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# The secret of rendering signs effective: the import of C. S. Peirce's semiotic rhetoric

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**Abstract**

In this article I trace the historical development of Peirce's semiotic rhetoric from its early appearance as a sub-discipline of symbolistic to its mature incarnation as one of the three main branches of the science of semiotic, and argue that this change in status is a symptom of Peirce's broadening semiotic interest. The article shows how the evolution of Peirce's theory of signs is linked to changes in his conception of logic. This modification is not merely a minor justification in his classification of the sciences; rather, it indicates a growing understanding of the interconnection between the different semiotic sub-disciplines. The scope and character of the mature discipline of rhetoric is further discussed in terms of a possible clash between rhetorical and methodological emphases, and a conciliatory strategy is suggested. The article concludes with some reflections on the relevance of Peircean rhetoric for future work in Peirce studies and semiotics.

Almost 100 years have passed since Charles S. Peirce declared himself to be a "pioneer, or rather a backwoodsman, in the work of clearing and opening up […] *semiotic*, that is, the doctrine of the essential nature and fundamental varieties of possible semiosis" (EP[1] 2:413 [1907]). Few would today deny the historical significance of his labours. Still, in view of the remarkable growth of semiotics in the 20th century, one may reasonably wonder whether Peirce's pioneering work is of any real relevance for contemporary semiotic inquiry. The elaborate trichotomies and hierarchies of Peircean sign theory can certainly appear dated and barren in a situation where semiotics is every so often dismissed as yesterday's intellectual fad and semioticians increasingly look for new approaches through which to reinvigorate their efforts.

Nonetheless, a return to Peirce might be just what semiotics needs. This claim may appear a bit misguided, if not outright imprudent; surely, the Peircean alternative must have been sufficiently tried and tested by now? I would argue that it has not. While the triadic model propounded by Peirce has made some gains in relation to the dyadic conception characteristic of de Saussure and his structualist followers, there are still several less obvious aspects of Peirce's project that have received only scant attention from semioticians. Indeed, certain promising leads concerning the varieties of semiotic inquiry have been all but ignored in the literature on Peircean semiotics.

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[1] In accordance with the customs of Peirce scholarship, I will refer to collections of Peirce's texts using abbreviations in references given in the text. *CP x.y* refers to *The Collected Papers of Charles Sanders Peirce*; *v* indicates volume number, *p*, paragraph number. *EP v:p* refers to *The Essential Peirce: Selected Philosophical Writings*; *v* indicates volume number, *p*, page number. *MS m* refers to an original manuscript; *m* indicates manuscript number. *NEM v:p* refers to *The New Elements of Mathematics by Charles S. Peirce*; *v* indicates volume number, *p*, page number. *SS p* refers to *Semiotics and Significs: The Correspondence between Charles S. Peirce and Victoria Lady Welby*; *p* indicates page number. *W v:p* refers to *Writings of Charles S. Peirce: A Chronological Edition*; *v* indicates volume number, *p*, page number. Where known, the year of writing or publication will be given.

Studies of Peirce's theory of signs have typically focused on the sub-disciplines he identified as *grammar* and *critic*, with comparatively little attention being paid to his third semiotic study, that is, to the field of inquiry he denoted as *rhetoric* or *methodeutic*. This emphasis is partly understandable, as Peirce's writings on explicitly rhetorical issues tend to be sparse and suggestive. Also, one should note that a considerable part of the work done by Peirce's followers (and other semioticians) falls quite naturally within the scope of rhetoric, although this is seldom acknowledged. On the other hand, the lack of an explicit consideration of the scientific status and impact of the rhetorical study – the *liveliest* branch of semiotic, according to Peirce – threatens to turn Peircean semiotic into a mere logico-grammatical exercise, a kind of glass-bead game for zealous intellectuals that is easily ignored by the rest of the world. Perhaps this explains why leading Peirce scholars such as Lucia Santaella Braga and James Jakób Liszka have turned their attention to the question of rhetoric in recent years.[2] While it is too soon to speak of a rhetorical turn in Peirce studies, it is nonetheless highly probable that this field will witness considerable advances in the near future.

In this short essay, I will mainly outline the historical development of Peirce's third semiotic discipline and consider the question of its scope, concluding the overview with a few thoughts on the prospects of rhetorical semiotic. Obviously, my treatment of the issues at hand is severely abridged; I could hardly even begin to fill the many gaps of Peircean rhetoric in this paper. However, I hope my presentation gives some indications of the great potential I see in this line of inquiry.

## Rhetoric as a branch of semiotic

As so many questions regarding Peirce's semiotic project, his division of semiotic into three branches involves many complex questions. Here, matters can be simplified by focusing on two different conceptions of the field of the philosophical study of signs, connected with his early and late semiotic phases.

The first recorded appearance of the term "semiotic" in Peirce's writings (in his 1865 Harvard lectures on the logic of science) merely states that logic is a species of "symbolistic", which in its turn is a branch of "semiotic", the general science of representations. For the young Peirce, logic is not a synonym for the doctrine of signs, but rather the branch of the semiotic of symbols that examines the relations of symbolic representations to their objects (W 1:303 [1865]). He does not pay much attention to the other parts of semiotic. We are told that there is a science of copies and a science of signs,[3] which accompany the science of symbols, and that symbolistic is divided into grammar, rhetoric, and logic (see Fig. 1); but only the logical part of semiotic is described in any detail.

[2] In particular in LISZKA J. J. (1996, 2000) and SANTAELLA BRAGA L. (1999). See also BERGMAN, M. (2000, 2004) for discussions of various aspects of Peirce's rhetoric.

[3] By "signs", Peirce in this context means the kind of representations later named "indices". "Copy" is an early name for "icon".

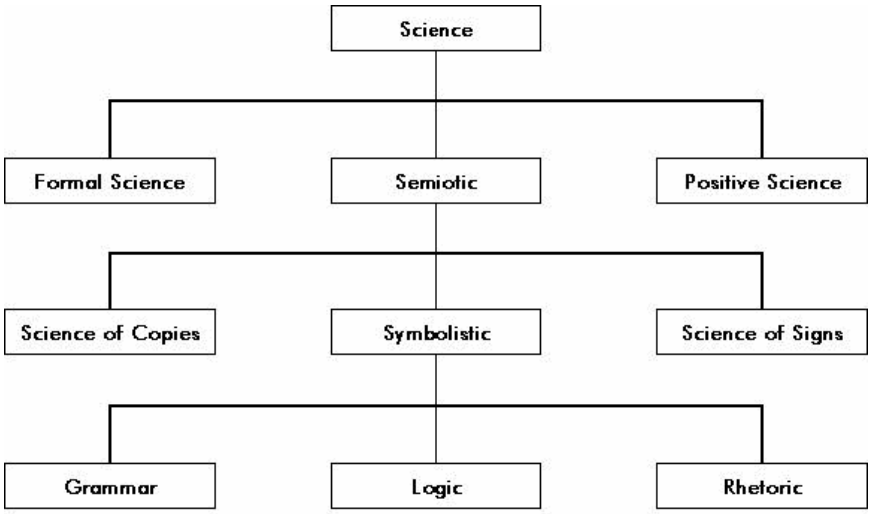


**Figure 1. Peirce's classification of the sciences in "Teleological Logic" (1865).**

Peirce's characterisation of the science of representations in his youthful writings is rather meagre; it is not possible to form any detailed conception of its scope and content. Nonetheless, some general features of the proposed domain of inquiry may be discerned. In the first place, Peirce's early attention to the science of semiotic follows from an endeavour to find a definition of logic that would avoid the pitfalls of psychologism (see W 1:308 [1865]). Thus, it is evident that the representations, which the various branches of semiotic study, are not to be explicated by an examination of the actual workings of the human mind. Secondly, it is of some interest to note that semiotic is one member of the basic *trivium* of science, of which the other components are the *science of forms* (formal science) and the *science of things* (positive science). This primary trivium can be connected to his work on the theory of categories. In "An Unpsychological View of Logic" (W 1:307-308 [1865]; W 1:313-314 [1865]), Peirce claims that form and matter can be abstracted from the phenomenon considered as an image or a representation. All three phenomenal aspects or elements may be generalised, giving three supposable objects: *representations in general*, *things*, and *qualities*. Positive science studies material things, while formal science examines qualitative forms (W 1:303 [1865]).[4] Semiotic, as the science of representations, would naturally be concerned with objects of the first kind, that is, with internal and external representations. Using later terminology, we could say that its proper domain is objects as *thirds*.

The anti-psychologistic emphasis and the intimate connection between the theory of signs and the category of thirdness are pervasive features of Peirce's semiotic, early and late alike. In addition, the trivium of grammar, logic, and rhetoric can also be found in his mature sign-theoretical writings. However, one of the interesting

[4] In this trivium of sciences, we may detect an early anticipation of Peirce's later division of sciences into mathematics, philosophy, and special science. On the other hand, it may be wise not to read too much into his earliest attempts to classify the sciences. In particular, Peirce vacillates concerning the relationship between the sciences of representation and form; whereas formal science is clearly (albeit programmatically) distinguished from the science of representations in "Teleological Logic", logic is described as the science of the forms of thought, concerned with both internal and external representations, in "An Unpsychological View of Logic" (1865). Nor is it clear to what extent formal science and semeiotic would be dependent on each other; on the one hand, form and thing are prescinded from representations, but on the other hand, Peirce's diagram of the relationship between the three basic sciences does not suggest any relation of dependency between the disciplines (see W 1:303-304 [1865]).

features of Peirce's first efforts to characterise semiotic inquiry is that they indicate that he was not originally all that interested in the study of all kinds of signs; rather, what he was looking for in his earliest classification of semiotic was a way to delimit the domain of logic, or the study of how symbols can stand truthfully for their objects. This is not surprising; after all, Peirce was primarily a logician.

Nevertheless, Peirce does offer some attempts to characterise the tasks of the different branches of symbolistic in his early writings. In "Teleological Logic", he asserts that the "science of the general conditions to which every symbol is subjected in so far as it is related to a logos is *General Grammar*, to a language is *General Rhetoric*, to an Object is *General Logic*" (W 1:304 [1865]). In another passage from the same period, Peirce describes the task of rhetoric as that of investigating the laws of a symbol *translating* anything (W 1:274 [1865]). Or to put the matter in slightly different terms, rhetoric is primarily interested in the laws determining the production of interpretants, representations that in some sense translate the original representation. From a different perspective, rhetoric can be viewed as the science of the *intelligibility* of symbols (W 1:175 [1865]).

Now, when one turns to Peirce's later writings, at least one major change in his conception of the semiotic sciences that affects the scope of rhetoric may be discerned. The in-between level consisting of the science of copies, the science of signs, and symbolistic is removed. In his mature semiotic, Peirce actually divides *logic* into the three sub-disciplines or branches of grammar, critic, and rhetoric or methodeutic.

This is related to the relatively well-known fact that Peirce changes his mind about the relationship between semiotic and logic as his thought develops. Whereas the young Peirce strives to carve a place for logic within the part of semiotic he calls symbolistic, the older Peirce conceives of logic *as* semiotic; and this is to include grammar and rhetoric as well as logic in the narrow sense, or *critic* as Peirce most often calls the second branch of semiotic.

> The term "logic" is unscientifically by me employed in two distinct senses. In its narrower sense, it is the science of the necessary conditions of the attainment of truth. In its broader sense, it is the science of the necessary laws of thought, or, still better (thought always taking place by means of signs), it is general semeiotic. (CP 1.444 [c. 1896])

Peirce now argues that as long as every logical relation is a semiotic relation (which he naturally holds it to be), then the deeper comprehension of logic requires an understanding of all forms of signs and their functions. Consequently, he urges logicians to widen the scope of their research; like medical men examining yeasty diseases study all kinds of yeast, so logicians ought to investigate anything that bears any real analogy to reasoning, and analyse the agreements and disagreements of such occurrences with reasoning (MS 634:15-16 [1909]). Peirce even asserts that the broader investigation is part of the *duties* of the logician (MS 640:10 [1909]).

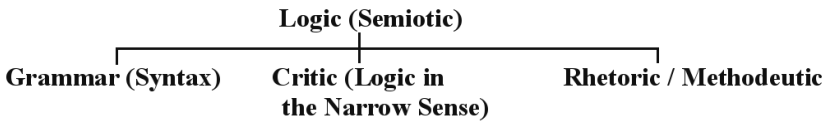


**Figure 2. Peirce's Division of Logic in His Later Philosophy**

It is clear that Peirce's mature conception of logic as semiotic entails that grammar, critic, and rhetoric are not to be restricted to the study of symbols – that is, to habitual or conventional signs. However, the transformation may have more profound consequences. Arguably, this change in Peirce's approach to logic is not a merely a minor justification in his classification of the sciences; rather, it indicates a growing understanding of the interconnection between the different semiotic subdisciplines. Moreover, whereas Peirce's early forays were primarily motivated by the need to establish the proper framework for logic in the narrow sense, his later work in semiotic in fact ranges over all of the three main semiotic compartments – a fact that may still not be adequately appreciated. In fact, most of what has become known as Peirce's "semiotics" after his death actually belongs to grammar, the first semiotic discipline. If we take Peirce's revised conception of the connection between semiotic and logic seriously, this is simply too narrow a perspective.

## Rhetoric versus methodeutic

As noted at the beginning, Peirce's work on rhetorical matters is altogether rather fragmentary, and it is an open question of what should belong to this area of inquiry. Moreover, the problem of how we should understand the domain of the third branch is heightened by the fact that Peirce appears to waver between a broader and a narrower conception of its domain.

In his later writings, Peirce defines *rhetoric* as "the study of the necessary conditions of the transmission of meaning by signs from mind to mind, and from one state of mind to another" (CP 1.444 [c. 1896]; cf. NEM 4:331 [1898]). The task of rhetoric "is to ascertain the laws by which in every scientific intelligence one sign gives birth to another, and especially one thought brings forth another" (CP 2.229 [c. 1897]). As such, the emphasis of rhetoric would naturally be on interpretation and other semiotic effects. This conception does not seem to differ greatly from that presented in Peirce's early writings, apart from the rather significant divergence in scope noted above.

However, approximately in 1902, the focus of the third sub-discipline of semiotic begins to turn toward methodological matters, something that is reflected in Peirce's new preferred name, "methodeutic" (see CP 4.9 [1906]). The occurrence of this shift can be seen quite concretely in *Minute Logic*, where the two terms still co-exist, albeit somewhat uneasily.[5] The definition of rhetoric offered in this context states that it is substantially the same as methodeutic, and that it is concerned with the "the general conditions of the reference of Symbols and other Signs to the Interpretants which they aim to determine" (CP 2.93 [c. 1902]).

At first, it does not seem that all that much has changed, apart from the name. In his *Carnegie Application*, Peirce says that "*methodeutic* looks to the purposed ultimate interpretant and inquires what conditions a sign must conform to, in order

[5] In one variant of the text, Peirce explicitly states that he prefers "Speculative Rhetoric" over "Methodeutic" or "Methodology" (MS 425:118); but in other drafts, "methodeutic" is used.

to be pertinent to the purpose" (NEM 4:62 [1902]). However, a year later we find him defining the third sub-discipline as "the principles of the production of valuable courses of research and exposition" (EP 2:272 [1903]). In another characterisation in *A Syllabus of Certain Topics of Logic*, Peirce says that methodeutic "studies the methods that ought to be pursued in the investigation, in the exposition, and in the application of truth" (EP 2:260 [1903]). More in the same vein follows. The third department of logic "considers how inquiries are to be ordered and arranged" (MS 452:6 [1903]); its "purpose is to ascertain the proper order of procedure in any inquiry" (MS 640:6 [1909]). In short, methodeutic "shows how to conduct an inquiry" (NEM 3:207 [1911]).

Thus, it would appear that Peirce has replaced rhetoric with the more concrete or better-defined methodeutic, at the same time restricting its scope to the study of effective methods. Some scholars have drawn this very conclusion; for instance, according to Santaella Braga, the third branch of semiotic develops from a narrow to a broad sense.[6] However, at roughly the same time as this transformation takes place, Peirce also continues to write on rhetoric, and even proposes a quite intricate scheme of various rhetorical studies in "Ideas, Stray or Stolen, about Scientific Writing" (1904).[7] In this context, Peirce defines the third branch of semiotic as "the science of the essential conditions under which a sign may determine an interpretant sign of itself and of whatever it signifies, or may, as a sign, bring about a physical result" (EP 2:326 [1904]; cf. MS 836). However, not all rhetorical questions are necessarily pursued in philosophy. According to Peirce, there is, as a matter of fact, a universal art of rhetoric, which is concerned with "the general secret of rendering signs effective" (EP 2:326 [1904]). From this art, which ought to include such practical concerns as the teaching of eloquence and the improvement of organisational communications, one may abstract the science of rhetoric, which should investigate the principles of everything that the art covers or could cover. It is by no means clear how this characterisation fits with the methodeutic point of view – or even if it is meant to do so.

Now one could obviously argue that "Ideas, Stray or Stolen" is explicitly focused on scientific writing and is therefore naturally a part of methodeutic; it is concerned with the publication of scientific findings, which is a central aspect of the sociality of science according to Peirce. This is true as far as it goes, but it does not explain the discrepancies between the rhetorical and methodeutic perspectives. In fact, it would seem that many of Peirce's characterisations of methodeutic are far narrower than his comparable definitions of rhetoric; some of the methodeutic definitions appear to turn the third branch of semiotic into a set of rules for conducting successful research. Furthermore, in "Ideas, Stray or Stolen" Peirce suggests that rhetoric could be divided into the rhetoric of art, the rhetoric of persuasion, and the rhetoric of science (see EP 2:329 [1904]). This, in turn, could be interpreted to imply that methodeutic is only the part of rhetoric known as rhetoric of science.

Yet, it may be that the contrast between rhetoric and methodeutic should not be exaggerated. By re-conceptualising the third branch of semiotic as methodeutic, Peirce finds a concrete function for it in inquiry. On the other hand, he also wants to retain the broader conception, in which rhetoric is defined in terms of bringing

[6] SANTELLA BRAGA L. (1999), p. 380).

[7] Curiously, Santaella Braga claims that it is this very text that signals Peirce's turn from rhetoric to methodeutic (see SANTAELLA BRAGA L. [1999], p. 391).

forth interpretative effects or results. Joseph Ransdell enumerates three principal functions of the third semiotic discipline; it "can be conceived variously as the general methodology of inquiry, as a theory about how beliefs are established when truth is sought, or as a theory about the representational process considered as an autonomous interpretant-generating process".[8] The autonomy claim is somewhat controversial, but if we speak more broadly about a theory of interpretant generation and communication, then Ransdell's summary should be acceptable to all parties.

These various aspects of rhetoric/methodeutic seem to be reconciled in the following characterisation of the logical trivium:

> The whole discussion of the logical nature of the different kinds of possible signs makes up the first division of logic, or Speculative Grammar. The second division, Critic, discusses the relation of signs to their objects, that is, their truth. The third division, Methodeutic, discusses the relations of signs to their interpretants, that is, their knowledge-producing value. (MS 793:20 [c. 1906])

Even more generally, it may be suggested that the third branch of semiotic is concerned with semiotic effects. This would allow for a division of labour between rhetoric and methodeutic; explicitly rhetorical studies would be primarily concerned with communication, while methodeutic investigation would be roughly equivalent to what is usually known as methodology. This proposal seems plausible from the point of view of Peirce's semiotic project. Taking "rhetoric" as an umbrella term, Liszka argues that rhetoric as speculative rhetoric (i.e., as an account of the conditions of communication and the fixation of belief) and rhetoric as methodeutic (i.e., as a systematic procedure for inquiry and for the systematisation of the sciences) are reconcilable within scientific rhetoric, which "works to underscore the formal conditions of inquiry as a practice, including its presuppositions, purposes, principles, and procedures".[9] Apart from certain doubts that could be entertained concerning the aptness of the term "formal conditions" in this context,[10] Liszka's proposal offers a good summary of the scope of Peirce's rhetoric. It retains the notion that the study of communication is an integral part of semiotic, while at the same time paying due heed to the scientific setting of Peirce's project.

## Toward a new pragmatics?

While there would be much more to say about the details of Peirce's different characterisations of rhetorical inquiry, and of the somewhat troubled relationship between rhetoric and methodeutic, we may now conclude this short sketch of the liveliest branch of semiotic with a few reflections on its import and potential. These may be roughly divided into two parts: the relevance of the rhetorical viewpoint for Peirce's system and the wider significance of Peircean rhetoric.

In the first instance, it is useful to repeat that Peirce's conception of rhetoric both remains the same in certain key respects and changes significantly over time. At

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[8] RANSDELL J. (1997), §19.

[9] LISZKA J. J. (2000), p. 470.

[10] Admittedly, Peirce sometimes describes the third logical science in such terms, but it might be more appropriate to use "theoretical" or even "speculative" rather than "formal" to avoid confusions. Moreover, it is advisable not to read "conditions" in a strong transcendental sense. Although it seems plausible to think that Peirce's characterisation points in the direction of "transcendental semiotics" (along the lines of APEL K.-O. [1998]), it might be too limiting a frame for a theory that supposedly needs to examine the practical settings of inquiry closely.

least, both early and late he argues that rhetoric, as a part of philosophical semiotic, ought not to be built on psychology. However, whereas Peirce in his early writings shows little interest in the study of rhetoric, his revised conception of the domain of semiotic amounts to a call for expansion of the field of logic. Arguably, the most significant advances occur precisely within the domain of rhetoric – something which to some extent affects the study of semiotic as whole, and may even have repercussions for the Peircean approach to philosophy.

Notably, Peirce moves toward a clearer appreciation of the social and dynamic character of basic semiotic experience – the stuff from which such theoretical entities as sign, object, and interpretant are to be abstracted. In a passage that is not easily reconciled with the formalistic and hierarchical mode of presentation he too often favours in his semiotic, Peirce contends that philosophers "must not begin by talking of pure ideas, – vagabond thoughts that tramp the public roads without any human habituation, – but must begin with men and their conversation" (CP 8.112 [c. 1900]). Ordinary dialogue is singled out as "a wonderfully perfect kind of sign-functioning" (EP 2:391 [c. 1906]). Furthermore, Peirce indicates that semeiotic grammar needs to employ so-called *rhetorical* evidence, that is, inferences drawn from our commonplace experiences of assertions. This evidential base is formally imperfect. Yet, it does not only provide the initial material for the inquiry, but also constitutes the testing ground for the systematically developed analysis; "the deductions, or quasi-predictions, from the theory having been made, it is requisite to turn to the rhetorical evidence and see whether or not they are verified by observation" (CP 2.333 [c. 1895]).

Another indication of Peirce's escalating interest in rhetoric is the development of his theory of the varieties of interpretants. As has been suggested several times already, rhetoric is the part of semiotic that focuses on semiotic effects, and thus on the interpretant pole of the sign relation. Whereas Peirce's early conception of the interpretant can be roughly summarised as a sign that translates the original sign, his later theory recognises a multiplicity of semiotic effects: for instance emotional, dynamical, and logical interpretants. Also, it is not a coincidence that Peirce in his final years at last succeeds in establishing an explicit connection between semiotic and pragmatism, as he argues that the ultimate logical interpretant is best characterised as a habit of action, or a modification of one (CP 5.476 [1907]). This marriage between pragmatism and semiotic, which is accompanied by fallibilism and critical common-sensism, forms the keystone of the mature rhetorical outlook. Arguably, this point of view paves the way for a richer conception of semiotic, within which questions of communicative context, vagueness, and purpose may be addressed.

Obviously, these rather bold claims would need to be substantiated, but that is a task for more scrupulous study than this somewhat programmatic overview. Instead, I will conclude this essay by suggesting a couple of reasons for giving Peirce's rhetoric a chance to prove its worth.

Firstly, I think a revitalised Peircean rhetoric could give us a new approach to pragmatics. The most well-known attempt to divide semiotic is of course Charles Morris's division of it into syntax, semantics, and pragmatics[11] – a three-fold division that was at least to some extent influenced by Peirce's work. Now, although

[11] MORRIS C. (1938).

Morris and Rudolf Carnap[12] portrayed syntax, semantics, and pragmatics as the three principal *semiotic* disciplines, philosophers of language and linguists have tended to ignore this origin, and conceive of syntax, semantics, and pragmatics as three aspects of the study of language. In contrast, Peircean semiotic is of course not restricted to linguistic signs, and this is also true of its rhetorical part. Although the study of language use is certainly among the most important parts of rhetoric, Peirce explicitly proposes a generalisation of rhetoric, so that it would not be restricted to speech (as the traditional conception of rhetoric would have it). Peircean rhetoric would be concerned with the interpretant-generating force of signs of all kinds: algebraic symbols, diagrams, paintings, sculptures, and so on – potentially even of signs without human originators.

At first blush, this does not seem to diverge all that much from Morris's conception of pragmatics, which is the part of semiotic that studies the "relation of signs to interpreters". But there is a crucial difference, in that Peircean rhetoric does not necessarily involve any reference to human subjects. As noted, one of the enduring marks of Peircean semiotic is its anti-psychologistic stance – albeit Peirce concedes that it may be acceptable to loosen the demands a bit when we come to rhetoric, and even accepts that some psychological facts may need to be taken into account (see CP 2.107 [c. 1902]). Still, I think that the main upshot of a Peircean approach to pragmatics would be a broadening of its scope – or perhaps rather a change of perspective from that of treating sign use psychologically to that of focusing on the effects of various kinds of signs.

Possibly, semiotics could more generally benefit from an appropriately revised Peircean way of dividing its field. This may go against the flow of much current work in semiotics, for which a division into grammar, critic, and rhetoric appear to be unnecessarily stiff and scholarly. However, there is at least this to be said for the Peircean point of view: it could serve as an aid in attempts to organise our semiotic efforts. Perhaps controversially, I would like to suggest that the rather formless field of present-day semiotics could use some methodical reordering; and while Peirce of course does not give us all the answers, his notion of semiotic inquiry is worthy of some consideration even in this day and age. Suitably applied, it could lead us toward a conception of semiotics capable of sustaining productive interaction between practical semiotic rhetoric and philosophical semiotic grammar, with theoretical rhetoric occupying a mediating position.

