Chapter 12
From 'Motivation' to 'Constraints', from 'Discourse' to 'Modeling System': Steering Multimodal Critical Discourse Analysis Towards Cybersemiotics

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Abstract Much contemporary applied, and externally-funded research requires interdisciplinarity to tackle complex world problems for sustainable future living, especially in the sciences. However, interdisciplinarity is a more difficult approach to adopt in the humanities, as these tend to remain largely skeptical about confronting ideas, findings and methods from the sciences. In order to counteract disciplinary insulation in the humanities, this chapter will attempt to integrate ideas originally developed in the sciences into established theories in the humanities. It will do so by proposing, firstly, to substitute the multimodal notion of 'motivation' (Kress 1993) for a less anthropomorphic notion of context, conceived broadly as cybersemiotics *constraints* (Brier 2008, 2009). This reconfiguration of context allows the cultural analyst to identify the feelings-emotional, environmental, physiological, erroneous, and second-order cybernetics' observership constraints of verbal communication and culture. Secondly, this chapter will also argue that the originally mathematical idea of *modelling system*, developed in semiotics by Chernov (1988), Lotman (1967) and Sebeok (1988), and resonant of Brier's cybersemiotics, would be more appropriate for cultural analysis rather than 'discourse'. This reconfiguration of discourse into modelling system could enrich Critical Discourse Analysis (CDA), including the multimodal type, on the basis of its pragmaticist, qualia-rich and phylogenetic stance. The benefit of such integrative initiative is that a cybersemiotic-inspired analysis of discourse in culture, can produce interpretations driven by a new *polis*, one that is not so much self-obsessed with the unicity of the human-animal species, and that always situates culture and society within a wider ecosystem.

Keywords Interdisciplinarity · Motivation · Cybersemiotics constraints · Modelling system · Discourse

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12.1 Introduction

The study of culture without an awareness of its relation to nature is no longer an option in the twenty-first century (Cannizzaro 2014). For complex world problems to be tackled for sustainable future living, there ought to be a collaboration between the sciences and the humanities. In the humanities, a disciplinary insulation approach results in ignorance of key results and methods developed in the sciences. If ignorance were not enough, typically it is sometime feared that scientific ideas may bring questionable and unethical ideas into the humanities. For example, the concept of 'control', so dear to cybernetics, is almost a dangerous one to mention in cultural studies – it brings about ideas of atomic warfare and technocratic management (Wolfe 1998, p. 78), while the equally relevant idea of self-organization, also associated with control is largely ignored, or at best, separated from its origin in cybernetics. Or, another subtler but not less significant example is that in cultural studies, gender is typically seen as a construct entirely divorced from sex, hence to the entirety of a human being's physiological constitution. This conception renders experience, including experience of the self, a wholly disembodied experience. While this approach bears the practical benefits of counteracting long-standing and culturally ingrained social divides manifest in sexism and gender discrimination, it is nevertheless guilty of presenting at the very least a partial picture of the human animal self, one in which mind and body are constantly and fixedly divorced from each other. This is hardly a scientifically acceptable idea given the dynamic and complex nature of the human-animal self.

Something to consider whilst humanities ignore the sciences, is that the sciences can get on pretty well without us humanists: million dollars' mathematical problems are solved, the latest technology is developed, and its implementation is promoted on a wide scale with much economic remuneration, at least for a lucky few. But without an interest on the humanists' side for scientific endeavors, and to probe such endeavors, such new scientific developments may end up ignoring basic and fundamental aspects of what makes us human, or better, human animals – that is, happiness, sustainability, trust, meaningfulness, to name a few.

By not mixing with the sciences, often due to idealisms, the humanities are themselves guilty of not doing enough to tackle these important problems at their roots. Indeed, their disciplinary insulation becomes a cause (though to be fair, not the sole cause) of neglect on the side of the sciences. This neglect then translates into lack of funding for the so-called classical subjects, which potentially diminishes the importance of humanities amongst prospective students, a process that in the long term will make us less of a human animal. That is why we need an awareness of the sciences, and we need interdisciplinarity, and interdisciplinary enterprises like cybersemiotics in the humanities, and particularly the study of culture. This chapter will provide an indication as to how scientific endeavor and related concepts can enrich humanist understanding. It will do so by projecting the cybernetics-inflected notions of 'constraints' and 'modelling' onto the cultural studies' classical notions of 'motivation' and 'discourse'.

