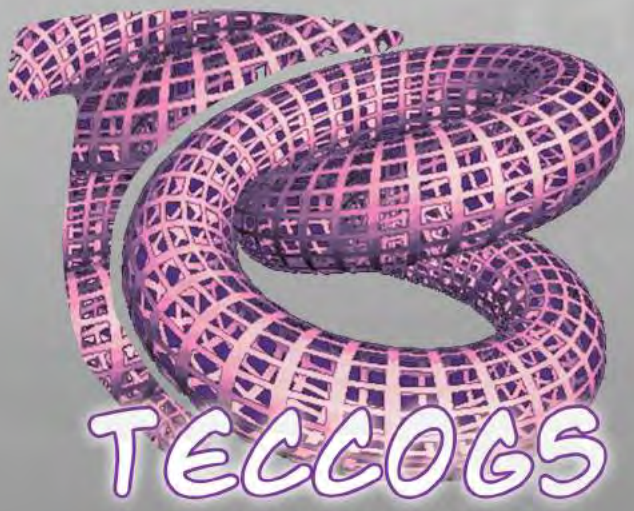
PONTIFÍCIA UNIVERSIDADE CATÓLICA DE SÃO PAULO
Programa de Pós-Graduação em Tecnologias da Inteligência e Design Digital

Aprendizagem, Interdisciplinaridade e Ação Criativa

linha de pesquisa: Aprendizagem e Semiótica Cognitiva



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O número 4 da Revista Digital de Tecnologias Cognitivas (TECCCOGS), do Programa de Pós-Graduação em Tecnologias da Inteligência e Design Digital (TIDD), da Pontifícia Universidade Católica de São Paulo (PUC/SP), apresenta um conjunto de artigos, resenhas, entrevistas, dossiês, relacionado à linha de pesquisa "*Aprendizagem e Semiótica Cognitiva*" com a temática direcionada à *Aprendizagem, Interdisciplinaridade e Ação Criativa*. Pesquisadores de áreas diversas, semiótica, ciências cognitivas, lingüística, literatura, teatro, dança se propõem a observar objetos criativamente.

A Semiótica Cognitiva se desenvolve nas tradições européias e americanas a partir de reflexões realizadas pelas Ciências da Cognição (*Cognitive Sciences*) e pela Semiótica (*Semiotics*) no desenvolvimento de estudos evolutivos dos significados, da mente, da arte, da aprendizagem etc. No Brasil, os estudos das Ciências Cognitivas e das Semióticas é tendência desenvolvida por Centros de Estudos em universidades estaduais, federais, e em algumas universidades privadas. A própria expressão Semiótica Cognitiva tem sido utilizada recentemente por pesquisadores brasileiros. A Semiótica Cognitiva nasce interdisciplinar com a integração de teorias e de métodos desenvolvidos no escopo das Semióticas e das Ciências Cognitivas, ação que possibilita a experimentação de idéias sob ângulos diferenciados para a geração de significação e da descoberta de modos de aprendizagem.

Atualmente, os estudos realizados por pesquisadores de ambas as áreas convergem para um recorrente uso do conceito de "*agency*", de "*kinaesthesia*", de abdução, de artefatos culturais complexos enquanto mediadores epistêmicos (ver MAGNANI, L., 2001) no incremento de habilidades cognitivas (atenção, memória etc.), de consciência, de teatralidade e externalismo, de intencionalidade, de *qualia* relacionado aos níveis baixos e altos de integração material no desenvolvimento da linguagem, bem como, do "*self*" para os estudos da aquisição de linguagem. A pesquisa contemporânea no escopo das Ciências Cognitivas é, dentre outras tendências, afeita à investigação de experiências perceptivas e das experimentações com a estrutura intersubjetiva intencional.

Noutras palavras, a investigação do pensamento em ato, do processo de criação, e da ação de se tomar consciência desse processo de fazimento são enfoques que oferecem resultados interessantes e instigantes ao teor e potencial criativo na

aprendizagem com o objeto, aberto em referências. Essa experiência perceptiva é enriquecida pelo olhar e reação de um outro, sua audiência, por exemplo. O dar atenção e atrair a atenção do outro atuam como um movimento cujos elementos irão integrar e modificar indissoluvelmente o próprio processo. Não por acaso, um dos sentidos de "*agency*" é o de uma consciência implícita pela qual um corpo se faz em relação funcional com quem está fazendo alguma ação, ou seja, indivíduos como os instigadores do movimento intencional em contínua interação, fundamento para formação intersubjetiva.

O conjunto de artigos dessa edição compõe leituras díspares e, mesmo assim, complementares ao entendimento de como está sendo edificado o campo de saber denominado de Semiótica Cognitiva. Os pesquisadores Ana Margarida Abrantes, da Universidade Católica Portuguesa, e Per Aage Brandt, do Case Western Reserve University, apresentam artigos mais teóricos sob embasamento linguístico e semiótico-cognitivo da auto-referência e da referência intersubjetiva. De outro modo, John Lutterbie, do Department of Theatre Arts, Stony Brook University, apresenta uma leitura da transição da fala/discurso gestual ao gesto teatral com breve estudo de caso da peça "*The Grapes of Wrath",* sob a base conceitual da Teoria dos Sistemas Dinâmicos junto aos princípios da Semiótica Cognitiva. Os pesquisadores João Queiroz e Daniella Aguiar, da Pós-Graduação em Literatura Comparada e em Comunicação, de Juiz de Fora, focalizam a geração de paisagens semióticas por artefatos cognitivos aliado à análise de técnicas de dança, apoio das bases sígnicas da Semiótica de C. S. Peirce e da cognição distribuída e estrutura de mediação de E. Hutchins.

A pesquisadora Ana Margarida Abrantes, do Centro de Estudos de Comunicação e Cultura, da Universidade Católica Portuguesa, Lisboa, propõe em seu artigo "*Consciousness and self in language. A view from cognitive semiotics*" estabelecer relações entre a idéia de consciência e a experiência de um "*eu*" na formação da intersubjetividade, com apoio na abordagem linguística da análise semiótico-cognitiva da auto-referência e da referência intersubjetiva. As palavras que se destacam são: agente ou sujeito, linguagem e teatralidade lidas por esse prisma da Semiótica Cognitiva. Enquanto experiência em ato, a experiência subjetiva é mediada e reportada pela linguagem e o objeto de referência captado é transformado conforme os pontos de vista de um interlocutor. A consciência será, então, entendida no sentido de experiência subjetiva. A representação lingüística do "*eu*" (*self*) é uma abordagem

alternativa embasada na diferenciação e projeção entre o agente social e o sujeito da consciência, um "*eu contingente*" na manifestação teatral, interagindo com objetos de referência em movimento sobre um palco mental.

O pesquisador Per Aage Brandt, do Case Western Reserve University, Cleveland, desenvolve no artigo "*The mental architecture of meaning. A view from cognitive semiotics*" uma proposta de pensar o conteúdo mental enquanto sinônimo de significado, sob integração material dos níveis mais baixos aos mais altos ("*lower to higher levels*"). As palavras que se destacam são: iconicidade e *qualia*, simbolicidade, integração semântica e arquitetura mental lidas por esse prisma da Semiótica Cognitiva. Per Brandt tem publicado muitos livros sobre Semiótica, Linguística, e suas relações culturais, além de ser um dos fundadores do *Center for Semiotics at the University of Aarhus*, portanto, no artigo, o autor retrata as camadas arquitetônicas formadas por ligações transversais sígnicas, ou fundamentos semióticos cognitivos, o que direciona à concepção de evolução no reino dos fenômenos culturais, da comunicação, e no da semiose da linguagem e do pensamento. Signos são entendidos como entidades estruturais ou funções semióticas e enquanto integração narrativa é o resultado da experiência do entendimento, denominado nível complexo de consciência.

John Lutterbie, do Department of Theatre Arts, Stony Brook University, New York, propõe em seu artigo "*Transforming gesture to sign in the theatre*" investigar a transição da fala/discurso gestual ao gesto teatral, sob a base conceitual da Teoria dos Sistemas Dinâmicos, a fim de acompanhar a transformação de um gesto espontâneo em um ato complexo, intencional e comunicativo. Apóia-se também na definição do gesto como parte integrante do discurso e cuja função fundamental é a organização do pensamento em linguagem, conforme ênfase dada às idéias de David McNeill e de Susan Goldin-Meadow. As palavras que se destacam são: gesto, linguagem, signos, encenação e teatralidade lidas pela Teoria dos Sistemas Dinâmicos e pela Semiótica Cognitiva, a fim de investigar as idéias de subjetividade e de encenação para compor uma "*General Theory of Acting*".

Os pesquisadores João Queiroz e Daniella Aguiar, da Pós-Graduação em Literatura Comparada e em Comunicação, Juiz de Fora, trazem o artigo "*Artefatos cognitivos e técnica de dança*" com a proposta epistêmica e interdisciplinar de diálogo e integração do conceito de artefatos cognitivos, embasados na definição de E. Hutchins,

ao de signo da Semiótica de C. S. Peirce (icônico, indicial e simbólico) para análise das técnicas de dança. As técnicas de dança são entendidas como artefatos cognitivos na estruturação de paisagens semióticas variadas e ligadas a diferentes níveis de artefatos materiais para a geração de estratégias criativas de manipulação de signos. Os autores trabalham a hipótese de que os artefatos atuam semioticamente sobre seus usuários e estruturam paisagens semióticas.

O número 4 da Revista TECCOGS conta com entrevistas, diálogo interdisciplinar, a pesquisadores representantes de dois grandes centros de estudos em Semiótica Cognitiva e Ciências Cognitivas: o Case Western Reserve University, de Cleveland, e o Centro da Universidade Estadual Paulista Júlio de Mesquita Filho, de Marilia. Per Aage Brandt é editor do *Cognitive Semiotics, Multidisciplinary Journal on Meaning and Mind*. Eunice Quilici Gonzalez é Livre Docente em Teoria do Conhecimento e Doutora em *Cognitive Science Language and Linguistics*. Em Marília, desenvolve a Linha de Pesquisa: Ciência Cognitiva, Filosofia da Mente e Semiótica com projeto sobre o processo de auto-organização na aquisição do conhecimento. Lauro F. Barbosa da Silveira é Doutor em Filosofia Linha de Pesquisa: Ciência Cognitiva, Filosofia da Mente e Semiótica com projeto sobre interpretação semiótica dos processos relacionados com a vida. Ambos dois pesquisadores colaboram com uma entrevista *sui generis* a quatro mãos e muitas idéias rumo à definição e ao crescimento das pesquisas em Semiótica Cognitiva.

As resenhas pontuais de Maria Ogécia Drigo sobre o livro *Imagem: cognição, semiótica, mídia,* de Lucia Santaella e Winfried Nöth; de Maria de Lourdes Bacha com o livro *Peirce's Theory of Signs*, de T. Short; e o de Maria Amélia de Carvalho sobre o livro *Topologia da ação mental - introdução à teoria da mente*, de Ana Maria Guimarães Jorge, apresentam uma gama das investigações sobre temas da Semiótica Cognitiva nos Estados Unidos e no Brasil.

Ao fim, este editorial se abre a reflexões e diálogos pelos instrumentos da Rede TECCOGS e envia agradecimentos à Profª Drª Lúcia Santaella, coordenadora do PPG TIDD, ao Prof. Dr. Sérgio Basbaum, docente e pesquisador do PPG TIDD, à Profª Drª Lucila Pesce, docente da UNIFESP-SP, membros da diretoria científica da Revista TECCOGS; à Profª Drª Cândida Almeida, diretoria executiva e *web designer* da revista. Agradecimento especial à Profª Lúcia Santaella pelo convite que me foi feito para

encaminhar esta edição da TECCOGS. Experimentação de equilíbrio sobre os ombros de gigantes...

Se "*toda linha reta é o arco de um círculo infinito*", como filosofa o poeta Jorge Luis Borges, que deixa de ser círculo e se põe somente a se fazer curvo, trajetórias de movimentos possíveis, há de se pensar nos desenhos dialógicos que hão de advir de investigações interdisciplinares cuja ação criativa é o próprio elemento de observação no ato de se fazer sob teste de linguagens e continua aprendizagem!

Profª Drª Ana Maria Guimarães Jorge

Mestrado e Doutorado em Comunicação e Semiótica pela PUC-SP, Artes e Tecnologia da Informação. Professora titular doutora da Fundação Armando Álvares Penteado (FAAP-SP). De 2007 a dezembro de 2010, é Líder e Diretora Executiva do Centro Internacional de Estudos Peirceanos (CIEP-SP, PUC-SP); coordenadora do Grupo de Pesquisas em Semiótica Cognitiva e Filosofia da Arte, do CIEP. Em 2009, Pós-Doutorado na Indiana University, School Liberal of Arts, Institute for American Thought, em Indianapolis (USA). Em 2010, é assessora científica da FAPESP.

http://filomente.com.br/index2.html

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ARTIGOS

DOSSIÊ

RESENHAS

ENTREVISTAS

CONSCIOUSNESS AND SELF IN LANGUAGE. A VIEW FROM COGNITIVE SEMIOTICS[1]

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Wichtig wohl ist de Kunst und schwer, sich selbst zu bewahren,
Aber schwieriger ist diese: sich selbst zu entfliehen.
J. W. Goethe

Ana Margarida Abrantes studied German and English at the Universities of Aveiro, Essen and Innsbruck. She completed her MA in cognitive linguistics and received her PhD in German language and literature from the Catholic University of Portugal in 2008. As a post-doc scholar supported by the Portuguese research foundation FCT, she was a visiting researcher at the Department of Cognitive Science of Case Western Reserve University (USA) between 2007 and 2009. She is currently senior researcher at the Center for Communication and Culture at the Catholic University of Portugal in Lisbon. Her research interests include cognitive literary studies, cognitive semiotics, cognitive culture studies and German language and literature.

Abstract

Consciousness is a subjective experience. To science it matters little whether there is an agent behind conscious experience – things like holding a belief, making a decision, remembering a person, attend to an object, act in a situation –; science (in this case neuroscience) is instead concerned with describing what processes in the brain are responsible for that experience. And yet we believe that we are agents of these experiences, that they are not the mechanical outcome of a series of such causal processes. This belief underlies and gives meaning to our individual existence and it is foundational to various aspects of social reality.

When studying cognition and mental life, we cannot do without subjective experience. It may not be observable as its neural substrate is, but it is nonetheless real, as experience, and moreover reportable in a semiotic exchange, mediated, among other means, through language. Language, in turn, is hardly ever purely referential: instead language invites shared attention to a common object of reference, and it can be a means of modeling or manipulating an interlocutor's conceptual viewpoint over that referent.

This paper explores this relationship between consciousness, the experience of a self and how this experience is shaped by intersubjectivity. These issues will be approached from a linguistic angle, namely through a cognitive semiotic analysis of self-reference and intersubjective reference. It is proposed that the representation of the self, as it is available in linguistic expression, relies on construal and perspective, an alternative account to a conceptualization of the person based on a differentiation between self (bodily, social) and subject (agent of consciousness, belief, feeling), and on a metaphorical projection between these. Moreover, it is suggested that a conceptualization of the self contingent on external perspective is a manifestation of theatricality, a strategy by which an object of reference is performed on a mental stage, towards which interlocutors jointly gear their attention.

Keywords: self – subject – cognitive semiotics – language – theatricality

[1] This paper was written during a post-doctoral research period supported by a grant of the Fundação para a Ciência e a Tecnologia. I am grateful to Prof. Per Aage Brandt for the invaluable input and helpful comments to this paper.

Consciousness and self-consciousness

In October 2007 the cultural foundation Calouste Gulbenkian in Lisbon held a conference with the title: *Is Science Nearing its Limits*?[2] To answer this question, high profiled humanists and scientists such as George Steiner or Wolf Singer were invited. On this occasion some interesting thoughts and ideas were expressed and discussed, like the claim by science journalist John Horgan that one of the two remaining challenges for science is the discovery of the neural code, i.e., the set of rules that explain how the electrochemical processes of the brain give rise to perceptions, memories, decisions and thoughts. Horgan showed optimism: after cracking the genetic code, he believes it is a matter of time until science solves the puzzle of how the brain gives rise to the conscious mind and to an inherent sense of self. The other challenge for science might take a while longer to fulfill: Horgan named it "the end of war".

Inviting as the idea may be, cracking the neural code may prove to be more difficult than Horgan assumed in his talk. After 2000 years of pondering, arguing, modeling, and more recently imaging, we have made unquestionable progress; but the truth is that as far as consciousness is concerned, "we still haven't a clue"[3].

Consciousness involves the awareness of perceptually available reality, of objects and others, of the contents of imagination, and an awareness about that awareness, or rather about the experiencer of that awareness: in other words, a sense of self. A theory of consciousness needs to accommodate this experience of agency and identity, the feeling that there is an *I* who is the protagonist of this individually tailored existential play. Conscious experience is unlikely to be the same in two different subjects. Perhaps the most obvious example of this are *qualia*, the process of experiencing sensations and feelings, from the redness of a rose to the smell of the ocean, the quenching of thirst or the experience of being moved by a piece of music. The explanatory gap is best conveyed by Thomas Nagel's formula of "what it is like" to have such experiences. Based on the similarity of our neurophysiological circuitry, despite individual uniqueness, we can infer that we all experience similar *qualia*. Yet, because these are subjective, inner experiences, they are not accessible to the external perspective, to another's objective observation. The closest we come to this is by expressing, by reporting them by the best means we have available: through signs to which we can assign and exchange meaning. Perhaps the most sophisticated of these are linguistic signs. Language allows us to convey and describe subjective experience, and

[2] In: Vilar, et al, 2008.
[3] The colloquialism is borrowed from Alva Noë and his latest book, *Out of Our Heads* (2008).

moreover to discuss and compare these descriptions, and thus to reach a consensus that ensures us that we evoke a similar experience whenever we refer to the redness of a rose. Language thus grants access to what is not otherwise amenable to scientific observation. Scientific descriptions of inner experience focus on observable behaviors – either those that lead to such experiences or those that occur as the result of them – and on the causal physical processes that underlie those experiences. However we experience red as a color, and not as a particular configuration of light waves; both accounts are true about "red", but they describe the same phenomenon on different levels, or from different perspectives: the world as it is experienced and the world as it is. We may know everything about how light waves produce color, based on the theoretical models that describe such causal processes; but this abstraction is different from first person and second person experience of this color. This is the level at which we can exchange reports about experience.

Consciousness also has the particularity of being meta-referential: we are not only conscious of phenomena, we are also conscious *that* we are conscious of those phenomena. Language is not arbitrary here: we do not say that our conscious is conscious of itself, but rather that *we are* conscious of being conscious. In other words, this meta-reflexive loop is subjective (in the sense that it has a subject – our selves) and agentive, in as far as we can accommodate the idea that having an experience is an action of some kind.[4] This agentive subject is also temporally deep; the notion of past and future are important to endow this subject with continuity and unity of experience. This temporal is a fundamental element that separates primary consciousness, forever trapped in the present, even if this present recruits past experience to make sense of each single moment (Gerald Edelman's ideia of primary consciousness as the "remembered present", 2004: 8) and higher-order consciousness which is reflexive, involving the representation of a self aware of its own consciousness, able to recall past experiences and his own awareness while experiencing them, and to formulate intentions and plan out the future, representing himself as the conscious agent of those future experiences. A concept of sequential time is therefore required for the representation of a conscious self.

One further important feature for the representation of the conscious self is the conceptualization of other equally conscious selves, of their experiences, which we can infer

[4] This should not require too much conceptual effort. If we consider visual perception, for instance, we know that what we perceive is as much the result of the object that is offered to our senses, as it is the result of the projection of our synthetic concepts. Cognitive neuropsychology delivers enough examples of how damage to brain areas responsible for those concepts causes the sensorial input to no longer be processed adequately, allowing intriguing aberrations such as a man mistaking his wife for a hat (Sacks: 1985).

being equivalent to our own from our mutual communicative interactions and semiotic exchanges; particularly relevant is our mental representation of how others conceptually represent ourselves. This is a manifestation of theory of mind or intersubjectivity.[5] It involves the conceptual feat of holding our perspective over our experience, while at the same time conceptually shifting to the perspective of the external other (our relevant interlocutor). Elaborate and cognitively costly as this process may seem, it is highly pervasive: from language and counterfactual thinking ("If I were you") to social attunement (modeling our actions and behaviors as to meet or challenge the expected or anticipated reactions of others), the experience of visual art (looking at the referent *and* looking at the artist looking at the referent), or engaging in the mental game that is literature.[6]

In brief, human consciousness is the awareness of the immediate here-and-now and of the objects (including other selves) that inhabit this situated environment. Moreover, it involves self-awareness, the consciousness of being conscious. Three aspects pertain to this level of meta-consciousness: the feeling of an agency of experience expressed by the first person (i.e. the representation of the self as experiencer, as the subject engaged in the experience), the temporal depth that endows the self with a sense of past and the representation of the future, and of the unity and continuity of this experience; and moreover the awareness of alterity, of others' selves and of their awareness of ourselves (a shift of perspective over one's self). These features of human higher-order consciousness are hardly amenable to direct observation, but they can be reported through language.

In the remainder of this paper we shall consider this last feature – the intersubjective dimension – in the representation of the self, as it is reported in language, and how it contributes to the experience of self-awareness, particularly as to how it works, conceptually, and what it is good for.

[5] The term Theory of Mind (ToM) was first used by Premack and Woodruff in a 1978 paper on chimpanzees' capacity for deception, published in the journal *Behavioral and Brain Sciences*. ToM refers to the capacity for assuming that others have a mind similar to our own, i.e. to attribute mental states to others and thus to predict reactions and behaviors from them. Jordan Zlatev et al. (2008) propose the alternative term (and corresponding idea) of "intersubjectivity", referring not only to the calculated awareness about the subjectivity of others but to the capacity for sharing experiential content with them.

[6] In *Why We Read Fiction*, Lisa Zunshine accounts for the experience of reading literature as mind reading, what is also known as theory of mind. But there are literary texts that actually make simultaneous double perspective their theme. Three examples: Octavio Paz, *Aquí* ("Mis passos en esta calle/ resuenan/ en otra calle/ donde/ oigo mis passos/ pasar en esta calle/ donde/ sólo es real la niebla"); Lydia Davis, *From Below as a Neighbor* ("If I were not me and overheard me from below, as a neighbor talking to him, I would say to myself how glad I was not to be her […]"); and Zehra Çirak, *Mit den Augen eines anderen* ("So zu sehen wie der Nachbar/ wenn er an seinem Fenster steht/ zu hören was er lauschen kann/sozusagen wie er zu sein […]").

The Self, the Subject and the Person

The terms *self* and *subject* are often used as synonyms in the reference to the individual being, despite the differences in their venerable multidisciplinary tradition. In this paper, we use the term *subject* to refer to a source of consciousness, an intentional being with subjective experience and in a relationship with objects and other subjects, an agent of experience; *self*, in turn, is here the mental representation of one's own sense of being, or of one's own identity. This rough distinction is not counterintuitive. In language the subject is a syntactic function so essential it is even materialized by an impersonal pronoun where there is no corresponding semantic role involved: "*It* rains", we say. Self, in turn, is a suffix that transforms the accusative personal pronoun in a reflexive: *myself, yourself, himself.*

Consciousness as an olympic perspective of the subject interacting, affecting and being affected by other subjects and the environment, is manifested in language in various ways: at the lexical level, for example, it is revealed in the system of pronouns, which are a particularly suitable morphological category to search for this manifestation of consciousness. The following pair is a classic in cognitive linguistics:

If I were you, I'd hate me.
If I were you, I'd hate myself.

