

Peircean Semiotics and Text Linguistic Models

Paul van den Hoven

Utrecht Institute of Linguistics, Utrecht University, The Netherlands

Abstract: Text linguists do not pay much attention to the semiotics of Charles Sanders Peirce. That is unjust. This essay illustrates its significance. By means of Peircean semiotics three questions that relate to proposed cognitive models for text processing can be stated more precisely than currently done in the literature. The triadic character and the (in principle unlimited) connectivity make the Peircean semiotic model dynamic and adaptive. These dynamics and this adaptively are exactly what text linguistic models presuppose. A Peircean semiotics analysis can therefore elaborate some of the fundamental presupposing underlying these cognitive models.

1. Introduction

Semiotics—the study of signs—is an abstract discipline. That may give rise to a somewhat skeptical attitude towards the value of general semiotic analyses for more specific theories about more specific classes of signs, for example for text linguistic theories. What is the use of confronting specific text linguistic theories with general semiotic frameworks? A specific cognitive theory that regards the process of the interpretation of a verbal text may feed and inspire general semiotic theories, but what relevancy can be expected the other way around? Maybe such natural skepticism explains the minor attention that is given to general semiotics in text linguistics. In this study, however, we argue that a semiotic analysis may contribute to text linguistic theories in three ways. Firstly it may deepen our understanding of internal relations within text linguistic models. Secondly it may suggest relations between seemingly unrelated issues in text linguistics. And lastly it may uncover basic philosophical positions that are implied in the text linguistic theories.

Empirical observations show that readers of a verbal text make several mental representations of that text. In the literature this observation is usually explained referring to the theory of Van Dijk & Kintsch (1983). Their model is included as a standard model in the *Handbook of psycholinguistics* (Fletcher,

1994). In this model three representation types are theoretically distinguished. Elements of the text form are represented in a *surface model*; a reader remembers often—at least during a certain time period—some parts of the text verbatim. Also a more or less coherent representation of the propositions in the text is attempted by the reader in a *text based model*; a reader often remembers—at least during a certain time period—whether a proposition was present in the text or not. And a rich representation is formed in which the textual information is integrated with prior knowledge and beliefs, the *situational model*.

We can add to this that a reader often also makes a mental representation of the physical medium; he may remember the position of the text on the page, the font, the paper color, et cetera. An issue that is hardly dealt with in the literature that relies on the Van Dijk & Kintsch model is how we should understand that these seemingly very different representations do not give the reader an experience that he is involved in a series of separate cognitive activities. Apparently the material text—the printed piece of paper or the screen—triggers a series of processes that are tightly related. In section 3 we shall argue that Peircean semiotics can help us to understand these relations.

Quite a different issue seems to be how we explain that a text form is *re-*recognized and given a meaning from something that is *a priori* present in the interpreting cognitive system, but that the process of the attribution of meaning is far from a rigid and mechanical process. In other words, how can an interpreter attach meaning to a form on the basis of a *a priori* present (linguistic) knowledge but nevertheless be creative, reach a unique specification in its context that may differ from the *a priori* meaning? Here is no consensus in text linguistic research about the theory that explains this observation. The models proposed however all seem to combine an element of recognition with an element of specification, creation. The issue is how these two elements combine. In section 4 we shall illustrate how Peircean semiotics help to elaborate on this issue. As an example we discuss the conceptual integration theory of Fauconnier & Turner (2003). This is certainly not a generally accepted standard theory, but it is inspiring and widely used in a massive amount of current research.

A third issue that is somewhat marginalized in text linguistic theory is how (linguistic) knowledge develops through text interpretation. Language users seem to ‘learn’ from interpreting texts. It seems that *a priori* language knowledge can be changed by these processes. Words, sentence structures, text structures develop. To account for these observations conceptual integration theory assumes a feed back mechanism from integrated ‘new’ meanings to its components. But how can we explain that a cognitive (language) item is a ‘depository’ of such specifying, sometimes even amending experiences without making such item highly instable? In section 5 we shall elaborate on this issue,

inspired again by a model that is found in Peircean semiotics.

In the text linguistic literature these three issues seem rather unrelated. But from a semiotic point of view they are. Peirce's semiotic model accounts for the representation of the text as a *material object*, as a *text form*, as an *object for interpretation* and as an *integrated complex of meaning* as a series of logically related processes (section 3). The same Peircean model is able to account for the connection between a priori knowledge and creativity and flexibility (section 4). And the same model is able to account for the fact that a relatively stable system can nevertheless be dynamic and capable to incorporate learning processes (section 5). This illustrates our claim that a semiotic analysis suggests relations between seemingly unrelated issues in text linguistics.

Together this also illustrates our third claim, namely that a semiotic analysis uncovers basic philosophical positions that are implied in the text linguistic theories. We show that current text linguistic models clearly imply a stand in the fundamental semiotic debate between (Saussurian) structuralism and (Peircean) pragmatism. When on empirical grounds it has to be assumed that text interpretation is a flexible and creative process and when on empirical grounds it has to be assumed that text interpretation implies a series of related processes that all leave traces, then it is shown that a Saussurian semiotics does not satisfy these assumptions and that a dynamic Peircean model is presupposed in these theories.