12.2 From Motivation to Cybersemiotic Constraints

Kress's notion of motivation (1993) takes a position on a long-standing debate in semiology on the nature of the relation between the two components of the sign, according to Saussure (1983 [1916]), the signifier and the signified. Saussure in fact argued that within the context of *la langue*, such a relation is 'arbitrary', whereas Benveniste (1970 [1949]) demonstrated that it is 'necessary'. Semiologists have typically taken a position that mediates between the two sides of the debate. For example, by means of reference to Peirce' semiotics, Fiske (1990, p. 46) explains that Saussure's followers recognized that the physical form of the sign [signifier]… and its associated mental concept [signified]… can be related in an *iconic* or *arbitrary* way. Coupled to this solution to the necessary-arbitrary linguistic debate, Kress argues against the arbitrariness of sign relations altogether in favor of necessity, which he calls 'motivation'. To do this, he brings the example of a three and a half year old child who drew seven ugly circles of different sizes on a piece of paper and said "this is a car". Kress (1993) argues that the child's drawing, taken as a sign, has been 'motivated' by the object he observed and by his context of observation, that is, "his place in the world, physically, cognitively, socially, culturally, conceptually" (p. 72). However, one could argue that understanding 'context as motivation' is not enough. In fact, when considering signs produced by the human being, one ought to remember that it is signs produced by a human animal that are being considered – hence the context of such signs must be, at least at root, of the same broad type as the context of other non-human animals – in other words, have *some* underlying overlap with it. That is why a less anthropocentric notion of context, to start with, is needed.

In this respect, the idea of 'context as motivation' is ill-conceived because it suggests that "the relations of motivation between signs and their users is supposedly subject to an act of will" (Cobley 2007, p. 51). In other words, the term 'motivation' may dangerously support "the humanist imperative in respect of signs… [which] re-casts motivation as an entirely voluntarist affair" (p. 51). Instead, as Cobley underlines, although "Althusser does suggest that humanism has its uses… he is absolutely forthright about the need for absolute anti-humanism in theoretical work" (p. 52) Hence, there emerges the necessity of substituting the anthropocentric notion of 'context as motivation', for a less anthropomorphic notion of 'context as cybersemiotic constraints'.

Cybersemiotics (Brier 2008) can be useful to frame contextual constraints, due to its links with Peirce's *realist* stance, Deely's *biological* stance and Sebeok and Danesi's *physiological* stance. Peirce's scholastic realism, as embedded in cybersemiotics, can provide a richer, anti-humanist grounding for understanding context than the voluntarist idea of motivation. Peirce's 'scholastic realism' consists in conceiving that there is a reality that is independent of animal, including the human-animal, experience of it. As he states, the sense in which the pragmaticist uses the world 'real' is "that is real which has such and such characters, whether anybody thinks to have those characters or not" (Peirce 1955b, p. 264). Indeed, "The

usefulness of some signs… consists in their being connected with the very thing they signify" (Peirce 1955a, p. 234). For Peirce, feelings provide a tight connection with reality. As he argues "so far as the sensation is a mere feeling of a particular sort, it is determined only by an inexplicable, occult power; and so far, it is not a representation, but only the *material quality* of a representation…" (Peirce 1955c, p. 238, my italics). This passage seems to suggest that emotional experience is 'qualified' by there being a world out there, hence is intrinsically connected to this world). Thus, far from being the result of free will, emotions are constrained by the reality that they reflect and whose material quality they embody.

Also, one of the contextual constraints embedded in cybersemiotics, could be usefully understood through what Deely calls 'the biological type'. According to Deely (2009), "the interaction [of two or more physical substances] partially specifies and determines the awareness of the animal (*species impressa*) semiosically to form and construct a further awareness of its own (*species expressa*) transforming the bare physical into an objective world with which the animal can and must deal according to its *biological* type" (p. 343). In other words, far from being an unconstrained act of will, meaning is always constrained by the biological embodiment and ecological situatedness of semiotic experience. Deely's reminder of the framing impact that the 'biological type' has on meaning-making, means that, for example, to 'read media texts' or to interpret the use of technology, one needs to envisage in addition to *emotion*, also *physiology* and *ecology* as the legitimate contextual constraints in which culture operates. This idea also resonates with Sebeok and Danesis's Modeling Systems Theory (2000), according to which human-animal communications are arranged over three, phylogenetically connected layers, i.e. the physiological, the linguistic and the cultural. The first layer, the Primary Modelling System, corresponds *grosso modo* to Peirce's category of firstness (Sebeok and Danesi 2000, p. 10), the feelings which provide an intrinsic connection with reality, and to Deely's *biological type*.