These examples have been pointed out and discussed by George Lakoff (1996, 1997). The problem about these sentences is that the referent of the three first person pronouns *I*, *me* and *myself* is not the same self, and this challenges a logical semantic explanation of the obvious different meanings of these two sentences. As an alternative, George Lakoff proposes a conceptualization of the person as consisting of a split between the subject and the self. In this view, the subject is "the locus of subjective experience: consciousness, perception, judgment, will, and capacity to feel" (Lakoff 1996: 93), and the self is the body, the physical characteristics and the social roles of the individual, "and in some cases past action, memory, etc." (Lakoff 1996: 99)[7]

Lakoff claims that distinguishing between the body (self) and consciousness (subject) in this way is required for correctly decoding the co-reference implied in the

[7] This separation suggests the reading that the subject is the inner individual, whereas the self is its external counterpart. This distinction could be compared to G. Edelman's distinction between primary consciousness, the "remembered present", as the self: past action and memory are activated for generating an integrated awareness of the present moment. However, Edelman's primary consciousness, unlike the self, does not involve a social identity. Higher-order consciousness would correspond to this concept of subject, which encompasses a sense of consciousness of being conscious.

personal and the reflexive pronouns in sentences like the previous ones. His analysis sets off from two fundamental conceptual metaphors: "the Divided-Person metaphor, according to which a person, a single entity, is understood as a group of two entities, which I [i.e. G. Lakoff] refer to as Subject and Self; and the Projected-Subject metaphor, according to which a Subject can be projected onto someone else's Self in a hypothetical situation." (Lakoff 1996: 99) From these two fundamental metaphors, others arise that according to the author account for strange occurrences of co-reference in language: e.g. the split-self metaphor (*I keep going back and forth between my scientific self and my religious self*), the self as companion metaphor (*I think I'll just hang out with myself tonight*), the scattered self metaphor (*Pull yourself together*) or the internal causation metaphor (*I made myself get up early*, oddly paired with *I lifted my arm*).

At least two questions arise from this view of the subject/self. The first concerns the boundaries between self and subject proposed. Lakoff sees in the subject an intentional being (although he never quite phrases it in this way), and the self as the social being, or rather, the physical container that performs social roles. This separation seems artificial if we consider that the subject's intentionality is geared by and oriented towards other subjects. The second question is that this split between subject and self is not very intuitive, in the sense of phenomenologically comprehensible. Language is quite explicit, in fact: we understand sentences like *If I were you*, not as the projection of a part of our person onto the container of another person, but, as the language suggests, rather as the speaker taking the place[8] of the hearer, conceptually *being* the other; in other words, engaging in a momentary theatrical representation of the *you* as the *I*. This mental exercise is shared by both, enabled by the semiotic exchange, the verbal interaction.

In order to explain such strange and imaginative expressions, as the ones above, we need to take into account a social and a speech-act dimension, i.e. a dimension of intersubjectivity. In fact, many of the examples provided by Lakoff are intensely social: *being at war* or *hanging out*, trigger highly interactional scenarios that are not confined to the projection of an inner subject onto another person's self, as a physical container, but instead involve the mutual displacement of both subjects.

Explicit traces of subjectivity in language, such as reflexives, mostly suggest perspective. This correlates with both the alternative use of *me* vs. *myself* in sentences as the above, as well as with the first part of these sentences: *if I were you*. This beginning points out

[8] This idea of inhabiting a different place is quite relevant: in visual perception, perspective is contingent with space. Lakoff refers to the Subject as the *locus* of subjective experience, but he does not further elaborate this idea.

for a counterfactual scenario with role inversion and it is often the case that this inversion is suggested by a spatial location: *to be in someone else's place, to put oneself in someone else's shoes, to be in someone else's skin*[9]. The new location assumed by the speaker is not so much a physical space but rather a relational situatedness that includes the hearer's world views and in particular the conditions of the deictic situation. Language therefore reveals that the act of imaginarily assuming the other's perspective is conceptualized as changing space and assuming the new strange location (e.g. the shoes or the skin), while simultaneously holding on to one's real existential place. This co-occurrence of perspectives is familiar from the experience of theater, in which attitudes and subjective experience are projected onto a space of performance, inviting a reflexive attitude towards what is displayed in this given or imagined stage.

Staging selves: from projection to theatricality

Linguistic expressions reveal that the experience of subjectivity is often conceived by means of reference to the subjective experience of the other, the interlocutor. An approach to such linguistic manifestations therefore needs to accommodate the ability to generate and inhabit two different perspectives over one same referent, a hypothesis which is consistent with experiments in literature (e.g. focalization), and which has a foundational counterpart in theory of mind and mental simulation, as well as in the experience of empathy. The perspective delegation is a manifestation of the reciprocal constitution of the self and the other. As neuroscientist Marco Iacoboni (2008:133) claims: "Without self, it makes little sense to define another, and without that other it does not make a lot of sense to define the self."

Construing one's own subjective experience through the conceptual eyes of another involves the momentarily conceptualization of oneself *as* the other. This imaginary performance is a manifestation of theatricality, a prevalent cognitive strategy that is evidenced in much of human communication. Theatricality is an expressive stylization of thought aimed at conveying the dramatic immediacy of a segment of experience. In essence, it is a mode of showing: very much like theatrical behavior, which is an explicit display of a gesture with signature, conceptual theatricality consists in performing a segment of experience on the imaginary stage of the mind, a stage that is the focus of shared attention: the addressee of the interaction is invited to share the subject's intentional view on the object in focus, within the

[9] The latter expression is Portuguese and it is mostly used in the negative form: *I wouldn't want to be in his skin*, as an assessment of his situation as not so favorable.

same temporal window. Examples of theatricality in language and discourse range from predications (a yes-we-can-attitude) to single sentences (It's like, who cares?) or full segments of reported speech. These occurrences suggest that discourse has a dialogical structure, which permeates even less interactive forms, such as narrative. The embedding of past discourse interactions (e.g. Obama's slogan in the example above) evokes the original speaker and his addressees, as well as the discourse situation, the affective values and the general attitude. This embedding carries the signature of the original discourse: the speaker impersonates the original speaker, and this is evident in the prosody of the original sentence; the original type of sentence is maintained (this is particularly evident in American English pervasive sentences beginning with "It's like"), and the degree of involvement of the actual speaker in the embedding discourse with the evoked interaction can bear the marks of high emotional involvement (e.g. speaker raising his voice, and even repairing eventual overlaps: "And there we were, the meeting almost over and the guy just wouldn't let go! What the hell is wrong with you, right? I mean, not you, I mean him!") Intonation, prosody, emotional charge, discourse repair are traces in discursive interaction of the dramatization that is being performed in a mental stage intentionally prompted by the speaker and aiming at the addressee to share attention to the ongoing performance.

Just as in actual theater, where the physical space of performance is a stage, which contains and confines the represented reality, and which is elevated from the audience space as to mark this separation, so is the conceptual stage indicated in language by space builders (e.g. a locative adverb, a temporal marker or a change in tense, a conjunction), and linguistically sustained throughout the interaction (e.g. the repetition of "you" above, to ensure the distinction between the addressee in the evoked situation from the actual addressee of the account). Theatricality involves the suspension of the immediate spatio-temporal context of the participants in the interaction, in order to allow the mutually aware attending to a performance in a shared focus, which has a different temporal and spatial configuration from the here-and-now of the viewing.

When intersubjectivity is performed in conceptualization (e.g. If I were you I'd hate me; If I were you I'd hate myself), this implies a simulation of myself as another (and vice-versa). In this simulation, though, I do not cease to be myself (and that is what is at the core of the blending account of subjectivity as we will describe it here). I am not fooled by the experience: while being the other, I am still myself. Were it not the case, the imaginative exercise would be bordering psychosis. But language provides one further hint: when we slip

into another's "skin", we need the subjunctive to mark in discourse that we are only performing this *conceptually*.

Intentional display and intense shared attention invite reflection: what is performed on stage, even if conceptual, gestural, floats from the level of the representation to the level of the audience. In this gravitation, what is conceptually staged affects the viewers; reflexivity carries assessment and it provides an opportunity to revise, improve, correct or prevent actual action.[10]

Theatricality is further involved in the experience of empathy. This capacity for sharing subjective content is normally described as the ability of getting into the core of the experience of another, of feeling what the other feels as he lives the experience (in a sense, accessing the other's *qualia*); to "feel oneself into the other", as the German verb *sich einfüllen* so clearly suggests. One other way of conceptualizing empathy is by understanding it in terms of a theatrical arrangement, a triadic constellation in which two subjects interact and another subject observes this interaction, eventually taking the side of one of the parties involved. This view, described by Fritz Breithaupt (2009), renders empathy not so much as an emotional identification with another subject, but as a process of observation and decision for one of the subjects observed and the situation this subject experiences. In this light, *Schadenfreude* – mischievousness or malicious joy – is also a form of empathy. Such a view is certainly problematic, if we consider the experiential dimension of empathy, based on affection and mutual understanding; in other words, if we consider empathy as one of the subjective contents that are shared in a context of intersubjectivity. For our purposes here, however, suffice it to notice that this triadic constellation (two interacting subjects, one observing subject) is a theatrical arrangement: it reveals the experience of identifying oneself with one of another subject, even when this is not a direct interlocutor.

Me, myself and I

Let's return to the two sentences mentioned before:

If I were you, I'd hate me.
If I were you, I'd hate myself.

[10] This relates to Arie Verhagen's idea that language use is not merely informative, but argumentative (Verhagen 2007). If it is a strategy for influencing someone's thoughts, attitudes and behavior, it does so by prompting reflexivity and generating values.

George Lakoff rightly demonstrates that a logical semantic account of these sentences fails to explain their different meanings, because the pronouns *I*, *me* and *myself* are not co-referential. His proposal, as we mentioned, is instead that both the *I* and the *you* are conceptualized in two parts: the *Self-of-I* and the *Subject-of-I*, on the one hand, and the *Self-of-You* and the *Subject-of-You*, on the other hand. Moreover the initial clause of the sentence opens a counterfactual possible world, in which the *Subject-of-I* (the judgments, feelings, perception, consciousness) replaces the *Subject-of-You*, i.e. the Subject of the first person is projected onto the Self of the second person. The replacement occurs in a counterfactual space (as in Fauconnier's alternative designation of possible worlds, Fauconnier 1997).

Phenomenologically, however, this split of both persons is hardly intuitive; this account fails to explain the need for this split in the first place and how this need is correlated with the interpersonal evaluative meanings of the sentences. This is where a cognitive semiotic[11] oriented analysis of both sentences and the interaction that prompts them, may be informative. Such an approach starts by situating them in a discourse interaction, in the concrete setting of the exchange of signs between two subjects. This allows a minimal delineation of both the interlocutors and the immediate context. These sentences are uttered during an argument between a couple, after one of the partners has cheated on the other.[12] The interaction is structured and informed by the situation that is modeled in accordance to cultural specificities (e.g. the cultural scenario of monogamy, which presupposes that the involvement with a third person is inadequate, and thus negatively referred to as "cheating"). The situated semiotic interaction is further embedded in a phenomenal world or pheno-world, which consists of all aspects of the physical, intersubjective, and imaginary world that can serve as objects of thought, that can be encompassed by human cognition, both pertaining to reality or to imagination (which is nonetheless real), and regardless of any constraining cultural editing.

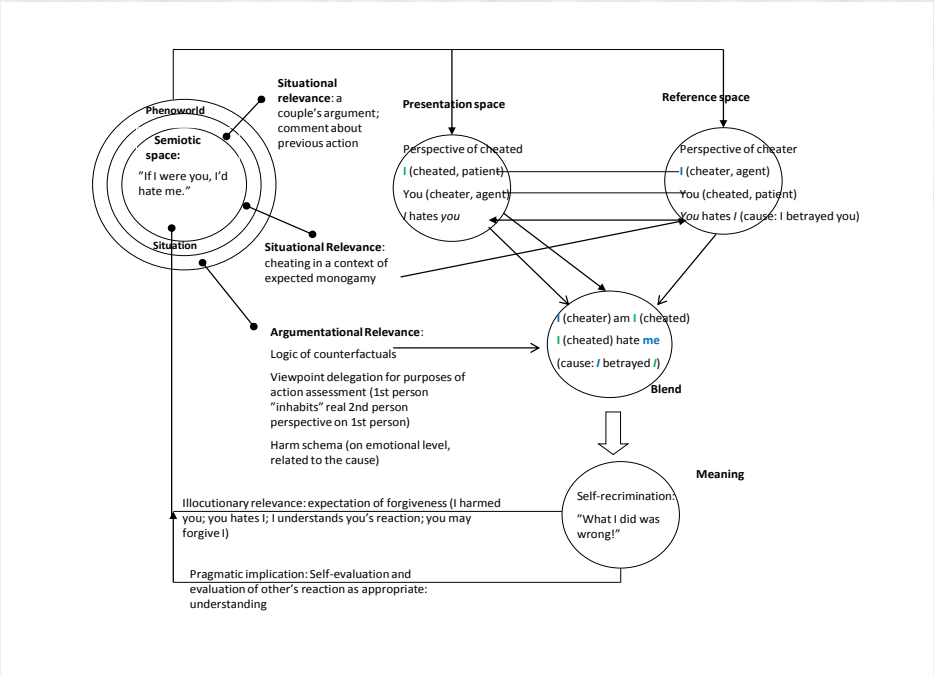
The interaction has a *referent*, namely the situation of cheating, as seen from the perspective of the agent, the cheater, who is also the speaker of the utterance. This referent is

[11] The field of studies of cognitive semiotics integrates the theoretical and epistemological tradition of the humanities (semiotics, linguistics, philosophy and anthropology) with the theories and methods of cognitive science in studying issues that are a common object to both fields: meaning, meaning making and evolution and development, historical and cultural dimensions of thought, and subjective experience (see also the Editorial Statement of the international journal of *Cognitive Semiotics*: http://www.cognitivesemiotics.com/what-is-cognitive-semiotics).For this particular analysis we follow Per Aage Brandt's (2004) theoretical revision of blending theory, further elaborated and demonstrated in Brandt and Brandt (2005).

[12] This is my simplification, perhaps somewhat more realistic, of Lakoff's proposed scenario: "Imagine a situation where a sentence such as (1) [If I were you I'd hate me] would be appropriate: suppose that I have done cruel things to you, but you are a very forgiving, perhaps saintlike, person, who doesn't feel badly toward me despite the cruelties. Suppose that I, on the other hand, am not particularly forgiving and harbor bad feelings for people who have hurt me. Now suppose you, instead of having your consciousness, perception, capacity for feeling, judgment and will, had mine. The resulting hypothetical person, in the same situation that you are in, would hate me." (Lakoff 1996: 94).

presented in the sentence from the perspective of the patient of the action of cheating, the hearer in the semiotic exchange. The impossible convergence of the two perspectives – an angular first person viewpoint (*I*'d hate) and the projected external perspective over the same person, originated in the interlocutor about (accusative *me*) – happens as a *blend*: in this mental space, this stage of the mind in which a hypothesis is performed, I (the cheater/speaker) *am* you (the cheated/hearer), and I (the cheated/hearer) hate *me* (the cheater/speaker). This creative impossibility is meaningful and *relevant* in the discourse situation on account of cognitive structures and schemas that are activated to stabilize the blend: the first is the *logic of counterfactuals*, the idea that what *is* inherits its indicative form from the contrast with *what is not*, and which *could be* or become, hypothetically; what could be, in turn, is constructed in the blend as a counterfactual, a virtual but plausible reality. One other active relevance strategy is *viewpoint delegation*, which allows one's actions to be assessed at the same time internally and from the outside, as seen from another center of subjectivity. This delegation prompts an evaluative attitude towards what is being observed. Finally, an ethical schema of *harming* (as a counterpart to the default of helping) is activated in order to depict the negative nature of the action that led to this argument (i.e. cheating as emotional harming). The emerging *meaning* of this blend is the expression of *self-recrimination*, with the pragmatic implication of this self-evaluation and empathic understanding for the interlocutor's expected reaction.

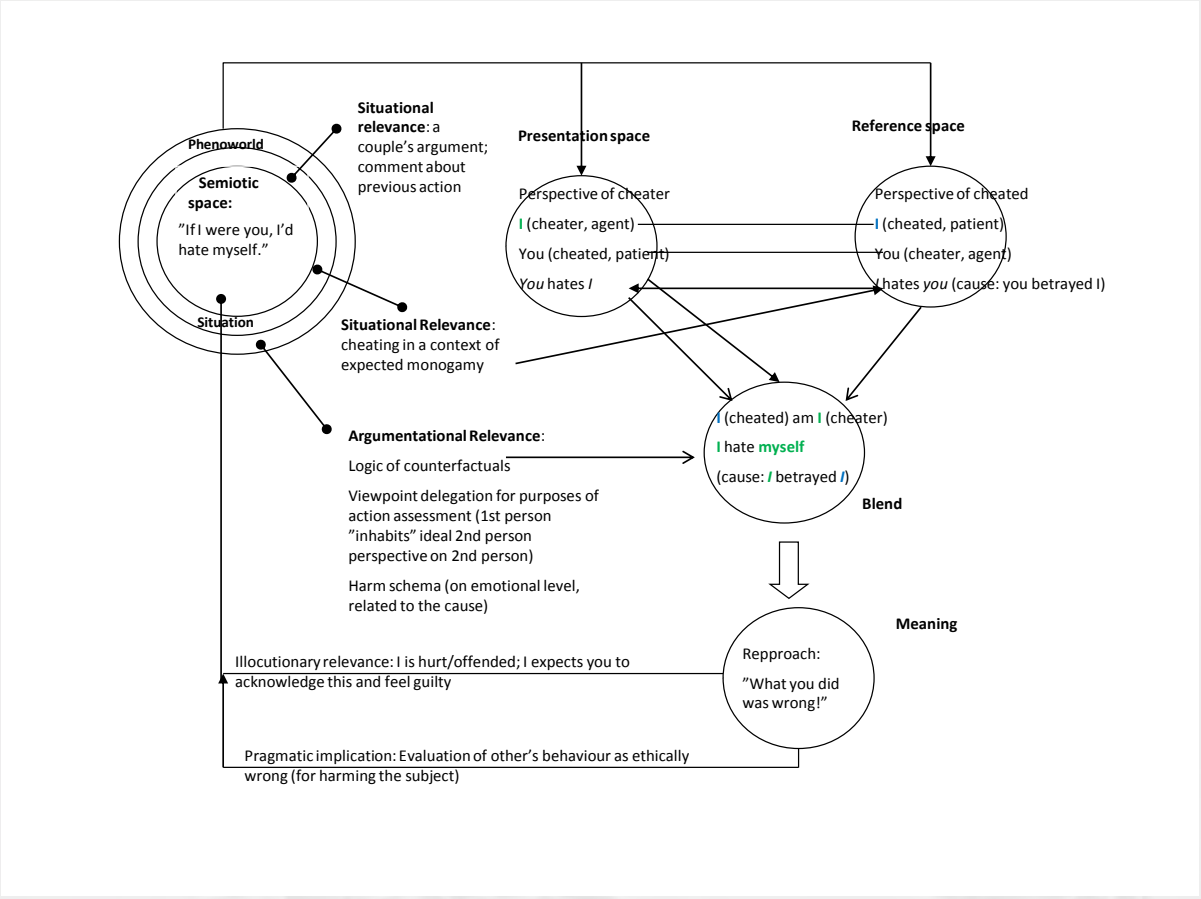
This account is rendered in the following diagram (Figure 1):



The impression of a certain insincerity or unreliability in this utterance can further be explained. Its *illocutionary relevance* is the expectation on the part of the speaker that the interlocutor forgives the harmful act. This reasoning is "dialogical", in the sense that it relies in a structure of turn-taking: the speaker harmed the hearer; the hearer hates the speaker (according to speaker); the speaker understands the hearer's reaction; the hearer should reciprocate the understanding by forgiving the speaker). The impression of insincerity results from the fact that the speaker anticipates the hearer's reaction in his own utterance; it is as if the interlocutor is harmed again by being prevented to react actively and according to the situation. The concession that the speaker does with respect to the hearer's expected reaction results offensive, and it is also somewhat coward: by springing over the actual hearer's reaction, it is as if both the narrative situation and its outcome are the result of the speaker's action. The projection of this illocutionary relevance onto the interaction raises some skepticism as to the wishful outcome of this argument, as the speaker would have it.

The alternate expression *If I were you I'd hate myself*, uttered in the same situation, is framed from the perspective of the affected part: *If I (the cheated) were you (the cheater), I (the cheater) would hate myself (the cheater)*. The same situation is viewed from the perspective of the patient of the cheating, which is the *referent, presented* from the perspective of the hearer (here, the cheater). The network is similar to the former one, except for the fact that here the interlocutor, who remains silent, is the agent of the previous harmful doing. The viewpoint delegation in this case is activated by the speaker (the affected part in the harmful action) as a way to engender the wishful 2nd person perspective on 2nd person, i.e. to elicit self-recrimination in the hearer as a compensation to the harm done to the speaker. The reflexive *myself* instead of the accusative *me* suggests this inner loop. The *meaning* that emerges from this *blended* perspective is the speaker's *reproach* of the listener, on account of the latter's actions, which entails an evaluation of these doings as ethically wrong and harmful to the speaker. The illocutionary relevance that is prompted by this meaningful blend is that the speaker is rightfully offended, and expects the hearer to acknowledge this and feel guilty, i.e. be affected by the consequences of his own doings. Again here there is an implicit exchange between the interlocutors: the hearer hurt the speaker; the speaker is hurt and wishes the hearer to self-recriminate. If there is a negative outcome for the hearer, as there was one for the speaker, then some equilibrium may be restored. Because the cheated part is agentive in this sentence (as opposed to its forced passivity in the previous one) this agentiveness may balance the cheater's agentiveness in the cheating process. This may be the starting point for a

better outcome to the argument in the semiotic space. Figure 2 shows summarizes this interaction and the meanign that emerges from it:



The related yet different meanings of these two sentences can thus be described when the subject is taken as holistic ensemble, an entity one can acknowledge, assess, empathize with. After all, these meanings are utterly interpersonal, and this exchange involves not only social roles, or inner feelings but the filigree of their interrelatedness.

Of shoes, places and other interesting locations

A common alternative to the opening clause of the former sentences (*If I were you*) is an expression with a locative: (*If I were*) *in your place I would*. The expression is common across languages:

An deiner *Stelle*, würde ich…
No teu *lugar* faria…
En tu *lugar*…
À ta *place*...
I dit *sted* ville jeg...

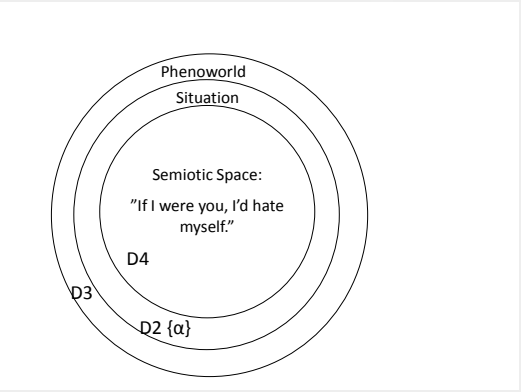
Perspective is inherently dependent on location. The awareness of one's own perspective is tied to the realization of other possible viewpoints and of the volatile nature of the object seen, depending on the angle chosen.

In the sentence *In your place I'd do y*, the speaker (S1) *refers* to the hearer (S2) and to the hearer's given situation, which is conceptualized as a place: it is an abstract place, not a generic one, deictically related to the hearer. In this reference is also included (even if not explicitly) the hearer's likely course of action in the situation. This referent is *presented* in the sentence from the perspective of the speaker; this presentation thus includes both the speaker and his course of action y. In the *blend*, S1 is S2 in the place where S2 is. And for the course of action, this blended agent chooses y, namely S1's course of action. The schematic *meaning* that arises from this blend is imperative, but it may be more or less forceful. The clause can introduce an advice, a warning, or a threat (we leave aside evaluative meanings such as reproach). The intensity of the imperative entailed in this clause (from a generic advice to an imminent deictic threat) is regulated by the different sphere of the base space where the *relevance* schema originates.