2. Peirce's cognitive semiotics

According to the philosopher and semiotician Charles Sanders Peirce (1839—1914) we live in a reality that we can only interpret through signs. A sensory stimulus can become a meaningful perception if and only if it matches sufficiently with a (mental) sign. To attach meaning to a form is to relate this form to (generalized) former experiences and therefore to project these former experiences on the future (Rosenthal, 2004). To attach meaning is to know what you can expect on the basis of learned experiences (Philström, 2004, 36v). Memories as well as expectations are therefore part of the process of interpretation which makes that process fallible and debatable. This distinguishes interpretation from immediate perception. A sign is in this theory a cognitive item that makes it possible to attach a hypothetical meaning to a new situation on the basis of generalized past experiences.

This cognitive 'interpretation' of the concept of a sign may surprise readers who are more familiar with Peirce's ontological project than with his 'logical' project. Is our 'interpretation' entirely according to Peirce? We think it is. For many terms that Peirce uses one can find a number of definitions in his work. Marty (sa) for example explored the primary sources and found more than 76

definitions of *sign*. Clearly in many of these definitions *sign* (sometimes *representamen*) refers to a cognitive notion, as do many other concepts in Peirce's work. Peirce himself uses the word *logical* where we nowadays often would use *cognitive* (Kattenbelt, 1994).

We are convinced that our cognitive 'interpretation' is implied in Peirce's *logical* project. For Peirce the ontological and the logical project are related. In the ontological project sign refers to the material object that stands for something else. The traffic sign stands for an instruction (symbol), the foot print stands for the presence of the culprit (index), the picture of a chair stands for the chair (icon). When we point to the picture of a chair an interpreter will tell us "That is a chair" in stead of "That is a picture". This ontology implies a cognitive logic. The interpreter approaches the material object (the painted iron plate, the picture, the text) from a mental category, a mental sign. The mental sign activates a mental object traffic sign, chair, story (compare Short 2004 for the development of Peirce's theory of the *thought-sign*). An elaborated Peircean *cognitive* semiotic model is—as we shall argue-presupposed in text linguistic models.

3. A series of related processes

"It is an intriguing story, although not so realistic and stylistically poor; but beautifully printed". A reader can formulate this evaluation of a text. His recognition of the text obviously concerns various aspects. But these different aspects are so tightly related that the reader can refer to them with one single "it". *It* has been interpreted as a narrative and is qualified as intriguing. *It* has been related to knowledge of the world and is qualified as not so realistic. *It* has been interpreted as a stylized form resulting in an evaluation as poor. And it has been interpreted as a material object which results in an evaluation as beautifully printed. We can recognize the three representation models from the Van Dijk & Kintsch theory (respectively the text based, the situational and the surface model) completed with a material model. Numerous studies rely on this theory (compare for example two recent text linguistics dissertations and their references: Kamalski, 2007, Mulder, 2008). But what are the relations between these distinguishable representations? What explains that a reader does not get a perception that he makes a series of separate interpretations?

Peircean semiotics helps to account for this. His cognitive semiotic theory—based on strong independent arguments—assumes that each semiotic process is a sequence of related iconic, indexical and symbolic cycles. Partly Peirce's arguments are fundamental, based on his general theory about firstness, secondness and thirdness that underlies his entire thinking. But more specific arguments can be given, supported by empirical observations. In this section we

shall develop these arguments for a simple example. We do not claim that this example can be transferred to complicated processes of text interpretation just like that, without raising many interesting problems. But we do claim that the three cycles always occur as a sequence of *available simile*, *attached experience* and *formed habits*.

Suppose an interpreter is confronted with:

茶

For many non-Chinese interpreters this is a rather alienating form. By alienating we mean that it tends to disorder the devices for text interpretation, to say the least. This makes the interpreter aware of the fact that he *re*-cognizes a (Chinese orthographic) form. A set of five groups of black pixels on a white sheet of paper turns out to be a nameable *form*. This is not explained by theories about immediate sensory perceptions, nor by psychological theories about the recognition of basic forms such as the Gestalt theory. To explain this *re*-cognition that evidently involves processes of a ‘higher’ order than Gestalt *re*-cognition; we need to assume that a relation is construed between the sense impression and a *sign*, a generalization of past experiences, knowledge that precedes the process of interpretation.

This *iconic* semiotic cycle relies on resemblance. Similarity is construed between the sense impression and the *sign*. On the basis of this similarity an initial *object* is activated that—from former experiences—is associated with the form. If and only if the sensory impression satisfies a set of criteria that has been built from former experiences and that is connected with the concept of Chinese orthographic element, the *initial* object Chinese orthographic element can be activated. Suppose that the only simile, the only sign available is associated with the initial object group of black dots, then only an initial object group of black dots can be activated. If the simile is available that is associated with the initial object form of the Chinese character cha, then the initial object form of the Chinese character cha can be activated. If no simile at all is available (hard to imagine) the consequence will be that in the world of the interpreter the ‘form’ does not exist! The interpreter is not able to isolate something as significant.

