flag, or not?
3. Tanya and Olya always drink tea together	Tanya drinks tea at 3 p.m.	Does Olya drink tea at 3 p.m., or not?
4. In all the squares the sides are equal	The girl has drawn a square on the blackboard	Are the sides of this square equal, or not?
5. All mammals suckle their babies with milk	The kangaroo is a mammal	Does the kangaroo suckle its babies with milk, or not?

Table 2. Typical answers in Experiment 1

Left active (right suppressed)	Right active (left suppressed)
1. Since it is said here that in all the rivers where people put nets are fish and the Neva is in river, and people put nets on it, so there are.	Of course there are, but inedible, they cannot be edible, there is much machine oil. Smelt should be.
2. Each state has a flag, so Zambia also has one.	Who knows it, this Zambia? How can I know whether it has a flag or not?
3. Since it is said that they drink tea together, then they also drink it now, at 3 p.m.	I don't know either Tanya, or Olya. Who knows about them, if they drink tea or not?
4. It is a square, so its sides are equal. She has drawn a square, the sides are equal.	I do not know any girl. Who knows about her, what she has drawn?
5. It is written on the card that mammals suckle their babies with milk, and the kangaroo, it is written, is a mammal, so it suckles.	Suckles, probably, I have heard that they have a bag, and the baby sits there.

In the control group, subjects gave predominantly theoretical answers (12 of 14), which could be expected, since all the subjects were educated within the culture in which syllogisms exist. Only two subjects gave empirical responses (in accordance with their experiences and beliefs) to some syllogisms, like the following in response to N.1: " everybody knows that there is smelt in the Neva", or the following in response to N.3: " no, they do not drink, one drinks tea in the morning". Empirical responses were extremely rare in the control group.

With right hemisphere suppression (left active) there was an even more pronounced tendency for usage of a theoretical mode: though the same number of subjects as in the control group (12 of 14) used the theoretical mode, all the tasks were solved more
readily, without hesitation, and with much more assurance than in the control investigations. In justifying their answers, the subjects referred spontaneously to the contents of the premises.

With left hemisphere suppression (right active) there was a strong difference from the previous cases. The number of empirical answers dramatically increased: 11 subjects of 14 used them. Some subjects even gave only empirical answers without using theoretical answers at all. In comparison with the control group, where only some syllogisms, usually those with strongly familiar or strongly unfamiliar content (e.g. 1, Table 1), were given empirical answers, here all syllogisms independently of the type of content (familiar-unfamiliar) were given empirical answers. However there was some difference in the statistical distribution of responses to syllogisms with familiar and unfamiliar content: in syllogisms with unfamiliar content the number of empirical answers was substantially lower. The subjects' behaviour in using the modes was also different: empirical answers were given quickly and with assurance, whereas theoretical answers were given with difficulty and hesitations.

Experiment 1 demonstrated that one and the same person solves one and the same task differently in different states. The type of answer depends mainly on which hemisphere is active, and to some extent on the familiarity of the content of premises. The experiment showed "that within our culture, under usual conditions the "right-hemisphere" mode of thought [empirical mode – I.D.] is not drawn to syllogism solving" (Deglin 1995: 23-24).

Table 3. Syllogisms with false premises (marked with *)

Major premise	Minor premise	Question
1. All trees sink in water*.	A balsa is a tree.	Does balsa sink in water, or not?
2. Winter is cold in tropical countries*.	Ecuador is a tropical country.	Is it cold in winter in Ecuador, or not?
3. Northern lights often happen in Africa*.	Uganda is in Africa.	Do northern lights happen in Uganda, or not?
4. All monkeys climb trees.	The hedgehog is a monkey*.	Does the hedgehog climb trees, or not?
5. All precious metals glitter.	Copper is a precious metal*.	Does copper glitter, or not?

Table 4. Typical answers and types of reactions

Control	Right active (left suppressed)	Left active (right suppressed)
1. Empirical mode – rejection of the premise (half of responses): – No, trees do not sink in water; if balsa is a tree, it will not sink. – Wrong, tropical countries do not have cold winters. 2. Theoretical mode – realities are ignored (half in often as empirical): – Yes, balsa sinks in water, because it is a tree, and all trees sink in water. – Yes, winters are cold in Ecuador… 3. Ambivalent: difficulties in choice between theoretical and empirical modes: – Due to the structure of what is written, the answer should be positive, but I think Northern lights never happen in Africa. I have never heard about it	1. Empirical mode: a) rejection of false premises (more than 2/3 of total answers). Attitude: extremely emotional to false premises: – Lies! – Nonsense! – Rubbish! b) more extended denials of false premises than in control: – It is a lie here! Northern lights can never happen in Africa! They happen at the North Pole, near the Arctic. – It is warm in Ecuador! Rubbish! It is a tropical country! It can't be winter there, because it is in the South. Wrong, what you write!	1. Theoretical mode (even if admitting the absurdity of the premise). If asked for the reason, the answer is: – But it is written so! – Here it is said so! Repeated drawing attention to absurdities has no influence on answers. Attitude: non-emotional (calm, with confidence, unmoved by absurdity of information is present)

6.2. Experiment 2: solving syllogisms with false premises

The types of syllogisms for this experiment are presented in Table 3 and the types of responses and typical reactions in Table 4. The control group gave three types of responses. Predominantly (2/3 of answers) empirical responses were used – rejection of the false premise or refusal to solve the syllogism. But there were also theoretical answers where irrelevance of the premises's content to reality was ignored: "Yes, balsa sinks in water, because balsa is a tree and all trees sink in water". In some case answers were ambivalent: the subjects were hesitant which of the strategies to use – the ftheoretical one, following the rules of syllogism but ignoring the false premise, or an empirical one, pursuing the truth: "Must I answer so as it is written here? Then the hedgehog climbs trees. But it does not climb. It is not a monkey."

With left hemisphere suppression there was very strong rejection of false premises (90% of answers): they refuted false premises with conviction with a strong emotional reaction, extreme indignation, and much more extended denials (see Table 4).

With suppression of the right hemisphere, there was a dramatic change: the number of theoretical answers more than doubled, and the number of empirical answeres strongly decreased, with some individuals not using them at all. The subjects who followed theoretical answers did not pay any attention to the falsehood of premises (relying instead on the authority of what is "said' or "written"), and proceeded to work with the information given to them. As a result there were absurd conclusions, derived in accordance with correct rules of formal logic. The emotional attitude radically changed – the subjects did their task calmly, with confidence, neglecting the absurdity of the premises.

So these neurological experiments demonstrated that the activated right hemisphere utilizes predominantly the empirical mode, whereas the activated left hemisphere utilizes predominantly the theoretical mode. Thus both mechanisms of reasoning are present in the brain simultaneously, both of them can be used, but each of them is controlled by a different hemisphere. The choice of strategy depends on the content of the issues discussed: issues with familiar content referring to everyday activities are discussed in the empirical mode, whereas issues with unfamiliar content are solved in a theoretical mode. These results explain the fact mentioned in much cross-cultural research that often educated subjects use both strategies. And these results give counterevidence to Johnson-Laird's claim that formal reasoning is not represented in the mind.

The results of the neurological experiments are congruent with the peculiarities of functioning of the hemispheres: the right hemisphere operates cognitively with unified configurations (in this case with familiar scripts), whereas the left one processes discrete items (Witelson 1987) – in this case with the rules of formal deduction. This can raise a question whether the syllogism constitutes a script with a content (as was assumed in the discourse theory of reasoning) or is only a system of formal rules, a "syntactic script" never tied to a definite content but only to a definite form. In my opinion, the latter understanding of the syllogism is much more plausible and is congruent with the linguistic functions of the hemispheres. Linguistically the right hemisphere is responsible for (among other things) the referential and semantic correctness of words, and the left hemisphere for their syntactic organization (Balonov, Deglin, Dolinina 1983).[ix] In the case of reasoning patterns, the right hemisphere appears to control the quality of information (e.g. the truthfulness of premises, testing them against the realities of the world and/or personal knowledge/experience), whereas the left hemisphere is responsible for the correctness of purely operational mechanisms (formal correctness of inferences).