We alluded already to the semiotic base space as a mental representation of the exchange itself, which encompasses three different embedded layers. We could relate these layers with semantic domains, or domains of experience as available for conceptualization, following Brandt's proposal for an Architecture of Semantic Domains[13]. Brandt suggest 4 fundamental semantic domains: D1, the physical domain or a causal world of physical phenomena, D2 the social or cultural domain, a collective dimension of intentional acts that regulate the actions of a person as part of a cultural ensemble, D3, the internal domain of imaginations, a mental theatre that relates to the experiences gained in the other external domains, by a set of associative, affective and memory connections, and finally D4, the speech act domain, in which empathy and volition, permission and prohibition are instantiated.[14] The distribution of these domains in the semiotic base space would look like the following (Fig. 3):

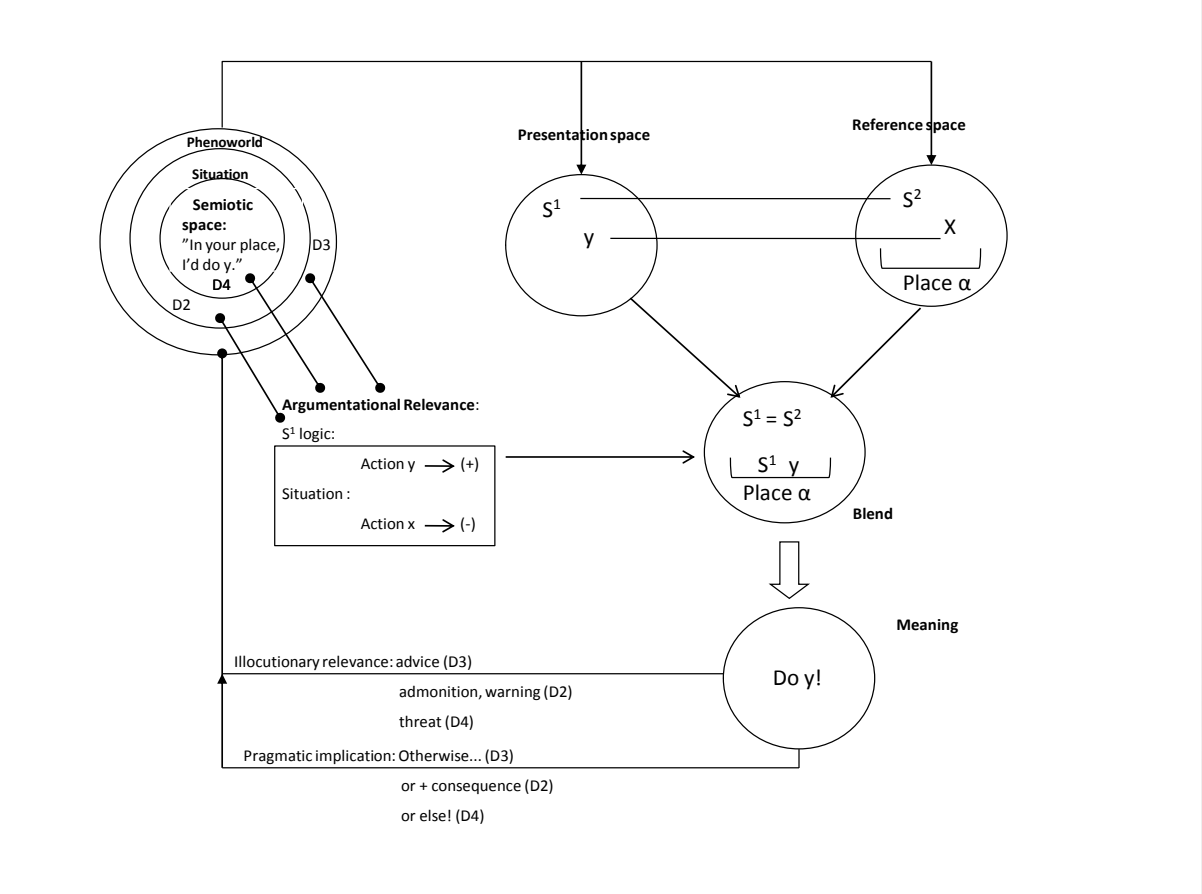
[13] Brandt, Per Aage (2004): The Architecture of Semantic Domains. In: *Spaces, Domains, and Meaning. Essays in Cognitive Semiotics*. Bern: Peter Lang. 33-67.

[14] The difference between D2 (social, generic) and D4 (interactional, deictic) can best be accounted for if one considers the expression of modality. If a policeman says to a driver "You can't park here", he is referring to the conventional norm, which regulates parking in both the designated and similar spots. This is a case of D2, of a social norm, reinstated in the interaction. If a parent tells to his child "You can't go out tonight" the validity of the prohibition is born in the deictically situated interaction (D4): there is no convention regulating the prohibition; the latter is asserted and validated in the parent's assertive speech act.



The semiosis, the exchange of verbal signs, is a manifestation of D4, or the domain of speech acts. It is embedded in a situational sphere, informed by the cultural norms that are shared and that sustain a social group. This situational layer would correspond to D2, or the social domain. Finally, the outer embedding layer, the so called pheno-world, encompasses the phenomena of human experience that can be conceptualized by the human mind: D3 or the mental domain.

So, in the blend of perspectives suggested in the expression *If I were in your place*, the stabilizing schema can originate in either one of the three layers, resulting in different meanings and thus different outcomes for the interaction. This logic schema pertains to S1 and has the formula of a situation in which two possible action paths are possible, resulting in different outcomes: either course of action x, with an expected negative outcome, or the course of action y, which is expected to be positive, all according to S1. If this schema originates in the outer layer of the semiotic base space (that which contains all that can be accessed by human thought, i.e. domain 3), the resulting imperative meaning has the illocutionary force of an *advice*, and the implication that if S2 does not take the proposed course of action, an undesired consequence may occur. If the same schema originates in the embedded situational layer, which corresponds to D2 or the social domain, the resulting meaning is more forceful than the previous one: an *admonition* or *warning*, with the implication of a negative consequence for S2 if he does not take the suggested course of action. If the schema originates in the innermost sphere, the domain 4 of speech acts, then its implication is more immediate to the semiotic exchange: the clause has the meaning of an imminent *threat* that can be made concrete in the course of the exchange; the consequence for S2 in case of non-compliance with the course of action Y, proposed by S1, is deictic and forceful. The following diagrams account for this differentiation:



In some expressions, the locative can be more specified, as in the expression in English *If I were in your shoes*. The reversal of the expected figure and ground order – the subject as the movable entity, the shoes, though smaller, are the static ground – suggests the conceptualization of the shoes as a location, which can be taken by the interlocutor or the speaker at a turn, and from which they can share a perspective over one same situation. In this gestural entailment there is some element of theatricality, as S1 takes the floor (here, the shoes) and assumes the action place in the situation considered.

Outlook: What language reveals about the Self

The foregoing examples suggest that the self is defined with respect to the other. The semiotic account proposed for the sentences analyzed meant to show that sentences are structured not only by lexical content, but also by perspective, and this is related with the double point of view of the two interlocutors over one common object of shared attention. A similar view was already proposed by early structuralists, in particular by Émil Benveniste. In his account of *enunciation* Benveniste (1966, 1974) defined it as a manifestation of a broader phenomenon he called "the subjectivity in language". Enunciation concerns the instantiation by linguistic means (e.g. pronouns – first person, second person – morphemes indicating

personhood, such as verb flective morphemes, demonstratives, modal adverbs[15]) of the roles of an intentional producer and an addressee. Enunciation linguistically establishes the role of *locuteur* or utterer – *I* –, which is defined by the opposition to a symmetrical *you*, the *alocuteur* or addressee of the utterance. This is a minimalistic account of the subject, because it makes the existence of the subject contingent on an utterance or verbal expressive art of some sort. A semiotic account elaborates this concept of subject and expands it in the semiotic base space of the interaction, which encompasses the representation of the exchange itself and the cultural embedding in which it occurs, framed by the conditions of human cognition.

The purpose of a theatrical representation of the self and the other, apparently a cognitive costly strategy, is to invite reflexivity: by performing possible action and eventual outcomes, the experience is staged, its consequences are anticipated in imagination, before they eventually materialized in action. This improves actual performance. Since we are social beings, and our selves are contingent on others, making sure the action is right is not a bad strategy for the success in the interaction within the community.

This experiential account of subjectivity, which enables also an empathetic transfer and the imaginative performance of what it might be like to be the other, is suggested by language. More recently, evidence from neurobiology concerning the structures and functions of mirror neuron circuitry, further supports this notion of subjectivity with an interpersonal foundation.

At this point, we may have not yet cracked the neural code, as John Horgan suggested, but if we consider philosophical tradition, linguistic analysis and the significance of theories of mental simulation and the explanation of the biology of empathy, we may find consonance. This convergence is as encouraging as it is challenging for the task at hand: to understand what our selves are.

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[15] Deictic reference is a further important feature of subjectivity in language, since it confirms the subjectivity of enunciation, acquiring each time a different meaning: "la deixis est contemporaine de l'instance de discourse qui porte l'indicateur de personne" (Benveniste 1966: 253). *I* can refer to as many persons as there are instances of discourse and respective enunciators. Yet *I* always means the agent of enunciation.

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THE MENTAL ARCHITECTURE OF MEANING.
A VIEW FROM COGNITIVE SEMIOTICS

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Abstract:

Mental content, also called meaning, is ostensibly organized in a layered architecture based on integration of material from lower to higher levels. Thus, qualia are integrated in objects, and these in situations, etc. However, I argue and show that there are significant transversal bindings connecting material of non-adjacent levels, and that these bindings constitute the structural entities we call signs, or semiotic functions. The finding of these bindings therefore grounds semiotics in cognition, and it allows cognitive studies to progress into the realm of cultural phenomena, communication, and the semiosis of language and thought. What I present in this article is a special version of the very base of the approach we now call cognitive semiotics.

Key words: Iconicity, symbolicity, semantic integration, mental architecture, cognitive semiotics.

Science is imagination in the service of the verifiable truth

Edelman/Patel

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This article is based on phenomenological observation and a minimum of theoretical construction. We will consider the cognitive and semiotic results of phenomenological observation in our first section and develop semiotic perspectives in the following sections.

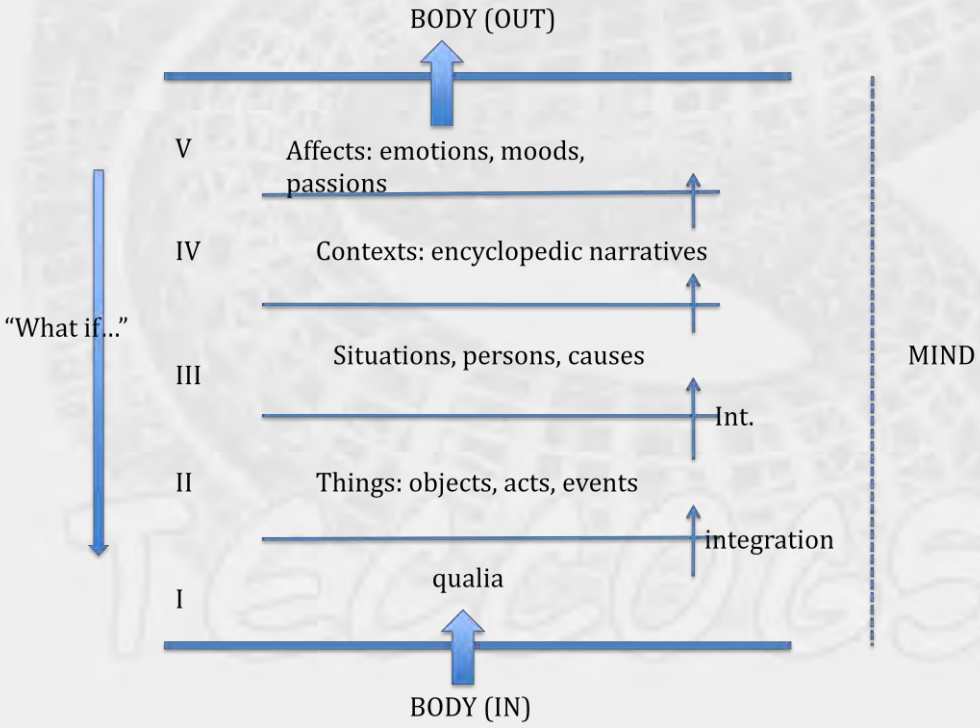
1. The basic architecture

The contents of our consciousness, or awareness, that is, 'the things we can be aware of', are accessible in a variety of levels of complexity. Whether in sensory perception, or in mental recall, we access items by directing our attention to specific versions of their appearance. The mono-modal forms such as colors, visual shapes, sound shapes, odors are either foregrounded as they are, as esthetic qualia, or absorbed in higher-order entities, normally multimodal, such as objects, acts or events of which they are aspects. It is worth noticing, for example, that our attention freely can go from the occurring tonal sound of a musical instrument to the act of it's being played, and then back again the "pure" tonal event. Furthermore, object, acts, and events can be, and normally are, experienced as situated in space and time as situated scenarios caused by certain forces, incl. personal intentions. Again, we are free to focus on the "pure" gesture of an act or the "pure" process of an event, or on the entire situation in which it occurs. This freedom is essential in situation of learning, where a skill is to be acquired and then "lifted out" of the situation where is was studied. We are able to "understand" situations as conditioned by a contextual history and as likely to bear consequences in their contexts – even if we are not able to perceive such conditions or consequences directly, but only able to imagine them as based on our encyclopedic knowledge. "Understanding", in this sense, contextualizes situations on a more comprehensive and, in so far, a more complex level of consciousness; here is where language will distinguish perceiving and conceiving, or "seeing" and "thinking". Finally the result of the experience of understanding, typically a narrative integration, gives rise to a comparative evaluation of the "case" in a framework of so-called values: degrees of justice, truth, elegance, utility, wisdom, or "evil", "ugliness", "horror", and so on. This ultimative level of mental activity leads to, or is directly linked to, affective reactions, such as personal emotions (pride, shame…), general moods (elation, gloom, boredom), passionate feelings (love, hate).

What we have followed through this series of steps is a structure of integrations, from qualia into things, from things into situations, from situations into states of affairs (cases), and from states of affairs into affective motives. The processes underlying the appearing of qualia

are evidently the physical and physiological processes of perception and memory. What further happens to our affective states of mind is related to their affecting our body and triggering motor reactions, incl. mental associations that change our mental work from its cascades of integration to a descent through the same levels into plans of possible action and details of such plans, allowing every sort of imaginary productions, from multimodal downwards to monomodal qualia representations. Whereas the ascending integrations are in principle passively reflective, the descending imaginary constructions, productions, representational "fantasies" are oriented toward action. A hypothetical action plan will be mentally examined by ascending integration before the emotional evaluation "stamps" it as good for execution.

The mental architecture summarized by the above corresponds to the following graph (fig. 1):



The "mind" is a small opening in the neural tissue surrounded by "body" functions of perception (IN) and motor reactions (OUT), and internally served by memory at all or at least several levels. Our claim is that there are exactly these five layers or levels, as shown, and that they are ordered by integrative processes ('upwards') that allow imaginative retroprocessing ("downwards": "what if…"), especially to prepare response acts.

2. Language and culture in mental architecture

If the mental architecture is in itself trans-culturally and trans-historically stable, which is our actual claim, the question of cultural and historical specification of meaning must be addressed. In order to do so, we need to relate an architecture of meaning to the semantics of human language. In fact, the language of our species, across idioms of all kinds, does make it possible to grossly label and refer to certain qualia (level I) and to certain affective experiences (level V), but mostly to the price of massive use of metaphors; it appears to be a preference of human language to literally operate on the intermediate levels (II – IV). Category-naming lexemes and phrases operate on level II, sentence meanings on level III, and discourse-creative concatenations, incl. dialogue, on level IV. These three levels – II, III, IV – are also, interestingly, the mental locations of all cultural creations, whether they be artifacts (II), institutions (III) or stories (IV). It has not been found that qualia or affects as such are culturally (or ethnically) variable – at least to any important extent, despite the evident variations in terminology. By contrast, phenomena of levels I and V are differently integrated and thus found in widely different cultural settings; comparable cultural "things" of course have variable sensory and emotional properties and aspects.

The central core of human consciousness – levels II, III, and IV – are thus culturally variable as to their actual content. They are not variable as to the sorts of integration that articulates them but certainly regarding the actual objects, situations, and knowledge forms that they contain. Trans-cultural communication, incl. interlingual translation, is possible because the elementary format of entities stays stable under all variations: acts are still acts, events are events, objects are objects, situations are situations (not objects, for instance), and narratives are narratives. This might seem evident but is less so in the perspective, for instance, of inter-species communication.

The peripheral instances, the all-important afferent first and efferent last levels, are the most physiologically dependent and therefore the least culturally malleable; they assure the very "embodiment" of the mind, its functional continuity with our neuro-muscular body, a relation that has to be less constraining on the internal levels, where consequently our creativity unfolds.

3. Signs and communication

This view of mental architecture makes it straightforward to describe the semiotic function – the phenomenon called sign – as distinct from contents and entities in general. All semiotic theories, from Antiquity to Modernity, distinguish the two aspects of any "significantly" signifying phenomenon: it can be perceived and it can call our attention to some idea; it has a "sensibilis" side and an "intelligibilis" side; it has a "signifier" and a "signified", a form and a meaning, a "representamen" and an "object", etc. It is of course the case that any phenomenon we can experience can be perceived or conceived as having such aspects. A chair has a characteristic configuration as a multi-modal object, and it has situational and social uses and functions.[1] However it is obvious that in signs, the two aspects, one being of lower level in the architecture and the other of a higher level, are separated by lacking intermediate integrations. There is a semantic gap between the signifier and the signified, so to speak. A sign calls for splitting our attention towards the two separated aspects.[2]

Traffic signs are objects whose qualia are readable as instructions for specific narrative behaviors that have generic descriptions addressing pedestrians, car drivers, etc. Such signs are typical symbolic signs. Their signifiers are entities of level II, **sa(II),** and their meanings are entities of level IV, **sé(IV)**; they do not integrate on the intermediate level III (the street can do without the parking sign post). Following the instruction is, for the driver, to perceive the **sa(II)**, to understand the **sé(IV)** and then to perform the content of the instruction in his situation **act(III)**.[3]

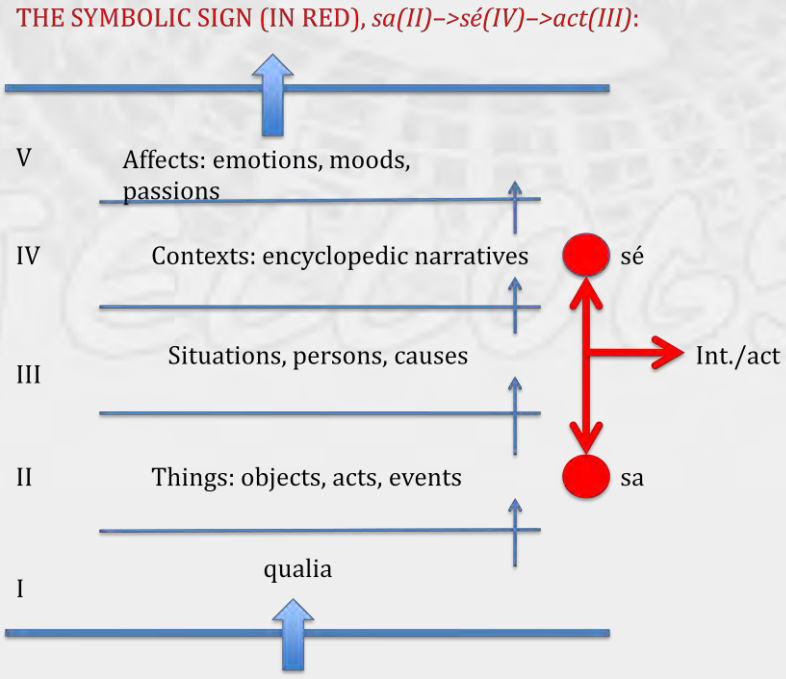
To read a musical score, and then to "play it", would accordingly imply a similar process: **sa(II) –> sé(IV) –> act(III)**. This formula summarizes the meaning involved in symbolic communication. Symbols are therefore essential to all cultural formations and creations. Whether the behavior "intended" by the instructional meaning be physical (traffic) or mental (calculus), or both, as in music, the dynamic process is one and the same: filling the gap that makes something a sign is "interpreting" it.[4] The immense advantage of written

[1] Cf. Umberto Eco's discussion of chairs in La struttura assente, 1968. Eco argues that the co-presence of these aspects in fact makes chairs be signs. Then all functional things would be signs, artifacts or not. Their meaning would be their function. Eco misses the point I am making here. (I forgive him.)
[2] So, again, a piece of furniture, in a museum or in a picture, can be a icon of a historical style or epoch; a urinal can be a work of art, as we know, if we create the semantic gap I am considering here.
[3] This account could explain in general what it means to 'follow a rule'.
[4] The term "interpretation" therefore seems polysemic: the musician "interprets" the written music by playing it. The actor "interprets" a role. The critic commenting a poem "interprets" it. The online translator "interprets" from language to language.

language over spoken is precisely this gap constituted by the absence of situation, when the "author" replaces the "speaker". Texts, written, have interpretations; spoken utterances are, by contrast, integrated immediately in the pragmatics of their situations of use.

In Fig. 2, below, we propose a simple representation of this view of the symbolic form of semiosis. In general, symbolic signs are, as mentioned, instructions, to be performed in the present. The semantic content would correspondingly refer to present states of affairs. However, monuments and similar memorial setups are symbolic signs referring to past states of affairs, while inducing present behaviors of respect, remembrance, awe, etc.; and it may be said that writing – whether linguistic, musical, or mathematical – refers to states of affairs that will be real at the time of their being conceived, interpreted, read, performed or "executed", thus in the future of its formulation. The latter circumstance is then particularly productive in cultural contexts, where such "realizations" of the writ are often collective endeavors.

Symbolic signs are said to be conventional, or arbitrary, or coded. They are of course historically intended, conceived, and worked out by human beings in certain situations, just as proper names are ceremoniously given by someone to someone through so-called speech acts; we could call the instituting acts of symbolization symbolic acts (such acts would include speech acts).[5] (Fig. 2):



[5] Symbolic acts thus consist in producing some object intended to mean some instruction, and to carry this meaning for some reason – the simplest version being the pure decision: A means B "because I say so". The decision itself is a historical reason motivating the symbol – "arbitrarily". Many symbolic acts have more detailed historical motivations, as we know from proper names.

A necessary remark: digital, graphic "signs" – letters, numbers, notes, etc. – must be integrated into sequences manifested on surfaces that are objects of some sort; in themselves they are qualia, short curved lines and line combinations that do not signify symbolically. The spaces of their composition define their meaning potential – so, due to the character of its space of manifestation, a telephone "number" is not really a number.

4. Iconicity

Many digital symbols share graphic properties with drawn figures that we would call images. The A of the alphabet (and alpha) seems to be a descendent of an archaic ploughshare. So what is an image, in this perspective?

If we ask a visual artist, we will learn that it consists of intentionally reproduced qualia observed in objects, events, and acts in space-time. These qualia are typically maintained in the artist's attention during moments of observation and then imitated in some material different from their original place of appearance (the color of an apple will be painted, not on an apple but on a canvas).[6] They then naturally induce the idea of the original place of appearance, an object etc. – it is an image. Such an image can furthermore become a symbol, since it is an object, and even more easily than other objects, because its materiality has no default functional place and context. It denotes what it looks like, while it connotes ideas to which the denoted content may be related; such connotation will assume symbolic force.[7] The entire image, framed and possibly signed by an artist, or cut out of a magazine, additionally connotes social information about the person in control of the space of exposition; this sort of meaning is again symbolic (since it invites an attitude on behalf of the viewer) and also, ultimately, simply causal: it is a symptom of its "owner", and in this capacity, a so-called index, or an indexical sign.

Images are signs by iconicity. Iconic signs include portraits, typically oriented toward the past (here is what someone looked like at a certain time); maps, only useful if they offer information valid in the present of the viewer; and diagrams, typically used for planning of future or hypothetical constructions of some kind. Icons are natural signs in the sense that the

[6] As a matter of fact, I know of no artist having painted an apple on an apple. My point seems overly obvious; but in concept art, an artist – in casu William Anastasi – can take an accurate picture of a wall and then cover that same wall with that picture (Untitled, Dwan Gallery, New York 1966).
[7] This is why Roland Barthes, in his Mythologies, critically studied connotations as ideological mechanisms.