Such contextual constraints –the realist, the biological type, the primary modelling system, can be dubbed 'cybersemiotic' because they broadly correspond to Brier's notion of *cybersemiotic information*, a perspective which holds that an organism's individual point of view is created by "bodily interactions with environment and creation of a signification sphere" (Brier 2008, p. 392). Both notions of cybersemiotic 'information' and cybersemiotic 'constraints' could be aligned on the basis of their insistence on a contextual understanding of information that must include both the semiotic and the cybernetic aspect of modelling. However, context is here referred to 'constraint' rather than 'information' because this chapter seeks to solve a problem within the humanities rather than the sciences. As Cobley argues, the humanities, have tended to overstress agency (2010b, p. 241) and have hence been more in need of a theorization of constraints than the first person experience that Brier's 'cybersemiotic information' stresses in order to make scientific knowledge more feelings and first-person aware. In light of this elucidation, one may argue that meaning in culture, including linguistic aspects of culture, is contextualized within both semiotic and cybernetic constraints, that is (1) feelings emerging through *abduction,* (2) *environmental* constraints, and (3) *physiological* constraints,

(4) theories of *error*/distortion, to account for misled meaning-making but also by (5) a theory of the *observer* which is applicable to all these levels of constraint.

On the one hand, (1) emotions (through abduction) constrain meaning-making by means of *previous experience*. Hence one may argue that an aspect of reality becomes relevant to a living system only when the system itself has already a model of that reality stored in the form of emotion within a wider web of other emotions. For example, fossil hunters are more likely to distinguish fossil from scattered unfossiliferous rock in a geological layer when they have previously seen and touched the kind of thing they are looking for first. This previous experience forms an experiential-emotional model, which in turn becomes the *antecedent cause* or the antecedent constraint of semiotic information. On the other hand, it is also *future causes*, or emotions triggered in the present by future objectives that constitute the emotional context of information. As Kull et al. (2009) affirm, "teleological processes that are specially organized with respect to specific ends or referents are unique to living systems" (p. 168), hence teleology is a defining feature of semiosis. This view is supported by the fact that Sebeok (1979a) himself declared that "the ideal of semiotic analysis is to combine causal with functional [teleological] explanation – to show how sign form interrelates dynamically with sign function" (p. 13).

This contextual constraint of meaning-making could be related to two notions in cybersemiotics: Firstness, which constitutes Level 1 of cybersemiotics' unitary philosophical framework for all sciences (Brier 2008), and also the second 'leg' of the cybersemiotic star (Brier 2009), that of the inner world of emotions. Derived from Peirce, firstness is a primary chaotic level of continuity that includes quality, pure feelings with the tendency to take habits and thus potentiality of systems emergence (Brier 2008, p. 389). Here, the Peircean-inspired cybersemiotics' idea that randomness and chaos precede lawfulness, or the emergence of systems, is relevant: "If chaos is basic, one cannot explain it with the absence of law, because chance or randomness precede law. Thus one must rather explain law from randomness, not the reverse. Chaos, chance and randomness must therefore be understood not only as emptiness but also as fullness, as hypercomplex dynamic processes that include characteristics of mind, matter and life" (Brier 2008, p. 200).

Also, the emotional context could be related to the second leg of the cybersemiotic star. This levels amounts to "the inner world of emotions, will, drives, affects and thoughts, manifested as mind and consciousness" (Brier 2009, p. 56). In addition, in order to account for both feelings (firstness) and emotional constraints (the inner world of emotions) one needs to also take into account second order cybernetic theory of the observer, and thus the idea that feelings and emotions may be present in both the *observed* system and the *observing* system. A personal worldview would also be constrained by (2) environmental framing, the realist stance of context. Simply put, one cannot form a model of something if there is not a 'something', or, as Brier puts it, 'The entire idea of perception will collapse if we do not attribute some independent reality to "things"'(Brier 2008, p. 185). How can a system perceive, emerge, and thrive if a world is lost? This type of context can be related to Secondness, a causal level of matter which includes atoms, molecules, energy, forces (Brier 2008, p. 389). Mapped onto the cybersemiotic star, this type of

context could amount to the third 'leg' of the star, the physico-chemical informational environment of the natural world (Brier 2009, p. 56).