7. Conclusion

Two reasoning patterns can be used in solving syllogisms: an empirical (prelogical, traditional) one and a theoretical (logical, formal) one. The first employs information from life experience, knowledge of realities, the second only the information contained in the syllogism.

Cross-cultural investigators (Lévy-Bruhl, Luria, Cole, Scribner, etc.) demonstrated that the theoretical mode is not available to individuals in traditional societies,

who employ only the empirical mode; the theoretical mode becomes available to them after acquisition of minimal literacy and Western-type schooling. This discovery contradicts Piaget's claim that the theoretical mode develops ontogenetically as an obligatory stage of cognitive development. Various explanations of the failure of adults in traditional societies to develop the formal way of reasoning (which they should, according to Piaget) were proposed. Scribner claimed that oral traditional cultures do not have a syllogism genre, and so make use only of the genres which are available to them; when they learn this genre they can work with it. Specialists in literacy (Ong, Olson) claimed that literacy alone is sufficient for formal thinking, but this consideration was not supported by Scribner and Cole, who investigated literate traditional cultures (Vai) with authentic literacy, but still without formal reasoning. So they claimed that Western-type schooling (of which literacy is only a part) is crucial for formal reasoning. Thus, contrary to Piaget's ontogenetic explanation of sources of formal reasoning, scholars (Tulviste) explained it as a function of sociocultural demands (though acquired, as Piaget claimed only after a certain age).

Since literate schooled individuals possess both modes of reasoning, the question arises which of the modes is normally used – both (in which case there arises the issue of "heterogeneity of thought"), predominantly the theoretical one (as more efficient and compact), or predominantly the empirical one (as based on everyday information). Some cognitive psychologists (e.g. Johnson-Laird and Moore) claim that the traditional, semantic way of reasoning is responsible for reasoning processes and is represented in the mind, the formal being only a "performance" strategy. Others (Wilson and Sperber) stress the priority of formal reasoning. Deglin's neurological experiments on functional differentiation of right and left hemispheres demonstrated that both strategies are present in the brain: the right hemisphere uses the empirical mode, whereas the left one uses the theoretical mode.

NOTES
i. Later researchers argued that this stage emerges at a much younger age.
ii. Later this position was strongly supported by Lévi-Strauss (1962).
iii. Lévy-Bruhl's position was rejected by many psychologists, anthropologists and linguists of that time (among them Boas) who took it as a statement of the inferiority of 'primitive' cultures, and who argued that the intellectual apparatus of people in primitive cultures was absolutely identical to that of people in more

advanced cultures, because the cognitive and linguistic abilities of any culture and of any language are equal.

iv. Luria's research was based on Vygotsky's theoretical position that consciousness is not given in advance, but is shaped by activity and is a product of social history.

v. Although Luria did his research in the 1930s, his monograph was not published in the original Russian edition until 1974.

vi. Test of memory and retrieval of the information.

vii. They were carried out in Africa in Senegal, among Wolof, in Liberia among Kpelle and among Kpelle and Vai, and also in Mexico among Mayan- and Spanish-speaking villagers, with results very similar to Luria's and to each other.

viii. Luria's own explanations were only partially accepted. The grounds for criticism differed. For example, Cole in his foreword to the English translation of Luria's monograph (Luria 1976: xv) comments that Luria, adopting the Piagetian developmental framework, does not differentiate between the performance of individuals in different cultures and the performance of younger and older children within the same culture.

ix. Under the influence of Chomsky's syntactically based approach to language, North American researchers generally ascribe all linguistic functions to the left hemisphere.

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ISSA Proceedings 1998 – Burden Of Proof: A Negociable Argumentative 'Chore'

The allocation of burden of proof is a very classical argumentative issue. This paper does not propose general reflections on the principles which rule this allocation, but rather tries to show how, when engaged in face-to-face argumentation, speakers themselves deal with this question.

I will first evoque briefly how the question of the burden of proof is treated within

the frame of judicial argumentation as well as ordinary argumentation. I will then indicate how it can be articulated with a global description of a rhetorico-argumentative situation. Finally I will show, through a case study, how the allocation of burden of proof is negotiated within a specific polemic: the media debate about parasciences (astrology, parapsychology, ufology, etc.).

1. The burden of proof allocation rules

The general principle which governs the allocation of burden of proof in ordinary argument is that argumentative scaffolding falls to the speaker who challenges the doxa, while his opponent enjoys the weight of what is supposedly admitted.

Thus, if two speakers disagree, one claiming that $2 + 2 = 5$ whereas the other assumes that $2 + 2 = 4$, it falls to the first one to argue his claim, not to the second one. Moreover, the one who promotes an unlikely claim must prove the validity of this claim, and should not ask his adversary to prove it to be false; such an attitude would lead to an ad ignorantiam fallacy.

The first consequence entailed by this general burden of proof allocation rule is that it is governed by a principle of inertia: since presumptions play in favour of what exists, only change requires to be justified.

The second consequence of this rule is that the burden of proof allocation is setting-dependent, since what is considered as doxastic on a given matter may vary with the audience.

The general allocation rule may also be associated with additional sub-rules which condition its application within some specific settings. In particular, within the judicial area, the burden of proof is tightly linked to the presumption of innocence: the prosecutor assumes the burden of proof, and any reasonable doubt must be in favour of the prosecuted. In this specific setting, using the adversary's failure to prove a proposition p (the guilt of X) as an argument in favour of non-p (the innocence of X) is not considered as fallacious.

Perelman insists on the fact that the allocation of burden of proof within the legal area also plays in favour of inertia: "il est conçu de manière à ratifier, jusqu'à plus ample informé, les faits tels qu'ils sont".**[i]**

2. Integration of the Burden of Proof within a global model of argumentation

Some authors, among whom Plantin, attach a central role to burden of proof in the definition of a rhetorico-argumentative situation. Thus, for Plantin (1993, 1996), the importance of burden of proof is related to the fundamentally asymmmetrical character of many rhetorical situations.

A rhetorical situation is defined by the emergence of a "rhetorical question"**[ii]** which brings two speakers into conflict. The relationship between those speakers and the question to be discussed is more often not symmetrical, contrary to what is suggested by the alternative "for / against" which often typifies such situations. One speaker actually defends a claim close to *doxa*, whereas the other brings in a new thesis which questions this doxastic claim. The allocation of burden of proof is linked to presumptions, and to the determination, for a given rhetorical question, of what may be considered as "normal", "admitted", "doxastic", as well as what challenges the doxa.

This point is crucial; it constitutes an important stake of the argumentation, inasmuch as the position of the one who assumes the burden of proof is somehow weakened: as it is put under discussion, it is not unquestionable anymore.

It is quite paradoxical for argument, which aims at supporting a claim with premises, but which, doing so, puts its fragility in the foreground. The very fact of scaffolding a claim with arguments makes it questionable. Thus it is in the interest of each speaker in a debate to shift the burden of proof onto his adversary, and to enjoy the weight of presumption.

One should not understand this description of a rhetorical situation as implying that the allocation of burden of proof has to be dealt with as a precondition of the argumentative debate itself, as a point to be settled a priori, once and for all, valid for all the following discussion.

Such a conception of burden of proof would pose many problems.