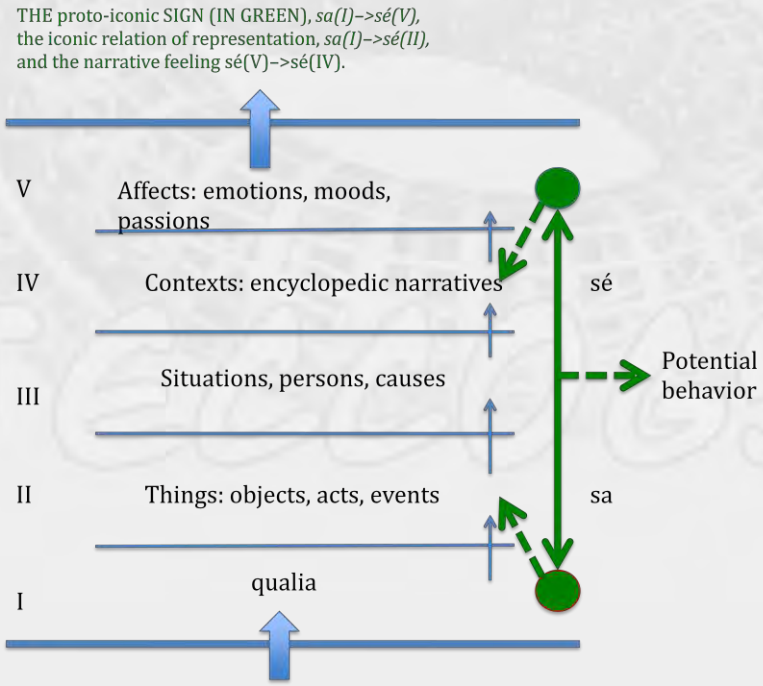
way in which their qualia integrate in the object they present in perception, naturally guides the way they integrate in the representation they form on the non-objectal support. The painting of an apple presents colors and contours of the model apple in a similar disposition, seen from some angle, on the new support that makes the result a representation. The distributed qualia of an apple are presented in a similar disposition in the image of an apple. The way an apple offers its qualia is not in any important way dependent on culture: it is natural (even if its perception will edit the way it is culturally experienced, especially if it is symbolically significant). The sensory material is naturally integrated as qualia of their material source in the pheno-physical world. This is why icons allow communication across cultures, while symbols do not.

Art demonstrates another remarkable property of icons, one that is all-important in so-called design: qualia can be stopped in perception and withheld from integrating on the next level of meaning, that is, they can be experienced on their own level (I) as colors, lines, sounds, and so on – as "form" and "forms". Forms can have names, like musical beats, tones, and scales, and like certain colors and shapes; this testifies to the fact that there are important circumstances where they are perceived as only integrated in the framework of a secondary support, without necessarily being selected from an original object (event, act) that they will now represent. These circumstances constitute what we call aesthetics. Humans possess a faculty of aesthetic perception, whose basic characteristic is to allow the experience of "free qualia", forms disintegrated from former integrations or manifested without any other integration than the present manifestation; we call this phenomenon composition. Basically, composition requires mono-modal perception: music is perceived mainly in the auditive realm, painting mainly in the visual realm.[8]

Compositions of "free qualia" are still iconic signs, I claim, even when their components or constellations do not represent anything on the next level of meaning. For it turns out that aesthetic perception universally entails feelings, states of mind appearing on the emotional level (V). Such aesthetic feelings are variably described, but there is little doubt that they occur by cognitive necessity. All "pure" qualia presentations evoke affective reactions of the mind; different "styles" of qualia are then developed as expressions of "styles" of affect. Style in general can be seen as the result of this differentiable connection; styles in language, architecture, music, pictorial art, dance, arts-and-crafts, and even industrial design, are always

[8] The mono-modality of elementary aesthetic perception may account for the frequent synesthesias found in art (and the myriads of "synesthesic" metaphors describing experiences of art).

somewhat emotionally effective. The factor that drives human interest in form, "pure" or "free" qualia, probably is precisely this immediate and direct mental connection it establishes to affect. Form–affect constitutes a proto-iconic sign relation: **sa(I) –> sé(V)** that opens an immense semantic gap: **II–III–IV**, to fill in the contexts of communication where this proto-icon appears. When a representational disposition of form – **sa(I)–>sé(II)** – fulfills the iconic sign, the aesthetic form-affect connection remains effective, unless it is neutralized by some functional pragmatics of the image (for instance, in the case of robot portraits in criminal investigation), and the gap essentially consists of imaginative concepts (of level IV) that can be triggered as a "narrative affect" by the semantic schemas inherent in affect s – **sé(V)–>sé(IV)** – inspiring possible behaviors (III). Icons represent only possible states of affairs,[9] not actual instructions, or injunctions, as symbols do; this important distinction is simply due to the fact that the iconic signifier is a **sa(I)**, not a **sa(II)**.[10] The signifier is a constellation or arrangement of qualia, a form, not the actual object carrying this constellation (the iconic sign is the text, so to speak, not the book! – an essential distinction, as we know from religion).[11] The following graph shows the mental structure of iconicity, as this analysis proposes to describe it (fig. 3).



[9] C. S. Peirce saw that icons were signs of 'possibility'; however, he did never try to explain this modal phenomenon.
[10] The author happens to have a non-parking sign in his garage; it is now only an image of a non-parking sign, since it has lost its space of relevance; and the idea of prohibiting "parking" in the space reserved for parked cars is now just what we call a "joke". Symbols degenerate into icons; thus, in clothing fashion, military uniform caps etc. are used as ironic and coquettish icons of what they 'have been'.
[11] People swear on books, not on texts. They therefore characteristically lay their hands on the book-object while doing so; forms cannot be touched in this ritual way.

Proto-iconic and iconic communication is cross-cultural; communicating (proto-) iconically is in fact, for humans, the main or only way to transcend cultural constraints on meaning in communication and thought. As individual persons, we are of course capable of naturally understanding images as such, and we are capable of experiencing form as expressions of human affect, with its narrative implicatures (sorrow implying loss; anger implying offense, etc.). Cross-cultural communication is primarily affective, as art demonstrates, to the extent that it is displayed internationally and travels across cultural boundaries. Art is crucial to human freedom and to critical thinking, because it is based on this semiotic property of the mind that allows us to not adhere entirely to any culturally specific community.[12]

In terms of modality, we could say that the core part of mental meaning architecture, II-III-IV, is dominated by displays of cultural instructions, that is, of a social ontology of things we must have (and not have), must do (and not do), and must know (and ignore). This central mass of meaning, which could be termed the deontic core of human consciousness, is negotiated through symbols, symbolic communication. The peripheral part of the architecture of meaning, I&V, embeds the former and consists of our most embodied contents: sensations and feelings, and their extensions: images (II) and intuitions (IV) that inform and guide our experience of the life world – a reality made of possibilities, of things that may exist, that we may do, that may be the case, a reality semiotically offered by the mechanisms of iconicity. The world of the (socially or physically) necessary is given as a part of the world of the possible.

5. Conclusion

In human evolution, the semiotic chapter begins when iconicity disintegrates from a former state of compact meaning integration that only consists of functional behaviors. Theatrical behavior, as we know it from technical teaching-by-showing, may be an important transitional form.[13] Then some theatrical gestural routines expressing extreme states – ecstasy,

[12] On the other hand, the pressure from culture is massive in perception, especially in the auditive domain: tonal pitch and timbre in music, phonemic fine-tuning in first-language, are unavoidable, as Aniruddh Patel (2008) stresses. But this is precisely why foreign music and languages are often experienced as more aesthetically pleasing or interesting than the sounds of one's 'own' culture. In order to experience the homely sounds as aesthetically significant, we have to modify them intentionally, and thus to be 'creative' – something which we can only or mainly be in our 'own' music and language, the idiomatic forms we grow up with!

[13] The mimetic phase in Merlin Donald's (2001) account of cultural evolution

panic, sexual arousal, passionate love and subsequent grief – lead to the invention of new collective forms, which become entrenched as inducing affect, not only expressing it.[14] Once affect can be induced intentionally, it can drive symbolization – which needs to be grounded in shared affect. Shared feelings develop shared stories, that subjects will feel they are part of. Participation drives identification and grounds the entire deontic core of culturalization.

A contrario, affective disturbances – from individual psychosis to collective "hysteria" – can cause deregulation of the symbolic routines of individuals and groups. Neologistic and alterated speech in schizophrenia manifests a certain dissolution of the binding between first-language phonetics and affect, namely the emotional charge of its sounds. The semiotics of psychosis manifests correspondingly an extension of the deontic core to the entire domain of consciousness, potentially erasing the "free qualia" altogether.

The view of the mental architecture of meaning we have sketched out here may shed some light on mental pathologies and thereby contribute to the general cognitive psychology of our "symbolic" species. Immediately, I would like to just underline one single point: the aesthetic and the functional modes of perception are distinct processes within the same mental architecture; their difference gives rise to iconicity, which drives symbolization but stays distinct from it. We might as well call humans the iconic species.[15]

However, the underlying point of all such semiotic points is the cognitive point that the mind indeed has an architecture of integrations by stable levels of complexity – not of increasing complexity but rather of different complexity – which makes the semiotic evolution of our species possible, and allows subjects of our species to think and to communicate but – *mirabile dictu* – to communicate thoughts.

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[14] Drug-induced ecstasy is found in many religious practices; extreme states of mind (and body) are regularly related to artistic activity and aesthetic sensibility; such states have been (and are) creative in so far as they involve the unfolding of proto-iconic connections.
[15] In Terrence Deacon's (1997) The Symbolic Species it is rather evident that the blind spot is iconicity.

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TRANSFORMING GESTURE TO SIGN IN THE THEATRE

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Abstract: This paper explores the transition from speech-gesture to theatrical gesture. Gestures, according to David McNeill and Susan Goldin-Meadow, are an integral part of speech, performing a crucial function in the organization of thought into language. In acting gesture is defined as a sign that communicates a character's action, state of mind and relationship with other characters to an audience. Portraying Granpa Joad, in a production of *The Grapes of Wrath*, I performed a spontaneous gesture in rehearsal that, fulfilling the needs of a theatrical gesture, was transformed into a sign through the repetition of rehearsal. Dynamic Systems Theory is used to understand the transformative process of making a spontaneous gesture into a complex, intentional, and communicative act.

Key Words: Dynamic Systems Theory, Gesture, Language, Signs, Acting, Theatre

The Joad family, in John Steinbeck's *The Grapes of Wrath*, plan to abandon their farm during the Oklahoma dust storms of the 1930s and head to California in search of a better life. Granpa Joad, a "hell raiser", is enthusiastic about going while the decision is being made, but balks when it comes to leaving the land he has tilled throughout his life. He tells his family to go on without him: he belongs on the farm. They carry him to the truck; and it is the last time he is seen alive – at least in the play. Frank Galotti and the Steppenwolf Theatre Company adapted the novel for the stage in 1988. I had the opportunity to play Granpa Joad in a Stony Brook University production by the Department of Theatre Arts in the Spring of 2008.

Granpa Joad enters from the barn where he has spent the night deciding that he is not going to California. As staged, he enters slowly, sits on a rock and, when the moment comes for him to tell his children that they should go on without him, he gestures for them to leave. During one rehearsal – on the line "You go right along."[1] instead of a single movement of dismissal I made two quick jerks of the hand, palm down, fingers curled. It was immediately clear that this movement gave significant insight into the character's weakened physical state and foreshadowed his death. This variation of the gesture was kept as part of the character's score (a sequence of movements, words and gestures memorized by the performer so the performance can be repeated more or less precisely night after night). The physical mechanics of the spontaneous gesture were committed to memory and timed to happen at a specific moment in the particular line. In the narrative of the character's life it remained a movement of dismissal, but in the production it became a sign of Granpa Joad's failing physical and psychic health.

This essay uses Dynamic Systems Theory (DST) to explore the transformation of a spontaneous gesture to a theatrical sign intended to communicate information about the character and narrative of the play to an audience. A brief definition of a dynamic system is followed by a more extensive discussion of the relationship between gesture and language in everyday life. Gestures in a theatre rehearsal are differentiated from those of everyday experience through examining the relationship between actor and character in realist plays. DST returns as a model for understanding how an unanticipated movement is transformed into a consciously performed sign that is intentionally learned and then repeated in performance to evoke a particular response in the spectators.

[1] Galati, Frank. *John Steinbeck's* ***The Grapes of Wrath*****.** New York: Dramatists Play Service, 1991: 27

Dynamic Systems Theory

Dynamic Systems Theory was first conceived as a set of mathematical formulae designed to explain *non-linear* phenomena that occur in the physical world, such as the patterns that form when some liquids are heated to the boiling point. It is also being used to describe the operations of other systems, such as neural networks. A *linear* system tends to be closed: a stimulus creates disequilibrium, triggering a sequence of events along a particular path that lead to the return of equilibrium (flipping a switch turns on a light). Rather than following a prescribed structure, a dynamic system is self-organizing, that is when perturbed by changes in the environment (the heating of water, for example) excitations give rise to patterns that restore it to a new state that is near equilibrium. Because open systems are continually in a reciprocal relationship with the environment (affected by and affecting it) the system is always in a state of disequilibrium. The influx of additional stimuli further destabilizes the system, which in human beings leads to responses expressed as behavior, thought and emotion relevant to a given situation. "Broadly defined, self-organization refers to the emergence of novel patterns or structures, the appearance of new levels of integration and organization in existing structures, and the spontaneous transition from states of lower order to states of higher order."[2] The realization that he is going to leave the farm upsets Granpa Joad. Emerging from this agitated state is the erroneous decision that he can survive without the family.

A dynamic system operates within certain parameters that are defined by internal organization and the relationship to the environment. Breathing requires the respiratory mechanisms and an atmosphere with sufficient amounts of oxygen. These limits are called boundary conditions, which constrain the range of possible emergent patterns. Attractor states, or conditions that encourage a particular response to circumstances, also decrease the time it takes for a system to respond to a disruption. Marathon runners learn that a particular rhythm of breathing provides the oxygen needed to sustain the amount of exertion and the correct frame of mind for enduring long distances. They do not begin running with that breathing pattern, but as the demand for oxygen increases, memories of the previous responses that were successful are activated and attract the system to that rhythm: "dynamic systems seek preferred behavioral modes as a function of the interactions of their internal components and their sensitivity to external conditions."[3] Not all attractor states are equally stable. The more

[2] Lewis, Marc D. "Bridging emotion theory and neurobiology through dynamic systems modeling." *Behavioral and Brain Sciences* (2005) 28, 173.
[3] Thelen, Esther and Linda B. Smith, *A Dynamic Systems Approach to the Development of Cognition and Action*. Cambridge, Massachusetts and London, England: The MIT Press, 1994: 60.

frequently a pattern is used, the more likely and quicker it will emerge as the dominant pattern. Techniques, for instance, are habitual patterns that recur with relative ease, while less stable attractors promote behaviors that respond to conditions experienced previously but not frequently.

The process of returning to a state of equilibrium can be simple or complex. Changing the rate of breathing may involve a single attractor while attuning to the correct state of mind involves more than one. Each attractor is associated with different patterns. For more than one attractor state to be simultaneously productive requires that the various rhythms elicit behavior that is not contradictory. The frame of mind of the runner cannot desire a slower pace if the breathing cadence necessary to sustain the effort is to be maintained. Similarly the change in the amount of oxygen brought into the body will alter the state of mind. They are interrelated in a reciprocal relationship of mutual support; and will continue to co-exist as long as the dynamics of the two aspects of the running are in harmony. The disruption of one – the runner feels she is falling too far behind, the muscles begin to tire – will throw the other out of sync requiring a readjustment that restores a state of near equilibrium to both. The same relationship exists between gesture and language.

Language

The fundamental tenet of a Neural Theory of Language is that abstract thought, long considered an autonomous function of the mind, is based on embodied experience. This claim is based on two supporting claims. The ability to understand language, both conceptually and grammatically, is possible because a) members of a culture have similar experiences, particularly as children, and b) they are taught to organize experiences according to frames that reflect cultural norms. Frames consist of attractors and boundary conditions that encourage the use of familiar patterns for communicating; and in language these form the basis of grammar. The use of these patterns is central to articulating thoughts in ways that are comprehensible in the culture. Common experiences and shared frames are the basis for understanding the structure and flexibility of language. Another foundational principle of this theory is the premise that the world does not consist of discrete objects. Instead the division of reality into things occurs because we organize it in a way that makes sense for us: "my categorization of trees is not at all like that of an arborist.[4]" Language, therefore, is based on a way of structuring the world that is formulated through experience and cultural frames; but it

[4] Feldman, Jerome A. *From Molecule to Metaphor: A Neural Theory of Language*. Cambridge, Massachusetts: The MIT Press, 2008: 96.

is circular in that the form and content of words and their ordering also determines how we construct our reality.

Experience, in its "raw" form, is not equivalent to meaningful language; rather the gestalt image derived from perceptual and proprioceptive information is used to generate more complex thoughts through metaphor. A further look at metaphor is needed to adequately understand the Neural Theory of Language. In this context, "*The essence of metaphor is understanding and experiencing one kind of thing in terms of another*.[5]" First steps in learning to gain control of the body and interaction with objects (such as liquid in cups) provide meaningful experiences forming schemas that can be used to communicate very different concepts. Schemas are constructs formed through active engagement in the world. Because of shared, if not identical histories, schemas can communicate to the community concepts not directly related to the experience. For instance, an infant wanting to get hold of an object, such as a favorite toy, is the kind of experience that gives rise to the source-path-goal schema; seeing water poured into a glass can form the foundation of the containment schema, and so forth. These forms are useful because they can be employed in a number of very different contexts, creating metaphors. Containment, for instance, can be used positively in reference to military strategy (to contain the enemy), medicine (to keep the disease from spreading), architecture (the articulation of space), and negatively, such as in astronomy (space is infinite, i.e., uncontained).

Returning to DST, ideas are perturbations that activate a number of attractors (possible meanings) and boundary conditions (including cultural frames) across several domains associated with speech and motor activity. The return to a near stable condition does not take place because of finding the correct answer but the "best fit": "People, including children, are always trying to find the best fit between what they observe and what they know.[6]" The temporal dimension of communication utilizes the instability of dynamic processes, "allowing" the consideration of a number of different patterns that may contribute to understanding (or the lack thereof). The meanings that emerge will be sensible provided they utilize cultural frames with sufficient precision to allow for a "best fit." As long as the structure of the sentence follows the rules of grammar more or less precisely, and the listener has the appropriate experiential schemas, meaning will be communicated that approximates the complexity of the intended idea.

[5] Lakoff, George and Mark Johnson. *Metaphors We Live By*. Chicago and London: The University of Chicago Press, 1980: 5.
[6] Feldman, 323

The ideas underlying linguistic expression are not predetermined but take form as they are spoken. Thought changes when the words that would be most appropriate to communicate an idea fail to materialize or an alternative way of saying the same thing presents itself. Speech stops as the speaker re-evaluates the dynamic between the intent and the words, and as other patterns of words appear. At its most successful it can lead to eloquent speech; when less successful, it can result in stuttering, mixed metaphors, and unfinished phrases as the speaker strives to find a more precise way of communicating the ideas. In this sense, language is a top down process that proceeds from idea to individual words and phrases.

Gesture

Gesture refers "to hand movements that are directly tied to speech. They can beat the tempo of speech, point out referents of speech, or exploit imagery to elaborate the contents of speech…[they] are in the service of communication and, in this sense are deliberate. [7]" Gestures emanate as part of a process parallel to and intimately entwined with the articulation of thought in words. Habits (running your hand through your hair) and emblems (thumbs up) are not considered gestures, because the former is not directly linked to speech and the latter takes the place of speech. David MacNeill and Susan Goldin-Meadow identify four types of hand movements that fit the definition of gesture: iconic, metaphoric, deictic and beat. They are most interested in the first three. Iconic gestures are those where there is a direct correlation between the hand movement and "the semantic content of speech."[8] Metaphoric gestures present abstract ideas, while deictic indicate a person or object referenced in speech.[9]

Gestures used in everyday conversation do not express complete meanings, but are an integral part of communicating, and are intimately connected to language: "gesture is not input to speech, nor is speech input to gesture; they occur together."[10] Gestures do not serve language; they are part of the generation of meaning arising from the process of transforming thought into words. "To make a gesture, then, is to iconically materialize a meaning in actional and spatial form."[11] Instead of taking the form of words, they are moving images (iconic) that relate to and communicate the thought being formed in space and over time.

[7] Goldin-Meadow, Susan. *Hearing Gesture: How Our Hands Help Us Think*. Cambridge, Massachusetts, and London, England: The Belknap Press of Harvard University Press, 2003: 4.
[8] Goldin-Meadow, 6.
[9] Goldin-Meadow: 7
[10] McNeill, David. *Gesture and Thought*. Chicago and London: University of Chicago Press, 2005: 93.
[11] McNeill, David: 56.

Gestures appear to arise spontaneously and, indeed, they are frequently not conscious acts. They are, however, part of the cognitive processes of language production and, in fact, have their origins in the same part of the brain. The Broca's area, located in the inferior frontal gyrus, part of the left frontal lobe, is generally associated with speech. More recent imaging technologies confirm that it is also used to generate physical actions, including gesture.

Broca's area is more than a 'speech center'. It is *the area of the brain orchestrating actions under some significance* – that is, it is the area of the brain that assembles sequences of movements and/or complexes of moving parts into performance packages unified by goals, meanings, and adaptability.[12]

Evoking gestures to express a thought occurs simultaneously with the search for the appropriate words. An idea perturbs the speech centers, activating attractors and boundary conditions in the search for linguistic patterns that provide the best fit for the thought, putting action centers into disequilibrium, producing gestures that assist the speaker and enhance the communication. Gestures therefore are not arbitrary but are material carriers of meaning, "not a representation but an updating [of] the speaker's momentary state of mind."[13] I gesture because it helps me to formulate the phrases that will communicate the idea to my listener(s).

To put it another way, the relationship between gesture and speech is dialectical, an interaction between different types of thought in the movement toward a synthesis of image and language.

This imagery language dialectic (materialized in gesture and speech) is an interaction between unlike modes of thinking. The disparity of these modes is the 'fuel' that propels thought and language; the dialectic is the point at which the two dimensions intersect.[14]

The sequence is further complicated because the dialectic takes place within the crucible of boundary conditions reflecting subjective intents and pressures exerted by the environment. "The field of oppositions indexes and is constrained by external conditions, both social and material, but an essential fact is that it is also *a mental construction, part of the speaker's effort to construct a meaning.*"[15] The intent to speak provides an impetus to the speech centers and the area associated with movement sequences, creating a three-step process consisting of a growth point, unpacking and stop order.

The key to the dialectic is that the two modes are simultaneously active in the mental experience of the speaker. Simultaneously representing the same idea unit in opposite modes

[12] MacNeill: 212.

[13] MacNeill: 19.
[14] MacNeill: 4.
[15] MacNeill: 107.

creates instability, a 'benevolent instability' that is resolved by accessing forms on the state dimension – constructions and lexical choice, states of repose par excellence.[16]

Intent leads to instability that resolves itself in repose. Unlike the dynamic system itself, which only obtains relative stability, the language gesture dialectic comes to an end when the thought is complete. This concept has important ramifications when it comes to a discussion of structuring a performance, but now the three parts of the dialectical process need to be defined.

The Growth Point (GP) or psychological predicate[17] arises from the speaker's intent. It is the perturbation that destabilizes the system, setting in motion the process of transforming thought into language and gesture. The uncertain origins of a Growth Point make it impossible to identify a beginning. Suffice it to say that it arises from subjective desires and environmental influences. As the name suggests, it is a seed from which a larger process grows. The thought contained by the GP initiates the dialectic between language and gesture. "All of this is meant to be a dynamic, continuously updated process in which new fields of oppositions are formed and new GPs or psychological predicates are differentiated in ongoing cycles of thinking or speaking."[18] As noted in earlier discussions of dynamic systems the process of perturbation continues as new perceptions and proprioceptions are introduced, evoking new patterns of behavior; so it is with speech/gesture.