Also, meaning-making is constrained by physiological availability (3). One may argue that when Sebeok (1991a [1988]) brought to the forefront Jakob von Uexküll's concept of *Umwelt* or sensorial world, he wanted to underline the fundamental role that sensorial framing, or the inner anatomical structure of the species itself plus the kind of innate modeling capability it possesses, has in shaping the organism's personal world view. Indeed, Sebeok was also aware that sensorial framing does not just apply to the observed system, but also to the observing system (1979b), hence both environmental and physiological framing may need to be included due to the constraints of the context of observation. Physiological constraints then can be related to the first 'leg' of the cybersemiotics star, with "body-hood as the source of life, which we share with other living species (Brier 2009, p. 56).

Physiological availability can also be read through Nedergaard Thomsen's (this volume), idea of biological contextual background. This includes the capacities to behave, to act and interact. Elaborating further on these capacities, Nedergaard Thomsen explains that the biology of communication includes its phylogenetic and ontogenetic aspects, that is, the evolution and development of the language faculty as well as the physiology of speech as a sensory-motor phenomenon (2011). This includes the physiological level of the vocal production and auditive perception of speech, as well as the capacity for coordination of coordination of behavior. This latter capacity can be related to *autopoiesis*, the organisms' capacity to "transform matter into themselves in a manner such that the product of their operation is their own organisation" (Maturana and Varela 1980, p. 82). As Nedergaard Thomsen (2011) reminds us, *Cybersemiotics*, makes it clear that biological systems are autopoietic, hence autopoiesis is a key aspect of the physiological context of communication.

Additionally, there is a fourth constraint to take in consideration, that is (4) the role of error, which may occur when interactions between knowledge arising from feelings and emotions, physiology, environment and mind, are and/or feel indeed misaligned. Through his concept of 'object', Deely (2006) reminds us that our view of the world may be objective (known) but deviant from a physical situation (the 'thing', which is independent from our perception of it) rather than coincident with it and in so doing he hints at the role of error in signification. Error "may help to make the third factor [the interpretant] evident, but removal of error does not at all take the third factor away" (p. 45). The proof is that an organism is still capable of building a picture of reality that 'makes sense' even when this is not accurate. It has to be remembered here that 'error' does not necessarily have, although it does not exclude, a negative valence, as it often constitutes the basis for learning. In fact, as essay-marking experience commonly shows, students aware of their own disabilities and that are likely to put three times the effort into their coursework than their able classmates, end up performing better than most of their classmates. Thus, 'error' needs to be considered on the basis of both its disabling and enabling capability, which, to a large extent, may be considered as two sides of the same coin and as the root to creative problem-solving, adaptation and personal as well as cultural

growth. Valuable theories of error that account for constraints in meaning-making have been proposed by Wilden (1980), Serres (1982), and Sebeok (1991b). But, specific theories of error too, especially within the context of sensory disabilities as these may shed light on the working modes of sensorial framing in general and how this sustains the interpretation of culture.

Lastly, meaning-making in culture cannot ignore Second Order Cybernetics' (von Foerster 1973; Maturana and Varela 1980; Luhmann 1986) explicit efforts to insert (5) a theory of the observer within any theory of observation, thus within science in general. As Brier (2008) states, "we must (…) acknowledge that we are observers co-existing in language with other humans in culture and society" (p. 119). As Cobley (2010a) notes in fact, "the future of research in the sphere of biosemiotics will be enhanced by a greater understanding of 'observership'" (p. 2045). Hence all levels of the contextual constraints to meaning in culture and language, including the feelings-emotional, environmental-physiological and error-based constraints, have to also be envisaged within the context of observership.