On the other hand, it is clear that much work remains to be done. Peircean semiotic is sometimes presented as a truly general perspective, capable of encompassing the entire field of semiotic studies. Lacking an adequately developed rhetoric capable of connecting theory with practice, this will remain a rather empty boast. At any rate, I feel that the pursuit of rhetoric is the path that Peircean semiotic must follow in order to begin to fulfil its potential, and to emerge as a genuinely viable framework for the study of the varieties of semiosis.

## References

APEL K.-O., 1998 – *From a Transcendental-Semiotic Point of View*, Manchester, Manchester University Press.

[12] CARNAP R. (1946).

BERGMAN M., 2000 – "Reflections on the Role of the Communicative Sign in Semeiotic", *Transactions of the Charles S. Peirce Society*, XXXVI(2), 225-254.

BERGMAN M., 2004 – *Fields of Signification: Explorations in Charles S. Peirce's Theory of Signs*, Vantaa, Philosophical Studies from the University of Helsinki 6.

CARNAP R., 1946 – *Introduction to Semantics*, Cambridge, MA, Harvard University Press.

LISZKA, J. J., 1996 – *A General Introduction to the Semeiotic of Charles Sanders Peirce*, Bloomington, Indiana University Press.

LISZKA J. J., 2000 – "Peirce's New Rhetoric", *Transactions of the Charles S. Peirce Society*, XXXVI (4), 439-476.

MORRIS C. W., 1938 – *Foundations of Semiotic*, Chicago, The University of Chicago Press.

PEIRCE C. S., 1931-58 – *Collected papers of Charles S. Peirce*. 8 vols. Ed. by C. Hartshorne & P. Weiss (vols. 1-6), & A. Burks (vols. 7-8). Cambridge, MA, Harvard University Press.

PEIRCE C. S., 1976 – *The New Elements of Mathematics*. 4 vols. Ed. by C. Eisele. The Hague, Mouton Publishers.

PEIRCE C. S., 1977 – *Semiotic and Significs: The Correspondence between Charles S. Peirce and Victoria Lady Welby*. Ed. by C. S. Hardwick. Bloomington, Indiana University Press.

PEIRCE C. S., 1982- – *Writings of Charles S. Peirce: A Chronological Edition*. 6 vols. to date. Ed. by The Peirce Edition Project. Bloomington: Indiana University Press.

PEIRCE C. S., 1992-8). *The Essential Peirce: Selected Philosophical Writings*. 2 vols. Ed. by N. Houser & C. Kloesel (vol. 1), & The Peirce Edition Project (vol. 2). Bloomington, Indiana University Press.

RANSDELL J., 1997 – "Is Peirce a Phenomenologist?", Retrieved October 30, 2001, from ARISBE, http://members.door.net/arisbe/menu/library/aboutcsp/ransdell/phenom.htm. (Article originally published in 1989 in *Études Phénoménologiques* 9-10, pp. 51-75, trans. into French by A. De Tienne)

SANTAELLA BRAGA L., 1999 – "Methodeutics, the Liveliest Branch of Semiotics", *Semiotica*, 124 (3/4), 377-395.

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# Principles of Corporeal Pragmatics

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**Abstract**

In response to recent findings in cognitive linguistics, the paper sums up the principles of 'corporeal pragmatics' as they have been developed so far. At the centre of the author's perceptually oriented investigation of natural language stands the relation between natural language and perception. The paper charges the philosophy of language and linguistics with having for too long committed the sin of *Wahrnehmungsvergessenheit*, the forgetting of taking for 'true' what our senses tell us. The author proposes to redress this imbalance by an argument that linguistic meaning events rely essentially on the activation of empty linguistic schemata by conceptually regulated, iconic sign materials. Such a claim requires a redefinition of the Saussurean signified, the concept, reference and deixis and other terms in the vocabulary of the study of language. The paper concludes by suggesting that corporeal pragmatics has serious implications for disciplines well beyond philosophy, semiotics, and linguistics.

**Keywords:** Corporeal pragmatics, iconicity, cognitive linguistics, *Wahrnehmungsvergessenheit*, the corporeal turn, *Vorstellung*, constraints, nonverbal semiosis, heterosemiotic, implicit deixis

## Introduction

Natural language, this paper argues, is fundamentally related to perception in the broadest sense of the term, both in its linguistic evolutionary history and in its contemporary configurations. If this is so, then we are facing the ironic situation that neither our dominant philosophical nor linguistic paradigms are in a position to account for this relation. True, *phenomenology* promised some avenues conducive to insights into the relation between language and perception. Sadly, though, they have never been seriously pursued. Husserl's theorisation of *appresentation*, mental presentations of things absent, (Husserl 1973), Roman Ingarden's elaboration of this notion in the specifics of literary *concretisations*, (Ingarden 1930;1959), Alfred Schutz's analysis of language as the dominant form of *typification* (Schutz 1967;1959a;1959b) or Adolf Reinach's *speech act phenomenology* of 1913 all provided fruitful pointers in the direction of the role which perceptual ingredients play in natural languages, but they failed to inspire more recent philosophers, let alone linguists. Nor have Heidegger's protolinguistic gestures in the context of his remarks of language and interpretation produced a major rethinking relevant to the relation between language and perception (Heidegger 1962). Perhaps the most promising path to perception in language was announced in the work of Merleau-Ponty under the heading of the *primacy of perception*. But once again, the enterprise collapsed under the weight of Merleau-Ponty's own self-doubt, or a renewed interest in Husserl's eidetic convictions, or perhaps because of his religious leanings, when he reverted to the concession that language was after all a 'logic in contingency' (Merleau-Ponty 1964:87f.) and that 'there is an *essence* beneath us, a common nervure of the signifying and the signified' (1968:118; my emphasis).

Logos rules once more, 'the pre-existent Logos is the world itself' (1962:xx). Thus he terminated the primacy of perception.

A more recent contribution towards a perceptually oriented theorisation of natural language announced itself for a while in some of the French feminist writings, especially those of Luce Irigaray, Helen Cixous, and Julia Kristeva, of which Kristeva's are by far the most significant. In *This Sex Which Is not One* Irigaray places the tactile at the forefront of her argument about the female experience of language and world, telling us to forget truth and instead acknowledge the prediscursive reality of the body' (Irigaray 1985:89). In 'The Laugh of the Medusa' Helen Cixous likewise argues that woman signifies 'with her body'; women should 'write with their bodies' and so create an 'impregnable language that will wreck partitions, classes, end rhetorics, regulations and codes' (Cixous 1997:351;355). Strong and exciting claims. However, the question arises whether either Irigaray or Cixous have in fact been able to develop a theoretical base strong enough to transcend their Saussurean heritage, which it seems to me remains a powerful obstacle to their own argument (Ruthrof 2000:109-115). If there is a major impulse coming out of French feminist writing for such a review it will probably emerge as a result of Julia Kristeva's psychoanalytic inspiration rather than from a direct engagement with linguistics, including her own work on Saussure (Kristeva 1989). In a very different book, *In the Beginning Was Love: Psychoanalysis and Faith* (Kristeva 1987) the author for the first time readily and fully embraces the body as an aspect of meaning in order to 'develop a powerful model of the human in which language is not divorced from the body; "word" and "flesh" can meet at any moment, for better or for worse' (Kristeva 1987:6). A full, theoretical picture able to fulfil this exciting promise is still to be published.

The third major impulse for a 'corporeal turn' in the theorisation of natural language has come from cognitive linguistics and its neurological research backup. As a result, language philosophy and linguistics, amongst other branches of theorisation, have recently been jolted out of their dogmatic slumber by a number of significant findings in neurologically based research (Gallese and Lakoff 2005; Verhagen 2005; Fauconnier and Turner 2002). Especially the Lakoff School has played a major, though by no means uncontroversial, role in this respect. Barring some of its more overbearing claims and especially its unsustainable anti-philosophical hype, *Philosophy in the Flesh: The Embodied Mind and Its Challenge to Western Thought* (Johnson and Lakoff 1999) is to be acknowledged as a pioneering case of this kind of research, which attempts to locate the roots of natural language meanings, concepts, and metaphor in the sensory-motor neural functions of the human brain. However successful this challenge will turn out to be, will have to be seen. On thing appears to be certain: we can no longer assume that the relation between natural language and perception is irrelevant to the philosophy of language or linguistics. Unfortunately, many a theorisation of natural language has refused to engage with this relation and so achieved results the positivist precision of which bears little resemblance to what is actually going on in living speech. Their frames of inquiry were conceived too narrowly. Writings which do attempt to account for some of the complexities of natural language, such as theories of speech acts, presuppositions, reference, deixis, and pragmatics very much look like belated attempts at widening the Spanish boots of a too tightly conceived set of starting principles. What is missing in this research is the question of the relation of language and perception, a relation which may very well be at the heart of natural

language. Once again, positivist research reveals a paradox: precision in description and a certain elegance of argument are marred by too narrow a focus and hence a discrepancy between its results and what actually goes on in the object of inquiry.

*Corporeal pragmatics* takes its broad methodological research inspiration from a very different tradition: the later parts of Kant's *Critique of Judgment*. Here we learn that in judging complex phenomena it is appropriate to apply the double strategy of 'reflective' and 'teleological' reasoning, the former which, in contemplating the function of details, is looking for a general law under which they can be understood, the latter stipulating an interpretive umbrella beneath which the detail appears in a larger and meaningful interpretive order (Ruthrof 2004). If this is a good strategy and if the details of natural language only make sense under a broader umbrella that includes perception, then our standard language philosophies and linguistics have for a considerable time been flawed by a collective form of research amnesia, a kind of *Wahrnehmungsvergessenheit*, or the forgetting of taking for true what we experience with our senses.

## Two major impediments to a rich description of language

Two founders of discourse largely responsible for the elimination of perception and its relation to language are Gottlob Frege and Ferdinand de Saussure. From very different points of departure, the one from mathematical logic, the other from a critique of historical linguistics, Frege and Saussure have left in their wake two separate traditions equally hostile to the investigation of the presence of perceptual ingredients in natural language. In Frege's case, the barring of subjective images from sense marked the beginning of a history of semantics that took its cues increasingly from the domain of formal signification. Having started analytical semantics by analogical reasoning from geometry and arithmetic to a natural language (German in his case), Frege made a radical move: he conflated two kinds of sense, the formal sense of geometry and the kind of sense that characterises such natural language terms as *Morgenstern* and *Abendstern* (Frege 1970). Thus he denied the fundamental difference between an *a priori* sign system for which we first define our terms before we play the formal game and *a posteriori* signification in natural language, which is spoken, usually for a very long time, before it is described at all. Formal sense can be governed unambiguously by definition, while the dictionaries of natural languages, I argue, have an entirely different function: they guide us to be able to activate the differential system of signifiers and their combinations by way of relating them to our perceptual grasp of our world. The difference between the two kinds of senses could not be any starker. *Formal sense* can be invented at any time; *natural language sense*, by contrast, has evolved over a million years, give or take a few, and so carries with it the semantic drift that cannot be separated out from perceptual indication. But perhaps Frege's most influential incision in the history of semantics was his ban of *Vorstellung* from the description of language, on the grounds that the image which one person may associate with a linguistic expression cannot be identical with someone else's mental, quasi-perceptual associations. Frege's reasoning here rests on the assumption that identity of meaning is as essential to natural language as it is to formally empty propositions, a presupposition that is as erroneous as it is arbitrary. If, for instance, natural language is able to function efficiently on the principle of significant overlap of imagined portions of the world rather than on the principle of identity, Frege's ban of *Vorstellung* from sense loses much of its apparent cogency.

It may just be the case that the TV images associated with the notion of 'UN peace keepers' is entirely sufficient as an intersubjectively shared, nonverbal ground for a common understanding of the meaning of the expression. Let me add here too that the standard translation of *Vorstellung* as 'idea' is not helpful; it would be more appropriate to translate *Vorstellung* as 'perception modification' or 'perceptual modification'. Unfortunately, the perceptual side of the German term is likewise lost in the more recent analytical literature which, in the wake of Frege, addresses states of consciousness in terms of 'propositional attitudes'. While propositional acts most likely do play a part in our mental states, they cannot replace the much broader notion of *Vorstellung* . Such propositional imperialism looks poised to lead us into yet another theoretical i*cul-de-sac*. Of course, Frege cannot be held guilty for the sins of his successors. After all, his goal was no more than the creation of a *Begriffsschrift*, a modest form of symbolic notation not be taken as the basis for a 'thick' description of natural language (Geertz 1973).

The other major impediment to a rich account of language can be located in the pioneering work of the linguist Ferdinand de Saussure (Saussure 1974). Here too, one has to concede that it is not so much Saussure himself as his inattentive students who recorded his lectures or more likely his successors who must bear most of the blame. And yet, his strong emphasis on differential, syntactic relations paved the way for an increasingly barren description of language as combinatory, as indeed a kind of chess (Saussure 1974:22f.;88f.;110). Even though Saussure had insisted that the signified and signifier played an equally important role, his minimal delineation of the signified as 'image' and 'concept' led to the gradual demise of the signified as 'meaning'. Today, the literature not only in the humanities, but also in some social sciences is full of talk of 'signifiers', as if they themselves were able to be meaningful without signifieds (Laclau 1996). This trend was of course strengthened by Saussure's definition of the linguistic sign as arbitrary, a move that increasingly favoured the signifier to the point where the signified is virtually abandoned, a position which however produces an embarrassing paradox: the arbitrary and empty signifier must now take on the semantic load of the signified, which its very definition does not permit. It is for this reason alone that Saussure's linguistic principle of arbitrariness needs to be revisited. Surprisingly, his generalisation of arbitrariness to cover the linguistic sign as a whole has hardly been challenged, even though, on closer inspection, it rests conspicuously on a fallacious *pars pro toto* form of reasoning. Because the signifier is arbitrary, Saussure says, therefore the linguistic sign as a whole is likewise arbitrary, which includes the signified as a vital part. Yet there is no argument for the signified to be rightly regarded as arbitrary in the same way as the signifier. Saussure (or his students' notes of his lectures), it would seem, has been rash. As we shall see, a somewhat different conception of the linguistic sign in *corporeal pragmatics* will produce a markedly different foundation for linguistics altogether. Suffice it here to say that Saussure's syntactic emphasis and rough definition of the linguistic sign have had a detrimental effect on the question of the relation of language and perception. Indeed, the vanishing signified in much contemporary literature is testimony to the diminishing role we now grant the perceptual ingredients of natural language and their modification in *Vorstellung*. And yet, without *Vorstellung* and its sedimentation in language we could not at all function as human beings.

## Language and perception

Taking an evolutionary perspective, the approach to natural language via formal sense and its differential relations or syntax reveals its historical motivation. Both Frege's calculus starting point and Saussure's syntactic emphasis belong firmly to the historical emergence of formal sign systems and scientific structuralism. Having distilled from natural language such formal features as *a priori* sense and an immanent matrix of differential relations we have now reapplied our findings to describe our non-formal starting point, natural language. It should not be surprising however that language will always yield to the imposition of formal measures, since these very measures were derived from language in the first place. This process of formalisation can be specified as *de-referentialisation* and *de-deictification*, both radical reductions of some of the essential perceptual ingredients of language. Predictably, of course, the formal path turns out to be a *cul-de-sac*: once we have de-materialised the specifics of human speech, the full formalisation bars the return to our starting point, that is, the living speech of natural language.

A very different approach is needed to balance the formal account. To meet the challenge of neurological research, we must now ask the question what role language plays in the larger picture of the survival of humans from pre-linguistic hominids to the present. To do so, I suggest to project a fictional, speculative spectrum stretching from ubiquitous, electromagnetic radiation and its readings by the pre-human organism, nonconscious perception, and perceptual experience to language and its derivatives, such as technical languages, formal sign systems and the digital code. The unifying principles here are information uptake and information processing, features that are shared to different degrees by all stages in this evolutionary process. The opposite principles of differentiation have to do with the varying degree to which, and the semiotic mode in which, information is absorbed, processed and controlled. In such a spectrum we can observe two chiastic, parallel movements, a gradual reduction in information processing and at the same time an increase in control. While information input gradually shrinks along the entire spectrum from non-conscious perception to the Boolean code, our control over the diminishing information increases sharply to the point of electronic mastery of bytes in the digital bitstream. Whereas the early human organism had to evolve under a barrage of excessive radiation, digital machinery is designed for specific quanta of information intake and preconditioned output. For a very long time the biological organism survived, it would seem, by selecting a small band of suitable information from the ubiquitous electromagnetic radiation out of which it constituted its perceptual world (Maud 2003). We now know that it is not our perceptual experience but non-conscious perception that is largely responsible for the way in which we experience our surroundings, the coloured world of objects. After a long phase of perceptual experience, increasingly complex social structures produced, one could speculate, an economisation of perceptual and gestural behaviour. Thus language evolved not at one stroke, as Levy-Strauss has suggested: 'no matter what the moment and the circumstances of its appearance in the animal scale, language could only have been born in a single stroke' (Kristeva 1989:46). Some critics suggest that he didn't quite mean it that way, but in what way did he mean it? Isn't it much more realistic to assume that language, like everything else, gradually evolved as a convenient and necessary economising matrix on top of perceptual communication? Technical languages and their formal cousins appear to be latecomers in this process, with the digital code their most recent descendent.

In this picture, natural language occupies a central position between perception and formal signification. If this is very roughly so, then it is curious that our dominant theorisations of natural language have persisted on throwing light onto language only from the angle of its own derivatives: formal, propositional approaches. A case of Descartes before the horse?

Sandwiched as it is between perception and its technical derivations, language cannot be adequately described if we forget its perceptual ground. *Wahrnehmungsvergessenheit* may indeed prove a major obstacle in the search for a linguistics appropriate to its task. What we need to ask beyond the findings by formal and syntactic approaches is what perceptual ingredients have survived in language to this day and in what form and what role they still play. This has not been a popular tack to take. Even as socio-semiotic a linguist as Michael Halliday shares the structuralist belief that in adult language mastery our performance is essentially syntactic (Halliday 1975:141). But perhaps the opposite is the case, as Eve Sweetser has persuasively argued, namely that every term, including function words, reflects perceptual experience (Sweetser 1990). This does not mean that Saussure's differential syntactic relations are not important, what it does mean is that logically prior to syntax language is fundamentally iconic, in the sense that resemblance relations of an aural, tactile, gustatory, olfactory, and visual kind co-determine linguistic meaning. Nor should we forget the emotional dimension of language as a complex nonverbal sign system in its own right (L#dtke 2006; Trevarthen 2005). In this respect, recent insights in neurological research concerning 'mapping' constitute a seminal moment in the history of language philosophy and linguistics (Fauconnier 1997). No doubt, a *corporeal turn* is finally in the offing.

## Corporeal pragmatics

What then would a linguistics based on perceptual premises look like? At the moment we do not have a fully fledged, cognitive theorisation of language. In its absence, the following offers a thumb nail sketch of *corporeal pragmatics*, an attempt at uniting the consequences of the cognitive emphasis on perception with insights from Peircean semiotics and phenomenological investigations into a coherent schematisation. In *corporeal pragmatics* , language is an empty syntactic matrix, with a meaning potential waiting to be activated. Language by itself does not 'mean'. Every natural language functions because its signifiers are typically paired, as Saussure rightly tells us, with signifieds. Beyond Saussure, this amounts to saying that mental materials, be they iconic or indexical, are ordered by concepts. The signifier-signified connection, however, is not stable nor, as it is in structural linguistics, reliant solely on intergrammatical relations. Rather, the linkage is fundamentally grounded in perceptual signification and so remains tentative, open to historical change, semantic drift, and other meaning transformations. This adds an important dimension to the Saussurean scenario: the differential relations within language are made meaningful by a nonverbal *Other*, the totality of nonverbal signs. In each meaning event, the language user, guided by the speech community, momentarily stabilises the signifier-signified relation by choosing a specific cluster of nonverbal signs with which to cash in a signifier by a signified. *In corporeal pragmatics, then, language is always parasitic on nonverbal semiosis.* The question to ask then is how this dependence relation can be made coherent.

To begin with, much of the standard vocabulary in the description of language needs to be revised. Both reference and deixis will have to be redefined as 'inter-

semiotic' relations (Ruthrof 1997). Nor can there be anything like a *semantics* of natural language in any strict sense because for meaning to occur at all, that is, for language to function as language, it has to be used, which means it must be activated pragmatically. Even the most abstract 'semantics' handbook is always already a pragmatics. Ironically, and in spite of its misleading name, there cannot be any meaning in such a 'semantics'; it requires a reader to activate its terms by nonverbal means. Only when we fully formalise language, that is, replace each term by a place holder *(x, y)* can we avoid pragmatic meaning activation in the sense of meaning used here. Yet would we then still speak of a semantics? As Rudolf Carnap has shown, it would make sense in such a case to speak of a 'formal semantics' only if we were to systematically, that is, *homosemiotically* , pair a fully formal Language 1 with a secondary formal system, Language 2 (Carnap 1975). This suggests that even in a fully fledged formal semantics, a singular language system does not suffice to warrant the term 'semantics'. One could argue that some such pairing also takes place in natural languages, except that here the two semiotic systems to be associated with one another are each of a different kind, they are *heterosemiotic*: one is verbal, the other nonverbal, iconic. In this sense and contrary to formal sign systems, natural language is in principle always already *heterosemiotic*.

As we have insisted, in *corporeal pragmatics* every instance of meaning relies on the practice of iconic realisation. This means that the notion of 'use' always involves mental states and so cannot be equated readily with Wittgenstein's definition. Nonetheless, the Wittgensteinian notion can be accommodated as a second-order public form of use (Wittgenstein 1953). In *corporeal pragmatics*, 'use' refers specifically to the event of activation of empty schemata by nonverbal materials ordered into units of iconic signs. The signifier 'slab' is activated by nonverbal signs including a typical size, the memory of a weighty object, the tactile impression of a relatively smooth surface, as well as other visual, tactile, olfactory, proximic, and kinetic readings. These are regulated by a concept and so together constitute the signified of 'slab'. No truth-conditional acrobatics are required to secure meaning; once acquired, our concepts decide for us roughly when sufficient iconic, mental materials have been brought to bear on the empty signifier to render it meaningful. *Iconicity* is understood here in a broad sense. Peirce's *indexical signs* are included under the principle of semiotic resemblance relations in the present account on the grounds that they display *indirect iconic relations* . The fact that indexical signs require more reconstructive interpretive labour than iconic signs affects the principle of resemblance relation only insofar as they foreground *Vorstellung*, or perceptual modification. What sort of nonverbal iconic materials, then, do we typically engage in the processes of verbal meaning construction? The bulk of our nonverbal signs are made up of olfactory, gustatory, thermal, gravitational, kinetic, aural, emotional, somatic, haptic (internal), tactile (external), and visual readings. In this scenario concepts are defined as social rules regulating linguistic directionality, the kinds of materials to be activated, the required quanta of iconic signs and their combinations, as well as the degree of schematisation to which we abstract iconic contents.

As a rule, in the process of meaning endowment, *we do not proceed etymologically* , but rather in terms of the current way a culture uses its language. We do not activate 'he is hot under the collar' by recourse to thermal signs, but rather by visual, kinetic, and emotional signs indicating anger. Both the degree of schematisation and the quantity of mental materials effected by the concept in the event of linguistic meaning is to be regarded as a function of *sufficient semiosis*, the

communicative boundaries implicit in the specific circumstances of each meaning event. Another characteristic of corporeal pragmatics is the *heterosemiotic* nature of the activated linguistic signifier. Since the nonverbal materials by which we transform our signifiers are heterosemiotic (olfactory, tactile, auditory, emotive, somatic, etc.) the linguistic sign must have features that act as a regulator assimilating its heterogeneous components. This task cannot be accomplished at the level at which iconic contents are assembled, but rather at a more abstract level, at which different nonverbal sign contents are homogenised. In *corporeal pragmatics* this function is performed by the concept, not however in its current usage (Margolis and Laurence 1999; Fodor 1998), but as defined below.

Central to *corporeal pragmatics* is the distinction between COSS (communicative sign systems) and ROSS (read-only sign systems) (Ruthrof 1997). Our perceptual grasp of the world tends to be both a combination of heterogeneous sign readings and a letting others know about our readings. In either case, we are activating various semiotic systems, invariably involving many steps of sign translation. In each case, however, we typically transform an *aliquid* into an *aliquo*, the minimal definition of *signum*. Accordingly, we can distinguish between read-only-signs and communicative signs. The social acts of looking, smelling, tasting, touching and so on are always already potentially both readings and communicative events, which also raises the old question whether we are able to perform nonverbal semiosis without language. That we should be able to do so certainly flies in the face of structuralist accounts, as for instance Saussure's claim that "nothing is distinct before the appearance of language" (Saussure 1974:111). This, of course, is no more than a powerful prejudice. Our distant pre-linguistic ancestors would surely not have survived if their hunting skills had not involved a high degree of precision. Could a pre-linguistic hominid have procreated if it had lived in a 'foggy world'? At this point a certain degree of theoretical fudging comes into play: they may not have spoken a language but their gestures were already linguistic in the sense of a differentially related system of communication. Yet this is no more than a thinly disguised form of linguistic imperialism. Moreover, to call all human semiotic behaviour a 'language' defeats the very point of trying to distinguish natural language from other sign systems, as it does any attempt at trying to argue a significant relationship between verbal and nonverbal semiosis. Here the Peircean semiotic route is by far the better bet. In any case, the structuralist position shows its theoretical weakness also in its failure to account for the experience of not being able to find the appropriate words to describe subtle smell or taste distinctions, the nuances of sexuality, daydreaming, in extreme emotional domains and other areas of human life not well covered by linguistic signs. Cognitive science has shown us that there is indeed a deep chasm between the myriad distinctions even decadent humans are still able to draw in the olfactory, gustatory, and tactile domains and the paucity of the vocabulary relevant to those distinctions in English, as in other languages. In a persuasive study of nonverbal signification, *A Natural History of the Senses*(Ackerman 1991), the author offers the reader a rich palette of examples of nonverbal readings of the world, providing *corporeal pragmatics* with ample evidence for the claim that the interaction of perception and language is indeed crucial for a rich description of human speech. But what about linguistic expressions by themselves?