– Deciding what, out of context, stands for doxa about a given matter is sometimes far from obvious. It is hardly questionable in the case of claims such as "2 + 2 = 5", which clearly challenge the arithmetical doxa. But what is the doxastic answer to the following question: "Is woman equal to man?" It becomes quickly evident that the answer will vary with the audience before which the discussion takes place. Amongst "good thinking people", the doxa will very probably come close to the affirmative; but elsewhere …

– In a debate, the rhetorical question structuring the argumentative exchanges tends to split into many rhetorical sub-questions, each of which may require a specific reflection about burden of proof.

– Even when identifying the doxastic position is possible, it is not necessarily relevant when one is concerned with the very dynamics of the argumentative face-to-face; establishing once and for all to whom the doxa belongs may prevent the analyst from observing that each discussant tries to appropriate it by means

of specific discursive devices.

Finally, the analysis of argumentative discussions shows that the allocation of burden of proof is not given prior to the interaction, but constitutes in itself one of the crucial issues at stake in the discussion. It is tightly negotiated by the interlocutors, each of them trying to ensure the most comfortable argumentative position – namely, the doxastic one.

The following case study illustrates what such negotiations are like, and what kind of rhetorical and argumentative devices they mobilize in a specific controversy: the media debate about parasciences.

3. The burden of proof negotiation devices within the Debate about parasciences
Before the actual analysis, a few points seem to be necessary:

– By "media debate about parasciences", I mean mainly TV debates which were broadcast since 1989 on French TV, dealing with varied disciplines or phenomena such as astrology, parapsychology, ufology or alternative medecines. Henceforth "para pros" will indicate parasciences' supporters, and "para cons" will stand for parasciences' opponents.

– Those debates constitute quite violent verbal exchanges, where argument takes place in a very polemic mode. It does not imply that argument always resembles that.

– it only is a specific case of argumentative discourse, and does not exclude that a pacified and constructive argument would be possible on the same matter. One might also assume that within more friendly discussions, the observations would be quite different. In particular, discussants would be less inclined to avoid the burden of proof and would probably take it on with less reluctance.

– The debate about parasciences constitutes a rhetorical situation where, at the start, the doxa seems to be rather close to the rationalist position. According to Blackburn (1992 : 418), the burden of proof falls to para pros because very often, the debate about parasciences is about determining whether paranormal phenomena do exist or not. Such a discussion is necessarily asymmetrical, the proof of the non-existence of something being almost impossible to establish, whereas finding out the criteria enabling to settle its reality is a perfectly attainable aim. This general principle is probably relevant in the case of a TV debate, where the audience is highly heterogeneous; but it would probably be defeated towards an audience consisting mainly of astrologers.

Even if a doxastic position within this specific debate may be identified, one

should keep in mind that:

– This does not imply that any rhetorical situation presents such an asymmetry *from the start*. One could imagine a rhetorical question which would concern such a novel problem that any answer would be original; the "doxastic" position should then be rhetorically constructed as such, rather than given.

– The a priori asymmetry does not prevent the burden of proof from being negotiated throughout the discussion.

3.1. Refusal of the burden of proof by parasciences' supporters: "rhetoric of acquired assent"

Since the argumentative discourse assuming the burden of proof might be weakened, the para pros try to shift the burden of proof onto their adversaries, and to present their own claims as generally accepted. For this purpose, they use what could be called a "rhetoric of acquired assent".

It consists mainly in mentioning technical works demonstrating the existence of paranormal phenomena, so as to make them appear unquestionable and widely admitted.

It is illustrated in example 1:

(1)

Telepathy – that is, transmission of desires or pictures without using the five senses – is henceforth a well attested fact, already established at the beginning of the century by works such as Tischner's "Télépathie et clairvoyance" (cited in Jean-Claude Becker, *Problèmes politiques et sociaux* 450-451, 1982, p.43).**[iii]** It's also the case in example 2:

(2)

Telepathy is a fact, proved by experiments (experimental thought transmission), and by observation (spontaneous cases) (Yvonne Castellan, *La Parapsychologie*, Paris: P.U.F., 1985, p. 37). This strategy consists in presenting as admitted what is precisely contested by the adversary; thus it might be a way of begging the question. It often opposes the situation in France (which would be comparable to Prehistory) to the American or, a few years ago, the Russian research situation. In Example 3, doctor Toffaloni defends osteopathy in the following way:

(3)

Dr T: People speak of an untested, non recognized profession or technique; "untested" isn't true as far as osteopathy is concerned because everything has been written, everything has been tested seriously in the United States – well, you know the way it is, in France, people have blinkers (TV, « *Le Glaive et la balance*

», M6, 1991).

Those claims very often follow a regular pattern:
telepathy
psychokinesis
premonition
…
is widely
henceforth
well
… attested
proved
established
… by works such as Tischner's in the United States
…
which amounts to: /Name of a parascience/is/adverb indicating intensity or temporal break//passed participle pointing out that the parascience is admitted//authority attesting the validity of the parascience/

This pattern may remind one of some discursive devices from popularized science where the journalist willing to legitimate his claims mentions explicitly the background where they first were developped: an authoritative environment in which facts are "attested", "established", "proved by experiment" in "high-performance laboratories".

The rhetoric of acquired assent suggests that if so many conclusive experiments do exist, the burden of proof then falls to the para cons. This strategy is mobilized by the parapsychologist Yves Lignon in example 4:
(4)
YL: But anyway Mr Cuniot, this is a false debate; we're not here to talk about Yves Lignon, but about parapsychology and about experiments signed "Yves Lignon", which are published in scientific papers. So I am asking you a question: do you challenge those experiments, yes or no? And if you do, where, how and why? In other words, since I claim that an experimental file showing the reality of the parapsychological phenomenon does exist, tell me where I went wrong (TV, « *Duel sur la 5* », 15/04/1988, la 5).
The rhetoric of acquired assent is often associated with two kinds of devices aimed at making facts more credible. The first one rests on the locus of quantity,

the second one, on the locus of quality**[iv]**. The first device consists in making the facts appear plain, banal. Since the more extraordinary a phenomenon is, the more convincing the proof of its reality has to be, many discursive devices are used by para pros in order to lessen the unusualness of paranormal phenomena. The most simple way of reaching this aim is pointing out the great number of experiments in this area. Thus the parapsychologist Yves Lignon claims that "one can find all over the world hundreds of thousands of successful experiments". Presenting the reality of the phenomena as broadly admitted empowers Yves Lignon to shift the burden of proof onto his adversary.

A variant of this strategy consists in suggesting that the phenomenon belongs to a well established, systematically described area of knowledge. Example 5 describes the way a famous French parapsychologist works:

(5)

Experiments in telepathy – which are the basic requirements of the job – are nothing to him but routine experiments (« Les nouveaux miracles de la parapsychologie », *Nouveau l'Inconnu* 158, août 1989). One may also present the antiquity of a theory as an argument establishing its validity, since it has been tested through ages by many people. This argument is used by Boris, a medium, who has just stigmatized the european research in parapsychology, which, according to him, is left far behind by american research; he adds:

(6)

B: So ok, people blame us, but I wish everybody would ask himself a question; besides, we do exist since the beginning of time, wizards have existed before lawyers and physicians, before scientists, they still exist; they now have a new label, they are called "parapsychologists". So, with all you can read at present against parapsychology, how can you explain to me why people come back to see us? Ok, just explain that to me (TV, « *Ciel Mon Mardi* », 27/11/1990, TF1). This way of mentioning the antiquity of a theory or practice in order to establish its validity is itself a very ancient (therefore very effective?) device; it was already used by Cicero in *De la divination*:

(7)

Let us make fun of haruspices! Let us pretend they are faithless and lacking authority! Their science, attested by such a wise man, by events and by reality, let us despise it! Let us despise also Babylon and those who, observing the heavenly signs from the Caucasus, follow, owing to their reckonings, the moves of the stars! Let us tax them with stupidity, with treachery or effrontery, those whose

writings contain, as they themselves assume, a 470 000 years old tradition! Let us consider they are lying and care little about the way the forthcoming generations will judge them! So be it! Barbarians are faithless and deceitful. But is greek history also deceitful? […] Delphi's oracle would never have met such a success and such a fame nor would it have received such rich presents from all countries and from all kings, if the truth of his prophecy had not been proved through the ages (Cicéron, *De la divination*, Paris: Les belles Lettres, 1992).