The metaphor "unpacking" is somewhat misleading, because when emptying a suitcase, say, the objects are already present. The dialectic between gesture and language is considerably more complex.

The implication of the unpacking effect is that, before a GP is unpacked, thinking is not complete. It is not that one thinks first, then finds the language to express the thought…rather, thinking, as the source of meaning, emerges throughout the process of utterance formation.[19]

The act of unpacking is the formulation of thought in material forms. As I write, the thoughts to be communicated start and stop, wrong words are identified, some replaced, additional phrases added or deleted, and slowly the ideas gain clarity. The knowledge of what is to be said only comes with the saying. "Unpacking fleshes out the material carrier of the speaker's meaning in its particular context of speaking, with added meanings generated to

[16] MacNeill, 18.

[17] MacNeill, 107.

[18] MacNeill, 107.

[19] MacNeill, 125.

achieve a well-formed pattern."[20] A pattern that consists of both words and gesture is formed that communicates the ideas as they pertain to the specific environment.

The third and final element of the dialectic is the "stop order" that occurs when the thought is complete. Words and gestures also cease. The process has no defined limit.

This process continues until, eventually, a 'stop-order' occurs (it stops only temporarily: a new cycle begins immediately or might overlap the earlier one). A stop order is an intuitively complete (or complete enough) static structure (intuitions of well-formedness being how one experiences the static dimension).[21]

At other times the dialectic does not come to a happy conclusion and the speaker is stymied, unable to complete the thought. Cycles may begin again or the person speaking may become a listener in a dialogic process as her interlocutor begins the transformation of thought into word and gesture.

Gesture to Theatrical Sign

An actor in a realist drama embodies a character by developing an understanding about his or her behavior as written by the playwright. Embodiment, in this instance, refers to the development of a body image – "a system of perceptions, attitudes and beliefs pertaining to one's own body"[22] – or in this case the body of the role being portrayed – including movement, gesture and speech. It is a labor intensive and complex process that uses analysis and rehearsal to discover motivations for the character's behavior. This process of physicalization and vocalization is based on relationships with other characters, the trajectory of the narrative and the given circumstances of the play. Given circumstances include physical characteristics (age, physical limitations), psychology, moral and ethical values, race, sexuality, culture, political outlook, economic and social class. The performer also uses the movement patterns or blocking devised by the director, and the work of other actors in the play. A significant part of creating the physical performance is coming to an understanding of the (imagined) cognitive processes that lead a character to express herself using the words written by the author.

This exploration inverts the everyday process of putting thoughts into words. The speeches are given, but the thoughts that justify them are implied rather than clearly stated. Characters seldom engage in general conversation but speak to greater purpose (they are

[20] MacNeill, 124.
[21] MacNeill, 18.
[22] Gallagher, Shaun. *How the Body Shapes the Mind*. Oxford: Clarendon Press, 2005: 24.

avoiding, concealing or trying to discover something) and with words that are designed to be evocative. While analysis and reflection are useful tools, the understanding of the character is ultimately derived from an active engagement in communicating with the other actors/characters during rehearsal. This dynamic interaction allows the actor to test different ways of achieving the character's objectives and compelling the other actor to respond in ways that are appropriate to the play. Developing reciprocity (a sense of give and take) between characters is accomplished cooperatively between the performers and is crucial for understanding the motivation for saying a line, justifying the words in the order in which they were written, and delivering them with the proper rhythm and intensity. The desired end is to convince an audience that the lines being spoken are happening *as if* it was taking place in everyday life.

Gestures, in this instance, do not arise from trying to find the right words to express the thought, but in finding the idea that is the best fit for the character's speeches. The gestures are no less spontaneous than in everyday life, because if an actor consciously plans how to use her hands, they lose their life-like quality. Public speakers who have been told how to gesture for greatest effect frequently look unnatural because the timing of the movements is premeditated. Focusing on the delivery of the lines and the reasons for saying them in rehearsal frees the actor from worrying about what her hands are doing and allows gestures to appear organically as part of the language-thought dialectic. It is not a straightforward process, however. Every gesture will not fit the circumstances when they first happen in rehearsal, rather they may appear to be awkward, forced or not appropriate for the character. The experience of the movement being not quite right may indicate a disjunction between the intent and the words, although there are other possible reasons. One alternative is that the gesture may not fit the body image the actor is developing; that is, this person in these circumstances would not behave in this way. When the gesture works, the performer may experience an "Aha!" moment that simultaneously validates the understanding of the character's intentions and provides new forms of expressing the character and the action.

When a best fit occurs – whether an epiphany or not – the actor remembers it (keeping it active until it can be consolidated in long term memory) and incorporates it into the performance score. In future rehearsals the gesture will be repeated and linked to the specific words (growth point), and rhythms and inflections (unpacking) of the speech, changing from an improvisational discovery to an intentional act that communicates information about the connection between the character's motives and the words, and her relationship to the circumstances in which it takes place. It gains a significance that it did not have as a

spontaneous gesture because it becomes integrated in the overall structure of the character – providing information about who this person is and what her actions mean. It becomes a sign that resonates with referents beyond the initial relationship of word to thought.

Granpa Joad's last scene before he dies in *The Grapes of Wrath* is one of resistance. Acknowledging his love of the earth that he tilled throughout his adult life, he is determined to stay on the land that is his home. The family refuses to let him stay; and when last seen he is being put into the truck that will take them to California. He does not go willingly, and in an act that showed weakness more than defiance, tells his son to go on without him. With my arm directed at my boy, palm down and fingers curled in, I made two quick flicks. It was not a conscious choice but a movement that arose out of the connection between the words and the intention that also communicated the character's fragile state and impending death. The flicks were iconic, meaningful, not only of the relationship between word and thought, but the character's relationship to the world of the play. Making the gesture gave meaning to the action outside of the manifest content of the words. Without the context, the gesture would have lost its complexity. Words and gestures work together to communicate meaning; when linked to the context defined by the given circumstances they become signs.

Dynamic Systems, Gestures and Signs

Non-linear systems are subject to perturbations from the external and internal environment, including memories that may be evoked unconsciously. These disruptions activate attractors and boundary conditions that serve to resolve the disruption by invoking rhythms and patterns that in the theatre lead (ideally) to novel solutions that restore a state of near equilibrium. Happy accidents that give insight into character and action during the rehearsal process occur because the actor is focused on performing specific actions and changing relationships with the other characters/actors. What is absent from this construct is the search for a solution. Seeking *an* answer changes the dynamics by imposing boundary conditions, limiting the emergence of patterns and associations that have the potential for providing unexpected insights into how the character behaves, thinks and feels. Once the discovery has been made the gesture can be integrated into the score as a unit of action, serving as an attractor linked to lines, movement patterns, vocal and physical intensities. That is, it ceases to be a gesture (in the strict sense of the word) and becomes a sign that cues the continued unfolding of the performance. It keeps the performer focused on the score and provides information to the audience who "read" its significance and fold it into their intellectual and emotional understanding of the play. They realize that Granpa Joad is a broken

man and, perhaps, connect that to the larger issues of the play – the destructive force of unfeeling institutions that foreclose on a mortgage, forcing a family from their land.

The transformation of gesture to sign can be seen as the reduction of a complex process (the dynamic interaction of thought-word-gesture) into a codified communication. This is a misapprehension about the function of a sign in the theatre, and perhaps in everyday life. The theatrical sign is also a perturbation that disrupts the equilibrium of the system, bringing into play the spectator's perceptions, proprioceptions and memories that allow for the emergence of new patterns of meaning. These associations resonate beyond Saussure's and Pierce's rather static definitions of the sign, and approach Deleuze and Guattari's image of spiraling significations, the proliferation of meaning. The theatre depends on the tension between a multiplicity of interpretations and the desire of the system to return to a state of near equilibrium. The well-crafted play strives to bring about a resolution to this tension; the great play does more than this because it communicates meanings that resist compression into a single idea. Just as the right gesture solidifies an understanding of the character at the same time that it opens new possibilities for expressing it, so the theatre, at its best, uses signs to encourage and resist understanding by opening the possibility of new insights into the human condition.

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ARTEFATOS COGNITIVOS E TÉCNICA DE DANÇA

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'Cognitive artifacts seem to amplify human abilities'.

Edwin Hutchins

'Rather than focusing exclusively on an individual's internal cognitive processes, that traditional cognitive approaches do, it focuses on the processes that take place in an extended cognitive system.'

Yvone Rogers

Resumo

Técnicas de dança podem ser descritas como artefatos cognitivos, ou mediadores epistêmicos, incrementando seus usuários com novas habilidades cognitivas. As técnicas projetam paisagens semióticas de complexos comportamentos motores relacionados a diferentes níveis de artefatos materiais (espaço tridimensional, sons e música, luz, etc), dando origem a estratégias orientadas para a manipulação de signos. Vamos introduzir aqui esta perspectiva e explorar preliminarmente algumas de suas consequências.

Palavras-Chave: cognição, artefatos, dança, arte.

Abstract

Dance techniques can be described as cognitive artifacts, or epistemic mediators, increasing its users with new cognitive skills. The techniques design semiotic landscape of complex motor behaviors related to different levels of material artifacts (three-dimensional space, sounds and music, light, etc.), leading to oriented strategies for the manipulation of signs. Here we introduce this perspective and preliminarily explore some of its consequences.

Key Words: Cognition, artifacts, dance, art.

1. Introdução

A dança é uma complexa atividade envolvendo a integração de muitos processos - percepção de padrões espaço-temporais, sincronização de signos externos, coordenação complexa de movimentos do corpo, no tempo e no espaço. Investigações recentes começam a elucidar as bases cognitivas da dança. A idéia de que a dança pode ter surgido como uma forma de proto-linguagem, já que complexos movimentos ativam áreas homólogas à área de Broca, associada à produção da fala, baseia-se em evidências empíricas bastante recentes (ver Brown, Martinez, & Parsons, 2005). Outras investigações estão preocupadas em como *signos* externos (e.g. *marking*, ver Kirsh, prelo) formam aquilo que muitos autores chamam de "pensamento distribuído" (e.g. Wilson & Clark 2009; Hutchins 2006, 1999, 1995; Clark, 2008, 2006, 2003, 2002). Nossa abordagem aqui se identifica, em termos gerais, com este paradigma (*distributed thinking*). Ele enfatiza os aspectos materiais, sociais e externos dos processos cognitivos (Hutchins, 2006), e foi desenvolvido em meados de 1980 por Edwin Hutchins usando *insights* e métodos da antropologia, ciências cognitivas, e da doutrina filosófica do *externalismo*. Como premissa fundamental, é assumido que, sob determinadas condições, o organismo está densamente vinculado a entidades e processos externos, em diversas formas de interação biunívoca, criando sistemas cognitivos dinâmicos acoplados.

Nossa questão específica aqui é: como situar cognitivamente as técnicas de dança (TDs)? Sabemos ainda muito pouco sobre o papel fundamental que as técnicas de dança têm na evolução e desenvolvimento das atividades cognitivas relacionadas à dança. As técnicas de dança podem ser descritas como artefatos cognitivos, ou mediadores epistêmicos, *incrementando* seus usuários com novas e específicas habilidades cognitivas. Há aqui uma importante suposição: a dança é uma tarefa cognitiva complexa que envolve primordialmente o uso e a manipulação sistemáticos do mundo externo. Esta premissa tem um papel crucial, e está alinhada àquilo que os cientistas cognitivos têm enfaticamente chamado de "cognição situada" (*situated cognition*) (Wilson & Clark 2009). Correlata, a noção de "mediadores epistêmicos' foi introduzida por Magnani (2001) e é derivada de Hutchins (1995), que cunhou a expressão "estrutura de mediação" para se referir a ferramentas externas que cognitivamente fornecem suporte (*scaffolding*) à atividade de navegação no espaço.

Sumariamente, artefatos cognitivos são dispositivos materiais não-biológicos acoplados aos sistemas cognitivos de modo que modificam fundamentalmente diversas competências cognitivas. Os artefatos ampliam e modificam a ação, criando novos espaços de problemas computáveis. Para Clark (2003: 3; 2006; 2009), os seres humanos são *ciborgues* inatos porque nascem com competência para acoplar artefatos não-biológicos a seus corpos-mentes para

resolver todo o tipo de problema. Os artefatos modificam as ações no meio ambiente, ampliam ou intensificam habilidades naturais, podendo alterá-las radicalmente. Exemplos de artefatos incluem: lápis e papel, notações, mapas, modelos, sinais, calendários, ábacos, calculadoras, computadores, internet, celulares, GPSs, blocos de desenho, algarismos arábicos, bússola, e muitos outros, incluindo a linguagem.

Esta perspectiva pode conduzir-nos ao menos a dois resultados importantes: (1) um tratamento externalista da noção de técnica de dança, e as principais conseqüências dessa suposição no contexto de discussões sobre formas de aprendizagem (um tópico que não vamos abordar diretamente), (2) uma morfologia semioticamente orientada de classes de artefatos (de acordo com a teoria do signo de Peirce) permitindo uma especulação sobre formas de desenvolvimento e de acoplamento funcional de artefatos como signos.

2. Técnicas de Dança

Para muitos autores (Sanches, 2005; Louppe, 2000; Soter, 1999; Foster, 1997), as técnicas de dança, frequentemente usadas em treinamentos, estão vinculadas ao "objetivo da cena", ou seja, sua elaboração acontece com o propósito de tornar o dançarino preparado para criações específicas. São típicos os exemplos de técnicas de dança organizadas por meio de sistemas de movimentos bem codificados, como o balé clássico e as diferentes técnicas de dança moderna americana (e.g. Martha Graham, Doris Humphrey, Lester Horton, José Limón). Também podem ser incluídas aquelas técnicas que não são sistematizadas por meio de passos codificados, mas operam através de restrições definidas de ações, como é o caso do contato improvisação, desenvolvida por Steve Paxton.

De acordo com esta abordagem, TDs são artefatos "acoplados"[1] aos sistemas cognitivos de dançarinos, alterando radicalmente suas competências (percepção espacial, tomada de decisão, inferência, etc.), e dando suporte (*scaffolding*) à concepção e solução de problemas motores locais.[2]. Além disso, fornecem suporte ao aprendizado de novos artefatos, para a execução (no palco ou em sala de aula) de movimentos, e para a criação, tanto de novos artefatos em aulas de dança, quanto em obras de dança[3]. Eles funcionam como "atalhos" para o acoplamento de novos artefatos, para melhorar a *performance* (no palco ou na sala de aula) de

[1] O termo 'acoplado' é usado seguindo uma asserção técnica, em teoria de sistemas dinâmicos (*acoplamento estrutural*) e em ciências cognitivas (e.g. *círculo funcional*). Embora a distinção pareça ser sutil, 'acoplamento funcional' deve incluir o uso resultante da aprendizagem de 'um sistema de regras e restrições', ou de uma coleção de instruções, que produzem resultados extensivos na execução de tarefas. No caso do acoplamento das técnicas de dança, a aprendizagem, o desempenho, o treinamento e os processos criativo/compositivos estão envolvidos.

[2] Pode-se especular que TDs amplificam propriedades de sistematicidade e combinatoriedade de componentes motores, especialmente as técnicas sistematizadas em códigos, uma perspectiva que deve ser examinada em outro trabalho.

[3] Para uma visão detalhada deste processo, ver Aguiar (2008: 28-29)

coreografias e para criação de novos artefatos na sala de aula ou de movimentos nas obras de dança.

É bem sabido que a técnica do balé clássico é organizada em *passos* de dança, combinados para execução de exercícios para o treinamento dos bailarinos e para a composição de coreografias em espetáculos (ver Faure, 2000)[4]. Neste caso, os passos, codificados em sistemas de passos, atuam como atalhos para a execução e para a criação de coreografias (ver Aguiar, 2008:34).

Figura 1 - Posições de braços e pernas da técnica de balé clássico do método Vaganova

Neste contexto, as TDs "constrangem" (*constraints*) as ações de bailarinos e coreógrafos em diferentes níveis. Deve ser possível analisar tais constrangimentos ao longo do desenvolvimento de um programa estético (e.g. Balé Romântico) e na criação/composição de trabalhos específicos, que atuam (coercitivamente) articulados a outros artefatos (cenário,

[4] Há diferentes métodos ou escolas de treinamento em balé clássico. Os mais comuns são os métodos Bournoville (dinamarquês), Vaganova (russo), Cecchetti (italiano), Royal Ballet School e Royal Academy of Dance (ingleses), Alicia Alonso (cubano) e Balanchine (americano).

iluminação, história, etc.), em diferentes escalas de tempo (dias, meses, décadas, etc.) e de espaço. Se esta é uma boa suposição que a relação entre programa estético e técnica não é de determinação unívoca, também é que as TDs não provêem apenas soluções para problemas estéticos, mas aberturas e coerções para o desenvolvimento de novos processos. O bailarino, coreógrafo, ou o bailarino-coreógrafo, e o que são capazes de conceber e fazer se baseiam (e dependem fundamentalmente) nos artefatos 'acoplados' aos seus corpos-mentes.

A variedade morfológica de artefatos tem sugerido diversas classificações – material *versus* mental (Norman, 1993); planejado para *versus* oportunístico (Hutchins, 1999); transparente *versus* opaco (Clark, 2003). Sugerimos, muito preliminarmente, uma versão distinta baseada no fato de que artefatos atuam semioticamente sobre seus usuários, e estruturam 'paisagens' ou 'nichos' semióticos (ver Queiroz 2007). Nossa sugestão baseia-se na teoria pragmática do signo de C. S. Peirce.

3. Semiose

A teoria do signo de Peirce está relacionada a tentativas formais de descrição dos processos cognitivos em geral (ver Skagestad, 2004, 1993). A teoria provê: (i) um modelo pragmático de semiose e uma concepção da mente como um processo de interpretação de signos (Ransdell, 1977); (ii) uma lista das variedades fundamentais de semioses com base em uma teoria lógica e fenomenológica de categorias (Queiroz, 2004).

Oposto a qualquer forma de internalismo, Peirce pode ser considerado um precursor importante da hipótese da mente estendida (*extended mind*) e cognição distribuída (*distributed cognition*) (Queiroz & Merrell, 2009). Há, para Peirce, a premissa fundamental de que não podemos pensar sem signos, e de que todo pensamento é um signo (CP 1.538, 2.253, 5.314, 5.470) [5]. Peirce define pragmaticamente um signo como um meio para a comunicação de uma forma ou de um hábito incorporado no objeto para o interpretante (cf. De Tienne, 2003), de modo a limitar (em geral), o comportamento do intérprete:

> … a Sign may be defined as a Medium for the communication of a Form. [...]. As a medium, the Sign is essentially in a triadic relation, to its Object which determines it, and to its Interpretant which it determines. [...]. That which is communicated from the Object through the Sign to the Interpretant is a Form; that is to say, it is nothing like an existent, but is a power, is the fact that something would happen under certain conditions (EP 2.544, n.22).

[5] A obra de Peirce será citada como CP (seguido por número de volume e parágrafo), *The Collected Papers of Charles S. Peirce*, Peirce 1866-1913; EP (seguido pelo número de volume e página), *The Essential Peirce*, Peirce 1893-1913.

Forma é definida como o sendo da natureza de um predicado, e de uma 'proposição condicional' afirmando que certas coisas deveriam acontecer sob circunstâncias específicas (EP 2.388). Para Peirce, a forma é algo que está incorporado no objeto (EP 2.544, n. 22) como um hábito, uma "regra de ação" (CP 5.397, CP 2.643, ver Queiroz & El-Hani, 2006).

3.1. A divisão mais fundamental dos signos– ícone, índice, símbolo

Em sua "divisão mais fundamental dos signos" (CP 2.275), Peirce caracteriza ícones, índices e símbolos como correspondentes, respectivamente, às relações de similaridade, contigüidade, e de lei entre S e O (relação signo-objeto) na tríade S-O-I (relação signo-objeto-interpretante) (ver Savan 1987). Em processos icônicos, a forma que é comunicada a partir do objeto para o interpretante através do signo é uma *similaridade* entre o objeto e o signo. Um signo icônico comunica um hábito incorporado em um objeto para o interpretante, de modo a restringir o comportamento do intérprete, como resultado de uma qualidade compartilhada pelo signo e o objeto. Em contrapartida, se S é um signo de O em virtude de 'uma conexão física direta' entre eles, então S é um índice de O. Um signo indexical comunica um hábito incorporado em um objeto para o interpretante como resultado de uma conexão física direta entre signo e objeto. Finalmente, em uma relação simbólica, o interpretante está para "o objeto através do signo" por uma lei, norma ou convenção (CP 2.276). Neste processo, a forma comunicada do objeto para o interpretante através do signo é uma relação *legal* entre um determinado tipo de signo e um determinado tipo de objeto. Um signo simbólico comunica um hábito incorporado em um objeto para o interpretante como resultado de uma regularidade na relação entre signo e objeto (lei, convenção ou regra).

3.2. O espaço morfológico das TDs como signos

De acordo com nossa aproximação inicial, TDs projetam "paisagens semióticas" bem estruturadas de comportamentos motores complexos acoplados a diferentes níveis de artefatos, de diversas naturezas – e.g. pulso rítmico da música. O espaço morfológico semiótico variado deve incluir classes de proto-símbolos (processos quase simbólicos), além de processos indexicais, icônicos e simbólicos. Podemos então supor que TDs, como signos, incorporam hábitos, padrões de comportamento ou "regras de ação". O hábito comunicado pelo signo, ou artefato, é uma qualidade (quando se trata de um ícone), um evento (índice) e/ou uma lei

(símbolo). De acordo com esta interpretação, há três modos de operação vinculados a três tipos de artefatos que constituem as TDs:

- **icônico**: regras e instruções que estruturam ou amplificam sensações/ sentimentos (*feeling*). Este tipo de artefato é frequentemente usado para o treinamento de percepções corporais básicas, como as técnicas de educação somática associadas à dança.

Figura 2 – Técnica de Feldenkrais: exemplo de técnica icônica (http://writers-gym.com/what.shtml)

- **indexical**: instruções com foco em estratégias de ação imediatamente 'responsivas' e de tomada rápida de decisão, como o contato improvisação. Neste tipo de artefato, a propriedade mais relevante está associada ao modo como dançarinos 'enfrentam' eventos considerados (localmente) relevantes.

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Figura 3 – Steve Paxton e Lisa Nelson em apresentação de contato-improvisação, técnica indexical. (http://www.liikekieli.com/arviot/20-night-stand-steve-paxton-ja-lisa-nelson-sivuaskel-2005-helsinki.html)

- **simbólico**: esta modalidade está relacionada a conceitos, vocabulários gerais, e antecipações estratégicas. É possível criar ações motoras com trajetórias bem definidas, com nomenclaturas próprias, investigadas e exploradas através de notações específicas. Esta modalidade também deve estar relacionada à construção de técnicas meta-semióticas, e desenvolvimento de notações associadas.

Figura 4 – Alunas de balé clássico na *School of American Ballet*, exemplo conhecido de técnica simbólica. (http://www.sab.org/winterterm/classschedule.php?wsid=6)

De acordo com esta abordagem inicial, TDs fornecem um espaço a seus usuários de qualidades, conexões físicas ou reações e padrões gerais de comportamentos, de modo a limitar suas formas de ação em direções específicas.