Linguistic expressions and terms by themselves are perceptually empty signifiers that belong strictly to the domain of the *dictionary*. This is why there are no mean-

ings in dictionaries. It is the reader who carries meaning into the dictionary by activating its empty schemata with the help of appropriate clusters of nonverbal signs. Nor can the 'as-structures' that characterise dictionaries be called definitions proper, for two reasons. For one, dictionary entries vary in length and detail, a fact that does not square with any strict notion of 'definition'. Second, dictionary entries are typically substitute signifiers, which are collected after the social event of speech. In other words, they are *a posteriori* descriptions. In formal systems this relation is reversed, where signifier relations function as *a priori* foundations. Third, the definitions of a formal system neither require nor permit additional mental materials for their activation. The definitions are their necessary and sufficient conditions. Furthermore, formal sign systems have neither reference nor deixis (unless we provide a system of reference as a definitional extra), let alone referential background, and certainly no *implicit deixis* . By contrast, in natural language, nonverbal ingredients are essential in all these respects. Language points, that is, it is directional and ostensive, a feature it has most likely inherited from its forerunners in *gestural protosemiosis*. If language is an economizing grid gradually superimposed on earlier forms of gestural communication, it is likely that the principle of i*nonverbal ostension* has survived in language as *directionality*. In *corporeal pragmatics*, linguistic signs, that is, combinations of verbal signifiers and conceptually regulated nonverbal sign clusters are argued to act as *directional schemata*. The speakers of a natural language are trained to associate signifiers and signifieds in such a way that they point in a certain direction in the world as it is realised by a speech community. All linguistic expressions are learned as vehicles of *cultural intentionality*, the directional agreements shared by the speech community. This includes pragmatic scope, the right kind, size and quantity of the portion of the world selected, the degree of schematisation, as well as sufficiency of indication. If there is lack of clarity, further directional schemata are typically called upon. One could say that in formal sign systems directionality acts like an unambiguous vector, in technical language as a narrow beam, in ordinary social exchange directionality allows for a certain interpretive leeway and negotiation, while in the breakdown of communication directionality becomes ubiquitous or shrinks to zero and so fails.

Linguistics speaks of *deixis* as a feature marking spatial, temporal, personal and other features of the speech situation, a limited convention in the sense that it addresses only *explicit deixis* , the tip of the iceberg of *general deixis*, which includes *implicit deixis* and also *deictic background*. The notion of 'ego-centric particulars' in philosophy is subject to the same kind of critique. In *corporeal pragmatics* every single term of a natural language is typically double-directional, pointing at the same time to its referential aspect and back to its deictic source. Even as simple a preposition as 'on' illustrates this point, indicating as it does simultaneously its referential 'surface contact' and its speaker and utterance position. In other words, language is not just fundamentally referential (as well as self-referential), but also essentially *deictic* (Bühler 1965). The radical generalisation of the deictic nature of language has serious implications, especially for the description of culture and communication.

## Mentalism, subjectivism and social constraints

Following the advice of Chomsky in his recent return to matters linguistic, meaning in *corporeal pragmatics* is being described here in a noncontroversial mental sense (Chomsky 2000). The fact of mental states is a *sine qua non*, one that cannot be

separated out from the processes that turn signifiers into signifieds. Mental states are indispensable for the event of linguistic meaning. This would not even be denied by supporters of arguments in favour of reducing mental states to the meagre status of 'propositional attitudes', though such a position does little to enlighten us on the question of the relation between language and perception. Nevertheless, the charges of mentalism and subjectivism, to which *corporeal pragmatics* is even more vulnerable than cognitive linguistics, must be disarmed. Enter the speech community as a set of social constraints on individual linguistic performance. From the first stuttering ventures into the complex field of our mother tongue, every association between signifiers and the conceptually organised nonverbal materials that make up our signifieds is guided not only once but always. Error is thus possible, but is gradually reduced (Trevarthen 1989;2001). On the other hand, this does not mean that the activation of signifiers by iconic signs need be identical in similar speech situations; rather, it only has to be sufficiently similar to guarantee the social functioning of linguistic communication. Thus no two persons of a culture are likely ever to perform identical meaning operations; sufficient overlap is what has to be stipulated. Differences in gender, class, age groups and professions, as well as 'semantic drift', neologisms, intellectual capacity and other factors all qualify as social constraints, as much as they are subject to them.

## Other constraints

Nonetheless, communication rests on members of a speech community making recognisably similar kinds of connections between signifiers and signifieds. They do so on the reciprocal assumption that normally no crassly deviant associations are being formed, an assumption that is supported on the whole by linguistic practice. The relative freedom of experimental poetry only underlines rather than questions this observation. The 'reality check' which every speech community employs to guarantee a reasonable alignment between speech and perceptual reality can be called *sufficient semiosis* (Ruthrof 1997: 48f.; 2000:140-150). Sufficient semiosis replaces truth-conditions by providing a negotiatory monitoring practice. Speech partners decide whether enough interpretation has occurred, whether there is sufficient promise of mutual understanding to continue a linguistic exchange, or whether it is advisable to terminate the exchange as fruitless. In this practice the question of whether something is the case or not does indeed occur, but has no effect on the problematic of meaning. Simply put: meaning precedes truth. Having said this, there is yet another level of constraint which affects all cultures: the *deep constraints* of the universe that every culture interested in survival has articulated. No pragmatics can ultimately avoid this metaphysical side of language. The preferred *metaphysic* of *corporeal pragmatics* could be described as an *autopoietic, inferential realism*. This suggests that human beings are organisms that bump into the world in such a way that their nonverbal and, over the last million years or so, also their linguistic responses, optimise survival. The way the human organism respects the deep constraints of the universe is by inferential response. Humans have learnt how to read those constraints as reflected in, or 'shining through', their own signifying practices, verbal as well as nonverbal. This explanatory scheme can be called *autopoietic* in the sense that humans, like other organisms, are regarded as 'self-creating' in interaction with their immediate environment, their *Umwelt* (Uexküll 1982; Maturana 1980; Varela 1980;1993). It was Kant who initiated the autopoietic thesis in paragraph 64 of the *Critique of Judgment,* where he speaks

of '*ein organisiertes und sich selbst organisierendes Wesen*'. The metaphysics of corporeal pragmatics can also be viewed as an inferential realism in the sense that it does not deny the existence of a mind independent universe, with the proviso that whatever we know about it is by way of inferential procedure, another Kantian motif. Inference, however, also plays a powerfully creative role in language in the form of *Vorstellung* or perceptual modification.

## The role of *Vorstellung* in language

*Vorstellung* has for some time had a very bad press in linguistics and language philosophy outside *phenomenology*. Especially under the onslaught of theories of mental states as 'propositional attitudes' *Vorstellung* has widely given way to calculus thinking. And yet, *Vorstellung* as a spectrum of mental performance stretching from the most realist reconstructions of daily experience to the wildest fantasies demonstrably plays a vital role in linguistic practice. Again, it is cognitive research and such non-propositional notions as 'cognitive maps' (Finke 1989), 'mapping' (Fauconnier 1997) and 'conceptual blending' (Fauconnier and Turner 2002; Hutchins 2005) that have reopened the path to the question of what precisely this role could be. In the speculative programme of *corporeal pragmatics*, *Vorstellung* is foundational. An embarrassment to post-Saussurean linguists and post-Fregean philosophers alike, the prominence of *Vorstellung* in natural language is difficult to deny. This is certainly so to the degree to which language draws on, reflects, and expresses typical mental activities. Perceptual modification functions as the *Vorstellung* of the actual (what we actually taste, smell, touch); in realist representation as the *Vorstellung* of the absent; in memory as the *Vorstellung* of the past (e.g. a painful emotion); in prediction as the *Vorstellung* of the future; in suggestion as the *Vorstellung* of the tentative; in certitude as the *Vorstellung* of what seems compelling; in hope as the *Vorstellung* of what we wish will be the case; in fantasy as the *Vorstellung* of the possible and impossible; in dream as the *Vorstellung* of the unconscious; in nightmares the *Vorstellung* of what is emotionally disturbing and unbearable; in hallucination as the *Vorstellung* of the counter-factual; in utopia as the *Vorstellung* of a desirable world; or in dystopia as the *Vorstellung* of a catastrophic world (Ruthrof 2005). To the extent to which these activities are communicated verbally, *Vorstellung* is an indispensable, quasi-perceptual ingredient of natural language. It is the engine which puts at our disposal a vast repertoire of nonverbal signs for linguistic activation. To drive home the point of the centrality of *Vorstellung* as perceptual modification in language and its description in *corporeal pragmatics* one could characterise *language as being no more or less than a set of instructions for how to imagine and act in the world*.

## Repair work on the linguistic sign

Given what has been said, the first term to be redefined is the Saussurean linguistic sign itself. In structural linguistics, the linguistic sign is made up of an unmotivated (arbitrary) verbal signifier and an equally unmotivated (i.e., arbitrary) signified. In *corporeal pragmatics*, the signifier remains the same as in Saussure, except that its arbitrariness is now understood as the result of a long history of 'iconic disembodiment' (Ruthrof 2000:85-97). The signified on the other hand requires serious repair work. It now consists of two elements, a concept and quasi-perceptual, iconic materials, the former acting as a social rule prescribing the kind of nonverbal materials to be drawn on for each signifier. Meaning occurs when empty verbal

signifiers are activated by iconic signs, producing a signified under the multiple constraints of a concept. In habitual meaning performance, the process of activation happens at synaptic speed; in consciously interpretive meaning events we tend to survey a number of possible signifieds before completing the meaning event or fail to proceed to meaning altogether. This is why the traditional description of conceptuality in propositional terms is unsatisfactory; it fails to account for the time required for interpretive labour. Ironically, this tradition can still be discovered in the otherwise radical revision of the concept in Deleuze and Guattari who believe that the concept occurs at 'infinite speed' (Deleuze and Guattari 1994). In all complex interpretive situations and especially in pedagogy dealing with children and mentally challenged language users this process deserves the most meticulous attention. Having said this, we are now in a position to redefine the signified and its components.

## Redefining the concept

In *corporeal pragmatics*, the signified now consists of a concept and nonverbal materials, available in the form of iconic signs. In this definition, the signified is no longer a unitary notion but divides into two distinct components, a regulatory concept and the nonverbal materials that allow us to imagine a quasi-perceptual version of a portion of the world. The concept is to be defined as a (1) social, directional rule which determines (2) the kind and (3) quantity of nonverbal, quasi-perceptual materials to be activated in the constitution of the linguistic sign, as well as (4) the degree of schematisation to which those materials are to be transformed to constitute linguistic meaning. In greater detail, the concept functions (1) as a regulator of the *direction* to which our mental gaze is directed by verbal expressions ('this state of affairs, not that'). This is so because we have learned what to focus on in response to the linguistic expressions of our mother tongue. (2) The concept also regulates the *kind* of iconic materials we have at our disposal for the activation of empty verbal schema. Typically, iconic signs so regulated are olfactory, gustatory, aural, kinetic, proximic, thermal, gravitational, haptic (internal), tactile (external), emotional, somatic, visual and other nonverbal readings of the world. Such signs can range from preconscious uptakes of electromagnetic radiation processed by the brain without perceptual experience to fully-fledged and consciously experienced clusters of resemblance relations, a point that will prove important once more towards the end of the paper. (3) The concept functions as a regulator of the *quantity* required for the identification of a verbally indicated item. Having observed that the quantity of iconic signs regulated by concepts is a function of *sufficient semiosis*, we need to add the qualification that the monitoring effects of sufficient semiosis are subtly adjusted to different circumstances and speech situations. In habitual speech, sufficient semiosis is automated and minimal, hence the impression of 'infinite speed'; in interpretive use, it is as complex as communication requires, and amongst linguistically challenged individuals the process can be laboured, requiring special attention. Such complications may appear to violate the kind of rules we tend to associate with William of Okham. After all, we are only dealing with linguistic meaning. Why are there so many components? Where is the razor? Unfortunately, nothing could be less appropriate to the facts. The sobering insight here is that it is not only the social monitoring processes that are multi-faceted, the sign relations in the process of meaning construction themselves are anything but simple. The iconic signs regulated by concepts as to kind and quantity are not neces-

sarily suitable for integration into a uniform signified. Iconic signs systems are distinguishable by the kind of biological, perceptual heritage they carry, depending on which of our senses they translate into semiotic units. In other words, the character of different iconic signs reflects the differences between our neurologically distinguishable perceptual realisations. Olfactory signs, for example, are fundamentally *heterogeneous* if compared with visual signification. Likewise, auditory readings are heterogeneous if compared with gustatory signs, such as specific taste recognitions. This relation is conspicuous in meaning events where the signifiers require activation by iconic signs that belong to perceptual domains normally regarded as incommensurable, as is the case typically in metaphor. Here the meaning event is retarded as a result of the non-linguistic, quasi-perceptual interpretive labour required before the heterosemiotic ingredients can be assembled under a compatible series of signifieds (Ruthrof 1997). Accordingly, we can specify the regulatory task of the concept further: concepts regulate *heterosemiotic* iconic materials into *intersemiotic schematisations*. (4) The concept, then, functions also as a regulator of the degree of schematisation to which each meaning event subjects the kind and quantity of iconic signs selected with the help of the concept. The process of schematisation, I suggest, follows the kind of principles discussed by Husserl under the terms of specification and generalisation, on the one hand, and materialisation and formalisation, on the other, two pairs that form the two intersecting axes of all possible abstraction. (Husserl 1969) The degree of abstraction (generalisation or even formalisation) performed by the language user depends primarily on the specifics of the speech situation, language register, discursive domains, genre, and a range of other factors. In philosophical discourse the conceptual schematisation of iconic materials will be typically high, at times to the point of formalisation, while in a story telling situation a good deal of iconicity will be retained to allow *Vorstellung* (perceptual modification) to produce a richly portrayed slice of world by means of verbal expressions. Yet no matter how schematic or richly iconic our signifieds may be in any given speech event, the fact of iconicity itself is crucial. *Corporeal pragmatics* here follows the profound Peircean insight that human scale comprehension relies always on the translation of whatever signification we are entertaining into iconic signs, that is, resemblance relations (Peirce 1.158).

## Kinds of concepts

The degree of schematisation of iconic contents is at the heart of the question of how we can reconcile perception and natural language. In the scenario sketched here, the relation between the two varies according to the kind and degree of schematisation of quasi-perceptual materials effected in the linguistic sign as a result of the regulatory work performed by the concept. This at the same time allows us to describe the character of different kind of concepts. Depending on the degree of generality and formalisation, concepts can be distinguished, somewhat arbitrarily, as *hard-edged*, *soft-edged*, or *soft-core*. Hard-edged concepts are formal logical concepts in which deixis and reference are reduced to zero. They also include numerical concepts which display traces of social iconicity (counting). Soft-edged concepts comprise all theoretical concepts governed by definitional descriptions; they have deixis (theoretical perspective) and reference (the kind of world to which they apply), that is, they display curtailed iconicity. Typical concepts in this category are ‘differance’; the ‘ontic-ontological difference’; ‘transcendental reasoning’; ‘teleological reason’; the ‘differend’; the ‘body without organs’; ‘the eternal

recurrence of the same'; and other philosophical notions governed by definitional descriptions without however being strictly formally determined. By contrast, the bulk of natural languages is made up of soft-core concepts which organise iconic materials according to something like Russell's principle of 'vagueness' (Russell 1923). 'Milk', 'running', 'anxiety', 'hollow', 'go-slow strike', 'please help me', as well as prepositions ('on', 'in', 'at') and the function words of natural language (e.g. 'but', 'and', 'if') all require the activation by iconic materials regulated by concepts in order to produce linguistic meaning. Their concepts are regarded as 'soft-core' because they cannot be shown to have either a formal definitional centre, or a Husserlian 'eidetic' essence, or a set-theoretical boundary guaranteeing definitional certitude. What they do display is a roughly shared, or intersubjectively agreed upon 'core' meaning with a sort of meaning 'halo' of diminishing horizonality.

## Reviewing reference and deixis as intersemiotic relations

While we can always add referential and deictic features arbitrarily to any formal sign system, in natural language both *reference* and *deixis* are necessary conditions. Moreover, natural language reference and deixis are very different creatures if compared with their logical cousins. To complicate matters, and as the example of Frege's conflation of two kinds of sense showed, natural language in addition also always already has what we can call *referential* and *deictic background* . This applies as much to realist speech as to jokes and fictional uses of language, the main difference being that in fictions reference and deixis are constructed by analogy in *Vorstellung* (perceptual modification) rather than by perceptual assurance. Importantly, in *corporeal pragmatics* reference and deixis are redefined as *intersemiotic relations*. This avoids the naïve realism of post-Fregean semantics and the idealism of post-Saussurean linguistics. While the Fregean position is guilty of aligning the sign system of language illegitimately with the object system of the actual world, two incommensurate domains lacking a *tertium comparationis*, the Saussurean scheme is deficient in the sense that reference and deixis are no more than internal, syntactic relations, which fails to account for how they gear into the nonverbal world of perception. *Corporeal pragmatics* absolves such *aporias* by its 'zoo-semiotic' and autopoietic evolutionary starting principles. World and language are aligned on the same plane of abstraction by regarding them as semiotic systems, the world as the sum of iconic signs and language as a heterosemiotic combination of schematised iconicity, conceptual rules, and verbal semiosis. Reference then can be viewed as a relation between verbal expressions and specific clusters of iconic signs with resemblance testable relations to the actual world. Much the same can be said of deixis, redefined as an intersemiotic relation between deictic verbal markers and the iconcity with which we can reconstruct speech situations in the actual world.

## Introducing referential and deictic background

Yet marked or *explicit reference and deixis* are only the obvious directional devices with which language points beyond itself to a nonverbal reality. From the perspective of meaning construction, by far the more intriguing features of language are their *implicit* counterparts: *referential and deictic background*. Here we find ourselves in linguistically uncharted waters. And yet, without sensitive attendance to these two characteristics of natural language we can go badly wrong in meaning

making, especially in intercultural exchange, such as translation. Not surprisingly, it is such features that further widen the chasm between natural languages and their formal relations. And once again, without iconicity we would be hard pressed to imagine the cultural specifics that make up the referential and deictic background of verbal utterances. Propositional abbreviations will not do and, in any case, can only be achieved after the fact of cultural specificity, such as the typical smells of a regional cuisine and its discourse. These are to be carefully distinguished from specific reference and deixis, which are embedded in such backgrounds. Unlike technical and formal languages, all natural language expressions exhibit this double background in the sense of the kind of world in which both reference (to objects) and deixis (reference to speakers) are interpreted to belong. As such, referential and deictic background is the broad, implicit general nonverbal, semiotic backdrop that is habitually assumed by speakers and readers of a shared culture. To outsiders this tacit knowledge is a major interpretive hurdle. This is why referential and deictic background affect the event of meaning most strongly when we are dealing with cultural difference and the historically distanced text. Referential and deictic backgrounds, then, are essential ingredients of the signified, though typically distributed over whole texts, and both are accessible to language users in a quasi-perceptual manner. Here too, then, *Vorstellung* as modified perception acts as a bridge between language and world.

## Corporeal pragmatics and the 'Myth of the Given'

The distinction in *corporeal pragmatics* between iconic readings and concepts is crucial here also for another reason. Iconic readings, nonconscious, conscious, realist and otherwise bridge the traditional, sharp divide between brute reality and conceptual experience, a divide which is as prominent in the philosophical literature as it is dissatisfying (Davidson 1984; Sellars 1956). We are unable as humans, the argument goes, to have access to brute reality without concepts. In other words, concepts block our direct access to the 'Given'. In contrast, *corporeal pragmatics* proposes arguments for a continuum from electromagnetic radiation to perceptual experience, natural language and beyond language to artificial sign systems, a spectrum that allows us to have it both ways: yes, our biological bodies do have direct access to the 'Given'; and, yes, our conscious experience accesses brute reality with the help of concepts, whereby concepts govern biologically given iconicity. While iconic uptake stretches all the way from the human organism's earliest uptake of ubiquitous radiation and so provided us with a non-consciously accepted coloured object world, concepts kick in at a certain evolutionary phase to add social, cultural control to this biological scenario. In this respect, cognitive linguistics seems to be letting its own side down. While its proposal of the 'embodied concept' respects the continuum, it fails to account for the difference between the biologically given materials, the concept as neural structure and the concept as social production (Lakoff and Johnson 1999). At the same time, the asymmetrical relation between iconic readings and concepts proposed here also places propositional approaches, as for instance Fodor's conceptual atomism, into a broader perspective (Fodor 1998). Fodor's choice of an atomistic conceptual starting point is dangling unsupported in mid air. What is it, *corporeal pragmatics* asks, that his concept organises? The answer would seem to be 'iconicity', that is the sum of pre-conceptual, biologically provided resemblance relations. Nor are concepts imposed out of the toolbox of a conceptual scheme (Davidson 1984) but gradually and flexibly

schematise iconic readings for specific conscious, experiential and social purposes. The asymmetrical relation between iconic readings and concepts permits us indeed to have it both ways: our concepts regulate our direct, iconic access to the 'Given' (Sellars 1956). As economising matrix gradually laid over perception, language optimises both principles. What I am suggesting here, then, is that the explanation of human perceptual grasp and natural language along the double axis of iconicity as a pre-linguistic, indeed pre-conscious, human faculty and conceptuality as a social, regulatory function of iconic materials, permits us to transcend the traditional divide of brute reality and human understanding, of what is *biologically Given and what is socially constructed*.

## Conclusion: implications for other disciplines

At the centre of *corporeal pragmatics* we have found an elaboration of the Saussurean signified from his minimal indication that 'image' and/or 'concept' are to be seen as components. As it turned out however, the review offered required a much more radical transformation of the Saussurean schema than might have been expected: from an idealistically conceived, self-contained, syntactically driven notion of language into a heterosemiotic, partly biologically and partly socio-culturally constrained picture of natural language. At the centre of *corporeal pragmatics* we placed iconicity and its regulation by concepts as social rules, a move that permitted the long neglected question of the relation of verbal expressions and perception to be raised as a respectable problematic in the study of natural language. By way of conclusion, the so redefined signified with its conceptually governed iconicity can be argued to have fruitful implication for disciplines well beyond language philosophy, linguistics and semiotics.

What for example does it mean to strive for a 'thick' description of culture, in the sense in which Clifford Geertz introduced the term, if not to write and document the cultural Other in such a way that its iconicity, the resemblance relations of their actual world can be captured as richly as possible? (Geertz 1973). No mere verbiage, less even propositional summaries, can do this kind of job. What is needed are both a language and a conception of language conducive to *nonverbal, iconic enrichment*. What Geertz has indicated applies to all cultural study, from anthropology to history, literature and cultural studies, to sociology, education, and media studies. Why do students vote with their feet, leaving their linguistics and literature classes for the viewing rooms of media studies? Perhaps because we have managed to theorise the richness of cultural life out of traditional subjects, while iconicity continues to exert its powerful attraction in film. With its emphasis on the nonverbal, *corporeal pragmatics* may be able to assist in re-invigorating some of the disciplines that have natural language at their core.

## References

Ackerman, Diane, 1991. A Natural History of the Senses. New York: Vintage Books.

Bühler, Karl, 1965. Sprachtheorie: Die Darstellungsfunktion der Sprache [1934] Stuttgart: Gustav Fischer.

Carnap, Rudolf, 1975. Semantics and Formalization of Logic. Cambridge, Mass.: Harvard University Press.

Chomsky, Noam, 2002. New Horizons in the Study of Language and Mind. Cambridge University Press.

Cixous, Helen, 1997. The Laugh of the Medusa. In Feminisms:An Anthology of Literary Theory and Criticism, ed. Robyn R.Warhol and Diane Price Herndl. (Basingstoke: Macmillan), pp. 347-362.

Davidson, Donald, 1984. On the Very Idea of a Conceptual Scheme. In Inquiries into Truth and Interpretation, ed. Ernest LePore (Oxford: Clarendon Press), pp.183-198.

Deleuze, Gilles and Felix Guattari, 1994. What Is Philosophy? trans. Hugh Tomlinson and Graham Burchell. New York: Columbia University Press.

Fauconnier, Gilles, 1997. Mappings in Thought's Language. Cambridge: Cambridge University Press.

Fauconnier, Gilles and Mark Turner, 2002. The Way We Think: Conceptual Blending and the Mind's Hidden Complexities. New York: Basic Books.

Finke, Ronald, 1989. Principles of Mental Imagery. Cambridge, Mass.: MIT Press.

Fodor, Jerry, 1998. Concepts: Where Cognitive Science Went Wrong. Oxford: Clarendon Press.

Frege, Gottlob, 1970. On Sense and Reference. In Translations from the Philosophical Writings of Gottlob Frege, ed. Peter Geach and Max Black (Oxford: Blackwell), pp.56-78.

Gallese, V. and Lakoff, G., 2005. The Brain's Concepts: The Role of the Sensory-motor System in Reason and Language. Cognitive Neuropsychology, 22 (2005) 455-479.

Geertz, Clifford, 1973. The Interpretation of Cultures: Selected Essays. New York: Basic Books.

Halliday, M.A.K., 1975. Learning How to Mean: Explorations in the Development Language. London: Edward Arnold.

Heidegger, Martin, 1962. Being and Time, trans. John Macquarrie and Edward Robinson. New York: Harper.

Husserl, Edmund, 1973. Cartesian Meditations, trans. Dorian Cairns. The Hague: Martinus Nijhoff.

Husserl, Edmund, 1969. Ideas: General Introduction to Pure Phenomenology, trans. W.R. Boyce Gibson. London: Collier-Macmillan.