Contrary to focussing on the great quantity of experiments, other strategies aiming at making the paranormal facts more credible are based on the locus of quality. The first one points out on the contrary to the scarcity of a phenomenon in order to make it appear more plausible. Acknowledging only one phenomenon as true among a great number of candidates is seen as an argument in favour of its reliability:

(8)

Rémy Chauvin: in all my long life I had the opportunity to meet three mediums, one being a well known scientist – three, no more, in forty-two years (TV, « *Star à la barre* », 09/05/1989, France 2). In a similar way, one may claim that the more humble a phenomenon, the more reliable it is:

(9)

Bernard Martino: First conclusion: I would say, as far as I'm concerned, that the bigger it is, the less credible it is. (…) That's what I would say to people who are inclined to believe too easily. (…) I've heard crazy things, I've heard people saying they were able to make a van levitate! No kidding! (TV, « *Ciel Mon Mardi* », 27/11/1990, TF1).

Rejecting some paranormal phenomena as poorly reliable enables a speaker to build an objective, critical ethos and to increase in proportion the credit attached to the scarce so-called positive paranormal facts.

3.2. Meta-argumentative reactions

The use of the rhetoric of acquired assent by para pros gives rise to varied meta-argumentative reactions by their adversaries, who also reject the burden of proof, and denounce the attempts at reversing it.

3.2.1. Making the burden of proof allocation rule explicit

These reactions are often associated with the explicitation of the burden of proof allocation rule, as in example 10 (the author is a rationalist physicist):

(10)

As I said before, it falls to the proponent to bring the proof of what he says. (…) One must clearly claim that the non-impossibility of something presented as an argument in favour of this thing is a fallacy which is close to schizophrenic delirium (Henri Broch, *Le Paranormal*, Paris: Seuil, p.199).

Here the question of burden of proof is associated with the denunciation of an argumentum ad ignorantiam. Example 11 is an answer to a "Science et Vie" reader's mail, which reproached this magazine of popularized science with rejecting astrology without justification:

(11)
So would it fall to us to demonstrate the inanity of astrology? If we published the information that pigs fly when the moon is full, it would fall to us to prove it, and not to those who don't believe us. Besides, we've never heard of a single methodical work in astrology ("scientific" would be a word too strong for that kind of matter) which would show the influence either of signs or of planets (*Science & Vie* 892, 1992, p.10).

3.2.2. Discussion of the application of this rule
Still on the meta-argumentative level, a possible reaction to the mention of the burden of proof allocation rule consists in discussing the plausibility of a theory – this plausibility being crucial for deciding who has to prove. Thus the two physicists Targ and Puthoff did claim in 1977 that:

(12)
In our time of gravitational waves and quantum interconnections, the burden of proof, when the discussion is about excluding the very possibility of paranormal abilities, falls to sceptical people (Targ & Puthoff, cited in Alcock J., *Parapsychologie: Science ou magie?*, Paris : Albin Michel, 1989, p.178). As is shown by example 12, the very plausibility judgment may vary according to the audience, and may itself be negotiated.

3.2.3. Proposition of burden of proof allocation alternative principles
Another meta-strategy may consist in proposing alternative burden of proof allocation rules. In example 13, Yves Galifret, a rationalist, refuses the burden of proof; the reaction of his adversary, the Magus Dessuart, is the following (JCB is the journalist running the debate):

(13)
JCB: So, professor Galifret, I suggest you open the intellectual duel. Please tell us what your position is on clairvoyance?

YG: Well, I'd rather... I don't have anything to prove; the burden of proof falls to the one who claims, doesn't it? I consider that the king is naked, I expect to be shown that the king is not naked.

JCB: Then, Magus Dessuart?

MD: So dear professor, I think it's exactly the reverse, because in the present case, we, mediums, are subjects, we are not scientists, and, having no technical information, we cannot demonstrate the mechanisms which rule that kind of phenomena. We're only subjects [...] but how could we explain the facts? We are poorly equipped for that, we are not scientists (TV, « *Duel sur la Cinq* » du 22/04/1988, la 5).

The burden of proof allocation rule proposed by the Magus rests on competence: the burden of proof falls to the most competent speaker (whatever his position in the debate is). Example 14 is from a quite different frame: the controversy about heliocentrism. The position of the Church towards Galileo was that, as long as the contrary has not been established, one should not cast doubt upon the traditional interpretation of the Bible: the burden of proof then falls to Galileo. Galileo claims on the contrary that the falsity of copernicianism has to be established by the Church itself:

(14)

Before a physical claim is condemned [by the Church] one must show that it isn't rigorously proved, and this has to be done not by the ones who hold this claim to be true, but by the ones who consider it as false. It seems natural and very sensible because those who consider an argument as erroneous may put its flaws to the fore much more easily than those who hold it to be conclusive (*Galilée, naissance de la physique, Les Cahiers de Science et Vie* ("Les grandes controverses scientifiques, n_2), avril 1991). This alternative burden of proof allocation rule rests on psychological or cognitive considerations.

3.3. Other argumentative devices aiming at shifting the burden of proof

Beside the meta-argumentative level, one may meet two other devices aiming at shifting the burden of proof.

3.3.1. Argument ad ignorantiam

The first one is very classical : it consists in using an appeal to ignorance. In the debate about parasciences, the failure of the sceptics to demonstrate the falsity of the paranormal hypothesis is often considered as a proof for its validity. That's

the way one should understand the so frequent "why not" answer advanced by parasciences' supporters when asked to justify their belief.

Very often, sceptics try to prove the inanity of a paranormal interpretation of a phenomenon by proposing a rational explanation for the same fact. Thus, para pros will try to show that those "rational" explanations cannot be accepted – and the criticism of the arguments of the adversary is seen as an argument in favour of the paranormal hypothesis.

In example 15, Pierre and Joël are two "UFO hunters". They are in the moutains, and they are commenting on a round mark which was supposedly left by a Ufo. In order to support this explanation, they criticize rival rational explanations "they" proposed ("they" standing probably for "the government", scientists or any non-believer).

(15)

Pierre: Then some people came to see a few years ago; they studied it; and at that time they told me maybe mushrooms produced those marks. In the old days they were called "witch circles". So, mushrooms would have been responsible for those circles. [...]

Joël: Even if one admits that mushrooms may make such a regular mark – why the hell wouldn't they also make a square mark? It's completely unlikely, because if you have a look at books about mushrooms, they don't mention such a thing, never.

Pierre: You know, I think if one day they saw a UFO in the middle of a field, they would tell you "everything is ok"; then what is it? They would always find something to tell you.

Joël: The day before, you came here and there was no mark.

Pierre: Yes, absolutely, there was nothing, and the day after the mark was here. So they said some people had had a party and so on; but there would have been cigarette butts, cans, you know, the kind of rubbish you might find after a party – and there was nothing.

Joël: About three years ago, two guys – actually they were poaching frogs during the night – they saw a luminous phenomenon, a very strange one, fabulously luminous – they compared it with the lighting of a football stadium, so you can imagine how luminous it was. Well, some people managed to explain this observation by luminous mushrooms. So, if you can show me luminous mushrooms giving off light as bright as the lighting of a football stadium, I'd be glad to see that. And nobody questions it! And we have a great collection of such completely foolish explanations... (TV, « *Zone interdite* », M6, 21/09/1997).

Such argumentative strategies are often associated with additional interpretative hypotheses. In particular, the supposedly absurd rational explanations are presented as the indication that a plot is being organized in order to keep the Ufo landings secret (as well as paranormal phenomena in general). The existence of such a plot is of course itself an indication that paranormal phenomena do exist.