12.3 Discourse and Jamesian Subjectivist Pragmatism

The second notion that is frequently used in the humanities and that would benefit from an interdisciplinary reframing, or at least, contextualization, is 'discourse'. Here, I will not question the use and purposefulness of the notion, but I will simply outline some of the implications for theoretical soundness and for analysis, of the linguistic bias with which the notion of 'discourse' is endowed with. As Cobley has outlined (2006), since the example set by Barthes in *Mythologies* (1957), cultural studies, and particularly media studies have strongly suffered from glottocentrism. That is because analyses of culture have very often been performed on the principle of Saussurean linguistics. This trend upholding the centrality of language in determining human systems of ideas, values and knowledge, can be traced back to the work of Benjamin L. Whorf (1956) and to the 'linguistic turn' in social thought which was inaugurated by Richard Rorty's 1967 collection (Cobley 2007, p. 45). The linguistic turn gave rise to the idea that knowledge is "constructed in discourse" (Cobley 2016, p. 18). Then, discourse studies, along with semiology, thrived in the humanities in established disciplines such as linguistics (Cobley 2016, p. 19), cultural studies, and particularly education (see for example the review of discourse studies in education by Rogers et al. 2005). Analyses of culture carried out within the broad spectrum of discourse have been labeled with the term Critical Discourse Analysis. (CDA).

CDA is an expression that appears to have first been used by Fairclough in an article published in 1985 (Fairclough in Breeze 2011), but was popularised by Fairclough's influential book *Language and Power* (1989) and developed by Wodak (1996) and van Dijk (1997). Today, CDA is widely practiced in cultural studies in Australia and Europe. There are different schools of CDA, but essentially the common purpose that all CDA analysts share is that of de-mystifying ideologies (Wodak

and Meyer 2009, p. 3). The focus of CDA is thus on investigating the role of discourse in the (re)production and challenge of dominance (van Dijk 1993, p. 249), and on the dynamic functions of (social, cultural, situative, cognitive) *contexts of language use* (my emphasis) (Wodak and Meyer 2009, p. 2). As evinced by the emphasis on 'context of use', the grounding of CDA is in pragmatism. It therefore could potentially fit with cybersemiotics' pragmaticist semiotic foundation, were it not for the fact that CDA lacks a realist philosophical foundation, as I will argue below.

That the grounding of CDA is in pragmatism, is clearly declared by Wodak and Meyer (2009, p. 2) when they state that the roots of CDA are in linguistics and pragmatics, amongst the other things. The pragmatic tradition I am referring to here, is the branch of linguistics developed in the last 60 or so years, partly from Austin, Searle and Grice, which developed into such forms as 'relevance theory' (e.g. Sperber and Wilson 1995). However, pragmatism also developed separately as a philosophical tradition through the work of William James and Charles S. Peirce. The two aforementioned traditions, that is, the linguistic 'pragmatic' tradition *and* philosophical pragmatism, have been developed by different scholars and thinkers in different domains. However, they both centre on the study of 'what works' in a general system of knowledge, and on how this is determined. However, given that Rorty, the linguist, was a follower of William James (Rescher 1995), the philosopher, the study of context of use in linguistics seems to have leaned on James' subjectivist pragmatic philosophy rather than Peirce's realist one.[1] For example, let's consider Rojo and van Dijk's (1997) view on that: "Discourses produce knowledge. They present specific versions of reality, formulate characteristics of social actors and groups and thus sustain and reinforce ideologies and social values. However, as with people, not all discourses are equal. Some are dominant or legitimate, others are not or are less" (p. 561).

This view focuses on dominance and the legitimacy of knowledge and realities produced in discourse, but eschews any discussion of the objectivity, truthfulness or realism of such knowledge within a context of what actually works. That is because the pragmatic approach embedded in CDA appears to be fundamentally grounded in a Jamesian or subjective pragmatism rather than in a Peircean realist pragmatism (Rescher 1995). In fact, the former focuses on 'What works for X' in proving efficient and effective for the realization of a particular person's (or group's) wishes and desires, whereas the latter focuses on 'What works impersonally' (Rescher 1995, p. 7127). It is for this reason, and the idea of a concept of truth that can only be sustained in a realism, that Peirce himself renames his pragmatic approach as 'pragmaticism' (Peirce 1955c [1906]). In this respect, Cobley affirms how the nominalism of the 'linguistic turn' is at odds with the Peircean realist perspective in biosemiotics (Cobley 2016, p. 18), and the realist perspective embedded in cybersemiotics too, as outlined above. Therefore, the discourse scholars have reduced