Hutchins, E., 2005. Material Anchors for Conceptual Blends. Journal of Pragmatics 37 (2005)1555-1577.

Ingarden, Roman, 1930. Das Literarische Kunstwerk. Tübingen: Max Niemeyer.

Ingarden, Roman, 1959. Vom Erkennen des Literarischen Kunstwerks. Tübingen: Max Niemeyer.

Irigaray, Luce, 1985. The Sex Which Is not One, trans. Catherine Porter. Ithaca: Cornell University Press.

Janssen, T. and G. Redeker (eds.), 1999. Cognitive Linguistics: Foundations, Scope and Methodology. Berlin, Mouton de Gruyter.

Kant, Immanuel, 1968. Kritik der Urteilskraft. Hamburg: Felix Meiner.

Kristeva, Julia, 1989. Language the Unknown: An Initiation into Linguistics, trans. Anne M. Menke. London: Harvester.

Kristeva, Julia, 1987. In the Beginning Was Love: Psychoanalysis and Faith. New York: Columbia University Press.

Laclau, Ernest, 1996. Empty Signifiers. In Emancipation(s). (London: Verso), pp. 36-46.

Lakoff, George and Mark Johnson, 1999. Philosophy in the Flesh: The Embodied Mind and Its Challenge to Western Thought. New York: Basic Books.

Lüdtke, Ulrike, 2006. Emotion und Sprache: Neurowissenschaftliche und linguistische Relationen. Die Sprachheilarbeit 51 (2006),160-175.

Margolis, Eric and Stephen Laurence (eds.), 1999. Concepts: Core Readings. Cambridge, Mass.: MIT Press.

Maturana, Humberto and Francisco Varela, 1980. Autopoiesis and Cognition: The Realisation of the Living. Dordrecht: Reidel.

Maund, Barry, 2003. Perception. Chesham: Acumen.

Merleau-Ponty, Maurice, 1968. The Visible and the Invisible, trans. Alfonso Lingis. Evanston: Northwestern University Press.

Merleau-Ponty, Maurice, 1964. Signs, trans. Richard McCleary. Evanston: Northwestern University Press.

Merleau-Ponty, Maurice, 1962. Phenomenology of Perception, trans. Colin Smith. London: Routledge and Kegan Paul.

Peirce, Charles Sanders, 1974. Collected Papers of Charles Sanders Peirce, vols 1-6, ed. by Charles Hartshorne and Paul Weiss. Cambridge, Mass.: Harvard University Press.

Putnam, Hilary, 1999. The Threefold Cord: Mind, Body, and the World. New York: Columbia University Press.

Russell, Bertrand, 1923. Vagueness. Australian Journal of Psychology and Philosophy,1, (1923)84-92.

Ruthrof, Horst, 2008. Language and Perception (forthcoming).

Ruthrof Horst, 2006. Modernity: *Vernunftspaltung*. Philosophy Today (Fall 2006), 324-337.

Ruthrof, Horst, 2005. The Semiotics of Intercultural Exchange: Ostensive Definition and Digital Reason, Semiotica 157 (2005)1/4, 387-410.

Ruthrof, Horst, 2004. The Fourth Critique. New Literary History 35 (2004)233-258.

Ruthrof, Horst, 2000. The Body in Language. London: Cassell.

Ruthrof, Horst, 1997. Semantics and the Body: Meaning from Frege to the Postmodern. Toronto: University of Toronto Press.

Schutz Alfred and Thomas Luckmann, 1973. The Structures of the Life-World, trans. Richard Zaner and H.-Tristram Engelhardt, Jr., Evanston: Northwestern University Press.

Schutz, Alfred, 1967. The Phenomenology of the Social World, trans. George Welsh and Frederick Lehnert. Evanston: Northwestern University Press.

Schutz, Alfred, 1959a. Collected Papers, v.1, ed. Maurice Natanson. The Hague: Martinus Nijhoff.

Schutz, Alfred, 1959b. Type and Eidos in Husserl's Late Philosophy. Philosophy and Phenomenological Research 20 (1959)147-165.

Saussure, Ferdinand de, 1974. Course in General Linguistics, trans. Wade Baskin. London: Fontana.

Sellars, Sellars, Wilfrid, 1956. Empiricism and the Philosophy of Mind. In Minnesota Studies in the Philosophy of Science ed. Herbert Feigl and Michael Scriven (Minneapolis: University of Minnesota Press), pp.253-329.

Sweetser, Eve, 1990. From Etymology to Pragmatics. Cambridge: Cambridge University Press.

Trevarthen, Colwyn, 2005. Action and Emotion in Development of the Human Self, Its Sociability and Cultural Intelligence: Why Infants Have Feelings Like

Ours. In Emotional Development, ed. J. Nadel and D. Muir (Oxford: Oxford University Press), pp.61-91.

Trevarthen, Colwyn, 2001. The Neurobiology of Early Communication: Intersubjective Regulations in Human Brain Development in Handbook on Brain and Behavior in Human Development, ed. Alex F. Kalverboe and Albert Gramsbergen (Dordrecht: Kluwer), pp.841-882.

Trevarthen, Colwyn, 1989. Signs before Speech. In The Semiotic Web, ed. Thomas A. Sebeok and Jean Umiker-Sebeok (Berlin, New York, Amsterdam: Mouton de Gruyter), pp. 689-755.

Uexküll, Jakob von, 1982. The Theory of Meaning. Semiotica 41-2 (1982)25-82.

Varela, Francisco, Evan Thompson and Eleanor Rosch, 1993. The Embodied Mind: Cognitive Science and Human Experience. Cambridge, Mass.: MIT Press.

Verhagen, Arie, 2005. Constructions of Intersubjectivity. Discourse, Syntax, and Cognition. Oxford: Oxford University Press.

Wittgenstein, Ludwig, 1953. Philosophical Investigations, trans. G.E.M. Anscombe. New York: Macmillan.

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# The Semiotic Immersion of Video Games, Gaming Technology and Interactive Strategies

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**Abstract**

The paper analyzes the effect of immersion in digital games using the theoretical apparatus of game theory. The paper illustrates interactive operations and the cause and effect relationship between player and designer, explaining the importance of strategic decision-making and pathing in player immersion. It considers the game function of creating a virtual world and proposes the idea that digital games are not just computer-mediated communication to the player. These games are games of "the moment", like the game Chicken, and played with apparently great emotion, intelligence, and physical dexterity, although represented in software form. The relationship between the player and the computer is one of sign exchange, precisely the one that semiotics calls *semiosis*. The paper concludes that the personal achievement of individual players (end-users) accounts for the phenomenon of deep immersion in digital games. Not virtuality, but virtuosity is the strong force in digital game playing.

More than the word *game* is present in both video games and game theory. At first glance, it is improbable that concepts designed to explain economic transactions (Morgenstern and von Neumann 1944, and Nash 1950 [1997]) or even evolutionary biological enigmas (Maynard Smith 1982) and other modes of conscious interaction between human players could be of any use to elucidate what succeeds when a rational individual faces deep interaction with a mechanical computer[1] or a software application.

Because of the popular interest in video games, considered to be the forefront of the new media, academics, social theorists, and even industry participants have systematically tried to define and understand games as they relate to traditional genres of entertainment and social tendencies. Such attempts fail to address in depth the key factor of games - strategy, and do not take into account the amount of interaction and the degree of immersion typical of video games. Interaction and immersion through semiotic input and output is not only what differentiates games from other media like film, TV, and books,[2] but also what explains the novelty of the games and the effect they exert over players. In this paper, game theory is presented as the alternative to the prevalent theoretical tendency to search (albeit

[1]Mechanical Computer is a reference to the hard drive or component configuration of a computer.

[2]An example of this standpoint is Rollings and Morris' (2004:11) statement: "an interactive game is no different than a work of 'classical art'. For example, if you read the epic poem, *The Iliad*, you construct your own unique narrative, which certainly differs from what Homer had in mind."

from the outside and with a dangling grasp of the interactive structure of gaming) for analogies linking well-established conceptual systems from sociology, media effects theory, philosophy, studies on literary narrative, or psychology, to game playing.

We will argue that the interactive exchange of game design, delivery, and immersion made possible through signs circulating between humans (end-users) and computers brings exponential consequences on the player and the contemporary state of game design. As the gaming experience unfolds, the act of playing (gameplay) defines the user's ability as he/she acts in a virtual world with its own laws, rules, modes of gameplay, and degrees of freedom. Moreover, we maintain that the theoretical apparatus to clarify the gaming experience is found in game theory, because game theory is fully committed to explaining the processes of interactive decision-making.

Our approach to this subject arrives from both an academic and professional perspective.[3] Communication principles and game theory when applied to game design and player response illustrate not only the function of strategic gameplay, but also how interactive decision-making is the vital component of immersion. To examine this process better, first, there must be a mutual understanding between the perspectives.

Concepts and discussions of video games, in the academic and professional world, should come to an agreement of terms before progress can be made in defining the attributes of playing games. Although, a tug-of-war is probable, both having ownership over games, neither should forget that it is the players that define the terms mostly and evolve these terms to have specific meanings. Terms used in this paper will apply the common usage and meaning, as it is related to the subject. An example of this is the term *cue*, which is a category of *sign*, but in regard to game design specifically it is a device used to direct the player's progress, or *virtual worlds* which is commonly known as the construct in which the player's representation in the game exist, usually replicating reality with 3D or 2D art.

Game testing and player feedback solidifies concepts that work in games and is used here to discuss game design and player immersion. Many specific comments come from the professional experience of overseeing a process called, *Quality Assurance (QA)*.[4] This process includes addressing development issues with the Producer responsible for the end product being a success in the market, fixing all software defects, and most important making the army of testers agree that the game is finally fun and worth playing.

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[3] The authors represent both academia and professional game design. Eduardo Neiva Ph.D. is a Professor of Communication Studies, University of Alabama-Birmingham and an authority on visual images. Carlo Romano, CEO of 3Romans LLC is a professional game designer, and a teacher of *Game Design* at Virginia College and American Sentinel in Birmingham, Alabama.

[4] Quality Assurance and game testing is a process that resembles a focus group, organized to determine if the game is immersive, intuitive, bug-free, and most of all – fun. The Project Manager and/or Game Designer manage this process. Carlo Romano, a 10-year veteran game designer, has overseen this process many times with groups of testers and producers to coordinate with. The information gleamed from this experience is illustrated in specific comments in the text. A list of the titles observed, during the testing stage of Alpha, Beta, and Gold Master, is provided: *Country Justice*, (2005); *RebelTrucker*, (2004); *Ultimate Demolition Derby*, (2003); *Muscle Car 3*, (2003); *Muscle Car 2*, (2002); *Roadrage*, (2001); *Boards and Blades 2*, (2000); *Tech Bike BMX*, (2000); *Shwinn's Freestyle BMX*, (2000); *Bass Tournament 3D*, (1999); E *xtreme Boards and Blades*; (1999) – All titles required at least twenty testers at each stage.

It is important to understand what is common in all games before discussing the impact of a specific type of game on a player. Additionally, it is the player and his interest that should be in the forefront of talks about games. This provides a foundation for future discussions about evolving genres and innovative features that are the driving force behind the popularity and level of immersion only attainable in games. Research on the sociological effects of games or theories about the relationship between games and other mediums are beneficial, but only conclusive in respect of the limited gameplay scenario.

Research attempting to enter the world of video games has found it quite difficult to separate the game's design from the designer's own biases, and therefore has problems simulating the interaction needed to explore social tendencies. Holin & Sun (2003) – for example - found the designers of the research application (game) preferred what is commonly considered fun factors to gender and social representation. This fact changed the goals of their research and illustrates why there must, first, be collaboration between academia and professionals concerned with studying video games and game players. This paper unifies these two perspectives, and although giving credit to other research goals, identifies the fundamental elements of game playing, game design, and how both are affected before addressing the effect of the game or the game design on the player.

Taking into account the fact that many players engage in role-playing with a community of immaterial individuals living a virtual life quite the opposite of their daily routine, Sherry Turkle (1996) argues that game playing is an "identity workshop", suggesting that the use of computers is a healing tool to repair uncomfortable, fractured, or damaged selves. After defining the computer as "an evocative object because it provoked self-reflection and stimulated thought", Turkle (1996: 362) levels human players and cyber-machines, claiming to have acquired, as a result, a new perspective on the nature of intelligence, free will, and life in general.

Although it is correct that a new perspective on intelligence and human will is revealed through the use of video games, as the player manages his/her own strategic choices in risk-taking, Turkle's approach tends to merely humanize the computer. The title of Turkle's earlier book – *The Second Self* (1984) – suggests that the computer is subaltern equipment in the hands of the user.

It may well be that cybernetic role-playing in games is an effective therapeutic tool of lasting value. It may also be a counseling tactic that unveils a horizon of experiences for introverts and individuals locked up in rigid presumptions crippling, maiming, or impoverishing their lives. If, for example, gender swapping is readily available for end-users, they will then acquire a new human perspective and an array of experiences usually barred from their regular interactions. Playing games generates personal and social effects. However, objections can be raised to support the criticism that a research such as this does not quite deal with the nature of games. In Turkle, what really matters is role-playing. Game playing and its peculiarities are visibly absent in this approach.

Another analytical tactic dealing with the problem of games could be to consider games from their components. If the player is frequently following semiotic and narrative cues, being involved as well as attempting to unravel a tale, it is tempting to presume that literary theories concerned with the issues of narrative could be the key to the experience of game playing. Here the objection is not any different from the one observed in the case of therapies of role-playing: Is a digital game a secondary literary object or a product with its own peculiar qualities? Bogost

(2006) argues that similar principles are at work in literary analysis and computation, which would in turn be extensive to games.

To avoid the mutation of game questions into what should pertain to literary analysis of narratives one ought to find crossroads where the study of games intersects with the study of narratives. Bogost (2006: 67) observes: "we use narratives to make sense of experiences, and games have embedded stories and backstories that are undeniably narrative". In this remark, the commonalities of games and narratives are obviously articulated, but that does not in itself lead to the fullest understanding of games. Consider the case of the skateboarding game *Extreme Boards and Blades,* in which the player is offered a style of gameplay called *Freestyle.* In the *Freestyle* mode of playing, the player is free to skate in an open area with no restrictions, goals, or obligations. The player experience is measured only in relation to his/her performance and not to any narrative elements or storyline. Moreover, the lack of narrative is more common in games that aim at pushing the boundaries of design, thus offering to players the opportunity of living the extremely personal experience of transforming his/her previous capacity and performance.

The solution to the quandary of giving analytical priority or not to narrative may reside not in the search for common points between narration and gameplay, but in their distinction. In games, the player is at the core of the gaming process, while, when compared to the deep intensity of game immersion, the power of literary narratives comes from a relative sense of alienation, for the reader of literary narratives always acquires knowledge from the distance, from a radically external viewpoint, whether in the obvious case of a story told from the perspective of a third person, or else reading a tale told by a character directly involved in the scene, in other words, by a first person narrator, who is obviously not the reader.

When compared to traditional literary narratives, games are not experienced from afar. The players of games are immersed in a world of cues signaling the path of their navigation. If, on one hand, in some games, tales and navigation are inseparable; on another hand, the readers of traditional literary tales are consistently aware that they are not the narrators (in the third or first person narrative) who supposedly had direct experience of the fictional plot and the incidents of the story. While the reader of literature may be told of a possible world, the player of video games is acting in a world of possibilities unfolding with a force akin to direct experiences. The players are exposed to digital simulations that may, in some game designs, correspond to real events, thus allowing the assessment of risks without paying the price of living out such scenarios in reality. Games that may not require the player to accomplish any narrative challenge, like *Extreme Boards and Blades (B&B),* have a definite objective: They foster self-improvement. The player has a sense of self-accomplishment, when he/she skates, and is free to take risk like skating off buildings and up higher ramps, attempting more intense stunts (tricks) to achieve a higher gameplay status. The substitution of actual experiences is far more enticing and dramatic than any narrative development.

Not only does the excessive and improper use of narrative procedures often indicate poor and unimaginative game design that does not take complete advantage of gameplay possibilities, but also narratives do not define a game, otherwise many extreme sports, flight and military simulations, as well as games with open-ended gameplay could not be considered video games, and indeed they are. One defining attribute for video games stands true in every scenario – video games are devices where a player attempts to achieve something desirable through strategic actions.

However, the player's initial expectations of wining are not relevant when measuring the impact of immersion and interaction in video games because the player always gains: When the player uses a vehicle to achieve something desirable, for example, experience is added to the existing player. The player has changed. In a general way, the player acquires information about him/herself, either negative, in the case of failure, or positive, in the case of success.

Video games take countless forms, a direct reflection of the irrepressible growth of the game industry, reaching all kinds of social actors, according to their interests and demands, regardless of race, age, gender, and social class. Statistical data about the market of games, released by the Entertainment Software Association (ESA) in its "2006 Essential Factors about the Computer and Video Game Industry", reveal that, contrary to the previous stereotype, video games are not just an exclusive medium for socially challenged teens any more. Presently the average age of game players is 33-years old, and the average age of the most frequent game purchaser is 40-years old[5]. According to the NPD Group-Point-of-Sale Information, 228 million game units were sold in 2005. These figures undeniably demonstrate that games are more than just a passing trend in contemporary popular culture. The permanent economic success of video games is evidence of the demand for more and more technologically sophisticated forms of interactive entertainment. To understand the intricacies of interaction is a challenge that cannot be dismissed by the theory of the new media.

Although games are approached and enjoyed from differing perspectives, the popularity and the communication strength of games are, in all forms, related to the fact that they offer the chance for a player to live out intense scenarios in a virtual world, even if these designs are flagrantly fantastic. Games provide an emerging interaction, whose progress is previously captured in algorithmic development, performing implicit or explicit strategies that mutually circulate from player(s) to computer. Even in games such as *Rebel Trucker* and *Grand Theft Auto* 3 that provide open-ended gameplay and storylines, the player and game interaction is coordinated by active and reactive strategies. These games offer the player missions to accomplish without time limits, and therefore freedom to not participate in the common design. However, the game is also designed to incorporate and even promote deviant and rebellious acts, and has programmed a virtual world to interact with the player accordingly. What is usually called "eye candy," like pedestrians on the sidewalk, can become active, and even hostile to the player that chooses to stop the vehicle beside them, get out, and assault them. Also, police cars and beat cops can even respond to the player's anti-social behavior. The game designer may not have forecasted that the average player would act this way; but to produce a game of intense immersion, the designer must program the artificial intelligence (AI) to react and learn from such behavior. Narratives are secondary devices in playing a digital game: "There is plot in any game, but for the most part it is created by the player himself. It is the player, not the game's designer, who is the author

[5] The gender shift in the market of video games is also striking. Women gamers over 18 are more numerous than boy gamers under 17, according to the Entertainment Software Association. The demographics of age and gender groups transformed not only the pool of consumers but have also placed female creators and developers of casual games at the head of game developing companies (see Jan (2006) for a journalistic report of the trend). Casual games are frequently based on existing games such as bowling, tennis, and mahjong. Characteristically, casual games are made with simpler graphics, and have short learning curves.

of the game's events. The game is a tool for allowing the player to create stories." (Rollings & Morris 2003: 13).

Determined through gameplay, the player's experience does not happen in a vacuum. As shown in Fig. 1 (below), the original game design provides a game state in which the player interacts by deciding a mode of play or simply progressing through a training scenario. In each case, the player enters the virtual world through one filter, as in a color/shade wheel, and is faced with options and choices, indicated as new filters or shades of the wheel. Once the player has accessed an option, the previous filter, indeed an acquired experience is added to the new filter that loops back and changes the state of the game. Each filter of the wheel adds to the shade of the next, expressed in the wheel as lightening or darkening each time around, thus forever changing the state of the game in correlation to the player's experience. The game environment or its Virtual World grows as the players make strategic choices. Technologically, this ever-revolving and looping process accounts for greater immersion in the case of player experience, and it also prompts changes in behavior of non-player characters (NPC), and additional artificial intelligence (AI) routines and new instructions that alter the game state.

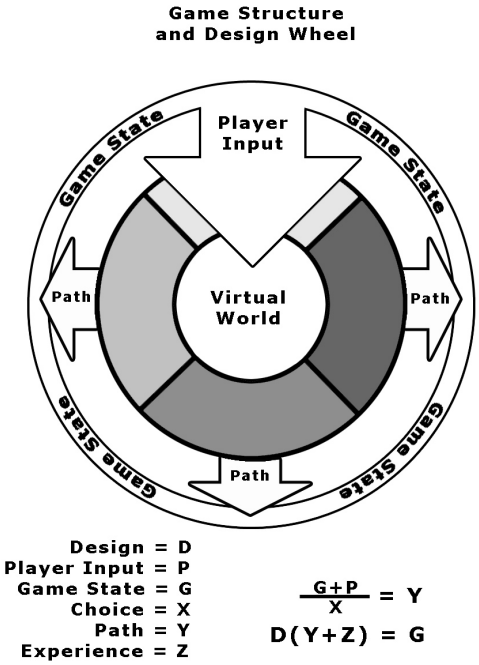


**Fig. 1**

The simple equation in Fig. 1 illustrates how the initial game state (G) and player input (P) is divided by the choice (X), either available or taken. This choice dictates a new path (Y) of gameplay. The original design (D) should take into account the paths resulting from the player's choice and experience (Z), and guide the player with intuitive gameplay while providing the freedom to alter paths. The changed path is a new experience, and the new game state loops back in reaction to the player's input. This should be understood as a semiotic loop of signs, signals, cues and reactions. The reactions are both organic and scripted, both human and mechanic – generating exponential growth of the game state and the player's experience.

If narrative is not the determining factor of gameplay, the question remains: what is the essential attribute of video games? Primarily, a game must have a point, which defines the purpose and the procedures of the gameplay. Before coming to the discussion of the point in video games, a recurrent mistake should be clarified. Points and genres should not be identified with one another. The focus on narrative dismisses the centrality of the player's role in the creation of the game's events. Genres, such as *fantasy*, or what Rollings and Morris (2004: 12) dubbed as J. R. R. Tolkien's rip-offs, are at best the goals of the designer, merely pushing the player into a potential direction. Narrative references to game genres may be appropriate in some cases, but lacks the needed player perception.

With this in mind, it is easy to see that *Action* games include sports games and games whose point requires a great deal of hand eye coordination, but so do *Adventure* games that are usually story driven. *Strategy* games demand simulated interaction, and *Simulations* offer the player interaction that is designed to evolve skills, but so do *Educational* games. Then, there are *Puzzle* games that are considered analytical, but even so-called *Toys*, which are designed for the sake of fun, include puzzles. This is why most players consider *genre* relevant in terms of the style in which the game is played. A sample list and brief description of game genres should include, without being limited to:

- *Real Time Strategy* (RTS): simplified simulation of a conflict.
- *Turn-based Strategy* – Players move in turns (simultaneous / sequence)
- *Simulation* – Skill enhancer: Flight, Military, Poker, etc
- *Role Playing Game* (RPG) – Mostly played from character perspective.
- *Action/Adventure* – Storyline - played in first or third person perspective.
- *Sports* – Simulated or fantastic: football, baseball, golf, racing, tennis, etc
- *Puzzle* – Casual gaming with out character or storyline involvement.
- *Educational* – Directly related to the goal of learning specific content.

So, the genre is not the point of games and it is evident that, although end-users have favorite types of games, players play many styles of games, which may be irrelevant to the point of playing. Hence, the player switch favorite games, genres, and style many times depending on the performance and challenges achieved. The point of video games is not achieved through the theme or style of gameplay, but in fact the point of games is realized only though the action of end-users, and never solely through in-game scenarios.

## Game On

Although theorists of games have been tempted to draw definitions of their object from Huizinga's *Homo Ludens* (1950 [1994]), a classic book on gaming and civilization that projects the qualities of make-believe and lack of seriousness to playing, the relationship between games (all kinds of games) and reality is not so easily established. Games and reality are undeniably distinct, and yet to play a digital game is to experience a fascinating and potential world that can be seen as a transformed surrogate of reality.

Before any attempt to comprehend how a possible world is actualized through the input and the output of digital signals, it is necessary to ponder on games and other types of game playing. Under its many forms, gaming is an experience that cannot be easily dissociated from social practices. Perhaps through make-believe and fun, and although societal interactions are not solely play, game playing is an integral

aspect of social life. More than a couple of decades ago, Sebeok (1981) noticed that naming in animals –the application of tags to individual organisms is possible through playing. All across nature, and in many species, socialization, playing, and naming are not only directly linked, but most specifically occur through signals traveling through the sensorial channels available to the living organisms.

The social trait of gaming is evident in the fact that playing a game is a recurrently interactive practice. For that reason, since von Neumann and Morgenstern's book of 1944, *The Theory of Games and Economic Behavior*, economic game theory postulates generally that games are not just recreational activities, but also any situation in which the interest of players collide. As a theory of conflict of interest, game theory deals with haggling and bargaining, buying and selling real state or stocks, labor negotiations, warfare, and political disputes among other human interactions. In situations such as these, a player develops plans of action with the goal of obtaining gains and advantages, but considering primordially what the opponent may do. For that reason, game theory should not be concerned with the evaluations of optimal strategies in abstract; it indicates what strategy or plan of action should a player pursue always bearing in mind the potential actions of the adversary or the opponent. In a loose manner, recreational games of dispute fall easily into that set of games that economic game theory tries to explain, but more important than that is game theory's concentration on interaction through dynamic rationality. The player adopts an optimizing strategy not according to an abstract collection of logical principles, but in a dynamic relation to another interactor (whether a human being or a digital program). This is what Robert J. Aumann (2000) calls individual rationality.

If that is true, how to explain games that players play alone? What are the players doing in this case? Is a solitary game an anti-social experience, or is there another trait besides interaction that may define the gaming experience? To produce a *transmedial* definition of games, Juul (2003) contends that, despite their multiple features, games (all kinds of games) share similar properties. In games, players must be aware that their behavior is, like all social behavior, demarcated by rules, although not determined by them, for deviance and cheating are persistently feasible. Such rules are integrated in an autonomous, systematic and formal manner, as is the case – for example - "Extreme Boards and Blades," "Muscle Car 3," "Rebel Trucker," and "Grand Theft Auto 3."