3.3.2. Alteration of the general discussion pattern
The last argumentative device used to shift the burden of proof onto the adversary consists in negotiating the general pattern of discussion. In the debate about parasciences, the discussion pattern usually admitted is the following:
– first, establishing the reality of the phenomena;
– second, trying to explain these phenomena;
– third, searching for potential applications.

The rhetoric of acquired assent aims at moving from the facts (which are presented as widely admitted) to their explanation; it appears in example 13 above. It is often associated with a new task allocation: para pros establish (and even provoke) the phenomena, scientists use their technical skills to explain them. Since scientists often refuse to concede the first step to their adversary, they refuse to assume the second step; thus the allocation of burden of proof often gives rise to the negotiation of the discussion pattern, as in example 16:
(16)
YG: "So", says Fontenelle, "is all this well attested? Let us make sure of the fact before trying to understand the cause. This method may seem quite slow to the many people who run naturally to the cause and pass over the truth of the fact. But let's avoid the ridiculousness of having found the cause of what is not. In other words, before explaining something you should make sure that this thing does exist". So I would say there is nothing to be demonstrated insofar as this social phenomenon [clairvoyance] rests on no objective scientific basis (TV, « *Duel sur la Cinq* » du 22/04/1988, la 5).

Thus the pattern of discussion also is an important stake of the debate; trying to move to the explanation or to the potential applications before having conclusively established the facts constitutes an attempt at escaping the chore of burden of proof.

Conclusion
The preceding examples (which may not exhaustively list the argumentative skills

aiming at shifting the burden of proof) may suggest that the burden of proof allocation always gives rise to negotiations; actually this is not always the case:

– in some institutional or strict rule-laden situations, the burden of proof may be allocated once and for all, and may be considered as unquestionable (it is the case to some extent in legal discussions, as mentioned previously);

– in situations with a low degree of polemicity, where discussants are not directly confronted with a counter-argument, the burden of proof is often assumed without any reluctance, as Wooffitt (1992) showed;

– in a media setting, discussants may also find some advantages in assuming the burden of proof. Accepting it often enables them to speak first and, while having the floor, to frame favourably the argumentative discussion to come: the asset of speaking first compensates for the handicap of assuming the burden of proof.

There is no doubt that the burden of proof is a crucial component of any argumentative situation: it has to be assumed by somebody, even if it weakens the discourse of the discussant who assumes it, and, in that sense, it is an unavoidable argumentative chore. But one should strongly emphasize that speakers may always use many argumentative skills in order to shift this chore onto their adversaries. So it is a very negotiable chore, and it is constructed by, rather than given previous to, the face-to-face argumentation.

NOTES

i. "[Burden of proof] is conceived in order to confirm the state of the issue, until there is evidence to the contrary" (Perelman 1988, 727, our translation).

ii. Following Plantin (1993, 1996), a rhetorical question is not a question wich requires no answer, but a question which structures an argumentative discussion.

iii. All the examples were initially in French ; the translation is ours.

iv. As defined by Perelman & Olbrechts-Tyteca 1988 : 115-129.

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ISSA Proceedings 1998 – The Use Of Metaphor In Scientific Argument: The Case Of Edward Clarke's Sex In Education

Contemporary research on metaphor has demonstrated with some emphasis that metaphor plays a significant role in science. Indeed, the discovery and description of the various functions performed by metaphor in scientific discourse has become a major research focus in metaphor scholarship (see Ortony, 1993). This focus was initiated in 1955, when philosopher Max Black (1955) argued in a landmark essay that metaphor constitutes "a distinctive intellectual operation" (79). By attributing cognitive content to metaphor, Black promoted the construct from a mere stylistic trope to a central figure in the process of scientific discovery. Subsequent research, including inquiry into the process of scientific modeling conducted by Black (1962) himself, established a virtual consensus regarding the necessity of metaphoric thought and description in science. Acknowledgment of this necessity can be found not only in the work of "metaphor-friendly" philosophers of science such as Thomas Kuhn (1993), but also in the work of logical positivists such as Ernest Nagel (1961).

This should not be taken to say that metaphor has been roundly embraced as a positive influence in science. Even Black (1955) was quick to point out that there is "no doubt metaphors are dangerous" (79). While metaphor may be indispensable in the process of theorizing, it can also mislead. The same heuristic function that enables metaphors to help us grasp new ideas can also serve to misdirect or limit our perceptions. In particular, there is an ever-present danger that metaphors will become reified or literalized. By this process, a metaphor,

construct, or model becomes for the researcher not just a representation of reality, but the reality itself (Black, 1962).

There is a second fashion by which metaphor poses a danger in science. Not only can metaphor mislead researchers by construing their perceptions, but it can also serve a powerful rhetorical function in the interpretation of scientific data and the application of those data to social contexts. Metaphor can serve as a bridge from scientific data to personal or political interests, and in the process, the data itself is reconstituted according to the metaphorical entailments. This risk pertains not so much to the good-faith misapprehension of reality as to the intentional, persuasive uses made of the results of scientific investigation. Metaphor is particularly vital in such uses given its peculiar efficacy as an ideological tool. Although the ideological function of metaphor has been explored in traditional analyses of rhetorical artifacts, far less attention has been paid to this function in the discourse of science. In this essay, I wish to characterize the rhetorical potential of metaphor in the interpretation and application of scientific data by way of a case study. My progress will be made up of an initial exploration of the ideological functions of metaphor, followed by an examination of these functions in the work of nineteenth-century Harvard physician Edward Clarke.

1. The ideological function of metaphor

Edwin Black (1970) writes that any discourse asserts a model of what the author would have his or her real audience become. This model is almost never characterized directly, but is implied by way of stylistic tokens. By the choice of language, the fashion in which the argument is clothed, an author implies an outlook. Style in this context serves as perspective, and, Black notes, this perspective matters inasmuch as "auditors look to the discourse they are attending for cues that tell them how they are to view the world, even beyond the expressed concerns, the overt propositional sense, of the discourse" (165). In all, stylistic cues link discourse to an ideology, a "network of interconnected convictions that functions in a man epistemically and that shapes his identity" (164).

Metaphor is particularly suited to conveying ideology or perspective due to its characteristic function of joining seamlessly dissimilar contexts. Modern scholarship on the construct (for an overview, see Johnson 1981, 3-47) allows that metaphor inspires original thought by animating elements or ideas from discrete domains. This thought results from a unique interaction of diverse associations in a process of comparison and negation. Language as a system is built on a vast

foundation or system of metaphors by which abstractions such as space, time, and movement are construed. The choice of particular types of metaphors conveys what Wayne Booth (1978) calls "a world" (61). This world is not presented as an invitation to join with a given perspective, but draws its audience in by way of the interpretive process: "To understand a metaphor is by its very nature to decide whether to join the metaphorist or reject him, and that is simultaneously to decide either to be shaped in the shape his metaphor requires or to resist" (63). This "decision" is seldom recognized as such; most often, auditors overlook the rhetorical dimensions of metaphor entirely in their interpretive processes, and assent by default to the perspective of the rhetor.

As a consequence, conventional metaphoric function – as contrasted with the function of novel, isolated metaphors – tends to take place without the awareness of auditors. This creates a significant rhetorical potential that may be of strategic advantage to participants in the discourse of science. However, while considerable scholarly attention has been devoted to charting the importance of metaphors in propagating scientific theory (e.g., Boyd 1993), and to demonstrating the ideological function of metaphors in sustaining research perspectives or paradigms (e.g., Brown 1986), less attention has been focused on the tactical uses of metaphor within particular scientific and quasi-scientific discourses. Questions of particular strategies of metaphoric conveyance have largely been left unanswered in the pursuit of larger issues of metaphor in science. It is my assumption in this essay that attention to such tactical issues is appropriate within the framework provided by existing research.