[1] Here I am avoiding to refer to Peirce's as an *objectivist* pragmatism, as Rescher (1995) called it, because I uphold the notion of objectivity only in the sense intended by Deely i.e. as purely objective reality (2009), as mentioned in the previous sections above.

culture to discourse *viz* the idea that the world is "constructed in discourse". This reductionist approach is not unlike that of Barthes-inspired semiologists (Barthes 1957; Goffman 1979; Schrøder and Vestergaard 1985; Williamson 2002) which reduced culture to myths, representations and false realities, in their intent to uncover the power relations subsumed in cultural texts. The lack of a fundamentally realist perspective in CDA, then, is its key philosophical shortcoming.

12.4 CDA and the Information-Transmission Model

Another reason why cybersemiotics' pragmatism differs from CDA's pragmatic tradition is the latter's reliance on a transmission model of information. There are to date a number of critiques of CDA (for example Cobb 1994; Slembrouck 2001; Haig 2004; Tyrwhitt-Drake 2005; Rogers et al. 2005; Breeze 2011). These have not been explicitly carried out from a semiotic perspective, but they often approach semiotic endeavors and as such could be enriched and supported by a biosemiotic and cybersemiotic contextualization. For example, Breeze (2011) outlines how CDA leans on a seriously dated "transmission model of hermeneutics whereby linguistic forms "convey" or 'construct' meaning" (p. 510). Indeed, she argues that "it is possible to maintain that language use determines cognition" (p. 508) but "it is unreasonable to assume a one-way influence from discourse to thought, and methodologically unsound to operate as though the existence of such an influence were unproblematic" (p. 509). Despite being so ill-conceived, this on one-way influence from discourse to thought is explicit, for example, in van Dijk's (1993) statement according to which "Metaphorically they [discourses] may be seen as cognitive programs or operating systems that organize and monitor the social attitudes of groups and members" (p. 258). Instead, if one was to conceive information as consisting of several layers or constraints, then it is easy to see that discursive information is not something that can be simply transmitted. So, if the cognitive program metaphor is useful from a purely practical perspective to outline the structural inequalities represented in media texts, why not substituting it with an organismic metaphor, as that subsumed in cybersemiotics? Here information arises out of a complex web of cybersemiotic constraints as outlined above, where human-environmental systems are open, where control is *not* exercised by a single central program, and where self-organization is contemplated in its organizational tendencies.

In fact, the obvious consequence of envisaging discourse as a program, and communication as an act of transmission, is the theorization of a problematic naïve recipient. According to van Dijk (1997, p. 4), CDA's whole point should be to provide insights into structures, strategies or other properties of discourse that could not readily be given by *naïve recipients* (my emphasis). The problem with this expression, in addition to underling its reliance on a transmission model of communication and information, is that it essentially envisages a dumb reader and a clever analyst; if what distinguishes the reader and the analyst is the access to

method and theory, and if the analyst is indeed in a privileged position to make sense of discourse, then CDA analysis "runs the risk of losing sight of whatever spontaneously productive 'hermeneutics' there already are in the lifeworlds" (Rabinow in Slembrouck 2001, p. 42 and Breeze 2011, p. 511). The consequence of this assumption is the missing out on a lot of what makes up interpretation, on what the participants actually think, or feel, on what is dynamically happening in and through a text. In other words, CDA risks equating spontaneity with naivety, in itself an ideological view that stresses the supremacy of reason over those automatic, non and pre-linguistic processes we cannot easily control, upon which emotions are built. Cybersemiotics instead gives serious consideration to this layer of communication, for example by bringing to us Reventlow's ethological notion of *rependium* (cited in Brier 2008, p. 167), defined by Brier as an act of insight which brings about structural changes in the animal's behavior. There is no 'rependium', or even a broad conception of *qualia*, accounted for in the idea of naïve recipient, or that of discourse as a monitoring program. On the other hand, cybersemiotics' emphasis on the qualia aspect of information stresses the key role of feelings in constituting information, including the information that make up discourse!