We speak about an *initial* object because in the Peircean theory the object is an element in a dynamic process. An activated initial object is the basis for a hypothesis about the (*iconic*) meaning of the form in this specific context. This hypothesis is tested against other active mental elements, resulting in an *interpretant*. If the initial object is adequate in the context the interpretant is similar to and confirms the object. This however is not necessarily the case (as we shall discuss in section 4) and can even render the object *dynamic* (as we shall discuss in section 5).

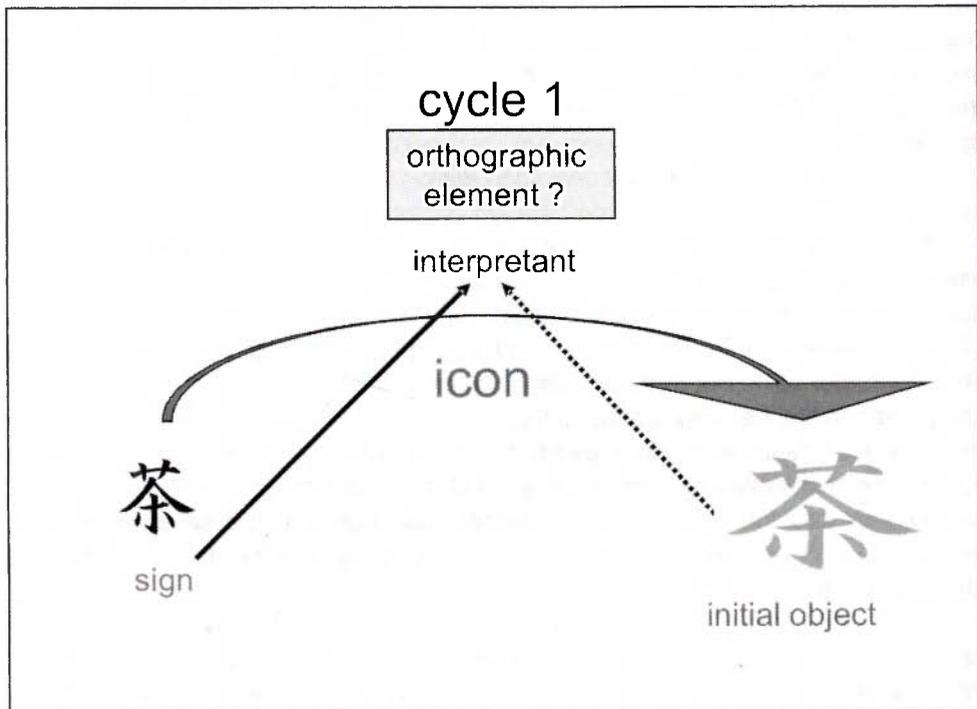


Fig. 1

According to Peirce, interpretation is an (in principle constantly) ongoing process of semiotic cycles. But there is a sequential logic in the process. The recognition of the sensory impression as an (orthographic) form itself is a sign that triggers a subsequent cycle. The iconic semiosis operates in a subsequent cycle as an *indexical* sign. The recognized form (icon) *indicates* one or more initial objects, on the basis of experience that the interpreter has about the world. Past experiences of an interpreter make that in his cognitive system smoke indicates fire, snow indicates slipperiness, and so on. A recognized orthographic form indicates for most interpreters—because they obtained this knowledge from their (educational) experiences, that this form is meant to represent some conventional meaning. An indexical relation exists between *being an orthographic form* and meant to be interpreted according to a specific code. That object form meant to be interpreted according to a specific code will be activated and that may equal the interpretant when it seems to fit in the specific context.