Accordingly, I am concerned with such questions as how, specifically, do metaphors serve as an inventional resource in the construal of scientific data? What are the commonplace uses of antagonism between science and poetics, and the theoretical antithesis between figuration and the language of empiricism, one would their uses of metaphor. Where in scientific discourse do metaphors most often appear, and where are they less in evidence? What levels of metaphoric function – word, sentence, subject, or discourse – are significant? In order to explore these questions, I turn to a case study in scientific discourse.

2. Edward Clarke's Sex in Education

Although largely absent from contemporary historical texts, the issue of women's access to traditionally male-dominated domains of higher education was an enormously popular concern in the United States during the latter half of the

nineteenth century, receiving attention comparable to the debate over slavery that preceded it. The inaugural edition of the *Woman's Journal* is a case in point: The *Journal* began publication in 1870 as the official organ of the American Woman Suffrage Association. However, the front page of the new periodical's first edition was dominated not by suffrage, but by the issue of co-education in American universities. According to one writer in the *Journal*, co-education was considered by many to be "the great problem of the age" (Woman's Place 1870: 266).

The problem was particularly newsworthy in 1870 inasmuch as it appeared to be on the verge of resolution. In the years since the Civil War, increasing numbers of colleges and universities opened their doors to women. Even the staunchest supporters of separate education of the sexes showed signs of compromise. Harvard's annual catalogue announced for the first time the names of women pupils in a post-graduate course, and the newly inaugurated president of the University admitted that the primary reasons for excluding women as full-time students related to the problem of common residence of the sexes rather than any categorical mandate. It seemed, in short, as if the "experiment of thirty-five years standing" had "long since passed the epoch of experiment," and that co-education stood at the very threshold of popular acceptance (Harvard 1870: 1).

However, over the course of the next three years, the evolving consensus underwent a profound rupture that suspended its development as a moral issue and redirected the slow accumulation of knowledge about women's education into a different field, that of medicine. This process of displacement and transformation was constituted rhetorically in scientific discourse. One work in particular, Harvard physician Edward Clarke's (1873) *Sex in Education, or, A Fair Chance for the Girls*, served as catalyst for this rupture in popular conceptions of co-education. Written for a popular audience, the book was nevertheless ostensibly a scientific work resulting from Clarke's extended clinical practice and his experience as a member of the Harvard oversight board.

First published in 1873, Clarke's book was comprised of five chapters, labeled as follows: (1). Introductory; (2). Chiefly Physiological; (3). Chiefly Clinical; (4). Co-Education; (5). The European Way. In it, Clarke admitted that women have the capacity to learn the same material as men, but argued that women lack the capacity to learn in the same manner as men: "Boys must study and work in a boy's way, and girls in a girl's way." Clarke's thesis rests on the notion that "the [human] system never does two things well at the same time" (18)" In this

instance, "two things" refer to thinking and developing a uterus. Should women persevere in their education, a host of calamities await them, including but not limited to the following: low spirits, lifelong painful menstruation, irregular menstruation, no menstruation, underdeveloped breasts and inability to breast feed, bearded masculinity, hysteria, anemia, St. Vitus' Dance, dyspepsia, neuralgia, headaches, loss of mental power, sterility, insomnia, insanity, and death (22). In short, educating women in the same fashion as men results in overwhelming physical damage.

The solution outlined by Clarke is that women should study one third less than men, and not at all during menstruation. This realistically negates the possibility of coeducation, since such an approach would require either an incompatible combination or a compromise that would yield "an average result," giving a fair chance "neither to a boy nor a girl." According to Clarke, then, "the inherent difficulty in the experiment of special and appropriate coeducation is the difficulty of adjusting in the same institution the methods of instruction to the physiological needs of each sex" (128). Perhaps the most controversial work on the limits of women's physiology ever written, Clarke's text was enormously popular, undergoing twelve printings in its first year and seventeen all told.

Such distant outposts of higher education as the University of Michigan, a co-educational institution, reported that "everyone" was reading the book: over two hundred copies were sold there in a single day (Walsh 1977: 124). References to the work can be found in a variety of documents ranging from personal correspondence and diaries to deliberative public records. The case of a woman student of the period is illustrative: M. Carey Thomas recalled that she and her fellow female students were "haunted by the clanging chains of that gloomy little specter, Dr. Edward Clarke's Sex in Education." (quoted in Walsh 1977: 124).

Nor was the book's effect limited to students. The degree to which the thesis was assimilated by the academy is demonstrated by a report of the Regents of the University of Wisconsin three years after the book was published: "Every physiologist is well aware that at stated times, nature makes a great demand upon the energies of early womanhood and that at these times great caution must be exercised lest injury be done.... Education is greatly to be desired, but it is better that the future matrons of the state should be without a University training than it should be produced at the fearful expense of ruined health; better that the future mothers of the state should be robust, hearty, healthy women, than that, by over study, they entail upon their descendants the germs of disease" (quoted in

Smith-Rosenberg & Rosenberg 1974: 341-2).

This should not be taken to imply that the book excited only positive response. A year after Clarke's publication, educator Anna C. Brackett (1874) wrote, "it is seldom that any book arouses so much criticism, and, withal, so much earnest opposition as this has provoked, and seldom the newspapers so generously open their columns to discussions so extended on the merits and demerits of any publication"; "The criticisms and the criticisms on criticisms would make already quite a volume" (368, 390).

In fact, the criticisms eventually filled at least four volumes, including Brackett's own, *The Education of American Girls*. Julia Ward Howe (1874), editor of a second volume*, Sex and Education: A Reply to Dr. E. H. Clarke's Sex in Education*, summed the thesis shared by most of the responses: "Dr. Clarke's discord exists not in nature, but in his own thought" (6). In addition to these volumes, the debate spawned any number of articles and monographs. Prominent educators and women's advocates, including Mary Bascom, Abby May, and Thomas Wentworth Higginson, responded to the issue with anecdotal evidence and observations of their own designed to counter Clarke's grim pronouncement. Dr. Mary Putnam Jacobi's essay "The Question of Rest for Women During Menstruation," winner of Harvard's Boylston Prize in 1876, was one of many scholarly attempts to gain the same end.

The historical significance of Clarke's text as flashpoint for this debate may be enough to warrant its examination; however, there is much else to recommend it to rhetorical analysis. Clarke was by no means the first physician to assert the importance of women's "special" physical nature. References to the overriding dominance of women's reproductive organs compared to all other bodily functions are common in the medical literature well before mid-century. Still, Clarke's project captured the public mind like none before it. Further, many of his most resolute opponents struggled to refute his claims. Feminist Caroline Dall wrote in her critique of *Sex in Education*: "I expected to find premises from which I should dissent, but, with the exception of that upon which the book is based [that higher education would destroy female health] I did not find any." (quoted in Rosenburg 1982: 13). That Clarke's critics should experience such difficulty in responding to what appears in retrospect to be an untenable position seems nothing less than remarkable.

3. A Confluence of Metaphors

As I hope to demonstrate, part of the effect of Clarke's (1873) work may be due to his extended and strategic use of metaphor, explicit comparisons in which one concept is likened to another or described in terms of another. There is no doubt that the text makes extensive use of these explicit metaphors. In illustration of the dictum that the "system never does two things well at the same time," it offers the analogy of one attempting to meditate on poetry and drive a saw simultaneously: "He may poetize fairly, and saw poorly; or he may saw fairly, and poetize poorly; or he may both saw and poetize indifferently" (40). The blood is compared to "the water flowing through the canals of Venice, that carries health and wealth to the portals of every house, and filth and disease from every doorway" (46). Education is like agriculture. Those who advocated coeducation ignored the differences among species: "Because a gardener has nursed an acorn till it grew into an oak, they would have him cradle a grape in the same soil and way, and make it a vine" (127-8).