Yet, even before rules of interaction of both end-users and in-game scenarios are established, game design must lay down the physics of the virtual world. Game design determines the technological and digital tools that are the foundation and the unity active in any of the game's interactions. The foundations are the laws, the physics at work all over the virtual universe of the game. If these laws are developed consistently and correctly, the player will be immersed in a total world that may or may not follow the physical strictures of nature. The player can then collide, fly, and jump with or without gravity's limits. In all kinds of settings, whether in fantastic or realistic universes, laws are the basis for the game virtual experience. The choice of the set of game laws must be made in complete agreement with the experience presented to the player. If this criterion is not met, the development team of the game will certainly fail: To give life to a game design, the developers must be in the technological forefront of programming innovation, searching for the most advanced systems of simulated physics, artificial intelligence, and graphical rendering systems. Programming errors, popularly known as bugs, disrupt the

player's suspension of disbelief, forcing the players to guide their attention on the design flaws of the virtual system, instead of the unfolding experience of gameplay.

The degree of success or failure of game developers and designers is directly proportional to the players' immersion in a virtual world. The player must be allowed to uncover game elements in a natural state of discovery and experience – as in reality – therefore providing the player a game design that is not dictated, but instead actively interactive. Baggaley (2002: 282) establishes the basic condition for the immersion of players: "To ensure that the player remains immersed in the experience, the game designer must keep as much of the needed exposition as possible within the interactive game world." The players must thus accept the totality of the virtual universe that is offered to them. Without that, the players' immersion is unattainable, and so only after the determination of the laws of the game can the rules of interaction begin to be digitally implemented.

It is correct to state that the rules of video games function as laws, but it would be more precise to identify rules as procedural of gameplay, and yet not worldly to the game environment or virtual world. Procedural rules are therefore elements of game design and can be used to define modes and sets of rules of gameplay. The institution of rules determines the player's satisfaction with gameplay. By nature, rules are arbitrary: A set of rules may be too restrictive or void of restrictions, depending on the game's objectives. As result of their essentially arbitrary nature, rules can even enable a temporary relief from the laws of the digital game. In the same spirit, a set of rules, in fact a mode may require the player to finish the proposed, required, or suggested task before a certain time limit expires. Moreover, sections, levels, or features of the game may not be unlocked until the task is accomplished under the conditions demanded by an array of rules. Rules indicate the availability of competitive factors, under the form of non-player characters, and by that it is meant incidents such as hindrances, obstacles, weapons, vehicles, as well as goals and rewards. Rules are actively constitutive of games, and for that reason, they must be put in place prior to the interaction of players.

Now talking of all kinds of games, digital ones included, gameplay is more than the search for outcomes. Games have outcomes that result from conditions, from rules that are mutual and reciprocal. The mutuality and the reciprocity of rules grant legitimacy to disputes between players. Rules are shared components of playing; they should also be common knowledge to all players in a game. Rule sets may be displayed on the load screen (the screen that is used as wallpaper while game assets are being rendered and processed for gameplay), and therefore adhered to any player that continues from the point of interaction. Because of the constitutive nature of rules, players behave uniformly in the way they do. The reciprocal acceptance of rules explains why players of some online games play, in groups, strictly against computer generated opposition, while other online games are played with players opposing each other. How many games can one play with the same deck of cards? There will be as many card games as there are constitutive rules accepted and known by players. Rules are present all throughout games. Rules confer unity and identity to a game. A rearrangement of rules indicates a new game, or in video games – a new mode of gameplay. Rules are not supposed to be questioned, or disputed, or changed as the gaming progresses: They must be followed even in the paradoxical situation when the rule is freedom from rules.

Despite their constitutive role establishing levels of secure interaction among players (as well as fairness in disputes), one should not assume that rules are capa-

ble of describing and prescribing the outcome of a competition. That would imply the automatic disregard of the creative actions and strategic choices of individual players. Rules are akin to a score in a concert. Rules and scores guide possible actions, but performance is far more than following rules and scores.

If one grants to rules the status of the prescribed essence of a game, the inference would be – like Claude Lévi-Strauss (1962: 48) states in *La Pensée Sauvage* – that playing a game is no different from being involved in a ritual. Games and rituals may have some family resemblance: They are social practices actualized through rules, but, considering that the performance and the actions of players in a game produce winners and losers, norms and prescriptions do not establish the outcome of playing a game. Moreover, conforming to rules – even in the case of rituals – assures that outcome is legitimate. Rules are consistently present in dispute because of their effect over an outcome. Performing a ritual, following conventions and shared rules, can also be a way of distinguishing individuals. Take into account video games with modes designed for training exclusively. Game rules are conceived as an exercise for the benefit of the player alone who wants to evolve past the initial learning curve, and start the game with improved strategic means. This is an example of a situation in which the player faces his/her own inadequacies with the goal of achieving better performance. As always is the case, in any game, whether digital or not, and in rituals, performance harvests prestige and reputation for an individual. Complying with a group of accepted rules not only avoids for the players the tag of being of low worth, but also ensures that the outcome is unquestionable.

That is not different from the case of rules stored as a system of algorithmic clues in a computer game. Even more so than in human social interaction, in video games a series of procedural rules is robustly realized, offering courses of the game play, and fully driving - although not shaping completely - the player's movements. The player cannot freely change or bend the embedded norms of procedure. Whoever plays in a computer must follow the given clues to constitute the experience of game playing. In games of extreme sport, the course of actions can be free, but the assessment of someone playing a digital skate board game – for example – observes the parameters established in the computer program. What the program does is to serve as a means of assessing the performance of the player. Then, two plans of action are pitched against each other. The player must act freely from the strictures of the program, generating a strategy outside of the design, whose tree of potential solutions has been algorithmically laid down. That is why players engage in a digital game setting: They do it to achieve personally desired – and yet variable – outcomes.

The simplified design grid of the digital game *Rebel Trucker* (Table 1) illustrates how a player's initial choice prompts a set of choices. The paths are designed and developed for entertainment, but the player is the one who decides what is entertaining. The player has the binary and excluding option of defining their player status, meaning that "[i]n every game, players are continually being presented with costs and tradeoffs. A cost doesn't have to mean money or victory points; it can be simply the things you had to succeed at before you could get to the options you're facing next. What is the real cost of a game choice – in terms of time, effort, attention and alternative resources to get there?" (Rollings & Morris, p.77) The choice made will determine gameplay attributes, which lead to in-game scenarios that alter the playing experience. Also, these choices lead to paths of gameplay that may

or may not satisfy the player's objective, but regardless of satisfaction, information about cost and benefit, risk and achievement are gained. Now, the player is redefined in a way that the game designer and the game state should match.

**Table 1. Rebel Trucker – *Tough truck driver or Sissy stool pigeon?***

| Modes (choice) | Cargo (arcade) | Long haul (simulation) | Career (storyline) | Player Rebellion (disregard design) |
|---|---|---|---|---|
| Path | Short missions | Certification | Work for mob | Free to explore |
| Path | Time limits | Delivery/pickup load | Work for FBI | Free to interact |
| Path | Points gain/loss | Obey Trucking laws | Refuse both | Free to evolve |

Although the player faces a pre-determined set of unambiguous and definite algorithmic alternatives, to a point that a digital game is beyond the influence of the player, it is fair to declare that, through the player's choices and performances, "the game changes the player that plays it" (Juul 2005: 96).

Players may predominantly wish to win a game, but it is quite feasible to imagine exceptions, as in the case of a father, who wants to encourage a son or a daughter to improve his or her playing skills, making every move to lose the game. Again, the game provides experience and information, and the parent should recognize the child's status and progression – therefore changing the parent's strategy accordingly. More than searching blindly and mechanically for a rigid victory, players must have a definite point and an outcome in mind when involved in a game; and – but not always - frequently point and outcome overlap.

It is thus also quite reasonable to expect that players will devote themselves to produce the intended outcomes. Because the players desire an outcome, Juul (2003) presumes his/her attachment to a previously designated goal. However, if the desired outcome is not a given, but a variable result, embodied in the formal system of the game, the outcome is a challenge. The player then feels that the effort expended during the gaming process is justified, although depending on the situation and context of each particular game challenge, the player may or may not be quite enthusiastic about the necessary effort to be successful in the fame. Variable outcomes presume more than victory and defeat; they indicate a progressive scale of payoffs.

## Games and Players

In several game settings – such as parlor games and sports – the main trait of playing is conflict of interest. That was von Neumann and Morgenstern's hypothesis when they compared economic competition to poker. Economic competition and poker playing would always end in a winner takes all situation. In the same way that the interests of competing economic agents collide, the poker player who has the higher hand of cards will consequently collect his and her chips as well the ones of the players with lesser hands. Each chip taken by the winner is a chip that his/her opponent lost. In mathematical terms, the addition of plus one with a minus one is always zero: (+1) + (-1) = 0. Technically, poker playing is a zero-sum game.

As games of extreme competition, zero-sum games are unashamedly committed to selfishness. In zero-sum games players try to implement – with different success – strategies that will simultaneously maximize their gains, while minimizing their losses. The interactive gamers in zero-sum competitions bluff (which is authorized

deviance) or even cheat. The optimal strategy in zero-sum games is always a minimax plan of action: minimizing losses, while maximizing gains. The outcome of the game is the one in which *A* wins, while *B* loses, or vice-versa: *A* loses while *B* wins.

Nonetheless, when a buyer and a seller close the deal of a car, for instance, that does not mean necessarily that one player lost, while the other won. Both economic agents can win: The buyer gets the car that he/she wants, and the dealer sold the car with a margin of profit. Buyer and seller reached an equilibrium point, from which ideally none of the players have any reason to depart. This is a non-zero sum game. In non-zero sum games, interests do not collide; they meet a common point.

However, if a player interacts with a digital game, one cannot say that he/she is colliding with the computer or meeting a common point. The interaction with the game's system of algorithmic clues is of a different type. Outcomes such as win/lose and lose/win of zero-sum games, or win/win and lose/lose of non-zero sum games are either irrelevant, or not even a possibility. In video games, outcomes do not define playing. Something more general than an outcome is needed.

As previously suggested, the point, and not the genre, is what define video games. The point of video games is to face a formidable opponent, the omniscient programmed computer laid into the machine prior to any playing. The thrill of playing comes from the impression that he/she is overcoming a supreme adversary. The player and the computer have no conflict of interest; frequently end-users do not play against other end-users.

Digital programs merely follow the players' actions. Therefore, video games are inevitably one-player games. The *de facto* opponent cannot be the set of previously conceived algorithmic choices. How can the computer be a leveled adversary of the player if its digital program is in charge of all alternatives? The actual opponent of the player has to be paradoxically no one but the player himself/herself, whose recurrent actions measure his/her present abilities. No greater degree of selfishness is possible: the players are involved in the radically self-centered experience of a zero-sum game in which they are the sole player. Is it surprising that self-absorption is the governing feature of video games?

However, the suggestion that the player has gains is consistently embedded in the design structure of a great number of video games, either under the form of overcoming hurdles or living out a scenario. Yet the player cannot gain a victory in the strict sense of the word because he/she is not facing an adversary. Superficially, the player appears to have accumulated points, but that cannot be the dominant point of playing. What is attractive to the end-user is the opportunity of adding skills and capacities to a previous and evolving repertoire or inventory of abilities. For that reason, game playing must offer to players the chance of becoming better and better in the game that they chose to perform. Again, the game cannot be about the actions and the events around the in-characters and the scenarios that structure gaming experiences. The game is all about the players themselves, and that is the fundamental reply to the puzzle of deep immersion as well as the effect of full absorption on the part of end-users.

## Virtuality and Virtuosity

Digital game development follows a blueprint –frequently named The Design Document– in which gameplay details, technical specifications, and developmental architecture are laid out. The idea is that, in this document, each aspect of the game is

fully described, but with consideration for technical deviations. From the viewpoint of product design, the developmental logic of video games is an initial progression from the whole to the parts, while complemented by the evaluation of how and if the parts adequately fit, thus leading to potential alterations in the way the design had been at first conceived. Yet, from the viewpoint of the end-users' experience, the players have partial and progressive access to the totality of the game, even if the totality is established *a priori*, albeit provisionally, since the earliest stages of the design. The virtuality of the game design and the virtuosity of end-users are the two complementary features and attributes of video games.

The Design Document is more than a mere technological tool; it actively defines how an imaginary end-user can achieve improvement through strategic choices made during gameplay. Whatever the game is, whether occurring in a fantastic setting, or simulating a real life situation, in any case always unfolding in virtual environments, in virtual worlds, gameplay is established so that the player achieves virtuosity. Virtuosity broadens the player's experience and capacity for more challenging gameplay. This is an effect where the player evolves as a result of playing the game, an effect that can have an impact on the player's real world experience, as in the case of military pilots able to get a plane off the ground and return it with a safe landing, never actually flying a plane before, only because a flight simulation had provided them the experience – risk free.

The role of the Design Document determines the developmental milestones of the game in all of its aspects, ranging from requirements of game completion to the final characteristics that will be offered to the public. Video games are ever changing organic entities that are developed not simply as the software is designed, but also as marketing strategies. It is perhaps trite to emphasize it, but video games survive or perish in competitive markets, where the products are successful in direct relation to their innovative features and player satisfaction.

If the immersion of the player in gameplay attributes is the factor that brings in sales, the discovery and the improvement of new means of immersion is a constant goal in game design. Because the games must sell, and the players buy products that have innovation, video games and players are involved in a process of co-evolution. Why buy a new game that simply repeats what other games have done before? Why go through the same experience if the result is wholly predictable? Redundancy is not only incompatible with immersion: it is the technological opposite of innovation.

Consider the phenomenon of sequels. A successful game is offered again to the market, but it must present definite innovations. While it is quite true that market demands allow the game designer to provide sequels of the original game design, this possibility comes with conditions. The players expect more gameplay from sequels as they have evolved as players, and require more semiotic stimuli and innovative features. This progression feeds the need for new modes of play that advance both the state of game design as well as player interaction. For this reason, one cannot say that the end-users face a completely adversarial computer program. Emerging gameplay indicates to players the possibility of improving their previous physical, mental, and emotional responses. The game design is an enabler, although presenting escalating obstacles and difficulties.

As the gameplay progresses, and as the player moves to higher and higher levels of achievement, the outcome should point to an improvement of the end-users' initial mental, emotional, and physical responses, generating the gratifying sense

of having done what was not possible before. That is the function and purpose of modes of playing. Through the set of rules that compose each mode of playing, the end-user is steered into scenarios of action, objectives, and rewards. The sequence of modes of playing is a definite progression, affecting the player as a whole. In this sense, and as such, video games are a new media, radically different from traditional media. In traditional media, the spectator is no more than a passive participant, frequently a mere voyeur. New interactive media is wholly active with direct effects over the player who is allowed to experience the exciting transformation of his/hers initial abilities.

In a game like *Muscle Car 3*, for instance, the player has the chance to train in one mode of gameplay, called 'Testdrive', in which it is possible to drive on tracks without opponents and time restrictions. The experience in this mode of gameplay is the one that prevails in arcade games. The end-user has a view of what he/she can do in a world without competition or challenge. However, when the player chooses the mode called, 'Checkpoint', the player must race against six other drivers, and complete the race in the top three places to open new racetracks. Another mode, 'Career', allows the player to ride around a city free of time restrictions. The player may challenge vehicles to street races, and should avoid the police This mode of gameplay puts the end-user in direct relationship to what can be a closer simulation to real-world and underground racing experiences. The initial arcade experience is left behind and the ante has increased.

## Playing Digital *Chicken*

Although without the risk inherent to real-life situations, video games are strikingly similar to a game called Chicken. In real-life, Chicken is a zero-sum game of intense risk that reveals the intrinsic personal qualities of the players. The most famous game of Chicken is shown in an American movie of the 50s, *Rebel Without a Cause*, despite the fact that the standard description of Chicken is quite different from the movie scenario. In *Rebel Without a Cause*, the game is referred to as "chickie, run": cars do not collide, but they are driven toward a cliff.

In the canonical game of Chicken, two drivers speed up cars going toward each other. The collision seems inevitable: if one driver does not swerve, the crash may be fatal. In real-life, Chicken is a two-person zero-sum game with potentially awful consequences, as the script of *Rebel Without a Cause* dramatizes the outcome of playing reckless "chickie, run".

The end of games of Chicken is reached when at least one of the drivers (although sometimes both) swerves, avoiding the crash; but the one who dodges the crash loses, and the loser is publicly humiliated, symbolically and socially "slaughtered", and dubbed "chicken". Video games are Chicken games played in an environment of multiple scenarios that may include human against human, human against machine, and all the variables between. Digital gaming. though simulated and controlled, is a virtual world that requires strategy and challenges just as Chicken does. The goal of real-life Chicken and digital chicken games is to reveal the personal qualities and attributes of the ones who are challenged. And yet, video games are games of Chicken with one significant difference and social advantage: if the opponent defeats the end-user, he/she can try it again, without public shame or death. In the end, after subsequent attempts the player will eventually became better and better. Digital Chicken is brinksmanship without a physical personal price, a mode of play that is not lethal or fatal. What seemed impossible to occur happened to the

game of Chicken: it is feasible to play Chicken digitally with tolerable humiliation, without symbolic and social death, and moreover without risking one's physical integrity. Digital Chicken is a tamed game, which makes the real and dangerous game of Chicken far more exciting. Video games transformed Chicken into a useful, attractive, and yet harmless parlor game.

Like Chicken, video games also build reputation: they assess personal qualities and attributes, revealing the end-users' virtuosity, under multiple forms: in a horror game, the lights blink out and it is evident the inmates are free to roam the asylum. This sign can put the player on edge. Then some bizarre creature, never seen before, jumps out of the dark at the character in the game; the player has an emotional response of moving in the seat and maybe even freezes and loses a life the first time. Undoubtedly, the monster is only on the screen, but the player's flinch mechanism kicked in all the same. This and other end-user's reactions to the event's in-game can only be defined as the result of immersive gameplay; the ability to have control in similar situations is the result of virtuosity.

That is not all: Outside of the game, the player has been changed too. The player has gained personal information about himself/herself, which in turn, has improved his/her neural processing of similar data. A player using game input has acquired information that included reactionary functions of output, hand and eye coordination, as well as the capacity of performing physical actions, even when the game is over.

In both video games and in real-life Chicken, the behavior during gameplay must be asymmetrical. The end-user must not follow the same strategic plan of the opponent, whether a human end-user or a computer. That is the case, because all games of the mode Chicken have two structurally excluding equilibrium points that solve the game. The solution is not strategic, but wholly dependent upon the personal qualities of the players. The equilibrium points are: 1) end-user outdoes the computer (in real-life Chicken, driver *A* does not swerve, but the opponent *B* avoids the crash, losing the game); 2) the computer outdoes the end-user (in real-life Chicken, driver A swerves and loses, while *B* stays the course and wins the game).

As is always the case with games of Chicken, in video games, the end-user (or end-users against one another) and the computer must follow different and asymmetrical strategic plans. The plans of action do not define the outcome of the game: in real-life, if both players stick to the same plan of action, the result is either a tie (both swerve), or a catastrophe (both stay the course and collide). In either case, bearing in mind that zero-sum games demand a win or a loss, the game ends without a solution. In real Chicken and in video games, the two players (the end-user and the computer, or in the case of humans playing against one another) should follow opposite plans. Real-life Chicken is a game whose outcome is either power or dishonor (the winner calls the loser "chicken"); but – as said before - without paying the potential price of symbolic, social, or actual death, the end-users demonstrate their hierarchical qualities, displaying clout and virtuosity.

In real-life, the solution of games of Chicken does not come just from the implementation of an optimal strategy. Victory depends on dissuading the opponent of driving head on. The optimal strategy of driving straight toward collision is a prerequisite for victory; but what defines victory is the capacity to drive straight, and at the same time to force the opponent not to pursue the optimal strategy, not just out of fear, but mainly as the result of the certainty that the player will not give in at the last moment.

The vivid and intense sense of liveliness in real and video games comes from the experience that the game is decided at the brink of the last moment. Indeed every stage of the game is a last moment. Nothing can be more akin to life itself, for life is succession of last moments, and moments are a succession of last seconds. No excitement and feeling of deep immersion can be greater than this one. In this type of demand, immersion has to be total, for the decision of the game can be reached at the flickering fiat from which life hangs on. Of all games, only Chicken can express the fullness of this ordeal. Games must go on until the smallest fraction of time before the final crash. Up to the last moment, the player can turn the game on his/her favor; and they ought to try to do that: the payoff is survival or extinction, defeat or victory.

The success of playing Chicken depends on intimidating the opponent to give up on the optimal strategy. The solution of Chicken is not in the driving, but in the signs that are sent to the opponent. The winner delivers signs whose role is to force the other player to do it differently. The winner is not a strategist only, but the player who can personally do what the opponent cannot do.

## Interactive and Digital Semiosis

We must now develop, in terms of games, the insight coming from the notion that that the solution of the real-life Chicken emerges from the signs sent from one player to another. In real-life Chicken, the solution comes when the player persuades the opponent that he/she will truthfully drive head on. To convey his/her intent, the player has to send more than the signs that he/she deems as truthful. The delivered signs must be representations forceful enough to influence the opponent before the crash; otherwise the game is not won, and ends in collision. Collision is more than a tie: it puts the player at severe risk.

In games, the expression “the sign is on the wall” is more than a literal statement. Signs are on almost everything. In reality, a billboard on the interstate may merely advertise a product, however in a game it has another purpose. The same sign, represented in a driving game, may present a cue to the player or it may be there to further immerse him/her in a virtual world. The sign, instead of advertising a film called Earthquake, is a clue that the suspension bridge will be demolished. If the sign is not interpreted appropriately, the player cannot escape danger, and therefore loses a life in the game.

Signs, cues, and symbols work together in the game and are created to immerse the player in a world that must be constantly reinterpreted as the hinting signs of something else. The hints are not always fully conspicuous. The player experiences the semiotic texture of the game, indeed the structural elements of game design, and then learns to react to this data in an more efficient way. Conversely, perception and game experience increase the player’s involvement and his/her ability to achieve greater player’s status. This is a factor no game designer can afford to ignore. “On occasion, a well placed symbol can generate cognitive resonance in the player.” (Lamaree, P.269) During their first appearance, gameplay hints (cues, signs, and symbols) bring about mental, emotional, or physical responses, not necessarily conscious, but always immediate. The player knows that all attention is demanded, and that is an immersion factor of gameplay. At the second time, the player will have a more controlled response and may even achieve something formerly not possible. At this point, when a player sees, for the second time, a sign saying Earthquake, he may already have his finger sitting on the B-button ready

for the broken bridge that is around the corner. The player has used the experience to become ready and more capable.

The delivery of signs follows the classical principle of semiosis. The actual material sign must be considered in relation to what the receiver can interpret. The interpretation of sign, a posterior semiotic action, should embody the intent and express the true resolve of the sender. The sent sign address a receiver, creating in the receiving mind an equivalent of more developed representation.

## Game Over

This paper recognizes that games are composed of multiple layers. Besides details and procedures concerning the market possibilities of the game as an economic product, the game design can establish a narrative level in the case of fictional games, but that is not even a strict necessity. An interesting digital game should allow the player to have the freedom to skip a narrative plot. That is commercially attractive for it expands the market of potential buyers, thus including gamers who can simply not be interested in the narrative, but attracted to the technological advances of this particular gameplay. Thus, coming from the study of traditional media, theories of literary narrative do not deal fully with the experience of video games. Furthermore, games of sport, simulation, and training are also part of the digital game world, although devoid of narrative.

Despite the fact that it is a component of the gaming experience, virtuality does not define gameplay. Virtuality is the net of possibilities for the virtual environment and the end-user: it is the lattice upon which the player performs. Virtuality lays out a world of possibilities, while playing is decisively and to varying degrees sheer virtuosity. Virtuosity is not what is merely possible; virtuosity is the actual. Virtuality exists so that virtuosity may be exercised or demonstrated. Virtuality triggers immersion. Immersion is feasible because the players perform at his/her level of virtuosity, attempting to improve previous performance. Virtuosity is always performance.[6]

The relation between virtuality and virtuosity is akin to the one that holds an energy field together. Virtuality is a weak force, while virtuosity is the strong force of video games: virtuality emerges from the pressures of deep immersion in gaming experiences. Virtuosity demands nothing less than the whole constitution of the players, who must engage physically, emotionally, and mentally in the experience that virtuality proposes; and that is what responds for the profound effect of games on gamers. Moreover, that is why graphic art of video games may appear to be ugly, clumsy, rough, and awkward for a non gamer, and yet rather effective for players. The illusionary effect of video games has nothing to do with mimetic *trompe-l'oeil*. The player is not immersed in the visual art and the look of a game.

The experience of video games redefines the nature of illusion as much more than absorption of an image into the object that it intends to represent. Digital illusion is a short script for immersion and deep thought. The player and the totality of

[6] Although this phenomenon does not occur presently in the United States, in South Korea, extraordinary players of the game are pros. Ten of thousands of spectators flock to stadiums to see players like Derek Jeters and Peyton Mannings, top performers of an online game, *StarCraft* (Schiesel 2006). Video games are featured in Korean sports channels. South Korea has almost twice the number of broadband subscribers per 100 inhabitants than the United States, which contributes to the generalized fever for online video games. However, in both models of consumption of video games, the solitary one in America and the South Korean two-person-zero-sum gaming, the dominant characteristic of video games is individual excellence in performance.

his/her experience is at the core of gameplay; as he/she is involved with all of his/her capacities and abilities. This is the threshold of immersion: "immersion is mentally absorbing and a process, a change, a passage from one state to another" (Grau 2003: 13).