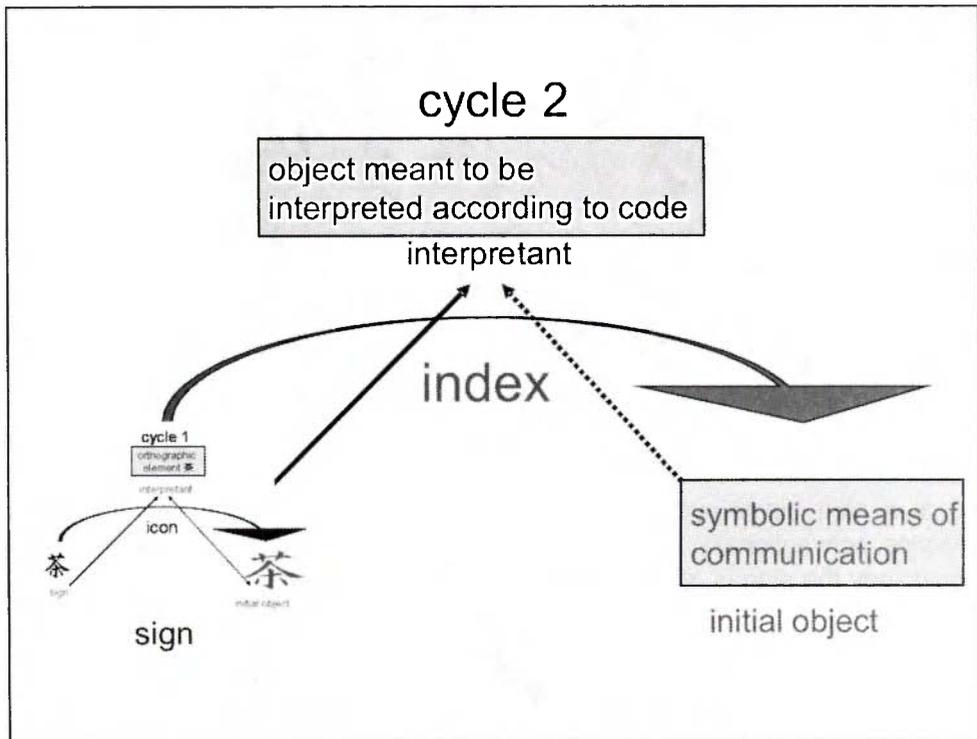


Fig. 2

Usually an interpreter will run this indexical cycle unconsciously. But not when the cycle is in some way 'disturbed'. A person who cannot read Chinese orthography can be confronted with such exuberant calligraphic forms that he begins to doubt. Although the forms resemble Chinese characters (iconic cycle) he is not sure whether these forms are still meant to be interpreted according to the code of the Chinese-Japanese orthography or that purely the esthetic value of the forms is at hand.



Fig. 3

On such a moment the interpreter awakes, becomes aware of this indexical cycle.

In a next, third cycle this indexical semiosis becomes a sign itself that activates conventionally associated initial objects, learned habits. In Peirce's terminology the sign is *symbolically* related with these initial objects.

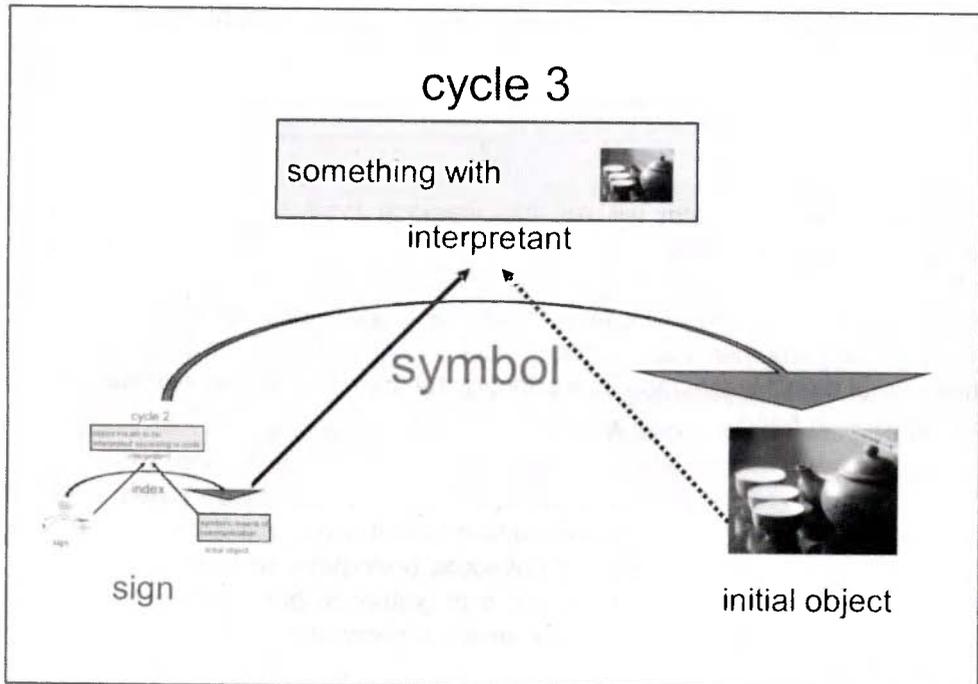


Fig. 4

We use here for the initial object  and for the interpretant *something* with  to indicate that a 'concept' is activated here, not necessarily a name, and certainly not necessarily an English name. But of course for many interpreters also a name will be activated in a symbolic cycle, together with possibly many other elements that are part of this symbolic relation. The symbolic initial object is the set of habits that an individual has formed, associated with the indices that are related to the icon. We come back on this in section 5.

This example is a simplified analysis of the semiotic process of form recognition. One form can trigger several sequences of semiosis and there is no reason to assume that the process stops after three cycles. Peircean cognitive theory can account for this as well as for relations between the sequences.