12.5 Discourse as a Modeling System

Furthermore, Breeze explains how CDA has a specific interest in the way *language* contributes to, perpetuates and reveals the workings of ideology and power in society (2011, p. 495). Also, CDA is said to emphasize the relationship between language (text, discourse) and power (political struggle, inequality, dominance) (Weiss and Wodak 2002, Breeze 2011, p. 495). The emphasis here is on the link between language and power, not communication and power. Breeze (2011, p. 502) also outlines the traditional three-level framework used in CDA: language operates on an ideational level (construction and representation of experience in the world), a relational level (enactment of social relations) and a textual level (production of texts). In both instanced, it is evident that CDA misses to situate ideology, power and language within a more complete model of communication. In fact, the lack of reference to the reality-reflective level of language – is being framed by our biological type - is rather striking. That is because language, as outlined by Sebeok (1988), is a species-specific trait of Homo sapiens. Hence the reference to the traditional three-level framework used in CDA could include a reflective level in which language is intertwined with the biological history of communication, that is, its evolutionary function. This would amount to a model of culture that conceives language –intended as externalized verbal communication – as a subset of the human animal's broad communication capabilities, and not as the main set (Sebeok and Danesi 2000).

The omission of the reflective level of communication and of its adaptive function denotes a lack of interest in clarifying theoretical premises of language, and is perhaps unsurprising: Rogers et al. (2005, p. 377) found in a review of 39 articles

using CDA in education, that more than a quarter did not address language theory at all. So, despite the fact that CDA scholars do intend to capture non and pre-linguistic signs in their analyses, e.g. the study of action and interaction, or gestures, images, the internet and multimedia (Wodak and Meyer 2009, p. 2), they fail to acknowledge the bigger picture when it comes to theoretically situating language within a broader communication framework. As such, CDA scholars reduce the entirety of the evolutionary communication repertoire available to the human animal to its linguistic capabilities. This means that discourse analysis, much like semiological analysis (Cobley 2007), is carried out on the principles of linguistics even when it seeks to analyze non and pre-linguistic communication. This flaw vitiates any claim made as to the scientific validity of critical discourse analyses of culture.

To a similar extent, this critique can be moved to multimodal discourse analysis. As the proponent of a form of analysis of culture which takes into account modes of communication that are not solely verbal, Kress and van Leeuwen (2006) proposed a 'multimodal' analysis that can unlock the "grammar of visual design" and "encompass oil painting as well as magazine layout, the comic strip as well as the scientific diagram" (p. 3). However, a linguistic metaphor remains the basis of their multimodal approach, and of further approaches integrating multimodality with discourse analysis (Fairclough 1989; Wodak 2001) to create multimodal discourse analysis (e.g. O′ Halloran 2004; Jones 2012; Machin and van Leeuwen 2016). Despite the efforts to account for nonverbal form of communications in cultural analysis, linguistic metaphors as 'grammar' and 'discourse' remain the core of the analytical toolkit, maintaining such approaches glottocentric at their very roots.

Cybersemiotics can offer an alternative viewpoint to the study of discourse in culture, because its inclusion of the biological aspect of communication as outlined in the cybersemiotics star, can support an evolutionary view of culture as a whole. Overall, an alternative approach to the nominalist, anthropocentric and computational model of culture outlined so far, would posit culture as communication, and discourse - seen as a specific instance of culture - as a specific type of *modeling system*, one describing power relations. Originally a mathematical term (Chernov 1988), the notion of modelling system was developed in the work of Lotman (1967, 1990) and Zaliznajak et al. (1977), both of whom had close links with cybernetics (Cannizzaro 2014). The notion of 'modeling system' brings about the *structural* aspect of signification, that is, that the activity of producing forms (modeling), that relies on *patterns* of production that can cut across nature and culture (hence the transdisciplinary aspect of modeling). Because these patterns possess a 'structure', they can be considered 'systems' (i.e. a set of elements and their relations) or more specifically, 'modeling systems', identified by Lotman as "The structure of elements and of rules for combining them that is in a state of fixed analogy to the entire sphere of an object of knowledge […]" (Lotman in Sebeok 1991a, p. 50).