So, among all games Chicken is the one that accounts for total mental immersion, brinksmanship, escalation, revelation, and expression of the individual power of players. As we demonstrated, the underlying presence of Chicken in video games explains the intense and vital experience that not only fascinates so many players, but also constitutes the dominant trend of what has been appropriately called the new media.

## Games

Rockstar Games. *Grand Theft Auto III*. Take-Two Interactive, PS2, 2001.

Silverfish Studios LLC. *Extreme Boards and Blades*. Activision, PC, 1999

3Romans LLC. *Muscle Car 3*. Global Star Software, Take-Two Interactive, PC, 2003

3Romans LLC. *Rebel Trucker: Cajun Blood Money*. Global Star Software, Take Two Interactive, PC, 2004

## References

Aumann, Robert J. (2000). *Collected Papers.* Cambridge, MA: The MIT Press.

Baggaley, Sean T (2002). Show and Tell: Applying Screenwriting Techniques to Computer Games. In *Game Design Perspectives.* François D. Lamarée, 281, 282 Hingman, MA: Charles River Media, Inc.

Bogost, Ian (2006). *Unit Operations: An Approach to Videogames Criticism.* Cambridge, MA: The MIT Press.

Grau, Oliver. *Virtual Art: From Illusion to Immersion*.; translated by Gloria Custance, Cambridge, MA: The MIT University Press.

Holin, L., & Sun, C. (2003). Problems in simulating social reality: Observations on a MUD construction. *Simulation & Gaming* 34, 69-88.

Huizinga, Johan (1994). *Homo Ludens.* Boston: Beacon Press.

Jana, Renee (2006). Enough with the shoot-'em-ups. *Business Week*, October 16, 92.

Juul, Jasper (2003). The game, the player, the world: Looking for a heart of gameness. In *Level Up: Video games Research Conference Proceedings*, Marinka Copier and Joost Raessens, 30-45. Utrecht: Utrecht University.

Juul, Jesper (2005). *Half-Real: Video Games Between Rules and Fictional Worlds.* Cambridge, MA: The MIT Press.

Lamarée François D, ed. (2002). In *Game Design Perspectives.* 269 Hingman, MA: Charles River Media, Inc.

Maynard, Smith, John (1982). *Evolution and the Theory of Games.* Oxford: Oxford University Press.

Nash, Jr, John F. Reprint. The bargaining problem. In *Classics in Game Tneoyr;* Harold W. Kuhn (ed), 5-13. Princeton: Princeton University press. Paper originally published in *Econometrica* 8 (1950), 155-162.

Rollings, Andrew and Morris, Dave (2004). *Game Architecture and Design: A New Edition.* Berkeley, CA: New Riders Publishing.

Schiesel, Seth (2006). The land of the video geek. *The New York Times*, October 16, online edition.

Sebeok, Thomas A, (1981). Naming in animals, with reference to playing. *Semiotic Inquiry* 1, 121-135.

Turkle, Sherry (1984). *The Second Self: Computers and the Human Spririt.* New York: Simon and Schuster.

Turkle, Sherry (1996). Constructions and Reconstructions of the Self in Virtual Realities. In *Eletronic Culture*, edited by Timothy Druckery, 354-365. New York: Apparatus.

von Neumann, John and Morgenstern, Oskar (1944). *Theory of Games and Economic Behavior*. Princeton: Princeton Univrsity Press.

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# The Cognemes of the Spanish Language: Towards a Cognitive Modelization of the Submorphemic Units in the Grammatical Words of the Spanish Language

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**Abstract**

This study will apply to the description of Castilian Spanish grammatical words and morphemes a paradigm of principles which were originally elaborated in morphological analyses of English morphemes (Bottineau 2002, 2003a, 2004, 2006) and then evolved into typological instruments for general morphology. Before starting out on the language it is therefore necessary to summarize the way in which they apply to English. This will be done firstly for lexical units and secondly for grammatical ones. For each, the Spanish data will be set against the English ones.

## The submorphology of lexical units

The Saussurean theory of the linguistic sign postulates that the link between meaning and form is essentially arbitrary and conventional in underived lexical units such as *gato, cat, perro, dog*: the word taken as a whole is said to refer to a unified concept and it is not possible to dissect the word into submorphemic units as one might try to dissect the corresponding concept into a series of semantic subcomponents or features. There is supposed to be no phonosymbolic iconicity in word structure at the level of the root if one leaves aside the notorious exception of the onomotopeaia. However I have suggested in various studies that the problematic is in fact much more complex than this commonplace formulation.

If one is to cling to the traditional terms of *signifier* for the form of a word and *signified* for its meaning, in written languages there are not one but two signifiers, the acoustic one and the luminous or photic one, and clearly if the meaning that one constructs on hearing he word *perro* is the concept of dog with a relatively consensual set of properties and pragmatic values, the immediate meaning that one constructs on reading the same written word is an acoustic score, *una partitura*, that is to say the sequence of syllables and phonemes by which the reader would utter the corresponding acoustic realization of the word if he or she were to turn into a speaker. The meaning of <perro> is primarily /perro/ and secondarily the canine notion. In this respect, the spelling of the written word cannot be said to be arbitrary, since its profile is aimed at prompting the reading of the word (just as the text of a play prompts the acting). The implication of this trivial statement is that phonetics can be viewed as an integral part of the semantics of written signifiers, at least in languages whose spelling relies on letters and syllabic units, as opposed to ideogrammatic writings like that of Chinese. Furthermore, the asymmetries of the two morphologies are not parallel: the acoustic sign, voiced by the emitter and heard by both receivers, only exists physically during the actual voicing and hearing because the acoustic waves are emitted by the living being endorsing the role of the speaker. Trivial as this may sound, the photic signifier is the absorbtion of natural or artificial light by the ink contrasting with the light reflected by the sheet

of paper that bears the ink (or the other way round), so that the photic signal is not immediately emitted by the writer; it keeps being reflected as long as the paper, the ink and the light continue interacting: the lifetime of the signal and of its visual perception (which is a tiny part of it) do not coincide with that of its actual production by handwriting. The output of a speaker's phoning is direct acoustic input into *both* hearers' brains, whereas the output of a writer's somatic handwriting is a permanent photic signal reflected by a trace left on a surface with no direct photic input into anybody else's cognitive system but the writer himself, who also happens to be his own very first reader. A speaker directly interacts with the hearer's cognitive system and, on hearing his own acoustic output, the speaker theoretically undergoes the same stimuli as the addressee, without even realizing it, carries out the same interpretive process and double-checks the accuracy of the the uttering 1) by (re)interpreting it and 2) by visually detecting the addressee's reactions and anticipating further needs, mismatches, etc. A writer has to make do with the simple-check of the reading. Conversely, the hearer's physical reactions (looks, mimicks, kinetics, proxemics) keep influencing the speaker's uttering, unlike the reader's. The acoustic signal is constantly being remoulded by immediate interference on both sides, unlike the photic signal, which is permanently shaped by provisional interference as anticipated by the writer. The linguistic vocal process of sentencing or *enunciation* is thus redefined as an *orienting process* (in Maturana's sense) in which either or both interpreting consciences are made to experience *inunciation*, the mustering of recorded heterogenous semantic prototypes (labelled by lexical units) which are to be assembled into a coherent and dynamic mental piece of experience following a procedure formatted by the language's syntactic patterns and involving a vast but limited gamut of combining processes labelled by grammatical morphemes (articles, auxiliaries, inflections, particles, free and bound morphemes of all kinds in linguistic typology).

The resulting meanings (distributed over all *oriented consciences* involved, *speaker's included*, and varying accordingly with personal, psychological contexts, and to be concerted and realigned through negotiation) may or may not match the perceived "external reality", but they will never coincide with it as by definition linguistic meaning stems from a combination of "vocal proustian madeleines"[1] to be set against the immediate data of empirical experience acquired through sensations: human consciousness is borne out of this constant dialogue between perception and, literally, *evocation*. Intelligence, literally (*inter-ligere*), features the amplifying effect of vocal words connecting singular experience with recorded and evolving types acquired through multiple experience. Speaking is thus understood as an *ideating* or idea-forming procedure (Bottineau 2007) in which meaning is the final output rather than the initial item to be symbolically transcoded from a putative cognitive mindscape into a somatic, behavioral, sensori-motor one: to speak is to make one(self) form an idea to be set against the "situation" (both material and psychological) in which the act of speech occurs so as to achieve concerted thinking in which *the idea opposes rather than reflects the sensation*.

Ordinary communication, understood as the somatic transmission to the hearer of the speaker's intended meaning by motor action upon the perceivable environment, is only a particular case in which meaning was actually planned in the first

[1] « Les mots sont de puissantes madeleines » (« words are powerful madeleines »), Stéphane Robert (conversation).

place. Not only can one doubt that this is ever the case, but it falls short from explaining why language is also used as an intimate idea-forming process for oneself in the case of silent thinking – a situation in which the idea that sentences express ideas must be rejected: actually they *impress* them in a "thoughting" process. To think is to mentally anticipate what the auditory proprioception of the corresponding vocal sentence would be if it were actually voiced rather than inhibited (as is daily experienced by any person on his or her own who will tend to mutter rather than silently think), neural speech having the prosodic features of vocal speech (tone units and profiles, variations in rhythm and intensity, and so on): to think is to cause oneself to form ideas through the "virtual experience" of inunciation of non-vocalized sentences. This results in suggesting that whether meaning is planned or not (communication vs thinking) the linguistic procedure as a motor-sensory-cognitive function of distributed co-ideation involving brains, bodies and the medium is shaped to operate as an idea-forming "vocal tango" that does not rely on any other intended meaning than the very need to form an idea that will be matched against the currently experienced situation, and this procedure is shared by both thinking and telling: ideation is conveyed by an orienting procedure whose effect is both transitive and reflexive, that is, distributed, negotiated and concerted between all the linguistic participants in the dialogue (the interlocutors), in the environment (the atmospheric acoustic waves and the human beings) and the internal dialogical relations between neural, nervous and muscular sensori-motor dynamics for each individual living being. In this perspective, the linguist's task is first and foremost to plot the vocal scenario of the ideating procedure such as it is evidenced in the various languages: syntactic patterns itemize the various steps of the "assembly line" in fixed or varying orders; the lexicon provides the "madeleines" required for retrieving the notions synthetizing the empirical knowledge aggregated through random individual and social experience of the environment; and grammatical morphology (if any) provides the key to re-activating the combinatory processes required to connect the lexical items into a network involving direct semantic relations between lexical types (notion and quality: *white dog*) and between those types and the dialogical situation under current scrutiny (determiner and noun: *a dog* – a type for which no current occurrence can be retrieved from the acquired experience of the situation and conversation, whether the orientee be the hearer or the thinker). So the question raised in this study about Spanish is whether any relevant data for modelling the ideating process can be found in the very phonological structure of grammatical morphology.

It follows that, blunt as this may seem, the signifier as Saussure describes it is a mere fiction which only exists in the linguist's mind. What does exist in the physical world is the signifier as it is emitted by the one speaker and the signifier as it is captured by the two receivers of the acoustic sequence, if we content with focussing on the acoustic sign. In the first case, the sign is a neuro-motor program lauched by an intention to trigger off the emergence or instantaneous selection of a certain type of representation in the targeted receiver's mind; a program which translates into a set of behavioral patterns that are basically concerned with the modulation of the outgoing air flow in order to generate articulated acoustic waves. For the speaker or writer, the sign is therefore the ritual execution of a physical procedure driven by mental purposes. In the second case, for the hearer or reader, the sign is a recognizable perceptual pattern connected with a semantic representation (whatever this may be), a sensitive sequence that translates into a semantic one once a

critical threshold of recognition has been trespassed, making it possible to make the decision to select the relevant notion. Obviously the way in which the signifying procedure is perceived also varies greatly depending on whether one focusses on the emitter's or receiver's part and the whole question of iconicity is to be reconsidered by taking into account the differenciated paradigms of senses implied in each and the nature of the iconicity under scrutiny.

The English lexicon provides a rich example of this difficulty, which is marginally evidenced in Romance languages. The so-called nordic monosyllabic stems usually comprise one or several consonant clusters in initial or final position known as ideophones or phonaesthemes (Firth 1930; Philps 1997, 2003) (capital letters are used when both the photic and acoustic signs are considered). ST refers to the notion of fixity o stability as in *stay*, *rest*, *stand*, *still*; SP to that of rapid rotation and ejection by centrifugal force as in *spear*, *spin*, *spend*, *spill*, *spread*; WR to the notion of constrained rotation as in *wrist*, *wriggle*, *wry*, *wreck*. I have shown that if the ideophone is located in the onset of the syllable, it will provide a semantic classifier expressing a property that encompasses the whole notion, wheras if it is sited in the coda it will express a salient property that may not be sufficiently prominent to serve as an overall prevailing classifier. Moreover, the meaning of ideophones is not so much concerned with the physical properties of objects as they are perceived visually as with the prediction of the type of behaviour the object is apt to have in common experience (the *stump* is the part of the object that will *stay* when the *rest* is removed) or of the type of behaviour which a human agent may embark on when confronted with the object. If the viewer contents with visualizing an anticipated behaviour, the interaction is absolutive (a *spear* does not *spin*, but is cast by means of a *spinning* movement of the user's arm); if the viewer suggests a potential interaction with an agent, the interaction is ergative (characteristically, a *sponge* can be caused to *spill*, *spray* or *sprinkle* water if constrained by a *spinning* movement of the user's hands: sp- points to neither the shape of the thing, nor a potential behaviour, but a potential agent, an expected typical spinner as it were). This amounts to engraving in a notion a submorpheme bearing the relational potentiality extrapolated from the experience and memory of previous encounters with its referent. A Basque example is *eguzki* "sun" with *gu* ("light") and *ki* (an infix which ordinarily introduces a pronoun understood to be in the dative in verb morphology), the whole meaning "the light given to (anybody)", the light permanently befalling any implicit receiver. In stump and sponge, the absolutive or ergative targeting of the interaction ST and SP remain unmentioned; in Basque; the dative targeting of *gu* is displayed by *ki*.

This approach to morphology should not be hastily dubbed as cratylian or phonosymbolical : so long as one does not contend that the semantic value of the cluster is iconically motivated by the physical properties of the sounds they are made up with and such as they are perceived by the emitter, the receiver or both, there is no phonosymbolism, but only a recession of the frontier of morphology, since the ideophone SP may be just as arbitrary and lacking in motivation for referring to centrifugality as *gato* is devoid of phonosymbolicity for pointing to the miaowing mammal.

Whether the Spanish language displays the same type of submorphological consistency is far from evident. Some of the consonant matrices corresponding to the clusters of English do indeed exist:

**S+P** : *esperar* "to wait for, to hope" (projection), *espejo* "mirror", *especulación*, *especie*, *espacio*, *despojar* "to spoil", *despensa*, *despreciar* "to despise", litterally "to *disprize", *despegar* "to take off".

**S+T** : *sitio* "place", "site", *situar*, *bastar* "to suffice", *justo*, *estar* circumstancial "be"from latin *stare*, "stand" (and all its derived forms), *desde* "since", *hasta* "till", "until", *satis(facer)* "satis(fy)".

However the number of exceptions seems to be far greater than in English, and the very hypothesis that those consonantal combinations might belong to semantically relevant matrices is indeed a risky one since they appear in reduced numbers and in locations that do not clearly correspond with ordinary morpheme boundaries. As in English the combination of S and P results from various diachronic origins (*des-* or *ex-* + root starting with *p*) but unlike in English these concurring etymologies are not made to coincide in one single morpheme which is clearly used as a unifying classifier *sp-*. English young children are sometimes told that *dogs dig* with a shared ideophone which is not connected with auditory perception and is not onomatopeic, while Spanish ones are told that *el perro gruña* "the dog is snarling": onomatopeic echoing *r*s in Spanish do not make up ideophones. Whether the Spanish lexicon displays a relevant submorphology remains unsure (other than occasional onomatopeiae), much more so than in English. Be that as it may, lexical submorphology deals with programming behavioral predictions attached to the object or to a potential animate agent that might interfere by using or facing it rather than to the visual and descriptive properties of the referent. We shall now turn to the semantics of submorphology in grammatical morphemes, which is based on a set of essentially distinct principles which do not serve the same type of semantics.

## The submorphology of grammatical words

As is well known (Danon-Boileau 1983, Lapaire & Rotgé 1993, Viel 1993) some English grammatical morphemes display some degree of morphological consistency. Two cases in point are the alternations of two vowels, I and A, and of two consonants, WH- and TH-. The operators marked in capital letters refer to the semantic core values associated with the corresponding phonemic and graphemic realization, considering that the acoustic vowel varies according to stress and syllable structure (cf. *a*, *that*, *what*, *all*) and was made to change positions during the Great Vowel Shift ; and the photic one usually comes out as <i> but also as <e> as in *be*, etc.

I allegedly deals with the notion of proximity, as opposed to A, which conveys that of distance or distanciation. This is to be found in demonstratives *this* and *that* and in interrogatives *which* and *what*, with *which* selecting a relevant referent among a group of several in praesentia, and *what* implying the research of a referent in absentia.

TH is a marker of anaphora as opposed to WH or cataphora (Adamczewski & Delmas 1982, Delmas 1987): *when* designates a moment in time whose referent remains to be pinpointed, as opposed to *then*, which anaphorically refers to an already known space in time. The same analysis is valid for *where* and *there*, *which* and *this* (*which* calls for the selection of a referent in praesentia and *this* anaphorizes it), *what* and *that*.

The theory of cognemes proposes a generalized recognition of submorphemic indicators wherever they are to be found in grammatical morphology. The word *cogneme* designates a semantic process that the speaker invites the hearer to implement in order to establish a relation between two preexisting semantic entities,

a cognitive hinge available in the linguistic system shared by the addresser and the addressee that the former can activate in the latter's mind by sending the relevant acoustic trigger sound in the appropriate syntactic environment. In the case of I, the instruction consists in joining or even merging two previously seperate entities. The nature of the semantic entities involved depends on the format of the syntactic units between which the cognemic submarker is operating. It may be two lexical notions:

**Adjectival suffix –y**: creation of single notion obtained by combining without any restriction the previously separate notions corresponding with underlying substantives. *An icy moon* is a moon whose visual perception is best summarized in one single noun, namely *ice*. *A dusty cloud* is a cloud whose first perception is best or primarily rendered by the word *dust*; this also applies to more abstract combination like *a testy letter*, *a thundery voice*.

**Be**: I may intervene between two phrases, the subject and the predicate, in which case it commands the combining not of the prototypical notions, but of their referencial referents after they have been processed by nominal determiners: *A camel is a mammal*. This sentence is cognitively relevant if and only if the speaker considers that the connection between *camel* and *mammal* does not preexist in the hearer's system of organization of semantic representation of the universe. In using this submorphemic marker of unrestricted assimilation, the speaker aims at inviting the hearer to create the hyperonymic relation which is taken for granted by logical analysis, which does not take into account the makeup of its own patterns in individual cognitive systems.

**Demonstrative *this***: Finally I may intervene between a couple of other submarkers, such as in TH and S in *this*:

> (1) In some scientists' minds, the small, round structures featured in this microscopic sample of Martian clay may be fossilized microbes. (*Sky and Telescope*, June 1999, *How far the stars?*, p.24)

In demonstrative *this*, three submarkers are present: TH for anaphora – the speaker invites the hearer to locate in the physical world the object he or she is talking about and which is supposed to have already been detected or mentioned; S for present definition: S indicates that the nomination that followed is a novel one in the context, in this example the reader was not supposed to have identified the content of the photograph described as being a "sample of martian clay"; and finally I in between to provoke the assimilation of the semantic entity captured by TH through the anaphora and the one captured at the same moment by S introducing an operation of present naming ("nouning" would be more accurate). In terms of neural networks, this implies that anaphora and nomination are computed separately before stringing together their results as commanded by submarker of assimilation I. The overall core value of *this* may be summarized by a set of instructions corresponding with the individual submarkers. What you now remember (TH) is made to coincide (I) with what you now discover (S):

THIS

[ASSIMILATE] (I)

{TH = *what you now remember*}-----+-----{S + *NOUN = what you now discover* }

When "what you remember" fully coincides with the preceding phrase, the anaphora goes without marking: *this* minus TH is *is*, in instructional terms [ASSIMILATE] (I) {*what precedes*} (zero) and {*the following concept*} (S). At this

stage, it should be clear that this cognitive semantics has nothing to do with any kind of cratylian symbolistic motivation whatsoever. One does not say *Take this chair, I'll take that one* just because the first one is the nearer and the second one the more distant of the two, but because the thing is pinpointed by a movement of the hand that makes it anaphorizable at a time when the corresponding class remains to be named, *this chair*, whereas in the second occurrence the class has already been selected, which is indicated by T, contrary to the real chair, which is distinct from the first one and remains to be anaphorized separately. In the case of *this*, anaphora and nomination coincide in cognitive sequence, so that they are assimilated by I. In that of *that*, the TH anaphora, which is carried out at the very moment of utterance, is to be dissimilated by A from the naming process, which is relegated to the cognitive past of preconstructs by the T marker.

THAT

[DISSIMILATE] (A)

{TH = *what you now remember*}-----&-----{T + *NOUN = what you then discovered*}

This paves the way for an implicit reassessment of the properties of the referent at the time of utterance, and the choice of *that* often has semantic implications which are to be interpreted in the context: *This is Richard, and this is Kathy* introduces both characters; *This is Richard, and that is Kathy* may be ironic: Kathy may have an appearance or attitude which in itself is already an indicator of her characteristics so that in using *that* the speaker is pointing to symptoms that call for a predetermined diagnosis.

The English language displays a whole range of such markers. Before itemizing them and turning to Spanish it must be made clear that a sound does not intrinsically refer to a cognitive procedural instruction. One phoneme will activate its twin cogneme only if some requirements are satisfied: the submarker has to be made detectable and validated as such by belonging to a network of alternations marking contrasts. WH will be identified as a submarker because its alternation with TH is regular (*when* / *then*) and marginal operators like *who* or *why* may be included despite their lacking a counterpart beginning with TH because they belong to the same functional paradigm. This excludes lexical units like *whale, whim, whistle, thistle, thorn, thumb* in which WH and TH do not relate to cataphora and anaphora because they do not oppose one another, nor do they belong to any word class which does so. I and A oppose processes of assimilation and dissimilation in *this* / *that*, *which* / *what*, *the* / *an*, *is* / *as*, *is* / *was*, *swim* / *swam* because their belonging to a common network is underlined by common denominators that may be semantic and functional (*be* and *have*), sometimes also morphological (*swim* and *swam*, with the ideophonic element SW as in *sweep, sweat, swear, swoon*, all of which share the notion of oscillation, pendular motion). Conversely, in the pair *pin* / *pan*, the I/A alternation is just as irrelevant as P_N as an ideophonic marker: sounds will not be made to mean a cognitive process so long as their belonging to a systemic network is not obvious. It is now possible to give a brief sketch of the English cognitive morphological system in grammatical morphemes:

| U [TARGET] | I [ASSIMILATE] | A [DISSIMILATE] |
|---|---|---|
| do | be | have |
| look | see | watch |
| to | in | at |
| do | did | |
| foot | feet | |
| | is | as |
| | is | was |
| the | an | |

**R/S/T: [INCHOATE] / [CONTINUE] / [DISCONTINUE]**

*high > higher, highest (high: average; higher: beyond high applied to an entity of the same kind; highest: exhausiton of higher)*

*is* (assimilation at the moment of utterance) / *it* (assimilation to some pre-identified notion that need not be made explicit because no further calculation is implied, cf. *that*)

*yes / yet* (present and past approval: concession)

*no / not* (negation and its anaphorization)

*plays / played* (validation / rejection)

**WH / TH: [POST] (cataphora) / [ANTE] (anaphora)**

*which* / *this*, *what* / *that*, *where* / *there*, *when* / *then*

**N: [REJECT] (negation)**

In initial position:

*no*, *not*, *nor*, *none*, *naught*, *now* (vs *yet*), *nil*, *null*, *new*

In final position:

*in* = restricted assimilation : integration

*An* = restricted dissimilation = extraction with no qualitative distinction

*-en (driven)* = the one that does not drive, shaven = the one that no longer shaves (that is marked by the result, not the operation)

**L: [PROJECT] (future)**

will, shall, still, till

Each gramatical operator thus appears as one global semantic procedure endowed with a complex core value engineered by a set of elemental cognitive instructions marked by individual components, hence some remarkable systems like *to / till*, *yes / yet*, *no / not* etc. An operator like *still* combines ST for stability, permanence (itself a combination of S for continuity and T for interruption) and L for futurity, which accounts for both the spatial and temporal meanings of this highly polyfunctional word (*still water, still better, still at work, and still*…).

## Submarkers in the Spanish language

The Spanish language does not use submorphemic markers of cognitive processes with such a high degree of consistency as English does but there do appear to be remarkable regularities. It is not possible for the Spanish language to argue that the engineering of grammatical relations sytematically revolves around the marking of basic cognitive patterns as it is the case in English and the phenomenon, to be accurately described, must be granted its due importance, no more, no less. This exploratory section aims at introducing representative systems involving such dynamics but will not pretend that the organization of morphemes is to be reduced to

this principle. The question why it operates as a trend that imposes itself unequally in one language as welle as among languages is to be broached after some preliminary investigation.

**I/A: *aquí* / *acá, allí* / *allá***

*Aquí* merely presents an introductory specification about the *here* the speaker wants to pinpoint: the location in space is selected as opposed to the rest of the paradigm of all the other potentially relevant places the term might cover. As clearly appears in the following example, *aquí* aims at providing a heuristic approach of spatial location: the informational import does not go beyond what the word *aquí* means literally, the place where the speaker happens to be at the moment of utterance, which the hearer is to construe either implicitly, on the basis of direct perception of previosly known information, or by direct explicitation as in the following example:

(2) Aquí, en las antípodas, hemos ganado la libertad quitándonos la ropa.

(2') Here, in the antipodes, we have gained our liberty ridding / stripping ourselves of our clothes.