Fig. 5

These two interconnected forms can get a meaning as *orthographic forms* through a sequence of iconic, indexical and symbolic cycles as described above. Simultaneously these forms may be *re-cognized* in their calligraphic quality. Starting with an iconic cycle based on similarity these forms may be placed in a specific calligraphic tradition. Or they may be recognized as an indication for a specific mood of the calligrapher. But again, this strongly depends on the signs to which the interpreter is made available. Many interpreters miss all knowledge to recognize these black streaks in any calligraphic quality. A semiotic sequence that starts from the re-cognition of specific similarities to prototypical *calligraphic* icons differs clearly from a semiotic sequence that starts from the re-cognition of specific similarities to prototypical *orthographic* icons.

The issue where and when the process of interpretation of forms comes to a temporary end will—according to the Peircean model—be determined by pragmatic factors. Every subsequent cycle in the integration processes with other active cognitive elements may create new dynamics. An interpretative episode will come to a temporary end when the interpreter shifts his attention to something else.

Decisive is that an interpretation can never go 'further' or 'deeper' than what the signs available make possible. For some interpreters the symbolic interpretant feng shui (wind water) may meet the recognition criteria of another sign, a symbolic pars-pro-toto relation which an initial object that elicits the exclamation "A superb image of the classical Chinese attitude to life". But of course then and only then when the interpreter had already a priori formed that mental sign.

We claim that there are several empirical arguments that support the validity of this Peircean theory.

(a) A reader is aware of the material text form, the language form, the meaning(s) of that form. The Peircean theory accounts for the observation that these aspects are not isolated and have a sequential ordering. In the Peircean cognitive theory it is clear how latter cycles presuppose the former ones.

(b) The theory reflects stages in understanding. Most non-Chinese natives can run 'adequately' (that is: more or less similar to others) an iconic and an indexical cycle when confronted with 茶: this is an orthographic form meant to be interpreted according to the Chinese language code. Only a few can run the symbolic cycle 'successfully': tea! But all have an awareness of the symbolic cycle; everybody does feel the failure: "I do know that this has a meaning but I have no idea which one". The theory elegantly accounts for the fact that an interpreter can know the standard of a 'successful', culturally adequate symbolic semiosis without being able to run the symbolic cycle according to that standard. This is because that standard is active from the indexical semiosis. Also the 'inadequate' interpreter, however, did run a symbolic cycle. His response makes that crystal clear. He did run the symbolic cycle in a way that deviates from the standard that is *indicated*; the cycle does not end with the interpretant tea but with the interpretant I know I do not know.

(c) The Peircean theory is compatible with learning theories that predict that in frequently repeated cognitive processes *contractions* can (and in many circumstances will) appear. This means that in initially consciously run cycles, short cuts will be formed. The Russian psychologist Gal'perin, a contemporary of Vygotski, names this process *internalization* (compare Van Parreren & Carpay, 1980). Similar mechanisms are assumed in modern cognitive linguistic theories (compare chapter 5 by Anna Wierzbicka in Tomasello, 1998). A contraction-in conceptual integration theory *compression*—is created for example when a sign in the iconic cycle gets an immediate relation with the initial object from the symbolic cycle. Indeed it is known from psycholinguistic research that recognition of frequent linguistic elements leads directly to a projection of a symbolic initial object, without awareness of mediating iconic and indexical cycles.