4. Consequências

As técnicas de dança são artefatos cognitivos. Elas "estruturam" paisagens semióticas de comportamentos motores complexos acoplados a diferentes níveis de artefatos materiais (espaço tridimensional, sons e música, luz, etc.), dando origem a estratégias orientadas para manipulação de signos. Obviamente trata-se de um fenômeno cultural, i.e., um fenômeno transmitido através de protocolos de aprendizagem que envolve imitação, simulação, emulação, etc. Mas a questão que colocamos em foco aqui é outra. As técnicas 'ancoram as idéias', que aliás não podem ter existência anteriormente, provendo espaços semióticos mais ou menos estruturados de ações. Trata-se de um desafio entender como isso acontece, em distintos níveis de descrição e análise. Quando dissemos que as técnicas ajudam a 'conceber' espaços de

problemas, estamos sugerindo que há um movimento causal reverso --- técnica > dançarino > técnica. Há um *looping* causal entre os problemas criados a partir de técnicas e as soluções resultantes do seu uso. Os artefatos materializam os problemas e, ao mesmo tempo, criam as condições para que possam ser manipulados e transformados. Esta evidência pode ajudar-nos a reconsiderar, por exemplo, sistemas de ensino de dança, especialmente em formações gerais (e.g. universitárias).

Descobertas recentes ajudam a elucidar os sistemas e os subsistemas neurais que estão ativados na prática de dança. Esta abordagem faz parte de uma tendência para explorar novas hipóteses de investigação em relação à performance musical, estética visual, exposição a estruturas narrativas (Brown & Parsons, 2008; Brown et al 2005). O exame que propomos aqui está orientado em outra direção, e está mais relacionado ao que Edwin Hutchins (1995) chamou de 'estrutura de mediação' para se referir a ferramentas externas que são construídas para *ajudar* atividades cognitivas diversas.

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RESENHA DO LIVRO "Imagem: cognição, semiótica, mídia", de Lucia Santaella e Winfried Nöth

por Maria Ogécia Drigo (UNISO-SP)

Lucia Santaella e Winfried Nöth mencionam na Introdução do livro "Imagem: cognição, semiótica, mídia" (São Paulo: Iluminuras, 2001), que "uma ciência da imagem, uma imagologia ou iconologia ainda está por existir" (p. 13). Nesse sentido, Durand (2004), enfatiza que os progressos das técnicas de reprodução por imagens, como a fotografia, o vídeo, as "imagens sintéticas", bem como os meios de transmissão dessas, não permitiram ao século XX desenvolver estudos vinculados à imagem capazes de abalar o reino da "galáxia de Gutemberg", expressão de Mc Luhan, reino esse caracterizado pela supremacia da imprensa e da comunicação escrita. "Embora a pesquisa triunfal decorrente do positivismo tenha se apaixonado pelos meios técnicos (óticos, físico-químicos, eletromagnéticos etc.) da produção, reprodução e transmissão de imagens, ela continuou ignorando o produto de suas descobertas." (p. 33).

Essas imagens geraram recenseamentos e classificações que tornaram possíveis estudos de processos de produção, transmissão e recepção para as imagens passadas, possíveis, produzidas, bem como as serem produzidas, conhecimentos esses presentes em vários capítulos da obra em questão. De um lado, a obra é extremamente importante, portanto, pois em cada capítulo, os autores apresentam idéias de uma centena de pesquisadores e as mais relevantes são discutidas com rigor e erudição. Por outro, é diferenciada por não ignorar os produtos dos meios técnicos, principalmente quando os autores fundamentam-se na semiótica peirceana.

As diversas correntes teóricas que abordam a imagem - enquanto representação visual e mental - constam do primeiro capítulo: "Imagem como representação visual e mental". "Não há imagens como representações visuais que não tenham surgido na mente daqueles que as produziram, do mesmo modo que não há imagens mentais que não tenham alguma origem no mundo concreto dos objetos visuais" (p. 15); logo, para os autores, há dois domínios, mas os conceitos que os unificam são os de signo e representação. Esse capítulo apresenta, portanto, uma investigação da teoria da representação e enfatiza a sua relevância para o estudo da imagem, adentrando a semiótica e a ciência cognitiva, "ciências vizinhas", que estudam as representações visuais e as mentais, respectivamente.

Destacamos, nesse capítulo, comentários sobre *Les mots et les choses* de Foucault (1966), como uma obra que aborda a origem e a perda da representação, sob o ponto de vista de uma teoria estruturalista. Também, em relação à naturalidade e à convencionalidade das imagens, os autores discutem a teoria da percepção ecológica de Gibson como defensora da naturalidade icônica das imagens; a teoria de Goodman enquanto defensora da convencionalidade e a de Gombrich, mediadora entre essas duas.

No segundo capítulo, "Semiótica da Imagem", os autores explicitam teorias que tentaram fundamentar uma ciência geral da imagem na relação com a ciência da arte; tratam da literatura sobre a semiótica da imagem, bem como apresentam os direcionamentos e tendências dessa semiótica.

A relação da imagem, enquanto representação visual, com a palavra, ou ainda, a linguagem verbal como contexto dessas representações; a relação entre a palavra e a imagem na pintura, bem como a imagem como contexto para imagem, vem no terceiro capítulo: "Imagem, texto e contexto". Complementando os estudos apresentados nesse capítulo, o quarto, intitulado "Palavra e Imagem", segundo os autores, fundamentado na semiótica de Charles Sanders Peirce, principalmente, pretende "explorar as semelhanças e diferenças entre palavra e imagem, indagando sobre os atributos imagéticos que existem na própria palavra, assim como o seu oposto, o que a imagem tem em comum com a palavra" (p. 59).

Vale destacar, de modo resumido (figura 1), os níveis de iconicidade tratados nesse capítulo, contribuição extremamente relevante, um diagrama mesmo, importante para compreendermos o papel da analogia na ação de signos, ou melhor, do que se faz signo envolvendo representações visuais.

Os autores discutem questões sobre o tempo intrínseco e extrínseco à imagem e anunciam um terceiro, o tempo intersticial, como concernente à percepção, no quinto capítulo: "Imagem, percepção e tempo". No entanto, vale enfatizar que mencionam como curioso "o modo como exploramos uma imagem, o que é feito não de modo global, mas por fixações sucessivas que duram alguns décimos de segundo cada uma e limitam-se às partes das imagens mais providas de informações" (p. 85).

1. Ícone puro	• simples qualidade de sentimento indivisível e não analisável • tem natureza		

	mental • mera possibilidade ainda não realizada		
2. Ícone atual	Diz respeito à sua atualidade e se refere às diferentes funções que o ícone adquire nos processos de percepção	**2.1.Aspecto passivo** (ação do percepto sobre a mente em estado não reativo)	**2.1.1.Qualidade de sentimento** (qualidade de sentimento absorvente e absoluta na faísca fora-do-tempo) Exemplos: a) qualidade exterior: cor, luz, cheiro b)compósito de qualidades: uma visão ou lembrança de plenitude na dor ou regozijo
			2.1.2. Revelação perceptiva (experiência que corresponde à identidade formal e material entre percepto e *percipuum*)
		2.2.Aspecto ativo (o percepto aparece no seu aspecto qualitativo, logo, a mente produz associações sob o efeito da similaridade)	2.2.1. Qualidades que se juntam numa só (uma nota musical)
			2.2.2. Uma qualidade individual é tomada como objeto de outra qualidade (analogia)
			2.2.3. Uma hipótese ou imagem de similaridade é adotada como regra geral
3. Signo icônico ou hipoícone	triádicos, mas não genuínos, pois a tríade é governada por similaridade e relações de comparação	**3.1.Imagem** **- similaridade na aparência -**	representa seu objeto porque apresenta similaridades ao nível da qualidade
		3.2.Diagrama **– similaridade nas relações -**	representa relações das partes de uma coisa, utilizando-se de relações análogas em suas próprias partes

		3.3.Metáfora **– similaridade no significado -**	faz um paralelo entre o caráter representativo de um signo – seu significado - , e algo diverso dele.

Figura 1

Essa reflexão nos leva a questionar se o termo "intersticial" não seria apropriado para o tempo da semiose. O usuário ou leitor da imagem, a partir de tempos tangenciais – os da percepção -, vivencia, com a ação do signo, um tempo que se alonga ao adentrar uma fenda... Tais instantes, geometricamente, podem ser representados por pontos infinitamente próximos do ponto "A" (ver figura 2).

Ao roçar um ponto infinitamente próximo ao ponto "A", como um dos inúmeros pontos que os autores mencionam – "fixações sucessivas que duram alguns décimos de segundo cada uma", em um deles, o olhar adentra. O tempo intersticial se desenha, então, se aprofunda, infinitamente... se enraiza... Assim, tal instante pode não ter o mesmo ritmo da linha do tempo, do tempo que flui, que percebemos como um contínuo, o tempo que passa. É um tempo denso que capta passado e futuro. Tempo condensado. Entre as representações visuais que permeiam nosso cotidiano, seria a imagem fotográfica aquela cujo tempo intrínseco – "constitutivo da natureza mesmo do signo ou lingua gem" -, coincide com o intersticial?

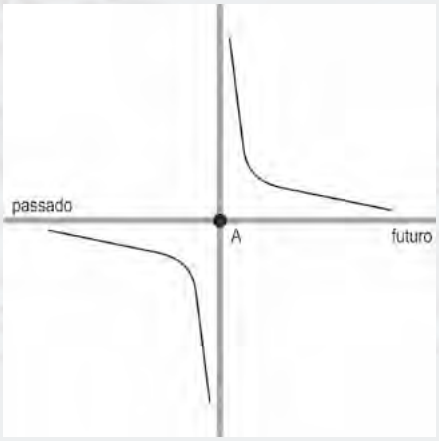

Figura 2

Figura elaborada a partir de Peirce (1998: 259)

Continuando a navegação pelos capítulos de "Imagem: cognição, semiótica, mídia", observamos que no sexto capítulo, "Computação gráfica e música", os autores enfatizam que estudos recentes com imagem em movimento destacam a possibilidade de uma nova "gramática" dos meios audiovisuais, reforçam a necessidade de novos parâmetros para os

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processos de recepção dessas imagens, bem como denunciam a dissolução das fronteiras entre o visual e o sonoro. Para os autores, "ao penetrar nas entranhas constitutivas e estruturais da computação gráfica como sistema de signos (...) se encontram as semelhanças fundamentais da computação gráfica ou imagem sintética ou digital com os modos de constituição da música em geral" (p. 90). Explicam ainda que a imagem vai ao encontro da morfogênese, forma que se engendra no tempo, própria da música.

Quanto ao capitulo sete, "Semiótica da pintura", os autores explicam que se trata, de certo modo, de um complemento do capítulo dois, com "um panorama dos precursores, das abordagens principais e alguns tópicos da semiótica da pintura" (p. 97). O mesmo olhar, rigoroso e erudito, percorre os diversos itens desse capítulo. O capítulo oito, "Semiótica da fotografia", também se baseia na semiótica da imagem e "coloca em questão a especificidade da fotografia em relação a outros tipos de imagem" (p. 107). Trata-se de reflexões amplamente fundamentadas e que constroem um tecido fértil para os capítulos dez e onze. Mas antes de comentá-los, resta mencionar que o capítulo nove, "A fotografia entre a morte e a eternidade", segundo os autores, apresenta textos relevantes entre aqueles que contemplam desde a mera descrição da máquina e dos potencias do dispositivo até os que abordam o fotográfico como forma de representação e conhecimento do mundo. Faz-se, portanto, um mapeamento do território dessa literatura, o qual guarda o propósito de enfatizar "a relação dialética entre morte e eternidade que, na fotografia, consubstancia-se de maneira exemplar, magistral." (p. 115).

No capítulo dez, "Imagem, pintura e fotografia à luz da semiótica peirceana", há contribuições inovadoras e significativas, uma vez que estão em oposição aos estudos que postulam "uma linguagem da imagem com estruturas análogas às da linguagem verbal" (p. 141). Vale ressaltar as discussões sobre a fotografia e a pintura realista como protótipos da imagem indexical, pois possibilitam compreender a origem da proposta dos três paradigmas da imagem, que vêm no capítulo seguinte.

No capítulo onze, denominado "Os três paradigmas da imagem", os autores explicitam os meios de produção, os meios de armazenamento, o papel do agente e do receptor, a natureza da imagem, a relação imagem/mundo e os meios de transmissão da imagem – os "níveis de que depende todo e qualquer processo de signos e linguagem" (p. 187) -, para caracterizar os três momentos: o pré-fotográfico, o fotográfico e o pós-fotográfico. Vamos elencar todas as especificidades desses três momentos, para cada nível mencionado, em uma tabela (figura 2), pois consideramos que essa pode funcionar como um mapa orientador, principalmente para delinear contextos de pesquisas que envolvem

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representações visuais. Isto torna a obra original e potencialmente significativa para a comunicação, principalmente para pesquisadores "que têm a imagem como matéria de investigação", como enfatiza Arlindo Machado.

O cotidiano das pessoas está permeado de imagens, objetos materiais, signos que representam nosso meio ambiente visual. Há estudiosos da comunicação que consideram as imagens encantadoras e outros que as menosprezam. Elas são planas, ocas de sentidos, dizem alguns. As imagens movimentam-se velozmente e propagam-se incessantemente, das tevês às telas dos celulares, dos aparelhos médicos de diagnóstico visual às câmeras digitais, do circuito interno aos satélites. Jean Baudrillard, Frederic Jameson e Paul Virilio, entre outros e sob diversas perspectivas também discutem o papel das imagens nas sociedades contemporâneas. Uma teoria da imagem, de fato, faz-se necessária.

PRÉ-FOTOGRÁFICA	FOTOGRÁFICA	PÓS-FOTOGRÁFICA
MEIOS DE PRODUÇÃO		
expressão da visão via mão	autonomia da visão via próteses óticas	derivação da visão via matriz numérica
processos artesanais de criação de imagem	processos automáticos de captação da imagem	processos matemáticos de geração de imagens
suporte matérico	suporte químico ou eletromagnético	computador e vídeo, modelos, programas
instrumentos de extensão da mão	técnicas óticas de formação da imagem	números e píxels
processo monádico	processo diádico	processo triádico
fusão:sujeito/objeto/fonte	colisão ótica	modelos e instruções modelos de visualização pixels na tela
imagem incompleta, inacabada	imagem corte, fixada para sempre	virtualidade e simulação
MEIOS DE ARMAZENAMENTO		
suporte único	negativo e fitas magnéticas	memória no computador
perecível	reprodutível	disponível
PAPEL DO AGENTE		
imaginação para a	percepção e prontidão	cálculo e modelização

figuração		
gesto idílico	rapto	agir sobre o real, captura do real
olhar do sujeito	olho da câmara e ponto de vista do sujeito	olhos de todos e de ninguém
Sujeito criador, demiurgo	Sujeito pulsional, movente	sujeito manipulador, ubíquo
PAPEL DO RECEPTOR		
contemplação	observação	interação
nostalgia	reconhecimento	imersão
aura	identificação	navegação
NATUREZA DA IMAGEM		
figurar o visível e o invisível	registrar o visível	visualizar o modelizável
figuração por imitação	capturar por conexão	simular por variações de parâmetro
imagem espelho	imagem documento	imagem matriz
cópia de uma aparência imaginarizada	registro do confronto entre sujeito e mundo	Substrato simbólico e experimento
IMAGEM/MUNDO		
aparência e miragem	duplo e emanação	simulação
metáfora	metonímia	metamorfose
janela para o mundo	biunívoca	virtual
ideal de simetria	ideal de conexão	ideal de autonomia
modelo imaginário e icônico	modelo físico	modelo simbólico
evocativa	sombra	ascética
símbolo	índice	ícone
MEIOS DE TRANSMISSÃO		
único	reprodutível	disponível
templos, museus, galerias	jornais, revistas, *outdoors*, telas	redes: individuais e planetárias
transporte do receptor	era da comunicação de massa	era da comutação

Figura 3

Ainda em relação à tabela (figura 3), podemos enfatizar que cada item especificado nela (que estão em linha) constitui um ponto denso que nos chama para o livro, principalmente para o capítulo mencionado, bem como nos leva a conjeturar sobre a possibilidade de lançarmos novos pontos de vista para os problemas da área de comunicação visual. Não concordamos com o emprego da palavra "paradigma", embora os autores expliquem em que sentido isso foi feito, uma vez que ela pode nublar o alcance das idéias apresentadas por ser uma palavra desgastada, usada, no mais das vezes, não no sentido proposto por Thomas S. Kuhn em "A estrutura das revoluções científicas".

Compreendemos que a lógica engendrada na representação visual, que subjaz quando algo – envolvendo uma representação visual -, prepondera como símbolo, índice ou ícone norteou a elaboração desses paradigmas. A leitura de imagens depende, por sua vez, de uma determinada percepção da imagem, imagem que é historicamente datada e nessa data está nossa imagem referência, a fotográfica.

Os autores concluem esse capítulo, mencionando a mistura dos "paradigmas" nos fenômenos artísticos que receberam o nome de hibridização das artes; nas "imagens que se acasalam e se interpenetram no cotidiano até o ponto de se poder afirmar que a mistura entre os paradigmas constitui-se no estatuto mesmo da imagem contemporânea" (p. 184); nos trabalhos dos impressionistas – híbridos da fotografia e da arte -, e, por fim, enfatizam que "o significado da palavra 'síntese', nas imagens de síntese, pode certamente, apresentar duas acepções: de um lado, a idéia de modelagem e síntese numérica, de outro, a idéia de síntese dos três paradigmas." (p. 186). A partir dessa observação, podemos dizer que as imagens se tornam mais complexas. Mas isso não indica que uma teoria da imagem deveria considerar o aparelho que as produz?

No capítulo doze, "O imaginário, o real e o simbólico da imagem", os autores apresentam os conceitos de imaginário, real e simbólico, na perspectiva de Lacan e nos leva a conjeturar se esse capítulo não seria mais interessante caso o livro tratasse de representações mentais e pensamento ou imagem mental e pensamento, Para concluir, no capítulo treze, intitulado: "As imagens podem mentir?", que consideramos também um complemento do capítulo dois, vem, diante de toda a densidade explicitada nos três momentos, nos convencer que a pergunta "As imagens podem mentir?" não é mais apropriada... pois ela traz à tona a questão idealismo x realismo... questão não pertinente ao momento do pós-fotográfico e talvez não pertinente aos outros momentos também.

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Tal obra emerge como um mapa minucioso, desenhado com rigor e precisão, com detalhes densos. Devido a essa característica, a obra vem como aquela que demanda sempre um novo olhar, o retorno e, por essa razão, agrega idéias originais e profícuas "no terreno movediço das chamadas comunicações visuais", como argumenta Arlindo Machado em relação ao alcance da obra em questão.

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RESENHA SOBRE LIVRO "Topologia da ação mental: introdução à teoria da mente", de Ana Maria Guimarães Jorge

por Maria Amelia de Carvalho (UNESP-Marilia)

O livro Topologia da ação mental: introdução à teoria da mente de Ana Maria Guimarães Jorge nos oferece uma leitura atenta e criativa acerca da teoria peirceana da mente. É uma leitura que demanda um encontro com uma complexidade de conceitos caleidos cópicos, pois se multiplicam e se conectam, inesgotavelmente, mas há nela caminhos lúdicos, pois a obra é um quebra-cabeça prazeroso que nos leva ao encontro de conceitos e temas tão relevantes à Filosofia da Mente, como por exemplo: pensamento, cognição, mente, matéria, diagrama, real, virtual, estados mentais, consciência, metafísica, lógica e etc.

A obra de Ana Guimarães nos possibilita entender a extensão do conceito de mente em qualquer tipo de processo biológico ou mesmo físico. Oferecendo inúmeras possibilidades de explorar o argumento peirceano de continuidade entre mente e matéria, a autora aponta que as bases para o entendimento peirceano da relação entre mente e matéria estão na consideração de que ambas são da mesma natureza.

De acordo com o pensamento ocidental moderno, a natureza e a mente estão em domínios diferentes. Peirce enumerou suposições sobre o mundo físico que recusam admitir ruptura absoluta na continuidade do tecido dos fenômenos e mesmo no mundo das idéias. Neste sentido, as leis físicas se derivam das psíquicas.

Ana Guimarães aponta para o monismo da mente ou Idealismo Objetivo de Peirce esclarecendo que a relação entre mente e matéria é vista por Peirce nos seguintes termos, matéria é mente cristalizada por hábito e o universo tem a substancia da mente.

Levando-se em conta que no contexto lógico da semiótica de Charles Sanders Peirce mente é sinônimo de semiose, ou ação do signo, é no conceito peirceano de continuidade que se aproximam as idéias de semiose e de aquisição de hábitos. Na perspectiva peirceana hábito é uma generalidade real e todo hábito tem ou é uma regra geral, e o que é geral se refere a um futuro indefinido. A tendência da mente à adquirir hábitos, se estende a de generalizar e gerar associações, e esta característica é o que marca o caráter infinito da semiose.

Apontando para a relevância da incerteza na lei peirceana da mente, a existência de uma indeterminação real no universo que não a indeterminação gerada pela ignorância humana sobre a lógica dos eventos cotidianos (CP 6.57), Ana Guimarães (2006: 93) destaca

que no contexto da metafísica e da semiótica de Peirce, mente é sinônimo de continuidade, a autogeração de novos hábitos, a continuidade da semiose.

Outro aspecto fundamental desenvolvido por Ana Guimarães é o que a autora elabora partindo das concepções peirceanas de mediação e representação, desde a base metafísica à cognitiva. Encontra-se no livro de Ana o conceito de cognição e de inferência fundamentado na obra de Peirce. Cognição é definida por Peirce no *On a new list of categories* (CP 1.545-67) como um processo inferencial embasado na tríade signo, objeto, interpretante, em que todo pensamento ou representação cognitiva é um signo cuja relação é triádica, e isso significa um rompimento com a visão tradicional nominalista da intuição.

Peirce trabalha a idéia de pensamento e de realidade por meio da percepção, inter-relacionando signo e objeto, e o pensamento com a ação deliberada, por meio do pragmatismo, resolvendo a indagação de como o pensamento ou crença, é capaz de conduzir a conduta(CP 5.213-357). Peirce considera que todo pensamento se dá em signos e que a cognição consiste em uma relação triádica entre sujeito e objeto que é mediada pelo signo.

Ana Guimarães (2006: 43) esclarece que na teoria peirceana da mente o pensamento é entendido como um processo ininterrupto que transcorre em pensamentos precedentes e subsequentes, sob relação sígnica triádica, fundamentando a teoria do conhecimento. Deste modo, todo pensamento é diagramático e todo diagrama é um ícone de relações inteligíveis, ou "expressão genuína do pensamento".

A autora indica que há duas teorias da cognição na obra peirceana: de 1867 a 1870, cognição é entendida como proposição; e de 1871 a 1880, a teoria do pensamento-signo é evidenciada com a negação da idéia de incognoscível, da intuição e da introspecção cartesianas, ao passo que desenvolve os princípios de crença e dúvida e métodos para fixação das crenças. Assim a mente cognitiva é aceita como inferencial encontra apoio na teoria peirceana do pensamento-signo.

Ana Guimarães (2006: 106) comenta que na concepção peirceana o processo cognitivo é inferencial, portanto sígnico e dispensa a consciência do "eu penso". A tendência própria do signo é aquela de determinar outro signo, dando fluxo ao pensamento que é signo (CP 5. 253). A generalidade do processo cognitivo se estende para *ad infinitum* (CP 5. 260).

O real, então, para Peirce, é aquilo no qual, mais cedo ou mais tarde, a informação e o raciocínio resultarão finalmente, e que é portanto independente das minhas e das suas fantasias. Assim, a verdadeira concepção de realidade mostra que esta concepção implica essencialmente a noção de uma comunidade sem limites definidos e capaz de um aumento de conhecimento indefinido (CP 5.311).

Neste sentido Ana Guimarães (2006: 98) aponta que realidade nada mais é do que uma idéia geral, ou personalidade coletiva (CP 5.119 1903), em busca do desenvolvimento de criações mentais, cuja influência mútua é estímulo ao desenvolvimento da ininterrupta pesquisa humana acerca da inteligibilidade do cosmos.