*Acá* implies additional secondary values: the *here* is defined in relation to the hearer and suggests some pragmatic implications. The speaker does not only aim at defining his own location but at recalling it (*los de acá*: the people who live here with their specificities). In most cases, the use of *acá* implies that the speaker considers that the hearer is already fully aware of the *aquí* he or she is referring to so that the mere replacement of I by A implies anaphorization and distanciation, clearly suggesting that the pragmatic value of the utterance is not informative, but interpersonal, an injunction in many cases; or that the informational value does not coincide with what the word literally suggests and calls further pondering. The choice of the modalization supported by the A anaphora is usually conveyed by prosodic indicators: ¡Ven acá en seguida! "Come here at once!" The same holds true for *allí* and *allá* :

(3) Normalmente, en la época de los descubridores, cuando se llegaba a un sitio nuevo, se encontraban tribus indígenas que se habían instalado allí desde mucho tiempo atrás, decenas o incluso cientos de miles de años.

(3') As a rule, in the days of the explorers, in every new place there were indigenous tribes which had settled there scores before, tens or even hundreds of thousands of years before.

The site is new for the pioneers, but also for the reader, as is indicated by the indefinite article *un sitio nuevo*.

(4) Es un lugar muy frío y seco. No me gustaría vivir allá. (conversation)

(4') It's a very cold and dry place. I wouldn't like to live there.

*Allí* would simply mean *in the place I have mentioned* (with a heuristic, open value) whereas *allá* also includes the qualification of it and saturates the interpretation (anaphora bearing a hermeneutic value). In the same way, *más allá (de)* "beyond" presupposes that some place other than *allí* is predefined, which can no longer take the heuristic form, hence **más allí*, which is, from a cognitive point of view, contradictory in terms. This use of the I/A contrast is not an isolated case. It is to be observed in very similar conditions in Italian with the homologous deictics *qui* / *qua*, *lì* / *là* (*sono qui* "I'm here", *vieni qua* "Come here!"). The French language, which does not have a pair of operators matching *aquí* and *acá*, goes so far as us-

ing *là* for *ici* whenever the speaker considers that the place is situationally predefined and loaded with pragmatic implication: *Viens ici!* "Come here." The speaker shows the place in question but gives no indication about what is to happen to the hearer once he or she gets there, unless some specific intonation, rhythm and stress sugest a strict order). *Viens là!* "Come here!" The speaker indicates that the hearer is supposed to be aware of the event which is to befall him or her in the location in question; the implication might be, if I am to comb your hair, you must sit on this chair instead of fooling around. Because the interpretation is saturated[2], the hermeutic form explicitly places the speaker in a dominant position with a notable lack of consideration for the addressee which contrasts sharply with the heuristic form even if the prosody bears a strong injunctive intention[3].

In wolof, an African language of the Atlantic group mostly used in Senegal, a substantive is ordinarily followed by a consonant indicating the class to which it belongs (8 for the singular and 2 for the plural), and then a vowel for spatial location: I in the case of proximity or heuristic localization (*xale bi* "this child"), A in the case of distanciation or hermeneutic location with interpretive or pragmatic implications (*xale ba* "that child"), U in the case of spatial indetermination, or, to be more accurate, in the case in which spatial localization has not been carried out yet and remains to be accomplished by some additional semantic specification as in *xale bu jygéén* (*child-who-girl* = "the little girl"; the child you may identify by spotting the one bearing the female trait, which by-passes spatial localization).

The striking fact is that the same value is attached to homologous sounds in natural languages which are not supposed to be connected by some common mother tongue, and even if this were the case, there would still have to be some other principle to account for the persistence of the link between form and meaning. In the case of I and A it is of course tempting to consider the properties of the sounds and assume that I was been selected for expressing junction because to utter an /i/ is to enact a contact between the tongue and the velum and to hear an /i/ is to detect the higher of the two formants, which is apt to mimick proximity on account of the

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[2]Douay 2000 proposes a theory of interlocutive relations according to which morphemic alternations stage the possibility to choose between various dialogic configurations in the semantic domain discussed by the marker (be it a determiner, a deictic, an auxiliary etc.) in terms of contrasted vs concerted commitments. As it happens, cognemic analyses often happen to arrive at analogous results: in romance languages the *i/a* contrast in spatial deictics is regularly underlaid by a spatial analysis of the dialogical assignment of grammatical values to each of the interlocutors.

[3]In Douay & Roulland's *theory of interlocutive relations* (Douay 2000) grammatical alternations are envisaged not so much as speaker-based markers of location in space, time, modality etc. as as markers of prototypical attitudes to be adopted by the hearer or receiver of the utterance in the process of interpreting the message. A threefold schema is postulated: (i) Configuration 0, in which immediate dialogical agreement between the interlocutors over the semantic issue discussed by the grammatical system of operators can be obtained directly in the context of the dialogical interplay; by contrast, Configurations 1 and 2 stage two profiles of the potential mismatch that may oppose the interlocutors' viewpoints and require further metalinguistic discussion. (ii) Configuration 1 stages the potential dialogic contrast: the speaker endorses the validation of the semantic choice albeit the hearer's position is regarded as potentially different: potential dissent is emphasized. (iii) Configuration 2 stages the case when the agreement between the interlocutor's stances is taken for granted, leaving no possibility for the receiver to assume his own difference: potential dissent is neutralized. This cognitive apparatus shaping interlocutive profiles is diversely instantiated by grammatical systems in their own semantic field: determiners (*Ø*: C0; *a*: C1; *the*: C2), deictics (*this*: C1, *that*: C2), modals (*can*: C1, *may*: C2), etc. As it happens, cognemic analyses often happen to produce analogous results: in romance languages the *i/a* contrast in spatial deictics is regularly underlaid by the spatial positioning of the dialogical source(s) that the speaker regards as responsible for the paradigmatic selection. In the dialects of Spanish and Italian that do not neutralize the *i/a* contrast in spatial deictics, the same analysis may be applied. In short, cognemes may be used as the markers of how intersubjective distribution is concentrated at the level of the semantic issue discussed by the grammatical microsystem.

Doppler effect, according to which any incoming sonorous object will be perceived as emitting a sound whose pitch is actually higher than the frequency at which it was originally emitted; and, conversely, A could be alleged to mimick distanciation because of both the manner of articulation and the perceivable formant at conscious level (Arapu 1988). Yet this kind of analogy seems improbable, difficult to demonstrate, and will not apply to all sounds since only the most extreme sounds like I and A display such an obvious connection between the features of the sounds and those of the semantic processes that may be derived from them.

The latter wording may be the key to understanding the true nature of the process: it is not the sound that is selected on account of its capacity to mimick a cognitive process, but, on the contrary, the cogneme itself whose very pattern is derived from that of the production of the sound. If I rests on a neural program consisting in performing a connection between two articulators, the cogneme that may be derived from it is a semantic procedure consisting in generating the same type of conjunction between two semantic entities which have replaced the articulators. My current interpretation of the phenomenon is therefore that cognemes are a kind of semantic software derived from a phonological one, at least when they originally came into existence. Once the semantic programs stabilize, their attachment to the sounds which generated them becomes unnecessary. Some languages opt to maintain some degree of cohesion between the sound and the structuring of sense but it is theoretically possible that this relation becomes entirely bleached. Spanish seems to have retained residual traces of the phenomenon in linguistic functions of exceptional relevance an sensitiveness for that matter, like the expression of spatial location, which happens to be based on computing relations of assimilation and dissimilation. An intermediate situation is to be found in English, in which major phonological changes such as the Great Vowel Shift have widened and diversified the gap between the properties of current sounds and those of the cognemes which were derived from their original counterparts in more primitive versions of the phonological system. That is the reason why a cogneme like I for junction may be displayed by a whole range of phonemes determined by syllable structure and stress patterns: *I, this, be* all bear the same cogneme under various semiological manifestation. The derivation of the cogneme from the sound is an historical phenomenon which occurred at a given moment of the history of human cognition, which may then be followed by an alteration of the link between sound and sense which does not affect the semantic side of the stabilized cogneme.

Concerning I and A, these vowels are known to be the extremities of the vocalic triangle which encompasses all phonological systems in the languages of the world and therefore constitutes a universal, even if there exists an infinite variety in the ways in which Is and As may adjust to the rest of one phonological system as it grows ever more complex. This universal trait need not imply that all languages descend from just one mother tongue as Ruhlen would have it: if the vocalic triangle is motivated by biological constraints, so are the cognemes that may be derived from its poles, so the same semantic procedures may have evolved in different places at different times just because this natural cognitive phenomenon remains universally available for further development and renewal. Thus the theory of cognemes does not confirm Ruhlen's hypothesis even if it is not incompatible with it: the derivation of semantic patterns from sound production is compatible with a polygenetic view of the origins of language. If we are to disentangle the

question of the origins of cognemes, the first thing to do is to dissociate it from that of the origins of language itself.

The theoretical interest of this model is that it dramatically reduces the cost of cognematics and predicts the kind of situation which is actually observed in the languages of the world: as I and A are available starting blocks for deriving cognemes, the latter may emerge sporadically at any time and in any place in human language, but need not do so or may become historically concealed as capricious phonological systems drift away from them, so that the phenomenon is both sporadic and universal: relatively exceptional in its most spectacular occurrences, but remarkably and abnormally consistent if one is to invoke fortuitous coincidence. Let us now turn to other similar cognemes in the Spanish language.

### 3.2. R, S and T

In the case of English the S/T alternation in grammatical morphemes is rooted in the present / past dichotomy. If formulated in these terms, this system is not to be found in Spanish in the conjugation of the *imperfecto* (imperfect) and of the *pretérito definido* (simple past). However T is to be found in the voiced form /d/ in the past participle which is derived from the latin form: *-atus* > *-ado*, *cantado* and in other operators dealing with other forms of completion like *todo* (total inclusion) and *nada* (total exclusion). S and T share the same place of articulation and are differenciated by their modes of articulation, with /s/ bearing the trait of continuity and /t/ that of plosivity, which is to say, discontinuity. In cognemic terms, the procedural instructions derived from them are respectively [CONTINUE] and [DISCONTINUE] the process to which S and/or T are applied.

The case of R is trickier as this graphemic consonant coincides with an extremely versatile bunch of consonants in the various phonological systems, but there is some reason to assume that primitive R is systematically apical as in Spanish and English (albeit in very different ways), which places it in the same position as S and T. In this system, R, S and T correspond to three different ways of treating the air flow in the same position. In substance, R consists in posing an obstacle on the direct path of the air flow, so that the latter has to be forced out by raising the air pressure and a lateral deviation. The interaction can be made sonorous by a movement of the tongue (Spanish *erre*) or by the use of the mouth as a resonating cavity (American dark *r*) but the physiological undertaking is the same: one way or another the speaker makes it heard that an effort is required to propel the air out of the oral tract, with the tongue interposing itself as an obstacle. The resulting cognitive reinvestment of this physiological procedure encodes an instruction of launching or initiating a process, of making an effort to trigger an event, in one word an impulsion. The system is thus complete, with R encoding [IMPULSE], S for [CONTINUE] and T for [INTERRUPT].

For this reason occurrences of grammaticalized R in Spanish (and in Romance languages in general) are commonly associated with the notion of potential agentivity. This concerns the infinitive in the first place: the infinitive verb phrase *cerrar la puerta* invites the hearer to construct a representation of an event, (to) close the door, in which the specification of a specific agent is missing. Hypothesizing a core value for infinitival *-r* is all the more legimate if one relates this with other studies which have consistently insisted on the relevance of vowel alternations in the infinitive of romance verbs such as *-ar*, *-er* and *-ir* in Spanish (Tobin 1993): a variable marked by a vowel is set against a constant marked by a consonant. In

*cerraR la puerta*, R stands for the virtual agent which is substituted for the actual one which could have been instanciated by a specific subject: *Juan cierra la puerta* "Juan closes the door"; the subject *Juan* forefronts one unit extracted from the paradigm labelled by R. R of potential agentivity is not incompatible with the mark of an actual agent unless it is distanced by A, in which case it implies mere futurity: Juan *cerrará* la puerta. Futurity may be virtualized in its turn by retracting word stress to the previous syllable: *antes de que Juan cerrara la puerta* "before Juan closed the door". This form of the subjunctive is essentially a virtualized future, one that the speaker has given up looking forward to, unlike the rival *se*-ending form (*cerrase*), which expresses a hypothesis motivated by contextual determinisms and therefore deserving to be considered more seriously :

(5) Supongamos que la artesa oceánica estuviera dividida por una colina o por una cresta, de forma que determinase una cuenca polar y otra ecuatorial.

(5') Let us imagine that the ocean basin is divided in two by a range of hills or a crest which separates a polar trough from an equatorial one. (literally, "in such a way that it determines a polar trough and an equatorial other one").

(6) Es casi seguro que Venus fuese humedo durante su formación, pero su superficie esta ahora completamente seca.

(6') It is almost certain that Venus was humid at the time of its formation, but its surface is now completely dry.

The same effect is obtained when *–ra* anaphorizes a preconstructed hypothesis out of which *–se* extracts a new one on which the speaker draws the hearer's or reader's attention :

(7) Suele hacerse referencia a los cometas diciendo que son bolas de nieve cósmica sucia, mitad hielo y mitad polvo. Christopher F. Chyba estima que bastaría con que el 25 por ciento de los cuerpos que chocaran con la Tierra durante ese período final de máximo bombardeo fuesen cometas para que hubiesen aportado toda el agua de los modernos océanos.

(7') Comets are usually regarded as cosmic balls of dirty snow, half ice and half dust. According to Christopher F. Chyba, it is required that only 25 per cent of the bodies which collided with the Earth during the final period of intense bombardment be comets to have imported all the water of the oceans we know.

In Romance language R is also commonly used in adjectival and nominal suffixes to imply potential or virtual agentivity or its weaker version, the [animate] feature. Added to a past participle, R refers the result of a process to a potential agent: *calentador* "heater", *bienhechor* "benefactor" (with the same construction: past participle *fact-* + R). In the same ways, words in *–ero* refer to professional agents producing the object mentioned in the radical: *panadero* "baker", *cocinero* "cook". In this construction one must distinguish the mark of potential activity (R) from the gender suffix (*o/a*) which implies a person of the masculine or feminine sex and refers an actual agent to the principle of activity fixed by R; this double mark of person makes it possible to distinguish the actor from the function. To prove the point, if one deletes the final *o/a* alternation to replace it by *–ía*, one obtains *panadería* "bakery" (when such a manipulation is relevant) which retains

the expression of the function associated to the virtual generic agent, R, while replacing the mark of the specific actor (o/a) by another suffix referring to the site of the activity.

In nouns like *calor* "heat", *amor* "love", *esplendor* "splendour", *-or* typically involves a virtual agent as the one who perceives the property in question, whether it is to be found within a human person (*amor*) or outside (*calor*). In French a whole gamut of suffixes express different shades of meaning (*chaleur, froideur* / *froidure, amour*): *-ure* merely poses the virtual agent as the subject of perception of the quality, without his or her passing any judgment or appreciation on it, so that there only remains the trait of duration (*froidure*); *-eur* adds a modal evaluation (and is thus connected with *-eux* / *-euse, -oso/a*): *chaleur*.

The suffix *-ar* involves a virtual non human agent in an adjective: *la energía solar* = the energy produced by the sun; *la fuerza muscular* = produced by the muscle. This may explain apparent irregularities in the distribution of suffixes in one given languages and also the lack of parallelism between two correlated idioms. *La energía solar* is *l'énergie solaire* in French and *the solar energy* in English, but la energía *eólica* is *l'énergie éolienne*, "eolian / wind energy" : Spanish uses the suffix *–ico* which is used for marking an abstract class or category of objects, whereas French uses *–ien* which designates the geographic or conceptual frame of an entity (*Italien*: that which belongs to Italy; *divin, divino, divine*: that which belongs to God). Owing to cultural differences in literary traditions such as the *Eolian Harp* Eole has not come to be so commonly known as to allow the adjective *eolian* to be so popular and untechnical as *éolien* in French or *eólico* in Spanish. If no language has ever generated **eolar* or **éolaire* it is because the pagan god mentioned in the radical is not presented as the agent generating the entitity under scrutiny, the energy. *Eolien* and *eolico* may refer to the same semantic class, but they do so following different mental paths (*framing* vs *classifying*): in theory **eolar* is not an impossibility as it would not be semantically irrelevant to view the god as blowing the wind, which is the case in pictorial representations indeed, but the rivalry between this way of depicting things and the preexisting ones is unproductive, almost unprofitable and has probably condemned **eolar* to lose the competition even before attempting to take part in it. *Alimentario* involves potential agentivity, as opposed to *alimenticio* (dictionaries consider them as purely synonymous); French only has *alimentaire*.

S instructs the hearer to [CONTINUE] the process to which it is applied.

The most obvious case is the plural of nouns: *perro* "dog" merely evokes a prototype, *perros* instructs the hearer to prolong the research of the referent until all possible occurrences have been covered. Whether this may be applied to the second person singular of verbs remains unclear.

The latin paradigm (in the singular) involves a three-step movement from a starting point, *amo* "I love", an intermediate position, *amas* and a final one, *amat* and the S/T alternation reflects the way in which the second and third persons are derived from the first one. This leads one to see a parallel between two ternary systems, that of aspect with the infinitive, the gerund and the past participle on the one hand, that of person on the other with the first, second and third persons, the latter taking a suffix relatively analogous to that of the past participle, a dental T. Many modern romance languages have eliminated the mark of the third person singular, breaking away from this parallelism in favour of a new order.

More marginally, S is used in to local subsystems: *ante* / *antes*, *quizá* / *quizás*. *Ante* is spatial and abstract, *antes* converts it into a temporal relation, in conformity with the core meaning of S. *Quizá* (meaning *maybe* or *perhaps*) expresses a lack of certainty affecting the validation of the predicative relation, hence the use of the subjunctive:

(8) Pero el éxito del alimento quizá provenga de otro elemento detectado en su composición : un aminoácido implicado en la creación de serotonina, neurotransmisor responsable de las sensaciones de felicidad.

(8') But perhaps the success of this food comes from another element detected in its composition: an amino-acid involved in the creation of serotonin, the neurotransmitter responsible for the sensations of happiness.

*Quizás* focalizes the very process corresponding to the uncertainty under scrutiny:

(9) Una idea que *servirá*, quizás, un día.

(9') An idea that might come in handy some day.

In both cases, S is used for validating at the moment of utterance the operation specified by the rest of the operator.

In Castilian S is frequently combined with T in grammatical morphemes. This cluster ST instructs the hearer to conduct a mental process (S) until its final limit (T): *desde* (*since*), *hasta* (*till, until*) and *justo* (*just*). *Desde* prescribes a mental path oriented toward an origin viewed as the final limit of the trajectory; *hasta* prescribes the same movement in the opposite direction; *justo* prescribes the hearer to mentally attain a threshold which is neither the beginning nor the end of a semantic domain and has to be defined in qualitative rather than topological terms.

A remarkable illustration of this alternation of S and ST in Castilian is provided by two parallel grammatical systems, that of the two verbs *be* on the one hand, that of the demonstratives on the other. The verb *ser* is used to aggregate a new property to the cluster of features which already constitute the notional prototype (or to introduce a new linguistic label for this property): *La nieve es blanca*, "snow is white". In referential semantics, the verb *ser* may seem to describe an immutable state of things, but in cognitive semantics, its real function is to enable the speaker to permanently modify the system of representation of the hearer around one specific notion. If you spontaneously say *la nieve es blanca* to the relevant person at the right moment, you will teach him or her something, that is to say, reorganize a local neural network. The verb *ser* has a heuristic value consisting in reshaping the set of features attached to the nominal notion. In contrast, the second verb *be*, *estar*, is a hermeneutic one: *la nieve está sucia, the snow is dirty*. In referential semantics, it is usually said that *está* expresses temporary states. In cognitive terms, *está* conveys an indicator that the property under scrutiny is to be discontinued and will not remain permanently attached to the prototype after the utterance concerning a specific referent. *Ser* modifies the notion, *estar* only affects the referent. Besides, *estar* is hermeneutic in so far as it can be understood only with reference to the bundle of core properties with which the momentary one is articulated: the fact that *la nieve está sucia* is remarkable because the snow is supposed to be white in the first place, white meaning clean and pure. This analysis includes some notoriously tricky examples such as

(10) La fiesta es en el barracón.

(10') The party is to take place in the parish hall.

*Estar* is used for locating permanent entities whose existence does not depend on spatial location, whereas in the case of *fiesta* we are dealing with a momentary social event which *by definition* takes place in a conventional place, so that if the predicate designates this location that is felt as belonging to the core properties of the subject, the verb *ser* has to be selected to indicate the modification of the properties of the *fiesta* in question, which is not the same *fiesta* if it occurs in the *barracón* or on the *plaza mayor*.

In very much the same way, demonstratives *ese* and *este* indicate respectively that the referent of the noun phrase is currently being defined (*ese*) or has already been so (*este*) and is merely being anaphorized:

> (11) Hace unos 4.400 millones de anos, durante las últimas fases de la agregación planetaria, sus superficies fueron bombardeadas por cometas y meteoritos condríticos como revela el registro de cráteres conservados sobre algunos de ellos. Ese bombardeo masivo fue enriquecedor ya que reintrodujo los volátiles que la presión de radiación del joven Sol habia expulsado con anterioridad a regiones externas del sistema solar. (…) En esas frías zonas exteriores los volátiles se agregaron en forma de hielos formando cometas. Estos cuerpos de baja densidad al ser atraídos gravitatoriamente hacia el sistema solar interior sembrarían los cuatro mundos con los compuestos volátiles de habrían de constituir sus atmósferas.
>
> (11') About 4,4 billion years ago, during the last stages of planet accretion, their surfaces were bombarded by comets ans chondritic meteorites as is evidenced by the record of craters that remain on some of them. This massive bombardment diversified their composition as it reintroduced the volatile chemicals which had been previously expulsed towards the outer part of the solar system. (…) In these cold exterior areas the volatiles accreted into ice, forming comets. Those low-density bodies were attracted by gravitational force towards the inner solar system, spraying the four worlds with the volatile components which were to make up their atmospheres.

The first sentence introduces the event in the form of a verb (*fueron bombardeadas*), the second one transforms it into a conceptual category which receives a more detailed definition (*masivo*). Indeed, the feature *masivo* had not been mentioned in the previous sentence and is introduced to modify the core properties of the bombardment so that the reader is left with the notion of a bombardment that entails the property of massiveness among its prominent characteristics (*es un bombardeo masivo* > *ese bomabardeo masivo*). The same holds true for *esas frías zonas exteriores*, which adds *frías* among the core features of *zonas exteriores*. Conversely, in *estos cuerpos de baja densidad*, the notion of *baja densidad* does not add any new piece of information since this property can be inferred from the previous sentence *los volátiles se agregaron en forma de hielos*: consciously or not, the writer of the article considered that his reader was competent enough to correctly interpret the link between the two assertions; another strategy would have been to ignore this link (*esos cuerpos de baja densidad*) and conceal the cause-to-effect relation. The following excerpt provides more examples of this alternation:

> (12) **La época de los impactos masivos.** Una vez completada la acreción de los cuatro mundos interiores, parte del material restante se encontraba formando cuerpos de diferentes tamaños (algunos incluso de las dimensiones del Marte actual), cuyas órbitas cruzaban las de los planetas recién formados. Debido a esas órbitas intrusivas, las colisiones de estos

> cuerpos sobre los planetas interiores fueron habituales en esa época denominada « el gran bombardeo ».
>
> (12') **The age of the massive impacts.** Once the accretion of the four inner worlds had been completed, a part of the remaining material continued forming bodies of various sizes (some of them as large as Mars as it is today) with orbits crossing those of the newly-born planets. As these orbits were intrusive, collisions between those bodies and the inner planets were frequent at this epoch known as "the big bombardment".

*Ese* and *ser* both provide heuristic definitions of the object, *este* and *estar* both presuppose that the core definition is already given and remains unaltered. This semantic common denominator is displayed in morphology by the relative morphological similarity of these operators. This strategy of transparency is motivated by an attempt at inscribing in the form of abstract grammatical operators sub-indicators which provide specific instructions to the hearer about how to reconstruct the abstract relations selected by the speaker.

**N**

In initial position in grammatical morphemes, N habitually deals with negation: *no* "no", *ni* "neither", "nor", "not (even)", *nada* "nothing", *nadie* "no one", *nunca* "never", *ninguno* "nobody". The same phenomenon is to be observed in many Indo-European languages. In previous studies I have defended the idea that N also serves the expression of negation when it appears in the coda of the monosyllabic grammatical morpheme as in the indefinite article *an* (*an apple*), the preposition *in* (*the man in the street*) or *on* (*the book on the table*), a few germanic past participles (*driven, shaven*), the nasal infinitive of German (*singen*), the *–ing* verbal flexion, and so on.

The general trend is that when N instanciates the onset of the syllable, it openly categorizes the operator in the field of negation. When it appears in the coda, it will apply a cognitive feature to the preceding cogneme or operator. In the case of *in* in English and latin, I instructs the hearer to merge the referents associated with the entities in presence (*the man in the street*), but N adds another instruction which is to reject or abort the notional merger that is made possible by the contact. If a speaker utters something like *the man is the street*, the notional fusion is made possible by I and validated by S, so that there is a predicative relation and the whole makes a sentence, which is not ungrammatical but semantically irrelevant. A simple way to lift this ban is to regulate the notional contact by aborting the merger it is bound to entail, which is the role of N, but then the predication is aborted too and the whole becomes a noun phrase which has to be embedded in a superordinate syntactic frame. The same analysis holds true for the indefinite article, *an* : if A is used as an operator of disjunction instructing the hearer to extract a sample out of a general category, negative N will restrict the extraction and prevent it from entailing that the sample is qualitatively different from the whole out of which it has been taken, and *an apple* remains perfectly representative of the general properties of the notion *apple* despite the singularizing effect the extraction might have.