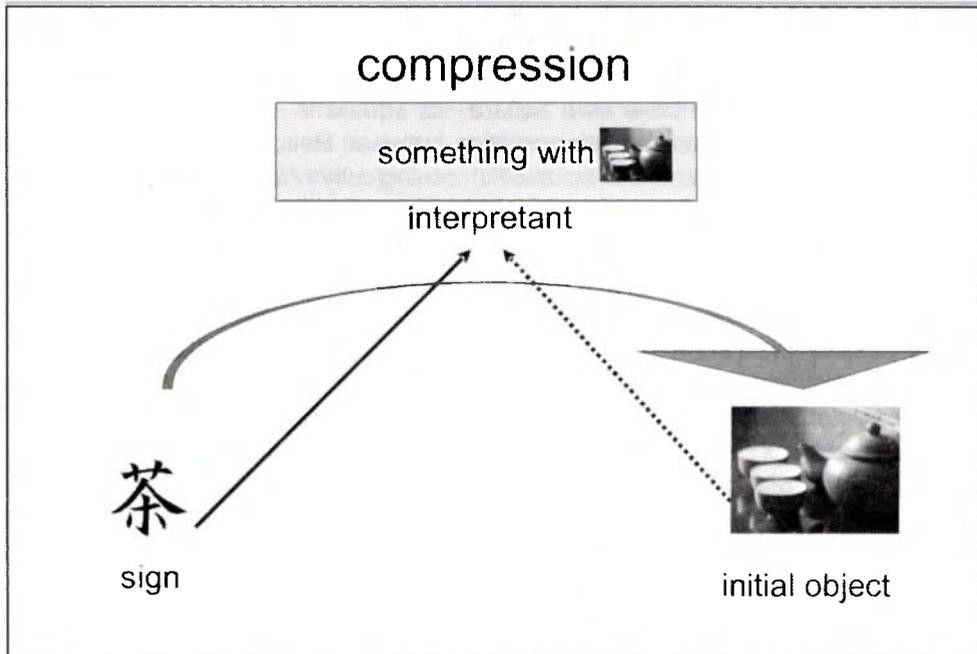


Fig. 6

The way such contractions are formed and the observation that it seems possible to break them up are compatible with Peircean cognitive theory. In initial reading education—at least in phonetic systems—one can follow step by step how the contractions between form and word sound are formed, followed by contractions between form and meaning; the child identifies the ‘meaning’ (symbolic object) ‘at a single glance’. Generally the cognitive relation between sound and meaning precedes the moment that these ‘odd black worms on paper’ get their potential to activate specific mental iconic signs.

Pictorial forms contract too. We tend to say “That is a teapot” when we see a picture of a teapot. But when someone asks us to pour a cup from it, we become aware of the fact that we reduced to iconicity what actually is a full sequence of icon-index-symbol. Non text mediated forms are even more coercive. But according to Peirce we live in a reality that we can only interpret through signs. So also non text mediated sensory stimuli that are re-recognized as a form imply thirdness, imply a ‘complete’ semiotic sequence. Seemingly a visual sensory stimulus drives us to the unconditioned conclusion that over there stands a teapot (Fauconnier & Turner, 2003, 78v). We do not have any intuition that this is a contraction of a sequence that can be broken up. Nevertheless, when we are confronted with forms of visual deception, we do become aware that

it is a contraction and that indeed even this contraction can be broken up. In a similar way theoretical reflection can bring back this awareness, for example when Bertrand Russell asks our attention to the fact that we have never in our entire life seen a square table as a square; its square is an inference.

Here we observe an interesting relation between Peirce's ontological and his logical (cognitive) project. In case of (ontologically) *iconic* signs (pictures, diagrams, schemata, et cetera) we tend to think that there is no indexical and symbolic cycle (compare Van den Hoven, 2010). In case of ontologically *symbolic* signs (such as orthographic and phonetic forms) we tend to think that the iconic and indexical cycles are absent. In both cases however we deal with a contraction, which can be shown when we create distortions.

An adult learner of Chinese orthography can report embarrassing experiences of distortions that make very clear that an iconic as well as an indexical cycle has to be assumed. The iconic cycle becomes manifest when the teacher looks at an orthographic attempt and says surprised: "Ah, you meant to write a character". Apparently at first the initial object that was activated in the iconic cycle did not lead the teacher smoothly to an indexical cycle that activates the initial indexical object orthographic element. Nevertheless, through a process of logical argumentation (compare section 4)—influenced by her teaching experience - she comes to the (indexical) interpretant silly attempt to write a Chinese character which brings her to the iconic *interpretant* (defect) Chinese character. More promising is a response "I can see that this form represents a Chinese character, but I have no idea which one". The teacher runs the iconic and indexical cycles as intended by the pupil, but the teacher is stuck in the symbolic cycle. A temporary highlight in the learning process has been reached when the teacher comments on an attempt "You intend to write the character cha, but that lower stroke should be written from top to bottom". Now the symbolic cycle did run according to the hopes of the pupil. But the teacher's interpretation process did not run that smoothly that all her consciousness of the iconic and indexical cycle did vanish—also due to the fact that the context here is a writing lesson.

We may unravel the last process, artificially. "I recognize a form (iconic) that comes close to the form of cha. On that basis I conclude that this may be the orthographic form meant to be interpreted as cha (index) which makes me activate the initial object cha as a hypothesis about the (symbolic) interpretant. This hypothesis is confirmed in the context (for example because it was the pupil's assignment to write the character for cha). This confirmed symbolic interpretant is the main factor in the confirmation of the indexical and iconic interpretant, hypothesized on the basis of the initial iconic and indexical objects. This leads me, teacher, to an interpretation of the difference between the

material form and the iconic sign, which is an observable mistake in the lower stroke.” Such an unraveled sequence may seem ridiculously complex. However such complexity is at least necessary to explain numerous phenomena. How can a parent conclude: “You say hose, but you mean horse”? How can we recognize Donald Duck as a duck? How can we explain why we thought in first instance to see uncle Arnie while a split second later we saw that it was a total stranger that in many respects does not look like uncle Arnie at all? Et cetera, et cetera.