In all, over seventy-five such explicit comparisons appear in the text. The metaphors deployed do not serve as reasoned support or formal proof; neither do they only function as ornamentation. Rather, they serve in a literal sense to animate particular relations among the terms of comparison, and in this manner effect a particular interpretation. I. A. Richards (1936) writes that "it is the peculiarity of meanings that they do so mind their company" (10). Metaphor achieves a semantic dynamism by way of tensions among meanings at various levels of interpretation. First, there is the tension among the constitutive terms of a particular metaphor. Consider, for example, the seemingly innocuous textual description of women's growth and development as a voyage: "the first few years that are necessary for the voyage from the first to the second period, and those from the second to the third, are justly called critical ones" (Clarke 1873: 34). "The first of these critical voyages is made during a girl's educational life, and extends over a very considerable portion of it" (35). Following Richards's description of the component parts of metaphor, we may say that "voyage" in this passage serves as a vehicle, a means for conveying an idea ancillary to the primary narrative. The tenor of the passage – the meaning provided by the combination of vehicle, "voyage" in this case, and the ostensive subject, female development – must be inferred by the reader. By a process of interinanimation, the possible meanings of each of these components are configured; by virtue of their proximity, certain shades of meaning are mobilized and others are constrained, yielding a combination unique to the particular context. In this case, I infer the salient characteristics of "voyage" to be risk, movement from one point

to another, change.

The application of these characteristics to female growth in a literal sense provides some insight: female growth is a risky process of change, a movement among stages of development. However, a deeper insight can be found by considering the telos smuggled into female development by way of this comparison. A voyage is undertaken for the sake of the destination; the "point" is to arrive, and this is the definitive character lent to the process of female development. We travel to get to some place. In the context of the metaphor, women grow to become fecund. The "point" to women's growth is becoming fertile, potential child-bearers. This metaphor lends women's existence a particular functional explanation – the reproductive capacity – and, by so doing, decenters other functions and explanations. Girls, in this light, are immature child-bearers; post-menopausal women are old, dysfunctional child-bearers.

The use of this and similar metaphors performs an especially effective rhetorical function. Metaphors instruct by combining and extending meanings with which we are already familiar in new and different ways. This collusion with accepted ideas dissipates the "newness" of metaphoric tenor and links it to the orthodox, which protects it and the larger case from attack (Ricoeur, 1975: 29). In the instance of the example at hand, the premise that women are essentially creatures of reproduction needed little protection in nineteenth-century American culture. Nevertheless, this meaning is smuggled into the "voyage" metaphor, secreted away in a process of overdetermination of meaning by the text. In a similar fashion, each explicit metaphor in the text exerts a limited or local influence over that portion of the narrative that it inhabits.

Not all metaphors deployed in the text have equal significance. In some cases, the metaphors used in the text are clearly isolated, and so less likely to elicit extended attention or interpretation by a reader. For example, on page 15, the passing textual reference to the "chains of matrimony" is unlikely to perform an especially significant rhetorical function. The reference is quite brief, the metaphoric form is subtle, and the images elicited have been so well and often used as to fail entirely to provoke associations. Rather, the juxtaposition has achieved the status of "dead" metaphor or cliché, and so may fail to perform any metaphoric function at all. In contrast, consider the extended comparison of education to agriculture that occurs on page 126: "The gardener may plant, if he choose, the lily and the rose, the oak and the vine, within the same enclosure; let

the same soil nourish them, the same air visit them, and the same sunshine warm and cheer them; still, he trains each of them with a separate art, warding from each its peculiar dangers, developing within each its peculiar powers, and teaching each to put forth to the utmost its divine and peculiar gifts of strength and beauty."

From this comparison, we might well take it that boys and girls are as dissimilar as different species of plants, overlooking the fact of the matter that they are of the same species, only different sexes. The extended attention lent to this comparison, its detail and vividness, combined with the newness of the elements in combination, results in a vivid, telling metaphor. These characteristics make it more likely that the metaphor will receive interpretive consideration and result in rhetorical effect. The reader is likely to be persuaded to consider boys and girls more different than he or she might otherwise be inclined to think.

A second level of interpretive tension is achieved by patterns of metaphoric reference. Through metaphoric repetition, a force of relations is rhetorically inscribed. Metaphors in which educators are compared to farmers, and boys and girls compared to widely dissimilar plant species occur three times in the text, and are among the most detailed and extended of all the comparisons found there. Several related metaphors, such as less-detailed references to educated women as "loaded grain before a storm," or the "fruits borne" by identical coeducation, extend and strengthen the relations that obtain in the extended garden metaphors, forming a web or complex of associations, and thus strengthening the rhetorical effect of the comparison. This pattern of references also entrenches the associations elicited, linking and securing them in a theme. Such a theme lends the strategy a certain discursive momentum that enables each successive reference to fit neatly into the growing complex of associations, facilitates assimilation, amplifies the effect, and reduces the likelihood of discord or rejection.

Clarke's text demonstrates a second pattern of metaphoric reference, this time in the object of repeated comparisons. The most frequent object of textual metaphors is the female reproductive function. A cluster of metaphors surrounds the process or reproduction generally, and the female reproductive organs in particular. In addition to the local effects on interpretation noted above, this pattern of metaphoric reference "overloads" particular concepts such as the reproductive function with metaphoric associations, and so reduces the ease of

singular interpretation. Moreover, this repeated metaphoric reference indicates to the reader that the function of reproduction is surrounded by a special mystery, an irresolvable complex of meanings, and aura of importance.

Repeated use of the same or similar vehicles in various metaphors is another type of pattern of rhetorical significance. Comparisons of the human body, and women's reproductive organs in particular, to machines and engines are especially common (Clarke 1873: 37, 38, 39, 83, 94, 131). This repeated comparison inspires a vision of humans as creatures of production, and women as producers of babies. Furthermore, simple characteristics of machines may also seem to apply to women: machines do not function autonomously, they have no feelings, they break down, but may in some cases be repaired. Machines, and by extension, women's bodies, are objects, distinct from the minds that direct them. They are also the engines of society, mechanisms of technology and advancement. Machines, particularly in the rampant industrialization of the late nineteenth century, represented progress and the future of the nation.

Women's reproductive organs are also frequently referred to as "the cradle of the race," so frequently, in fact, that what might otherwise be considered a passing cliché becomes an embedded reference, a deep-seated association of women and the responsibility of continuing the complex of American cultural and genetic elements. This association downplays alternative visions of women, such as that of women as independent agents, actors whose primary responsibility is to themselves or their immediate families. Women in this light are objects whose sole function is to nurture and protect the progeny of the race.

The pattern described by the location and frequency of metaphors in the unfolding narrative is also instructive. The introductory chapter contained ten metaphors, at a frequency of .53 per page. The second chapter, in which physiological issues were dealt with, contained 30 metaphors at a frequency of 1.03 per page. The third chapter, "chiefly clinical," relied on 20 metaphors at a frequency of .36 per page. The fourth chapter, "coeducation," contained 14 metaphors at a frequency of .33 per page. The fifth and final chapter, in which the European alternative was described, made use of only 3 metaphors, at a frequency of .16 per page.

Deployment of metaphors begins in the first chapter with a relatively high frequency, peaks in the second chapter, then tapers off thereafter. To the degree that we take metaphors to perform a rhetorical function, we may say that their rhetorical effect in the text is concentrated in what appears to be a functional

manner. In the first chapter, "Introductory," Clarke outlines his case. In the second, he describes the physiological basis of his findings, including the bodily mechanisms and functions that relate identical coeducation to women's illness. The third chapter, "Chiefly Clinical," describes a series of cases in some detail and illustrates the phenomenon to which the text bears witness. The fourth chapter, "Coeducation," distinguishes among various options for educating women, identifies logistical and other practical barriers to the appropriate education of the sexes, and lays out Clarke's recommendations in this matter. The fifth and final chapter, "The European Way," describes in detail the pastoral vision of European education, in which Clarke's admonitions take form, and by which the evils of women's illness are avoided.