The same kind of description is valid for several operators in Spanish, among which the indefinite article *un*, which I will leave aside[4] as its description would require the introduction of yet another vocalic marker, U; the preposition *en*, which is to be opposed to *es* in the same way as *in* contrasts with *is* in English; and, last but not least, the gerund, *cantando* "singing". The dental suffix of the past participle *cantado* "sung" is indicative of a process of interruption, from which the notion of perfectivation stems. If one considers the term *imperfect*, one will see that the notion of continuousness is obtained negatively by prefixing a negative marker which indicates that the final limit has not been reached: *imperfect*, *imperfecto*, *inaccompli*, *infinite*, this construction is very common in grammatical terminology. My contention is that in latin *amans*, *amantis*, in French *chantant*, in Castilian *cantando*, the N that is inserted before the dental consonant is in fact a negative infix which literally and iconically indicates that the final limit fixed by the dental has not been reached. Therefore the N of *cantando* is the marker of the same cognitive operator as the ones that are found in *un*, *en* or *ni*, *no* and so on; they instruct the hearer to execute the same cognemic procedure, the one that consists in aborting the procedure targeted by N. The same construction is involved in *cuando* "when" (*-ando* applied to an unknown event, replaced by interrogative *cu-* "wh-") and probably *cuanto* "how much" and *tanto* "as much" (as opposed to *todo* "every", "all"), *allende* "beyond" (*beyond* displaying the same *nd* too). In the lexicon *momento* and *mundo* fall into the same category and *tiempo* "time", *siempre* "always", *temprano* "early" are potential candidates. The distinction between *cu-* and *t-* as in *cuan* "how" (+ adjective) and *tan* "so" (+ adjective), *cual* "which" and *tal* "such" is on a par with the *wh-* / *th-* distinction in English, *w-* / *d-* in German etc. (cataphora vs anaphora).

If the notion of interiority and inaccomplishment are both built around a negative procedure, it comes as no surprise that in many indo-european languages the corresponding operators are virtually homophonous: *to be in command*, *to be commanding*; *en chantant*; *le danger dans la maison* ("the danger in the house"), *le péril en la demeure* ("peril at home").

The Spanish language possesses many other operators involving the same combination of a dental preceded by a nasal and involving inaccomplishment:

*-miento (derrumbamiento)* « collapse » (noun)
*-mienta (herramienta)* « tool »
*-mente (felizmente)* « happily »
*-ienda (una vivienda)* « place where one lives »
*-encia (la convivencia)* « coexistence », « living together »
*-ante (interesante* „interesting", *espeluznante* „hair-raising", *presente* „present"*)*
*-ente (urgente* „urgent"*)*
*-ento (momento* „moment"*)*

This model makes it possible to explain away the difference between *polvoso* (which is suggestive of dust), *polvoriento* (which emits dust) and *polvoroso* (which is suggestive of dust emission).

[4]The hypothesis of a nasal forming element common to no and un in Spanish was originally formulated by Molho 1988 in guillaumean terms: " (…) *n signifierait un positif entendu dans un champ de négativité" (p.300).

**M**

The last cognemic morpheme to be mentioned in this study is M. M is involved in the representation of the first person, the speaker (Bottineau 2006): *me* "me", *mi* "my", *mí* "me" (after preposition). It regularly appears in grammatical systems in which the speaker's subjectivity is strongly involved and plays a structuring role:

Measuring quantities: *muy* "very", *mucho* "much", "a lot (of)", *más* "more", *menos* "less" / "fewer"; cf. English *much, many, more, most*. To those, we may add *minimum* and *maximum* and all their corresponding forms in other languages.

Drawing comparisons: *como* « as », « like », *mismo* « same », « -self », *semejante* "such", *mientras* "as", "while", "whereas", *-mente* "-ly" (adverbial).

In Germanic languages, the modal auxiliaries which emphasize the speaker's responsibility in the computation regularly mark this component by M: *may, might* and *must*, not to mention *mood* and *modal, modality* and other suffixes (*-ism* to establish a concept, *-ist* to refer it to a person). I have devoted one specific study to this operator and another one to N.

## Conclusion

The general theory to be drawn out of this brief overview is that there exists a universal tendency to draw units of cognitive procedures or *cognemes* which is manifest in languages of different types and families, among which Spanish is fairly well represented even if the system is not so systematically implemented as in English or in Basque, which is probably the most spectacular example of the phenomenon I have encountered so far, along with Japanese. Marking cognemes in morphology aims at providing the sendee of the message with a set of instructions about how to reconstruct the abstract relation induced by a grammatical operator, a problem which is not raised by lexical units, which refer to memorizable prototypes. The derivation of cognemes from sound patterns seems to be consistently available but is probably not necessary, it is one strategy which some language types favour more than others.

Moreover we have only mentioned the case in which cognemes are derived from phonemes, but in fact the same process can take its source in any systematic and stable acoustic segment of the utterance, which includes tonemes, prosodemes and syntactemes. In Spanish, for example, forefronting an adjective creates between it and its substantive the same kind of relationship as between a substantive and an article: syntatic inversion is indicative of a preexisting program that leaves no room for improvisation and leads to categorization; in English, any rising tune, no matter if it is to be found in the head or in the nucleus of the tone unit, even if it is part of complex tunes such as the fall-rise or the rise-fall, will indicate that somehow the information is incomplete, raising a question that calls for an answer, which is to come from within or outside the current utterance. Recurring syntactic and intonational patterns may also support cognemic derivation, and the way in which a given language or linguistic type focusses on cognemizing one type of acoustic pattern rather than another reveals its position and historically developed strategy in what should be known as general cognitive typology.

This model is compatible with both a mono- or polygenetic conception of the origins of language and therefore does not provide any decisive argument for or against Ruhlen's hypothesis, but it strongly militates in favour of a naturalistic approach of linguistic and cognitive phenomena. And, unexpectedly enough, it points

towards a possible indirect biological anchoring of cognitive and linguistic functions. For more conclusive results, all this investigation is to be continued.

## Bibliography

Adamczewski, H. & Delmas, C. (1982), *Grammaire Linguistique de l'Anglais*, Colin, Paris.

Arapu, D. (1988), « Eléments de symbolisme dans l'expression morphologique », *Bulletin de la société de linguistique de Paris*, LXXXIII (compte rendu de l'exposé de la séance du 12 décembre 1987).

Austin, J.L. ( 1962), *How To Do Things With Words* (Oxford: Clarendon Press).

Bateson, G. (1979), *Mind and Nature, a necessary unity*, Bantam.

Benveniste, E. (1939), « Nature du signe linguistique », *Acta Linguistica, I,* Copenhagen, reprinted in (1966) *Problèmes de linguistique générale, 1*, Gallimard, 49-55.

Bergen, B. K. (2004), "The psychological reality of phonæsthemes", *Language, 80, 2,* 290-311.

Bohas, G. (2006), "The organization of the lexicon in Arabic and other semitic languages", in Boudelaa, S. (ed.), Perspectives on Arabic Linguistics XVI, Papers from the sixteenth annual symposium on arabic linguistics, Cambridge, March, 2002, John Benjamins Publishing Company, Amsterdam/Philadelphia, 1–37.

Bottineau, D. (2002), « Les cognèmes de l'anglais : principes théoriques », LOWE, R. (dir.), en collaboration avec PATTEE, J. et TREMBLAY, R., *Le système des parties du discours, Sémantique et syntaxe, Actes du IXe colloque de l'Association internationale de psychomécanique du langage,* Les Presses de l'Université Laval, Québec, Canada, 423-437.

Bottineau, D. (2003a), « Les cognèmes de l'anglais et autres langues », Ouattara, A. (éd.), *Parcours énonciatifs et parcours interprétatifs, Théories et applications, Actes du Colloque de Tromsø organisé par le Département de Français de l'Université, 26-28 octobre 2000*, Ophrys, Gap, France, 185-201.

Bottineau, D. (2003b), « Iconicité, théorie du signe et typologie des langues », MONNERET, Ph. (dir.), *Cahiers de linguistique analogique, no 1 – Juin 2003, Le mot comme signe et comme image : lieux et enjeux de l'iconicité linguistique*, Association Bourguignonne d'Etudes Linguistiques et Littéraires (ABELL), Dijon, 209-228.

Bottineau, D. (2003c), « De la linguistique à la traductologie : remarques sur les suffixes *–y* et *–ous* et leurs traductions françaises », BALLARD, M. & EL-KALADI, A., *Traductologie, linguistique et traduction*, Artois Presses Université, Arras, France, 73-82.

Bottineau, D. (2004), « Le problème de la négation et sa solution dans la langue anglaise : le cognème N », DELMAS, C. & ROUX, L., *La contradiction en anglais, C.I.E.R.E.C. Travaux 116*, Publications de l'Université de Saint-Etienne, 27-53.

Bottineau, D. (2005), « Prédication et interaction cognitive en basque », François, J. & Behr, I., *Les constituants prédicatifs et la diversité des langues, Mémoires de la Société de Linguistique, XIV*, Peeters, Louvain, 97-132.

Bottineau, D. (2005), « Périphrases verbales et genèse de la prédication en langue anglaise », Le Querler, N. & Bat-Zeev Shyldkrot H. (dir.), *Les périphrases verbales, Lingvisticæ Investigationes Supplementa 25*, Benjamins, 475-495.

Bottineau, D. (2006), « Le cognème <M>, marque linguistique de la présence de l'auteur dans les grammèmes anglais », BANKS, D. (éd.), *Les marqueurs linguistiques de la présence de l'auteur*, L'Harmattan, 143-164.

Bottineau, D. (2007), « Language and enaction », Stewart, J., Gapenne, O. & Di Paolo, E. (eds), *Enaction: towards a new paradigm for cognitive science*, MIT, in press.

Bourgine, P. & Stewart, J. (2004), "Autopoiesis and Cognition", *Artificial Life* 10, 327–345.

Bybee, J. (1985), *Morphology*, Benjamins.

Cadiot, P. & Visetti, Y.-M. (2001), *Pour une théorie des formes en sémantiques, motifs, profils, thèmes*, PUF, Paris.

Chastaing, M. (1958), « Le symbolisme des voyelles : signification des 'i' » I & II, *Journal de Psychologie*, 55, 403-23 & 461-81.

Chastaing, M. (1960), « Audition colorée : une enquête », *Vie et langage*, 105, 631-7.

Chastaing, M. (1961), « Des sons et des couleurs », *Vie et langage*, 112, 158-65.

Chastaing, M. (1962), « La brillance des voyelles », *Archivum linguisticum*, 14, 1-13.

Chastaing, M. (1964), « L'opposition des consonnes sourdes aux consonnes sonores et muettes : a-t-elle une valeur symbolique? », *Vie et langage*, 147, 367-70.

Chastaing, M. (1965a), « Dernières recherches sur le symbolisme vocalique de la petitesse », *Revue philosophique*, 155, 141-56.

Chevalier, J.-C. (1980), « Mot et sens du mot », Joly, A. & Hirtle, W. (eds), *Langage et psychomécanique du langage, Etudes dédiées à Roch Valin*, Presses de L'Université de Lille, Presses de L'Université Laval - Québec, 75-86.

Chevalier, J.-C., Launay, M. et Molho, M. (1984), « La raison du signifiant », *Modèles Linguistiques*, 6/2, 12, 27-41.

Chevalier, J.-C., Launay, M. et Molho, M. (1986), « Pour une linguistique du signifiant », *Actes des Colloques de Linguistique Hispanique 1*, 95-99.

Cotte, P. et al., *Les théories de la grammaire anglaise en France*, Hachette, 1993.

Coursil, J. (2000), *La fonction muette du langage*, Ibis Rouge Éditions, presses Universitaires Créoles, Guadeloupe.

Culioli, A. ([1981] 1990), « Sur le concept de notion », *BULAG no8*, repris dans *Pour une linguistique de l'énonciation, t.1 : Opérations et représentations*, Ophrys.

Curat, H. (1991), *Morphologie verbale et référence temporelle en français moderne*, Droz, Genève.

Danon-Boileau, L. (1983), « *This, that, which, what* et la construction de la référence », *Travaux du CIEREC XXXIX, Méthodes en linguistique anglaise*, Université de Saint-Etienne.

Danon-Boileau, L. (1991), « De quelques préjugés relatifs à l'usage des notions de motivation et d'iconicité », *Faits de langues, 1, Motivation et iconicité*, PUF, 79-87.

Darbord, B. (1994), « Sur le contenu de la forme en *ra* en espagnol et en portugais », *Actes des Colloques de Linguistique Hispanique* 5, 313-323.

Davis, J., Gorup, R. J. & Stern, N. (Eds) (2006), *Advances in Functional Linguistics, Columbia School beyond its origins*, Studies in Functional and Structural Linguistics 48, John Benjamins.

Delmas, C. (1987), *Structuration abstraite et chaîne linéaire en anglais contemporain*, Klincksieck.

Dennett, D.C. (1991), *Consciousness Explained.* Boston: Little, Brown and Co.

Dessalles, J-L. (2000), *Aux origines du langage - Une histoire naturelle de la parole*, Hermès, Paris.

Diver, W. (1979), "Phonology as human behavior," in D. Aaronson and R. Rieber (eds.), *Psycholinguistic research: implications and applications.* Hillsdale, N.Y., Lawrence Erlbaum Assoc., 161-182.

Douay, C. (2000), *Eléments pour une théorie de l'interlocution, Un autre regard sur la grammaire anglaise*, Presses Universitaires de Rennes.

Duchet, J.-L. (1990), « Arbitraire et motivation dans le lexique et la morphologie de l'anglais », ROUX, L. (ed), *L'organisation du sens, domaine anglais, Recueil en l'honneur de Jean Lavédrine, Travaux du CIEREC*, LXVIII, 57-66.

Edelman G. (1989), *The remembered present: a biological theory of consciousness*, Basic Books, New York.

Engler, R. (1962), « Théorie et critique d'un principe saussurien. L'arbitraire du signe », *Cahiers Ferdinand de Saussure*, 19, 5-66.

Engler, R. (1964), « Compléments à l'arbitraire », *Cahiers Ferdinand de Saussure*, 21, 25-32.

Erard, Y., « De l'énonciation à l'enaction. L'inscription corporelle de la langue », *Cahiers de l'Institut de Linguistique et des Sciences du Langage, n° 11, Mélanges offerts en hommage à Mortéza Mahmoudian, tome I et II.*

Feldman, J., & Narayanan, S. (2004). "Embodied meaning in a neural theory of language". *Brain and Language*, *89*, 385-392.

Firth, J.-R. (1930) *Speech*, London, Ernest Benn.

Fischer, O., & Nänny, M. (eds.) (2001), *The Motivated Sign : Iconicity in Language and Literature 2*, Benjamins, 249-276.

Fischer Jorgensen, E. (1978), « On the universal character of phonetic symbolism with special reference to vowels », *Studia linguistica*, 32, 80-90.

Fónagy, I. (1983), *La vive voix, essai de psycho-phonétique*, Payot.

Gallese, V., & Lakoff, G. (2005), The brain's concepts: the role of the sensory-motor system in conceptual knowledge. *Cognitive Neuropsychology*, *22 (3/4)*, 455-479.

Gardiner, A. H. ([1932] 1951), *The Theory of Speech and Language*, Oxford, Clarendon Press.

Gardner, H. (1985), *The mind's new science: a history of the cognitive revolution*. Basic Books, New York.

Genette, G. (1976), *Mimologiques*, Seuil.

Givon, T. (1994), "On the Co-evolution of Language, Cognition and Neurology". Paper for 10th meeting of Language Origins Society, Berkeley.

Grammont, M. (1933), *Traité de phonétique*, Delagrave, 377-424.

Gregory, R.L. (1976), *Concepts and mechanisms of perception*. London: Duckworth.

Guillaume, G. (1964), *Langage et science du langage*, Paris, Québec, Nizet/P. U. Laval.

Guiraud, P. (1986), *Structures étymologiques du lexique français*, Payot.

Heine, B. (1997). *Cognitive foundations of grammar*. New York: Oxford University Press.

Householder, F. W. (1946), « On the Problem of Sound and Meaning, an English Phonestheme », *World* 2, 83 sq.

Jacob F. (1970), *La logique du vivant*, Gallimard, Paris.

Jakobson, R. (1963), Essais de linguistique générale. Tome I : les fondations du langage. Paris : Editions de Minuit, 1963.

Jakobson, R. & Waugh, L. ([1979] 1980), *La charpente phonique du langage*, Minuit.

Jespersen, O. ([1922] 1933), « Symbolic value of the vowel i », *Linguistica*, College Park, Maryland, 283-303.

Keller, P.-H. (2006), *Le dialogue du corps et de l'esprit*, Odile Jacob, Paris.

Kemp, J. A. (1972), *John Wallis's Grammar of the English Language*, Longman.

Kravchenko, A. V. (2004), "Essential properties of language from the point of view of autopoiesis", http://cogprints.org/4008/01/PropertiesOfLanguage.pdf

Lakoff, G. & Johnson, M. (1999), *Philosophy In The Flesh: the Embodied Mind and its Challenge to Western Thought*, Basic Books.

Langacker R.W. (1987), *Foundations of cognitive grammar*. Stanford University Press, Stanford.

Lapaire, J.R. & Rotgé, W. (1993), *Linguistique et Grammaire de l'Anglais*, Presses universitaire du Mirail, Toulouse.

Larthomas, P. (1988), « Notes sur *ça*, *ci* et l'alternance *i*/*a* en français », *Grammaire et histoire de la grammaire, Hommage à la mémoire de Jean Stéfanini*, recueil d'études rassemblées par Blanche-Benveniste, C., Chervel, A. & Gross, M., Publications de l'Université de Provence, 271-9.

Launay, M. (1987), « Signe, signifiant, signifié : leçons de Saussure et de Guillaume » in Chevalier, J.-C., Delport, M.-F. et Vich-Campos, M. (éds.) (1987), *Mélanges offerts à M. Molho. III : Linguistique* - Fontenay-aux-Roses, ENS, N° spécial de *Les Cahiers de Fontenay* (vol. 46-48),139-159.

Leroi-Gourhan A. (1964), *Le geste et la parole. I. Technique et langage. II. La mémoire et les rythmes*, Albin Michel, Paris.

Lieberman, P. (1991), *Uniquely Human: The Evolution of Speech, Thought, and Selfless Behavior*. Cambridge, MA: Harvard University Press.

Luquet, G. (1996a), "Un caso de motivación del signo lingüístico : oposición regular / irregular en la historia de los pretéritos indefinidos", in Alonso González, A. *et alii* (éds.) - *Actas del III Congreso Internacional de Historia de la Lengua Española* (Salamanca, 22-27 November 1993), Arco Libros, Madrid, 403-410.

Luquet, G. (1996b) – "Arbitrariness and Non-Arbitrariness in the Historical Evolution of Language" in Tollis, F. (ed.), *The Psychomechanics of language and guillaumism = LynX* (Valence et Philadelphie), 5, 154-157.

Luquet, G. (2004), La teoría de los modos en la descripción del verbo español. Un nuevo planteamiento, Madrid, Arco / Libros.

Macchi, Y. (1986), « Du rôle du signifiant dans la genèse du sens énonciatif », *Langages*, 82, 67-82.

Macchi, Y. (1991) « Halte aux manipulations sémiques : de la métaphore chimique en sémantique », *Modèles Linguistiques*, 13/1, 25 101-116.

Marchand, H. (1959), « *Phonetic Symbolism in English Word-Formation* », Indogermanische Forschungen, 64, 146-68, 256-77.

Markel, N. N. & Hamp, E. P. (1960-1), « Connotative Meanings of Certain Phoneme Sequences », *Studies in Linguistics*, 15, 47-61.

Maturana, H. (1978), "Biology of language: The epistemology of reality", in Miller, G., and E. Lenneberg (eds.), Psychology and Biology of Language and Thought: Essays in Honor of Eric Lenneberg, New York: Academic Press, 1978, 27-64.

Maturana H.R. & Varela F.J. (1980). *Autopoiesis and cognition: the realization of the living.* Reidel, Dordrecht.

Maturana H. & Varela F.J. (1987), *The Tree of Knowledge: the biological roots of human understanding*, Shambhala, Boston, London.

McNeill, D. (2005), *Gesture and thought*, Chicago & London: University of Chicago Press.

Molho, M. (1958), "Acerca de la evolución del grupo *-skl- -sl-* en romance", *Archivo de filología aragonesa*, 8-9, p. 63-71.

Molho, M. (1980), « Verbe et personne. De l'arbitraire du signe », *Cahiers de linguistique hispanique médiévale*, 5, 5-23.

Molho, M. (1986), « Grammaire analogique, grammaire du signifiant », *Langages, 82, Le signifiant*, 41-51.

Molho, M. (1988), « L'hypothèse du « formant » : sur la constitution du signifiant : esp. *un*/*no* », *Grammaire et histoire de la grammaire, Hommage à la mémoire de Jean Stéfanini*, recueil d'études rassemblées par Blanche-Benveniste, C., Chervel, A. & Gross, M., Publications de l'Université de Provence, 291-303.

Newman, S. S. (1933), « Further Experiments in Phonetic Symbolism », *American Journal of Psychology*, 45, 53-75.

Oudeyer, P.-Y. (2006), *Self-organization in the evolution of speech*, Oxford.

Peirce, C. S. [1894] "What is a Sign", In: Houser; Kloesel (eds). *The Essential Peirce*. Selected Philosophical Writings. Vol 2. (1893-1913), Indiana University Press.

Philps, D. (1997), « A la recherche du sens perdu : <sn->, du marqueur au mythe », *Anglophonia, 2, English Linguistics*, 209-38, Presses Universitaires du Mirail, Toulouse.

Philps, D. (2003), « L'invariance sub-lexicale et le marqueur », *Anglophonia / Sigma 14*, Toulouse : Presses Universitaires du Mirail : 177-193.

Reid, W., Otheguy, R. & Stern, N. (eds) (2002), *Signal, Meaning, and Message, Perspectives on sign-based linguistics*, John Benjamins.

Robert, S. (éd.). (2003), *Perspectives synchroniques sur la grammaticalisation*, Peeters, Louvain-Paris.

Robert, S. & Chapouthier, G. (2006), "The Mosaic of Language", *Marges linguistiques* – Issue N°11, May 2006 - M.L.M.S. Publisher, 160-166. http://www.marges-linguistiques.com - 13250 Saint-Chamas (France)

Rousseau, A. (2005), « La notion de « schème cognitif » en typologie des langues », in Lazard, G. & Moyse-Faurie, C. (eds), *Linguistique typologique*, Presses Universitaires du Septentrion, Villeneuve d'Ascq, France.

Salzen, E. A. (2006), "From Calls to Words : How ethology can bridge the divide", *Marges linguistiques* - Numéro 11, Mai 2006 - M.L.M.S. éditeur, 200-217, http://www.marges-linguistiques.com - 13250 Saint-Chamas (France)

Schmidely, J. (1988), "La *-y* de *doy*, *estoy*, *soy*, *voy*" in Ariza M., Salvador, A. et Viudas, A. (éds.), *Actas del I Congreso Internacional de Historia de la Lengua Española (Cáceres, 30 marzo-4 abril 1987)* Arco Libros, Madrid, I, 611-619.

Schogt, H. (1992), « Onomatopées, mots expressifs et la métaphore en phonétique », *Mélanges Pierre Léon*, Martin, P. (dir), Toronto, Mélodie, Canadian Scholars' Press et Didier Erudition, Paris, 463-71.

Shanon, B. (1993), *The Representational and The Presentational: An essay on cognition and the study of mind*. London: Harvester-Wheatsheaf.

Stewart, J. (1996). Cognition = Life : Implications for higher-level cognition. *Behavioural Processes* 35: 311-326.

Studdert-Kennedy, M., & Goldstein L. (2003). Launching language: the gestural origin of discrete infinity. In M. H. Christiansen & S. Kirby (Eds.), *Language evolution* (pp. 235-254). Oxford: Oxford University Press.

Talmy, L. (2000), *Toward a Cognitive Semantics, volumes I and II,* MIT Press.

Tobin, Y. (1993), *Aspect in the English Verb*, Longman.

Tobin, Y. (1997), Phonology *as human behavior: Theoretical implications and clinical applications*. Durham & London: Duke University Press.

Tollis, F. (1998a), « À propos de la prétendue "négativité" de *algún* » in *Estudios en honor del Profesor Josse de Kock*, Leuven University Press, 519-528.

Tollis, F. (1998b), « Le couplage analytique des morphèmes en */un/-* et en *-/l/-*, vu de l'espagnol » in Leeman, Danielle, Boone, Annie *et alii*, *Du percevoir au dire. Hommage à André Joly*, L'Harmattan, Paris :, 132-145.

Toussaint, M., (1983), *Contre l'arbitraire du signe*, Paris, Didier.

Varela F., Thompson E. & Rosch E. (1993*). The Embodied Mind: Cognitive Science and Human Experience*. MIT Press, Cambridge.

Viel, M. (1993), « L'opposition i-æ en anglais : ordre des voyelles, ordre des mots, iconicité », *L'ordre des mots II - Domaine anglais, CIEREC, Travaux LXXXI*, 181-193, Saint-Etienne.

Vygotsky L.S. (1962), *Thought and Language.* E.Kaufamnn & G.Vakar, eds & trans., MIT Press, Cambridge.

Wallis, J. (1653). *Grammatica linguæ anglicanæ*. R.C. Alston (Ed.), Reprint 142 (1969). Menston: The Scolar Press.

Waugh, L. (1993), « Lexique : iconicité diagrammatique », *Faits de langues, 1, Motivation et iconicité*, PUF, 227-34.

Whorf, B. Lee. (1956), *Language, thought, and reality: selected writings of Benjamin Lee Whorf.*, Ed. J.B. Carroll, MIT Press, Cambridge.

Wilson, M. (2002), "Six views of embodied cognition". *Psychological Bulletin and Review*, 9(4), 625-636.

Ziemke, T. (2002), "What's that thing called embodiment?" in *Proceedings of the 25th Annual Meeting of the Cognitive Science Society*, Lawrence Erlbaum, 1305-1310.