For Lotman, the functioning of Primary (speech) and Secondary Modeling systems (arts, literature, culture) is embedded in the 'semiosphere' (Lotman 1967, 1990). Lotman formulated the semiosphere as a model to describe culture synchronically but also historically. The semiosphere investigates not just how information is transmitted through culture, but how new information is generated through

it and how information is preserved in collective cultural memory (Lotman 2001 [1990]: 2). Sebeok recognized the fundamental contribution that Lotman and Soviet scholars brought to semiotics with their emphasis on modeling, which implies a necessary concept of space, history and innovation through translation, and their emphasis on the derivational character of culture in relation to verbal communication. However, Sebeok developed this extentionality notion further by emphasizing *the derivational character of verbal communication from nonverbal communication*, two levels which Lotman and other 'Soviet semioticians' at the time, had collapsed into a single modelling system, the 'primary modelling system'. Clearly disentangling primary modelling system from secondary modelling system, Sebeok posited that primary modelling includes only externalized nonverbal signs, and excludes externalized linguistic signs, even while it harbours their potential. Secondary modelling system instead included systems of externalized, verbal signs or speech (Sebeok 1988). It is with Danesi that Sebeok adds a tertiary modeling system to the framework – that of cultural superstructures (Sebeok and Danesi 2000).

Sebeok and Danesi's Modeling Systems Theory (2000) in fact propose an extensionality principle which suggests that modeling systems are phylogenetically connected to each other, i.e. the primary modeling system (nonverbal communication plus a sophisticated capacity for cognitive differentiation) is the precondition for secondary modeling system, whereas this latter (verbal communication) is the precondition for the tertiary modeling system (cultural communication, and discourse). As mentioned earlier, critical discourse analysts usually lack a valid theorization of language and possesses no valid notion of nonverbal communication, yet much in a Modeling Systems Theory fashion, one of their aims is to provide thick historical-contextual descriptions of discourses; only, within the framework of Modeling Systems Theory, the history of man's discourse would be set against the history of life, alas, evolution!

Together with Sebeok and Danesi's Modeling Systems Theory (2000), Brier's cybersemiotic model of communication also constitutes an important step for a non-anthropocentric vision of human communication, culture and discourse. Brier in fact defines cybersemiotics as a 'development of biosemiotics achieved by combining the latter with, among other things, Niklas Luhmann's work (Brier 2008, p. 392). As he explains, the three levels that Luhmann envisages – biological, psychological, social - are interconnected and do interpenetrate – that is, use each other as environments and form mutual structural couplings, thus accounting for both semiotics and cybernetics' insights. Brier (2008, p. 393) acknowledges the need to conceive the interpenetration between the biological, psychic and social autopoietic systems as the *signification sphere* that surrounds the organism. Such a sphere is traversed by communications. Here Brier, much like Sebeok (1988) and Sebeok and Danesi (2000), is clearly echoing Lotman's notion of semiosphere, and particularly its structural, developmental, functional, hence fundamentally pragmatic character.

Brier's underlining of Luhmann's concept of interpenetration among biological, psychological, social levels is useful theoretical evidence, which in addition to Modeling Systems Theory's insight, supports an overall evolutionary view of culture. That is because integrating Luhmann's concept of interpenetration across

biological, psychological and social systems within a biosemiotics terminology allows for a more comprehensive categorization classification system. This view holds that when one envisages studying the human, one will necessarily confront the biological. The same point can be made in respect of the critique of CDA from *within* CDA. As Breeze explains, those carrying out CDA analysis are expected to clarify their own political inclinations and bias, before providing their interpretation of the text. Traditionally left-leaning, however, such interpretations "might equally be challenged from the right, or from any other political dimension that might exist" (Breeze 2011, p. 501). CDA, then, including multimodal CDA (e.g. O'Halloran 2004) would be enriched by interpretations driven by a new *polis*, and particularly, one that is not so much self-obsessed with the unicity of the human-animal species. A new *polis*, would also situate culture and society within a wider ecosystem, where this latter expression is not used as a mere metaphor as in much of cultural studies. As Cannizzaro and Cobley (2015, p. 220) stated, "biosemiotics has a bigger fish to fry than traditional political approaches that signal the tyrannies of language". The same point can made about cybersemiotics, which by bringing about realism, phylogeny, and *qualia* in discourse studies, offers an opportunity to completely recapitulate the politics of critical and multimodal discourse analysis.

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