Our examples suggest that a Peircean cognitive semiotic theory is able to account for the relations between different mental representations that interpreters make. The theory can also account for a number of definition problems in the Van Dijk & Kintsch standard model. One is the problem to demarcate the term *situational model* (see for example the inconsistencies in Kamalski, 2007 as discussed in Van den Hoven, 2008). This term is sometimes taken very wide, sometimes very restrictive. One moment attitudes and emotions of the interpreter are integrated in the situational model, the other moment only some inferences are added to the text base model. From Peircean semiotics this demarcation problem is predictable. Basically every semiosis can become a sign itself in a sequential cycle and all these cycles form a continuum. Therefore the term *situational model* indicates a snapshots in a continuous (although structured) process. This explains that it may be unclear which ‘phase’ in this process is referred to.

A fortiori a demarcation problem can be predicted between *text base model* and *situational model*. The theoretical distinction is that in the text base model the propositions as present in the text are represented while in the situational model these text propositions are ‘integrated’ with prior knowledge. From a semiotic point of view this is a confusing criterion. Interpretation is in all cycles necessarily based on signs and sign are generalizations from former experiences, prior knowledge. Even in building up a *surface model* prior knowledge is presupposed. Abstracting propositions from text forms is certainly a process in which many elaborated complexes of prior knowledge are involved.

4. Dynamic interpretations

A cognitive theory about text interpretation has to explain how text interpretation is on the one hand re-cognition, on the other hand creative. In section 3 we saw how text interpretation presupposes a priori signs. These signs are generalizations of passed experiences. A sign is ‘formed’ in former situations and is re-cognized in the latter. In Saussurean terms we can characterize this aspect of the sign as a relation between *signifier* and *signified*. When a set of sense perceptions matches sufficiently with a set of criteria (a

mental 'signifier'), this match activates the initial object (the 'signified'). But empirical evidence shows that the 'signifiers', the objects that are initially activated through a sign are *dynamic*. They can be specified in a sometimes highly unpredictable way (though posteriori always understandable). A resulting interpretation can deviate from the initially activated object. In other words, the application of a priori signs does obviously not result in a fixed system. In Peircean terminology there is thirdness, there is the *interpretant*.

Fauconnier & Turner (2003) give many examples of the creativity in human cognition, including in interpretation processes. They show (2003, 25—27, 144—145) that the meaning of a word can get many specifications, but also the relation between words. Even the relation between a formally fixed pair of words, for example [adjective noun] can be flexible, depending on context. In *safe beach*, *safe* can qualify *beach*, meaning for example that this particular beach is safe for the destructive plans of real estate developers while other beaches are not. The (symbolic) interpretant of *safe* ends up as something like: *without risk to be hurt, destroyed, damaged*. But when discussing whether a child should be allowed to play on a beach, *safe* in "This is a safe beach" refers to the situation of the child. This example illustrates also the flexibility of the interpretant of *beach*. In the first context *beach* means that piece of ground, in the second that meeting point of ground and water and in "This is a safe beach for the dolphins" the spatial picture is an interlocutor who stands on the soil, looking over the water for fishing nets.

Larger constructions such as *A because of B*, *B causes A*, *B therefore A*, et cetera have been studied rather intense in several languages. Results show that the meaning of such sequences is also flexible with respect to the volition of the discourse voice (compare for instance Sweetser, 1990, Couper-Kuhlen & Kortmann, 2000; Pit, 2006; Stukker, Sanders & Verhagen, 2008). Some of the so called causal connectives however have intuitively a rather tight meaning. In Dutch *A doordat B* or *doordat B*, *A* indicates that *A* is a non voluntary, mechanical result of *B*. Nevertheless a speaker can utter perfectly well: "[*Doordat*] he behaves so nasty I do not want to collaborate with him anymore". *I do not want to collaborate with him anymore* is basically a voluntary situation. The result of the (marked) use of *doordat* is that native speakers of Dutch understand that the speaker intends to express that he feels the nasty behavior of his colleague as a compulsory force, as a force that overrules his will. In the interpretation process of this construction we have to assume that on the one hand the initial (symbolic) non voluntary meaning of *Doordat B*, *A* remains relevant, including some expectations about the prototypical, non-voluntary event that should fill slot [*A*], while on the other hand the meaning of the sequence *I do not want to collaborate with her anymore*, initially in the domain

of voluntary acts, is interpreted in the domain of non-voluntary acts. The important observation is that there seems to be an initial, 'prototypical' meaning that may be overruled *but still remains relevant on the background*. The 'overruling' causes that an interpreter 'feels' the construction as a marked one.