We should expect, by this topical division and by Clarke's own emphases, that the greatest burden of proof should fall to Chapter 2, in which Clarke's authority and the jurisdiction of physiology are extended into the realm of women's education. In fact, this is the chapter in which the greatest number and frequency of metaphors occur. The introductory overview in which he hopes to gain initial compliance from reader has the second highest frequency. The third and fourth chapters, detailing case studies and Clarke's prescriptions, each contain a moderate number and frequency, and use of metaphor drops off sharply in the final chapter describing European educational traditions.

In addition to correlating with the text's varying logical burden of proof, the metaphors deployed correlate with the changing tone taken by the authorial voice. In the first chapter, the text is generously welcoming and personally expansive. In the second chapter, the reader is initiated into the mysteries of physiological function. It is in this section that the loftiest, awestricken tone, and the highest notes are sounded. The third chapter is largely filled with details of the lives and ills of the women who are the subject of the case studies. The tone here is one of deep, somber regret, as might befit the scene of a tragedy. The fourth chapter takes on an admonitory tone, in which the authorial voice lectures the reader in appropriate rules and guidelines of education. Finally, the last chapter engages the objective reporting voice embodied in Chapter 3 before ascending once again to the lofty abstractions found in Chapter 2. The point to my observations of tone is not to explain the incidence of one construct, metaphor, with another, tone, but rather to show a concerted movement in the text. Metaphors, like tone, form part of an orchestration of individual elements in which various rhetorical tools are brought to bear for maximum effect as needed

by the unfolding narrative. By deploying metaphors appropriate to the logic and tone of argument, the text achieves a type of rhetorical force.

Literal associations and patterns of reference do not exhaust the role of metaphor in the text. Metaphors inscribe a third level of interpretive tension. The experience of textual forms exceeds mimesis; language is not only literal, but figurative, affective. This affective impression need not rely on interpretation. Metaphors need not be "about" anything other than themselves, in the strictly denotative sense. Reading metaphors may provide a sensual pleasure derived from the simple experience of juxtaposition of concepts. In this sense, the experience of metaphor is gratuitous, self-fulfilling. Consider, for example, the text's description of the damage caused by women's forms of dress: "Corsets that embrace the waist with a tighter and steadier grip than any lover's arm, and skirts that weight the hips with heavier than maternal burdens, have often caused grievous maladies, and imposed a needless invalidism" (Clarke 1873: 25). This passage is part of a section in which the text appropriates a discursive momentum by association with the dress reform movement. The metaphor may be read literally as saying that the conventions of women's dress put a greater burden on women than do normal actions in the regular course of their lives. But this literal translation misses the richness of the metaphoric relation, the vivid, poetic connotations elicited by the thought of a lover's grasp, or the settling weight of pregnancy.

In another example, the text succinctly describes its purpose using a metaphor: "[The book's] object is to call attention to the errors of physical training that have crept into, and twined themselves about, our ways of educating girls, both in public and private schools...." (24). This reference may be literally read to say that errors have slowly and stealthily become part of the institution of American education. However, this interpretation is only part of the meaning evoked by the terms of the metaphor. The language employed draws a connotation of feral evil, even of serpentine constriction, and faintly echoes the Edenic fall from grace. These images are by no means a literal extension of the metaphor, nor in any sense a reduction of the primary form. Rather, these meanings reside at the very surface of the original composition.

Together, these examples demonstrate the erotic dimension of metaphoric reference. Although isolating the literal and figurative functions for analytic reasons may be informative, these performances work in concert in the text to achieve metaphoric effect. Hence, the text's extended use of metaphor performs a suasory function at both rational and affective levels.

4. Discussion

This case study suggests first that metaphor serves a complex role as a tactical resource for participants in scientific or quasi-scientific discourse. Three particular levels of function were identified. First, metaphors may be used locally to obtain particular conclusions. In this role, metaphor asserts conclusions by way of familiar images, making the extension seem routine and logical. Second, repeated patterns of metaphoric tenors, vehicles, and objects may be used to create redundant "waves" of implication. This redundancy can serve to overdetermine impressions on the part of the reader, and so strengthen conclusions reached in the text. Third, the presence of metaphors may provide an inherent attraction for readers insofar as the experience of metaphor can result in a sense of satisfaction.

Science has long asserted a transcendence of language by way of direct correspondence with reality, a claim disputed by rhetoricians and students of the scientific idiom during the past forty years. This study adds to a growing consensus that holds that scientific legitimacy should be considered a rhetorical device, apart from whatever other functions it may perform. Scientific legitimacy applied to lay contexts changes the interpretation of language in important ways. Among the most important of these changes concerns evidence and burden of proof. In lay contexts, we might expect an effective argument to present evidence linked by logic to some conclusion. Scientific legitimacy removes understanding of argument from the layperson by drawing on technical knowledge and esoteric connections. Far from disarming metaphor and other rhetorical devices, the use of this strategy allows for greater rhetorical effect by removing the grounds of counterargument from the common person, leaving him or her rhetorically defenseless against scientific pronouncement.

Sex in Education demonstrates the efficacy of crossing argumentative domains. Taken as a whole, the text represents a rhetorical hybrid, in which scientific data that support its case are combined with the figurative and ideological function of metaphor. Neither resource alone would suffice as utilized in the text; the case lacks scientific rigor and persuasive virtuosity in the traditional sense. But the hybrid strategy makes each resource more effective by virtue of the other's contribution. Case studies that should, by scientific standards, represent a population are transformed by way of figuration into pathos, a form of popular proof, and so escape the judgment and constraint of scientific criteria. Credibility that should ordinarily rely on the strength of pronouncement is amplified in the text by the idiom of science. By shuttling back and forth in this fashion between

esoteric and public language domains, the text constructs a powerful argument that evades counterarguments grounded solely in either domain.

A defense to this strategy cannot be found in purging science of rhetoric, because the language that constitutes science has a rhetorical "intent" entirely apart from the goals and desires of any particular author (even though, in some cases, these intentions may overlap). This rhetorical intention resides in the common language itself, and cannot be divorced from any particular articulation. Still less profit may be found in attempting to remove science from rhetoric. Technical fields of study encompass knowledge that for practical reasons is removed from the layperson, and any attempt to make every argument accessible to everyone invites certain failure. Instead, this study indicates greater comprehension of the rhetorical dimension of the interplay of science and the public domain. Simply, and not so simply, understanding the rhetorical operations that affect us, and how these operations change when conducted across discursive geography equips us with the skills needed to decipher confusion, dispel mystery, and disarm obfuscation. In this role of common denominator, rhetoric provides continuity, a link among discursive domains.

Like Darwin's *Origin of Species*, Clarke's work makes little pretense of following the hypothetico-deductive model. Rather, both texts are remarkable for their virtuosity in reframing what was previously considered "fact," and exploiting argumentative potentials of diverse discursive traditions. Both authors combined ostensive fact and the heuristic potential of literary resources, suggesting an inventional strategy common to the genre. If Clarke's work has proven far less influential than Darwin's, it may be due to the less ambitious scope of Clarke's vision, and the extended reframing of fact that followed the publication of *Sex in Education*.

This should not be taken to minimize the achievement of *Sex in Education*. The text formed an important part of an emerging bio-rhetoric, in which the discursive resources of physiology were applied in the field of women's education. This application initiated a new source of rhetorical invention, and may be said to have revolutionized the debate over women's educational access. In addition, the text serves as an illustration of both the rhetorical potential and danger represented by the ideological function of metaphor.

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