É muito interessante o modo como Ana Guimarães aborda o tema "topologia da ação mental" na perspectiva peirceana de uma termodinâmica mental. A autora (2006: 137) reitera que para sustentar a hipótese de unificação da ação física e psíquica Peirce considera que as forças conservativas nos processos físicos da natureza "não governam nada, exceto as relações espaciais das partículas e reagem umas sobre as outras tanto mais fortemente quanto mais próximas estiverem umas das outras" (CP 7.523). Por outro lado, o não-conservativo se relaciona a fenômenos irreversíveis que rumam ao estado final (CP 7.471 1898), ou seja, eventos no mundo formam uma sequência unidirecional: por exemplo, a reconstituição de um ovo quebrado em seu estado de ovo inteiro não é reversível.

Ana Guimarães indica que é no princípio da segunda lei da termodinâmica que se desenvolve a concepção de entropia de um sistema isolado, ou de modo aproximado seu grau de desordem, que tende a crescer no tempo. Essa lei da termodinâmica dos processos físicos irreversíveis na natureza expõe uma evidente assimetria entre direções passada e futura, ao longo do eixo do tempo. Deste modo, Ana Guimarães (2006: 138) comenta que na obra de Peirce, a metáfora da flecha do tempo apontando para o futuro, por exemplo, não significa que ela esteja se movendo para o futuro, tais quais os ponteiros de uma rosa-dos-rumos ou de uma bússola, mas corporificando assimetria.

Resumindo: Peirce sustenta que a física sutil dos processos irreversíveis transforma o fluxo do tempo em um aspecto objetivo do mundo. De modo especial Ana Guimarães desenvolve a hipótese acerca do caráter essencial icônico do conceito de diagrama e da possibilidade de conceber os protodiagramas.

Trabalhando as bases da teoria peirceana da percepção para a geração de idéias sob associação por semelhança e contiguidade, Ana Guimarães indica que a idéia de protodiagramas surge para compor o processo de associação mental e retenção qualitativa da memória, ou melhor, numa relação eficiente protodiagramática para a geração de idéias sob associação por semelhança e contiguidade.

Ana Guimarães (2006: 109) indica que na lei peirceana da mente, a tendência de associação, manifesta na natureza, para a generalização e aquisição de hábito, sustenta a possibilidade de continuidade dos eventos. O infinitesimal possui capacidade de retenção

qualitativa, por disposição natural da mente, ou memória, dos caracteres do continuum em que transcorre sob possibilidade de atualização de idéias.

Ana Guimarães comenta que Peirce se refere a um estado associativo germinal de proto-diagramas que tendem à atração e separação acásicas, auto-assimilando algo das qualidades dessas atrações não duradouras, até que haja fusão de idéias, perda de intensidade, mas ganho de generalidade pela força de uma determinação relacional com seu substrato de segundidade.

É preciso notar que de acordo com Peirce "em momento algum, num estado mental, há cognição ou representação, mas na relação dos estados mentais, em momentos diferentes, há. Ana Guimarães indica (2006: 114) que Peirce rejeita enclausurar o conhecimento do mundo externo como sujeito e derivado dos moldes da autoconsciência humana, pois toda cognição surge de um processo contínuo, o que se inicia, por sua vez, é um processo de cognição similar ao da lógica processual dos fatos externos (CP 5.267 1868).

Na obra peirceana, diagrama é tido como um "ícone de relações" e, em sua generalidade, todo diagrama é formal, icônico e remático. Diagrama é um signo de possibilidade qualitativa para seu interpretante, ou seja, é um objeto possível. Sendo assim, Ana Guimarães aponta que são "aspectos relacionais", com possibilidade de representar 'formas relacionais', sendo que a força de atualização característica do raciocínio humano é diagramática, e não procura diagramas em sua individualidade, mas é a passagem de um diagrama para outro que sustenta a possibilidade de ver algo de uma natureza geral (CP 2.282 1903).

Ana Guimaraes (2006: 111) comenta que a associação de idéias por semelhança é um modo fundamental de associação, pela qual semelhança consiste em uma associação devido ao substrato implícito do pensamento (CP 7.394 1893). Na associação por semelhança, uma idéia evoca a idéia do campo em cuja eficiência implícita da mente a coloca, enquanto que na associação por contiguidade uma idéia evoca outra de um campo em que a experiência a tem colocado. Sob o princípio de associação por contiguidade, um hábito adquirido da mente, a mente humana atribui ênfase a algumas semelhanças ou diferenças. Desse modo, a Sucessão inferencial se faz, por conseguinte, sob mediação.

Ana Guimarães (2006: 120) aponta que a questão relativa ao modo como se dá o processo de mediação se desenvolve nos seguintes termos: na teoria peirceana da mente acontece experiência de unidade de consciência pela aproximação de idéias conduzidas por ações fortuitas, reunidas em idéias gerais na produção de associações mentais, prenunciando o crescimento da terceiridade, sendo que a unidade de consciência não é de origem fisiológica,

mas metafísica. Esta afirmação se esclarece do seguinte modo:... "O pensamento não está necessariamente conectado a um cérebro". Com essa frase, Peirce compreende o pensamento como inerente à natureza do mundo. Neste sentido, negar a realidade das cores, das formas e dos objetos "é ser levado a alguma forma de idealismo nominalista..." (CP 4.551 1906) e, não faz sentido considerar o pensamento como meramente ou exclusivamente subjetivo (CP 5.597 1898).

Ana Guimarães (2006: 123) ressalta que de acordo com Peirce "Os pensamentos são derivados de sensações que têm origem no real e são fundamentos para as conclusões do raciocínio. A realidade das coisas e das experiências é externa a uma mente" (CP 7.338 1873).

Considerando que "todo pensamento é diagramático e todo diagrama é um ícone de relações inteligíveis, ou "expressão genuína do pensamento"; de acordo com Peirce há três elementos para a definição de pensamento: função representativa, aplicação denotativa e qualidade material. Os elementos qualidade material, conexão real, e função representativa para a configuração de pensamentos, são interdependentes e inseparáveis; o que de acordo com a observação de Ana Guimarães (2006: 19) sugere a importância dos fatos externos para a formação do processo cognitivo humano.

Ana Guimarães (2006: 123) esclarece que para Peirce "o que é externo à mente é o que é a despeito de quais sejam nossos pensamentos sobre qualquer assunto; exatamente da forma que é real aquilo que o é, não importam quais sejam nossos pensamentos a respeito daquela coisa em particular". E não há objeção em se dizer que esta realidade externa provoca a sensação, e que por meio da sensação originou toda aquela cadeia de pensamento que finalmente levou à uma conexão habitual de idéias(CP 7.354 e 359 1873); à crença(CP 7.339 1873).

Assim, na teoria peirceana da mente, o processo de conexão entre idéias é um hábito da mente (CP 358 1873) e a significância intelectual de todo pensamento está ultimamente nos seus efeitos sobre nossas ações. Peirce considera que "Pensamento é um hábito-crença que se inicia vago e se torna mais geral e preciso, de modo ilimitado, formando um processo de desenvolvimento na imaginação, por exemplo, de um indivíduo (CP 3.158 1880).

Ana Guimarães (2006: 174) comenta que na perspectiva peirceana, todas as cognições contêm termos gerais e vagos, permitindo a plena autogeração interpretativa do signo em outro signo, sob a continuidade espaço-temporal, o que possibilita múltiplas e futuras interpretações, base para toda significação (CP 5.287 1868). Tanto continuidade temporal quanto espacial é plausível no ver peirceano e tem sua gênese no princípio de

possibilidade que é geral. Cabe dizer que na obra peirceana tempo é continuidade (CP 1.384 1890).

Indicando que é necessário um transcorrer temporal, caracteristicamente irreversível, para que o diagrama seja experienciado, Ana Guimarães (2006: 139) alerta que se o pensamento requer temporalidade para transcorrer em seu fluxo dinâmico, não há porque desconsiderar a importância dos fatos externos sobre uma consciência individual na determinação de cadeias de cognições e de signos (CP 5.251 1868).

Ana Guimarães (2006: 181) esclarece ainda que na obra peirceana a virtualidade do protodiagrama compreende virtual como "potencialidade real de existência sob processo de retenção qualitativa infinitesimal que fortuitamente se espalha e gradativamente se atualiza em conexões mentais possíveis". Contudo, virtual não deve ser confundido com potencial, que não tem eficiência atual nele mesmo, pois é na atualização associativa de idéias que o virtual atinge a extensão de seu grau de eficiência no tempo, e suas gradações de sentidos possíveis, parte-passado-parte-vir-a-ser, podem indutivamente se fazer desvendadas ao longo do caminho pela investigação.

Ana Guimarães reitera que o princípio de continuidade entre mente e matéria fundamenta a idéia de protodiagramas na formação da mente natural, figurando a realidade que impõe recognição como alguma coisa que não a criação de uma mente em particular (CP 7.659 1903).

Indicando que protodiagrama virtual é a idéia de diagrama no seu sentido mais geral e vago, Ana Guimarães (2006: 215) o considera aberto a transformações e misturanças, fazendo-se processo contínuo na dança híbrida de qualidades de sentimento que se assimilam e aos poucos se fundem sob atração irresistível, oferecendo coloração às idéias. Mente diagramática, por sua vez, é pensamento em ato, atualizando-se em pensamentos subsequentes e a trajetória dos fenômenos naturais e da ação humana é teleologicamente traçada no próprio ato irresistível de viver, ou seja, de escolher caminhos por uma idealidade que se objetiva em atualizações.

Por fim, é importante notar que os conceitos discutidos no livro de Ana Guimarães não se referem apenas à Filosofia da Mente, mas igualmente abordam questões referentes à Ciência Cognitiva. António Machuco Rosa (2001) discutindo as relações entre a Semiótica de Peirce e as Ciências Cognitivas considerou que um projeto cognitivo assentado num quadro semiótico como o de Peirce ainda não se encontrava sistematicamente desenvolvido. Do mesmo modo, no prefácio ao livro de Ana Guimarães, Lucia Santaella (2006) considerou que, com exceção do conceito da abdução, a ciência cognitiva ainda não descobriu Peirce.

Deste modo, concordando com essas afirmações, devemos reconhecer as importantes contribuições trazidas pelo livro de Ana Guimarães aos atuais e futuros caminhos das pesquisas realizadas nas áreas da Ciência Cognitiva, Filosofia da Mente, bem como, na área da Semiótica Cognitiva, recente área de pesquisa na qual os fundamentos conceituais ainda se encontram abertos à construção.

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RESENHA DO LIVRO "Peirce´s Theory of Signs, de T. Short"

por Maria de Lourdes Bacha (Mackenzie-SP)

Peirce´s Theory of Signs is a dense, rather difficult book, in which the author makes no concessions to the reader. Short has a thorough knowledge of Peirce's work and supports his points of view quite clearly, mainly when he argues against the vision of other commentators. Short does not assume that the reader has any specialist knowledge, whether of Charles Sanders Peirce's philosophy or of contemporary philosophy, yet he cannot claim that it is easy reading. The structure of the language is dialogic, written in the style of Peirce and one notices a mark of humor from the author among the titles and subtitles of the work.

In the Preface the author explains his attempt to show how contemporary discussions in the philosophy of mind and science might benefit from a deeper study of Peirce's ideas: the purpose of the book is to say what Peirce's theory of signs is. Short emphasizes that Peirce's mature semeiotic was developed in an attempt to explain, on a naturalistic basis, what we call "intentionality" of mind. In the author's opinion, Peirce was bold in many ways, mainly for the ontological depth of his theory of final causation, which challenges contemporary philosophy's unexamined conceptions of the physical.

The book is divided in twelve chapters and according to the author's classification, the first two chapters **(1. Antecedents and Alternatives; 2. The Development of Peirce´s Semeiotic**) are introductory. The following three **(3. Phaneroscopy; 4. A Preface to Final Causation, 5. Final Causation)** lay the foundations to the mature semeiotic, which is developed systematically in the succeeding four chapters **(6. Significance; 7. Objects and Interpretants**; 8. **A Taxonomy of Signs; 9. More Taxa**). The last three chapters seek to apply the foregoing to contemporary issues (**10. How Symbols Grow; 11. Semeiosis and the Mental; 12. The Structure of Objectivity**).

The purpose of the first chapter, **Antecedents and Alternatives**, is to put Peirce's semeiotic into context. The author starts by drawing a short biography of Peirce. He then follows discussing sources of Peirce's semeiotic in Locke and Kant: Peirce's theory of signs had its origin in Kant's theory of knowledge; however, the term "semeiotic" was used by Locke, who included both words and ideas among signs, words being "signs of ideas", although that wasn't Peirce's conception. Short then argues the philosophy of Brentano, Husserl and Continental phenomenology, generally to be a major alternative to Peirce's mature semeiotic. Peirce rejected all dualisms on the principle that, by positing inexplicables, they block the road of inquiry. As a corollary, he proposed a doctrine of "synechism". The

first chapter also examines the influence of Aristotle, the Stoics and St Augustine in Peirce's work.

The second chapter, **The Development of Peirce´s Semeiotic**, serves several purposes. The first is to show that Peirce's 1868-9 doctrine of thought-sign was deeply flawed, and that he corrected them in divers steps over many years, a process completed in 1907. The second purpose is to demonstrate that Peirce's semeiotic was developed with an eye to theories of knowledge and of mind, an issue which adds more value to the book. As expected, the chapter deals with nominalism versus realism and the theory of reality in the context of the years 1859-1877. Yet, which would be the three flaws in the 1868-1869 Doctrine of thought-sign? The first one derives from the doctrine that every thought-sign interprets the preceding sign and that all thought-signs are general. The other two problems derive from the doctrine that every thought-sign is interpreted in a subsequent thought-sign. For Short, that infinite *progressus* is not itself a problem. Problem is that if a sign's significance depends on its actually being interpreted and the arbitrarity of the sign related to it, a topic in Peirce's work which is not clear: significance depends on translation. Summing up, the three main problems of Peirce's early semeiotic are: it makes the object signified to disappear; it makes significance to be arbitrary; and it fails to tell us what significance is. The first paradox was corrected between 1877-1885 with the new conceptions of 2ndness and of indices. In 1988 he adopted Scotus' term *"haecceity"*. The discovery of the index brought up several consequences among which the strengthening of the theory that every cognition is preceded by a preceding cognition *ad infinitum*. The discovery of the indices led to the development of new classes of signs, interpretants and interpreters other than human and eventually, significance is triadic for Peirce. The second paradox of arbitrariness was corrected based on the idea that signs may be interpreted and reinterpreted *ad infinitum,* but their being interpreted is not necessary to their having significance, hence, to their being signs. There is a fundamental difference between ultimate interpretant and final, or ideal. And, eventually, the last flaw was corrected in 1907, meaning is not an endless translation of sign into sign, there must always be an interpretant that is ultimate in the sense of not being yet another and there is a difference between ultimate interpretant and final, the final interpretant is the truth sought, but any statement, true or false, final or provisional, must be meaningful, hence, it must have and ultimate interpretant.

The third chapter is about **Phaneroscopy,** name originally given by Peirce to phenomenology. With the development of an architectonic philosophy, first used by Kant, Peirce emphasized the social aspect of knowledge's architecture and its evolution over time.

The idea of architectonic is itself teleological and the engine of that development was phenomenology, which in itself required a new model of analysis of the elements and a new way of philosophizing to guide the reader to his/her own experience, and not to the words in themselves, therefore, the experience becomes the center and when analyzing the work of Peirce, one notices that the flow of reasoning becomes clearer and more appropriated. The third chapter introduces the categories 1stness, 2ndness and 3rdness, being the formal structure of phenomenology an elaborated system where, on one hand the categories apply to one another, and on the other, they subdivide endlessly. From the point of view of the metaphysical interpretation of the categories, Peirce distinguishes between reality and existence. The existing is instantaneous, here and now, but there would be no reality without existence, reality refers to the laws which govern actual reactions.

Chapter four, **A Preface to Final Causation,** prepares the ground to final causation (the subject of the subsequent and fifth chapter), where Short revises literature on final causation, citing Plato and Aristotle among others. Human actions are done for the sake of an end or in order to bring it about. Aristotle extended the same way of thinking to natural processes. By "teleology" it is meant such a doctrine as Aristotle's, that there are final causes in nature. According to Peirce, final causation is not against modern science, but lies implicit in some theories like Darwin's for example. The author emphasizes the difference between purposes (they are general) and desires (they are particular, psychological). A purpose is a general consequence of that what is desired. Still for this topic, the term mechanical is used in opposition to teleological. There are philosophers who insist that a mechanistic explanation must cite particular mechanisms that "bring about" the effects explained, thus final cause is excluded by our having made mechanistic explanations of particulars always to be by particulars. For a final cause is never a particular.

In the fifth chapter, **Final Causation**, Short inquires if teleology has a future and if it should be excluded by modern science? For the author, in Peirce's work, some parts suggest that types of outcome play an explanatory role in some science and that this is the key to making final causation inteligible. The analysis of final causation is discussed in term of irreversible phenomena. This is one of the most difficult chapters of the book, in terms of the concepts as much as for the point of view of the examples discussed. The argument on evolution and entropy connected to final causation is important and elucidating. The chapter also discusses the difference between the final causation conception in Peirce and in Aristotle. Yet, the strong point lies on the comparison with contemporary authors including Braithwaite, Ayala, Monod, and Mayr among others. Peirce's conception of final causation attributes

power to the type itself, independently of that type's being the nature of any existing individual or being otherwise embodied.

The sixth chapter, **Significance,** studies "sign" and "significance". In Short's opinion, the systematic reconstruction of Peirce's mature semeiotic as a science relies on various aspects of the final causation conception, thus, the "sign" becomes a technical term justified by the power of the system of semeiotic to illuminate a wide variety of phenomena. Short then presents his own definition of "sign" compared to Peirce's many definitions of "sign", culminating with the analysis of the 1907 manuscripts where Peirce formulated the differences between final (triadic) and mechanical (dyadic) action.

The seventh chapter, **Objects and Interpretants,** deals with various trichotomies trying to clarify the distinctions between *dynamic* and *immediate object* and the immediate, dynamic, final, emotional, energetic and logical interpretants. It might be supposed that a discussion on immediate and dynamic objects leads to Peirce's realism. Short ends the chapter emphasizing that Peirce's conception of dynamic object is a contribution implying that it has not a merely conventional or subjective structure.

Chapter eight, **A Taxonomy of Signs,** describes a subject which will continue in the next chapter. According to Short, Peirce initiated his works on sign taxonomy in 1903, but never completed it. The chapter begins with the qualisign, sinsign and legisign, the three basic trichotomies. Next, the author introduces the dichotomy icon, index and symbol. Still, the chapter's strongest point is the attempt to demystify arguments of scholars like Jakobson (1985) or Eco (1976), mainly concerning to the real meaning of genuine versus degenerate sign. A discussion on the trichotomy rheme, decisign and argument ends the chapter.

Chapter nine, **More Taxa,** argues the relations implied in each trichotomy in terms of categories. We can not avoid mentioning that it is a polemical chapter, mainly due to the difficulties pertaining to Peirces' classifications, as well as the ones of the topics related to the assertion theory, besides authors like Austin and Goodman among others.

In chapter ten, **How Symbols Grow,** Short discusses the growth of symbols and Peirce's conception of "meaning" in comparison to the term's reference in analytical philosophy. The discussion includes the conditions for signical and accuracy abstraction, besides to the contribution of pragmatism to understand how symbols grow considering that a symbol's meaning lies in its potentiality.

In the eleventh chapter, **Semeiosis and the Mental,** Short begins by stating that Peirce's early semeiotic was a theory of mind: it identified thoughts as signs interpreting signs. The author then explores the richness of Peirce's semeiotic by means of a counterpoint

with the contemporary theories (including Dennet, Fodor, and Putnam). The subject of the *self* is also brought up for discussion in this chapter, in the context of concepts as consciousness, generality and self-control, establishing a link with the preceding chapters.

The twelfth and final chapter, **The Structure of Objectivity,** examines the structure of objectivity in opposition to foundationalism, for which Peirce developed his reality, inquiry and perception theories, grounded on the conception of truth and reality.

Peirce´s Theory of Signs is an important and necessary work for the student of Peirce, although rather difficult to recommend for beginners. The author demonstrates a sure grasp with polemical subjects and mainly boldness for bringing up Peirce's semeiotic for a contemporary discussion.

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Entrevista com PER AAGE BRANDT

por Ana Maria Guimarães Jorge

1. **Could you tell us about your path towards the studies on semiotics and Cognitive Semiotics? How did the Cognitive Semiotics turn into an area of study?**

Well, let me just tell you my own story. Many other stories are possible affluences to this river. I began my studies at the University of Copenhagen in 1963 and chose Romance Philology, since philosophy was too anglo-saxon and pedantic for my taste; linguistics and psychology were in my scope, and I followed many lectures in these departments. So I had the opportunity to hear Louis Hjelmslev in his last years (Language, in Danish, came out in 1963, and we all read it eagerly. Roman Jakobson was a great souce of inspiration for all of us – and a friend of Hjemslev. With a group of students (now all professors), I founded a journal of formalist studies of text and language, Poetik, and became interested in structuralism on many levels of study – language, literature, anthropology, psychoanalysis, philosophy – , since the 60ies were great years for structural research: Greimas (Sémantique structurale, 1966) visited Copenhagen and spoke in Cercle de linguistique; Derrida's books came out in 1967, Foucault, Lacan, Barthes… a true festival, which was connected to the student revolt in 1968, when we were on the barricades asking for an updating of the old professoral teaching of dead philology (so we thought). My Ph.D. 1971 (L'analyse phrastique, published in 73) was on sentence syntax, against Chomsky and developing Tesnière's ideas further into a non-linear view of grammar, closer to semantics, and thus in contact with Greimas' models. After an early habilitation dissertation in Danish on structural semantics in narratology and enthropological myth analysis (Sætningen Sandheden Døden, published 1983), I started working with Greimas directly on a French Thèse d'Etat in semio-linguistics, using semantic models of early cognitive semantics and René Thom's catastrophe theory (which I had essentially learned from W. Wildgen and J. Petitot) with regards to a dynamic semantics of modality, in both Greimas' sense and in the sense of standard modal verb grammar (La charpente modale du sens, 1987, published in 1992). I found that the Californian scholar of those years had reached almost the same results and started communicating with them. In Aarhus, my colleagues and I founded a Center for Semiotics and launched a research and curricular program in Dynamic Semiotics. We had a Danish national basic research contract for five years (1993-1998) and began to interact regularly with cognitive linguists worldwide. We published a monumental reader,

Kognitiv Semiotik (ed. P. Bundgaard et al.) in 2003. In the U.S., whereto I had moved in 2005, we then founded the journal Cognitive Semiotics (2007). The title is a term suggested by Elmar Holenstein in the 1990ies, in our Jakobson centenary conference in Copenhagen. It describes what is happening, namely that two scholarly traditions overlap and partially fusion.

2. What is Cognitive Semiotics?

In an abstract for the Chinese Semiotics Association, I wrote the following to answer the same question: Classical semiotics has evolved as either an extension of the linguistic paradigm (from F. de Saussure to R. Barthes and E. Benveniste) or an extension of the behavioristic paradigm (from C. S. Peirce to T. Sebeok and U. Eco), and exceptionally, as both (R. Jakobson). While important ideas and findings have been made in these frameworks, they also implied an important limitation to further growth: the belief in the autonomy of language and discourse as origins of meaning. However, linguistic communication is but one of many expressive manifestations, besides music, gesture, imagery, of the semiotic underpinnings of the human mind, and cannot be understood as meaning production without a deeper study of these underlying semiotic properties of the human mind as such, which are inseparable from the properties of human cognition. This is the core endeavor of cognitive semiotics. To find the principles that make signs and sign use possible and sign types necessary; to find the representational laws of the mind that allow human imagination and meaning creation to develop and differentiate into the manifold discourses and practices that characterize our cultures and genres; to find the basic principles that lets us make sense (or nonsense) of the world we live in – these are the challenging open questions that motivate what we call cognitive semiotics.

3. Which universities, research groups and scientific journals around the world are developing studies on Cognitive Semiotics?

I do not have a representative list, but let me mention at least one luminous example: the Center for Cognitive Semiotics of the University of Lund, Sweden (G. Sonesson, J. Zlatev). Of course, the Center for Semiotics of the University of Aarhus is still a hub of the same activities, now with extensions to neuroscience.

Let me add that some cognitive research groups do not understand the importance of meaning and semiotic functions, and concentrate on neural correlations – mainly for philosophical reasons (no phenomenology). Many groups of semioticians, on the other

hand, do not understand why we should bother about the properties of the human mind (because they think that Cultures can do the job all by themselves).

4. **Over the years, the worldwide scientific community is assigning different meanings to different conceptual principles. Currently, how can we understand the relation between "consciousness", "mind", and "self- consciousness" according to the different points of view on Cognitive Semiotics?**

   Firstly, we would have to be Cartesians. I agree with J. Fodor on this point. Dualism is necessary – in order to study the causal connections between mind and body, as Descartes started to do (in his Traité des passions). Monistic reductionism does not work, and its consequence behaviorism, which plagues cognitive science, has to be avoided. Consciousness has to be studied phenomenologically and then correlated with neuroscientific findings – which many research teams, including ours, are currently doing in the field of music, for example. Art and other expressions of human affectivity have to be fields of semio-cognitive study. Since postcolonial and similar deconstructive attempts are failing to produce valid knowledge, these fields – and cultural studies in general – will invite cognitive semioticians open to and sensitive both to cultural differentiations, differences, specificities, historicities… and to underlying properties of the mind, including the fact of having a 'self', namely a stratified representation of its owner (me).

5. **Many authors conceived the notion of agency as one of the most important aspects to human experience. Could you make a comment about the relation between the concepts of agency and consciousness?**

   The first issue of Cognitive Semiotics was on Agency! (The second on Consciousness and Semiosis). My view of agency is that it is born in a dynamic schema of intentional causation. So what is a dynamic schema? I hope to publish a long article on narrativity and schematism in Poetics Today – but you never know, people don't necessarily find these things worthy of a classically trained scholar's attention. Nevertheless, there are various schemas of causation and change, and their study helps us find out how our minds 'think' and represent what happens to us in life.

6. **What are the most important ideas developed on the concepts of diagram and abduction by scholars of the Cognitive Sciences or Cognitive Semiotics?**

As concerns abduction, my experience is that Peircean scholars waste their time trying to find out what the old man was saying; his problem in this framework is that he was a convinced monist and did not think of logic as cognitive at all; instead, the World was a logical process. Which is nonsense.

As to the semiotics of diagrams, it is a totally different story. There is, in the human mind, a basic set of 'graphic' procedures, which come out in the shape of the diagrams that we spontaneously draw on blackboards etc. in order to make ourselves understood. Lines of channeling, for dividing, for dependency, mapping and binding, for direction; arrows for causation, containers, and metric units for scale. Things like that; they work smoothly and elegantly with symbols and icons, without any explicit formalization needed. A formalized diagram is a 'model', and by contrast, an artefact. In cognitively related philosophy, Nancy Nersessian has written a beautiful book on diagramming in scientific creativity (Creating scientific concepts, 2008). I have a modest chapter on diagrams in my 2004 book, no comparison.

7. **Could you talk about any premise on the concept of diagram linked to the studies of self-organizing systems?**

Look, diagrams express the basic ways in which the human mind thinks. We do not think in pure symbols, and iconic representations cannot think at all. Diagrams can. They do seldom form systems, and they are not self-organizing, since they depend directly on communication and experience. Our minds are interactive, so in fact there is only a thin distinction between thinking and communication. Taking away diagramming from scientific work would be like taking away music from social life.

The only self-organizing systems I know of are: organisms. The trick seems to be what René Thom called circular causation: the effects in an organism causes its own causes to change, etc. But even organisms need an Unwelt, a natural niche, to exist. Self-organization appears to be a weird notion issued by a certain sociologist (Luhmann); meaning emerges when experience meets mental representation and thus is schematized and hit by categorization. Midway between 'perception' and 'conceptualization'.

8. **Can you comment on the idea of the spatiality and non-spatiality of the "mental thing" versus the tendency of thought localism?**

Well, res cogitans is spatial, but not physically spatial; space is a mental format. The elementary domains of experience in the human lifeworld are not only physical, but also

social, emotional, and internal-mental (aesthetical, ethical, epistemical)! Dreams have spatial properties, as diagrams have. To derive all abstract concepts from 'concrete' physical phenomena and sensory percepts is common, wrong, and a bad empiricist habit. All animals do abstraction – namely when we categorize food, enemies, conspecifics, mating partners, etc.

There are dimensional unfoldings in all mental spaces. The mind holds objects of attention, categorization, and schematiation, if these objects appear in contexts that form scenarios; these scenarios are mental spaces. The mind is really a theater – and we are both on stage and in the audience. Theatricality is a basic property of meaning production, I think.

9. In your opinion, what is the future direction of Cognitive Semiotics studies?

Academia is in bad shape these days, so it is not easy to tell what will happen. But I have to hope that the negative influence that analytic philosophy has had on the study of both cognition and semiosis will decrease, and that the next generation will be able to see where the philosophical hurdle is: modernist and logico-mystical (Wittgensteinian) resistance to Cartesian reason, to representational theory of mind. The present generation does rarely emit signs of such critical unrest; contemporary academia is mainly a list of chapels and sects you can enroll in, and there is not sufficient space for critical debate in the doctored minds; I have to believe that younger, pre-professional students still are motivated by a desire to know (not only to survive, in the all-consuming nastiness of the institutional world). I remember my formalist youth with excitement each time I cross the streets in Copenhagen or Paris where Hjelmslev, Jakobson, Greimas, Lévi-Strauss and my local masters used to walk and talk. The streets do not remember anything.

Per Aage Brandt, born 1944, Ph.D. from University of Copenhagen 1971 (L'analyse phrastique, 1973), Doctorat d'Etat from Sorbonne Paris I in 1987 (La charpente modale du sens, 1992). Grand Prix de Philosophie de l'Académie française 2002. Founder of the Center for Semiotics at the University of Aarhus. Professor of Cognitive Science at Case Western Reserve University, Cleveland. Recent publication: Spaces, Domains, and Meaning, 2004. Founding (2007-) editor of Cognitive Semiotics. Multidisciplinary Journal on Meaning and Mind.

Entrevista com MARIA EUNICE QUILICI GONZALEZ E LAURO F. BARBOSA DA SILVEIRA

(diálogo entre os Centros de Pesquisa em Ciências Cognitivas e o Centro de Semiótica, da Universidade Estadual Paulista Júlio de Mesquita Filho, de Marília)

por Ana Maria Guimarães Jorge

1. **Poderiam nos dizer de suas trajetórias nas áreas de Semiótica e de Semiótica Cognitiva? Como a Semiótica se transformou em uma área de estudos?**

Eunice Q. Gonzalez: Minha trajetória na Semiótica Cognitiva se iniciou com o meu afortunado encontro com o professor Lauro Frederico Barbosa da Silveira no departamento de Filosofia, da UNESP, campus de Marilia. Tive a imensa sorte de poder participar, desde o final da década de 1980, de um grupo de estudos com o professor Lauro, que me apresentou a semiótica Peirceana. Desde então, a minha compreensão de textos dos *Collected Papers of Charles Sanders Peirce,* e dos *The Essential Peirce,* em seus dois volumes, entre outros escritos tem sido bastante facilitada com o inestimável auxilio do professor Lauro. Além disso, contatos com os professores Ivo Ibri e Lucia Santaella da PUC-SP, impulsionadores, por excelência, dos estudos peirceanos, me permitiram conhecer os principais estudiosos, nacionais e internacionais, das idéias de Peirce, com quem venho aprendendo, a cada dia que passa, um pouco mais sobre esse universo complexo e extremamente original da Semiótica peirceana.

Atualmente, ministro um curso de pos graduação, sobre a Lógica da Descoberta, juntamente com os professores Lauro F. B. da Silveira e Jézio Hernani B. Gutierre, na UNESP de Marilia.

Lauro F. B. da Silveira: Antes de abordar as questões, parece-me importante esclarecer que de minha parte a contribuição para os estudos de Ciência Cognitiva se restringe aos estudos que venho fazendo do pensamento de Charles Sanders Peirce e as proveitosas conversas e trocas de idéias com os colegas do Programa de Pos-Graduação em Filosofia da UNESP e do grupo de estudos sobre Auto-organização do Centro de Lógica, Epistemologia e História da Ciência da UNICAMP. Especificamente, pois, não teria como opinar sobre Semiótica Cognitiva, mas talvez somente sobre Semiótica como ciência geral.

Para responder à primeira questão, no que me concerne diria que minha trajetória na área da Semiótica teve início assistindo aos seminários do professor Décio Pignatari na PUC-SP

no ano de 1973 e se desenvolveu quando de minha vinda para a, então, Faculdade de Filosofia, Ciência e Letras de Assis, tive acesso, em 1976, aos oito volumes *Collected Papers of Charles Sanders Peirce*, e comecei sistematicamente a estudar a obra daquele autor. Com a criação da Universidade Estadual Paulista, continuei meus estudos daquele pensamento na agora Faculdade de Filosofia e Ciências da UNESP – campus de Marilia, me encarregando da disciplina Semiótica no curso de bacharelado e licenciatura em Filosofia daquela Faculdade. Com o tempo, fui adquirindo uma bibliografia mais ampla, me associei à *Charles Sanders Peirce Society*, tendo acesso à publicação trimestral da revista *Transactions of the C. S. Peirce Society*. Paralelamente aos textos adquiridos para meu uso, fui providenciando sua aquisição pela biblioteca do campus. Escrevi sistematicamente artigos pertinentes ao pensamento Peirceano e passei a participar, sempre que possível, de congressos na área. Lecionei por três anos Semiótica e Pragmática no Programa de Pós-Graduação em Estudos Literários da UNESP – campus de Araraquara, cuja inspiração semiótica de tradição eminentemente greimasiana era predominante, cabendo-me apresentar aos alunos a vertente peirceana. Lecionei Semiótica da Aprendizagem no Programa de Pós-Graduação em Educação da UNESP, campus de Marília. Lecionei Semiótica jurídica no Programa de Mestrado em Direito da Fundação de Ensino "Eurípides Soares da Rocha" de Marília da onde resultou o livro Curso de Semiótica Geral, publicado no ano de 2007. Atualmente, embora aposentado, continuo a participar das atividades docentes e culturais do Programa de Pós-Graduação em Filosofia da UNESP – Marília, das atividades de ensino e pesquisa do Núcleo de Psicanálise de Marília e Região, e me encarrego de duas exposições teóricas anuais do grupo de estudos sobre Auto-organização do Centro de Lógica, Epistemologia e História da ciência da UNICAMP, em Campinas.

2. O que é Semiótica Cognitiva?

Eunice Q. Gonzalez: A Semiótica Cognitiva é uma área de investigação interdisciplinar sobre a natureza e dinâmica dos signos que constituem a base dos processos cognitivos. Estes processos, segundo a perspectiva semiótica peirceana, não se restringem ao domínio humano, mas pertencem a qualquer sistema inteligente capaz de gerar e/ou modificar hábitos de ação. Um tópico fundamental de especial interesse para os estudiosos desta área diz respeito à natureza do significado, e de seu reconhecimento, nos processos de comunicação.

Lauro F. B. da Silveira: Minha resposta à segunda pergunta irá se restringir à Semiótica como ciência geral, da ordem das ciências da descoberta e inserida, juntamente com a Fenomenologia, a Estética, a Ética e a Metafísica, no domínio da Filosofia tal como propõe Peirce em seus textos da maturidade, a partir dos primeiros anos do século XX. Para Peirce, semiótica é a quase necessária ou formal doutrina dos signos; seu escopo é determinar como devem ser todos os signos para uma inteligência capaz de aprender tendo por base a experiência. Sendo uma ciência de como devem ser todos os signos, tem um caráter geral. Portanto, atribuir-lhe como objeto o Conhecimento, irá constituí-la numa ciência especial cujo objeto deverá ser devidamente recortado e feito distinto do que se supõe não seja de natureza cognitiva. Cabe, pois, aos estudiosos deste objeto em seu caráter especial caracterizá-la, mais detalhadamente.

3. **Quais universidades, grupos de pesquisa e jornais científicos existentes estão desenvolvendo estudos nessa área?**

Eunice Q. Gonzalez*:* No Brasil, os grupos de pesquisa da PUC-SP, da USP e da UNESP campus de Marilia são os primeiros que me vêm à mente. Além disso, podemos mencionar pesquisadores como Ana Guimarães, Winfried Nöth e Lúcia Leão (PUC-SP), Priscila Farias (USP) Ricardo Gudwin (UNICAMP), João Queiroz (Universidade Federal de Juiz de Fora), Angelo Loula (Universidade Estadual Feira de Santana) e Vinicius Romanini (USP).

As revistas *Cognitio*, editada pelo professor Ivo Ibri, da PUC-SP, e a *Cognitive Semiotics: multidisciplinary journal on meaning and mind* podem ser mencionadas entre as mais destacadas do mundo sobre o assunto.

4. **Como se pode entender as relações entre consciência, mente, e autoconsciência de acordo com diferentes pontos de vista no escopo da Semiótica Cognitiva?**

Eunice Q. Gonzalez: Aprendemos com Peirce que a mente, entendida como um sistema sígnico complexo, tem no pensamento um propulsor da geração e modificação de hábitos de ação. De acordo com a perspectiva da semiótica peirceana, tal como a concebo, a consciência humana não desempenha um papel de grande destaque nesse sistema, sendo possivelmente uma, entre as várias camadas selecionadoras de informação relevante para a

ação. Neste contexto, a autoconsciência realizaria a tarefa de selecionar informação a partir de uma perspectiva de primeira pessoa. Contudo, temos pouco conhecimento sobre a natureza da consciência, razão pela qual pesquisadores como David Chalmers, ficaram famosos por polemizar sobre o que ele denominou "*o problema difícil da consciência*" (t*he hard problem*). Particularmente acredito que grande parte dos debates sobre o problema da natureza da consciência constitui um resquício mal resolvido do dualismo cartesiano, atualmente revestido de conotações elaboradas a partir da neurociência cognitiva.

5. **Muitos autores têm refletido sobre a noção de "*agency*" como um dos mais importantes aspectos da experiência humana. Poderiam comentar sobre essa tendência?**

Lauro F. B. da Silveira*:* Procurando trazer alguma contribuição para que se responda a questão quinta, irei me limitar a breves considerações sobre "*agency*" em textos colhidos nos *Collected Papers of Charles S. Peirce*: "*agency*" é, em diversos textos (por exemplo: 1,174;5.547; 6.58), o agente responsável por todos os processos evolutivos, sendo válido desde o crescimento dos seres vivos até a evolução do cosmos; é o agente que efetiva uma idéia (2.149). Em outros textos, "*agency*" aparece como o princípio geral que permite que se atualizem as reações químicas (1.249) ou, mais em geral, o princípio eficiente que a partir de uma substância alcance um resultado experimental, trate-se de substâncias físicas ou mesmo psíquicas, como no caso do comportamento humano e animal; um princípio que determina eficientemente, no plano comportamental, uma conduta ética (1.592-3,605-607); a ação do homem que atualiza suas idéias graças à sua interação no mundo (2.149); um princípio eficiente que molda uma civilização (6.145); no alvor da filosofia, o Amor como princípio constitutivo do cosmos. Na lógica, em especial na construção dos Grafos Existenciais, o princípio formal que permite aos signos discentes (Femas) transmitirem na forma de argumentos (Delomas) a verdade asseverada.

Eunice Q. Gonzalez: Gostaria de acrescentar à resposta do professor Lauro sobre essa questão algumas hipóteses sobre a concepção externalista do conhecimento que se fundamenta na ação. De acordo com a visão externalista, o conhecimento e a experiência humana, em geral, não encontram no interior de uma mente o seu habitat natural, como defendem os adeptos do solipsismo metodológico. Eles se constituem e se desenvolvem, antes, na forma de disposições para a ação habilidosa em organismos situados e

incorporados que atuam no meio ambiente em concordância com um principio de reciprocidade, segundo o qual organismo e ambiente evoluem conjuntamente.

Inspirados na Filosofia Ecológica, inaugurada originalmente por James J. Gibson, na década de 1950, entendemos que organismo e meio ambiente co-evoluem formando nichos semióticos nos quais diferentes formas de ação moldam a diversidade de experiências, significados e identidades no reino animal.

6. **Quais as mais relevantes idéias desenvolvidas sobre os conceitos de abdução e de diagrama por pesquisadores das Ciências Cognitivas ou da Semiótica?**

Eunice Q. Gonzalez*:* Nas Ciências Cognitivas, o conceito de abdução ocupa lugar de destaque nos estudos dos modelos mecânicos supostamente explicativos dos processos de criação e de descoberta. Pesquisadores como Paul Thagard e Margaret Boden, por exemplo, elaboraram propostas interessantes sobre esse tema, enfatizando as noções de *espaço conceitual* e de *algoritmos* que permitem a exploração e estruturação de diferentes formas de raciocínio envolvidos no processo de criação de hipóteses explicativas. Especial ênfase é dada por Thagard ao raciocínio abdutivo nos processos de criação. Além deles, o pesquisador italiano Lorenzo Magnani tem várias publicações sobre o tema da abdução e sua possível implementação em modelos cognitivos. A coletânea intitulada *Model-Based Reasoning in Scientific Discovery*, organizada por L. Magnani, P. Thagard e N.J. Nersessian traz bons exemplos de aplicações do conceito de *abdução* na ciência cognitiva.

Lauro F. B. da Silveira: Para a semiótica de tradição Peirceana, a abdução é a forma de argumento que permite inferir uma idéia nova e tentar inteligir, ou representar um evento anômalo ou predominantemente singular, supondo ser um caso de uma lei geral já conhecida. Isto se faz por Observação Abstrativa (CP.2.227) pela construção de um diagrama que conjecturalmente explicite as relações que os componentes daquele evento manteriam entre si, e, em seguida, dedutivamente, possibilite inferir as conseqüências que decorreriam da classe de fenômenos da qual o fato seria um exemplar, caso se estabelecessem as condições experimentais de atuar sobre exemplares a eles semelhantes em suas relações. Por um tal processo daria lugar a concepção do fenômeno, dela resultando seu conceito.

7. Poderiam comentar sobre uma premissa do conceito de diagrama ligada aos estudos dos sistemas auto-organizativos?

Lauro F. B. da Silveira: Procurando responder à questão sobre o diagrama como premissa nos estudos de auto-organização, procurarei oferecer subsídios para a resposta levando em conta o que o diagrama significa na teoria semiótica de Peirce. As construções diagramáticas ocupam na concepção Peirceana de pensamento um lugar indiscutivelmente central. Todo conhecimento se faz por meio de signos e estes, por sua natureza são constructos imaginários que representam o objeto que os determina para uma conduta futura por eles determinada. Esta construção relacional ao nível da imaginação tem a forma de um diagrama, a qual enseja que a razão produza um conceito. E não há, pois, conhecimento que não seja diagramático, como condição necessária para que uma razão que aprenda com a experiência possa antecipar imaginativamente sua conduta futura de modo autoconsciente e autocontrolado.

Eunice Q. Gonzalez: Complementando a resposta do prof. Lauro sobre a importância das construções diagramáticas na concepção Peirceana de pensamento e sua relação com sistemas auto-organizativos, cabe ressaltar que os sistemas auto-organizados são aqueles que se estruturam principalmente em função da interação espontânea que ocorre entre seus elementos constituintes, sem a predominância de um centro organizador. Entendemos que as construções diagramáticas ocorram, em grande parte, de modo auto-organizado, como um produto emergente de nossas experiências sem um direcionamento predeterminado, seja por uma razão controladora, seja por um ambiente que possa se impor temporariamente ao agente. Os sistemas auto-organizativos são, em geral, complexos, na medida em que incorporam informação proveniente de várias dimensões temporais, espaciais, ecológicas, entre outras. A beleza e a força das construções diagramáticas residem, em nosso entender, no seu poder de síntese sem empobrecimento das relações que as constituem.

8. Poderiam comentar sobre a idéia de espacialidade e de não-espacialidade do que se pode chamar de mental versus a tendência de pensamento localizado?

Eunice Q. Gonzalez*:* A hipótese de que o pensamento seria situado e incorporado constitui a base da vertente Externalista, que se contrapõe ao Internalismo subjetivo, no estudo da mente.

De acordo com a vertente internalista tradicional, o pensamento seria uma substância imaterial, indivisível e interna a um sujeito que teria acesso privilegiado a ele através da introspecção. Uma primeira dificuldade concernente a essa concepção consiste em se compreender como é possível que uma substância imaterial, que não ocupa um lugar no espaço, seja interna a um sujeito. Entre os inúmeros problemas subjacentes à concepção Internalista, pode ser destacado o conhecido *problema das outras mentes*: como saber que outros indivíduos, além de mim mesma; teria pensamento se o seu acesso se dá na primeira pessoa?

Na tentativa de evitar as dificuldades enfrentadas pelo Internalismo no estudo do pensamento, a vertente Externalista caracteriza o pensamento em termos de relações informacionais que se estabelecem entre organismo e meio ambiente, no domínio da ação. Nessa perspectiva, o pensamento seria público, resultante das restrições (*constraints*) ambientais, motoras, histórico-sociais e informacionais delimitadoras de possibilidades de ação no ambiente. Espalhado no ambiente, o pensamento se expressaria através das relações emergentes da dinâmica auto-organizadora de signos.

9. Em suas opiniões, qual é o direcionamento futuro dos estudos da Semiótica Cognitiva?

Eunice Q. Gonzalez: Como o desenvolvimento filosófico e cientifico acompanha, em geral, o desenvolvimento tecnológico de sua época, acredito que as novas tecnologias informacionais direcionarão uma parte significativa dos futuros estudos da Semiótica Cognitiva. Para ser sincera, tenho um pouco de receio sobre esse desenvolvimento.

Explico o porquê: até o final do século passado, os modelos mecânicos supostamente simuladores do pensamento, propostos pela Robótica e pela Inteligência artificial, eram pouco mais do que brinquedos para entreter a comunidade dos cognitivistas. Contudo, a recente parceria da Ciência cognitiva com a Semiótica parece colaborar para um salto qualitativo nas técnicas de modelagem, em especial nos estudos da vida artificial e da robótica humanóide. O meu receio vem da possível influência estritamente mecanicista (tão criticada por Peirce) que essa parceria possa exercer sobre a nossa auto-imagem e visão de mundo, sem um cuidadoso estudo de suas consequências no plano ético. A minha esperança é que o acaso, com sua força criadora, possa contribuir para que a poesia não seja esquecida nessa empreitada e que o agapismo seja o farol iluminador das futuras pesquisas da área.

Lauro F. B. da Silveira: Os pontos de convergência entre as propostas filosóficas de Peirce e as elaborações levadas a efeito no âmbito dos estudos da Auto-organização são notórias. A própria noção evolutiva que permeia o pensamento Peirceano, desde os escritos posteriores à leitura feita por Peirce da Origem das Espécies de Charles Darwin e das discussões que tiveram lugar no Clube Metafísico de Cambridge, logo após a publicação daquela obra, levaram-no a ir constituindo uma teoria cosmológica genuinamente evolutiva que envolvia não somente o universo astronômico mas também o âmbito da geração das idéias e da determinação estética, ética e lógica da conduta. O universo total Peirceano pode se entendido como um sistema auto-organizado. Todo o trabalho que os estudos da auto-organização vêm realizando contribuem, portanto, para uma elucidação cada vez maior de do pensamento Peirceano, em seus diversos aspectos. No interior deste quadro de referência, os modelos lógicos propostos por Peirce para o desenvolvimento e o incremento dos processos de investigação e descoberta, com certeza, são bastante adequados para que se pense uma lógica evolutiva e, consequentemente, a elaboração de modelos lógicos para equacionar hipóteses de processos dinâmicos auto-oganizacionais. Muito melhor do que eu, podem dizer nossos colegas que investigam estes processos, considerando-se o grande conhecimento e competência em lógica e em matemática de que são portadores. Deixo com eles, pois, esta bela missão.

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