This relation between an initial, prototypical meaning (initial object) and a contextually derived meaning (interpretant), both remaining relevant in a dynamic process, is from a Peircean point of view predictable. In every semiosis *sign-object-interpretant* are involved in a dynamic relation. This specific dynamic can intuitively be observed in processes of interpretation where the initial object deviates from the interpretant. We give one more example. On the level of the narrative diagram we may re-cognize a form (iconic), activate experiences with that form (indexical), and activate our culturally legitimized habits (symbolic). For example, "Once upon a time..." activates a specific narrative diagram (icon) of the [western] fairy tale. The prototype of this diagram *indicates* a disruption of a balance (Propp, 1958). This we experienced when we listened as a child to many fairy tales. We inferred a habit that such a disruption should be in the narrative (symbolic). Suppose that an interpreter encounters: "Once upon a time there was a little girl. She went out for a walk. And then she came back home again". The iconic form of the third sentence does not confirm the activated narrative diagram. A disruption is missing. The interpreter will search for a solution. Is this a text from a child that did already grasp some of the culturally conventional features of the sign fairy tale narrative but not yet the causal dynamics? Or is it a 100 characters narrative i-phone experiment? Or is this a form that—although there is an iconic simile with the sign fairy tale narrative—should not get this icon as its interpretant? Whatever the outcome is, it may be clear that the initially activated iconic-indexical-symbolic objects remain relevant to explain the astonishment and surprise.

Fauconnier & Turner (2003) explain the creativity and flexibility in interpretation processes in their conceptual integration model. In their book *The way we think. Conceptual blending and the mind's hidden complexities* we do not find any reference to Peirce. This is a pity, not only because the assumptions underlying their theory are basically Peircean, but also because Peircean semiotics may help to clarify one of their crucial notions, the *generic space*. The conceptual integration theory explains the process of meaning creation from the assumption that a cognitive element (in *mental space 1*) gets related to another already active cognitive element (in *mental space 2*). This is possible because both elements are part of a *generic space*. So the element in space 2 as well as the routine to relate these two (generic space) are presupposed. In the simplest case the structure of space 2 is projected on the content of space 1 in a resulting

blended space. This process is called *simplex blending*.

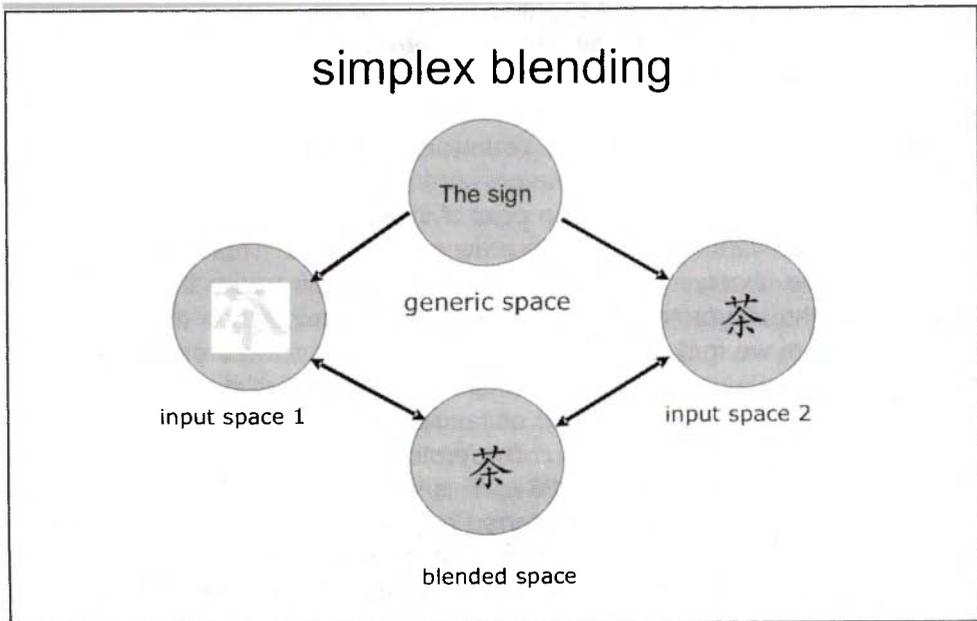


Fig. 7

Not always the blended space is simply a projection of the structure of space 2 on the content of space 1. Creativity is explained in the model because in the blended space 'new' structures can be formed when structural features from both spaces are selectively projected in the blended space. In the example of *A doordat B* some features of *doordat* 'merge' with some features of *A* [*voluntary response to*] *B* because in input space 1 the content of *A* is clearly a voluntary event. This is the basic answer of the conceptual integration theory on the question how language as a semiotic system can function to express an infinite series of new situations.

Fauconnier & Turner (2003) elaborate on several complex blending processes. But not so much attention is given to the notion *generic space*. Not much more than a definition is given; a generic mental space maps onto each of the inputs and contains what the inputs have in common (2003, 41). Peircean semiotics can clarify the semiotic assumptions that underlie this notion. In iconic re-cognition the Peircean notion of sign corresponds with the *generic space*. The *initial object* corresponds then with space 2, the *sense perception* with space 1 and the *interpretant* with the *blended space*. In the indexical and symbolic cycles the sign is the dynamic outcome of a former cycle. Therefore the concept of the *generic space* corresponds with this outcome of a former cycle.

So the generic space, a sign, is formed as the result of a generalization from former experiences. *Blending* is a process in which former experiences are projected on the new situation. Simplex blending is a (default) process in which it is expected that the structure of the blended space corresponds with the structure of space 2. In Peircean terminology we would say that in the specific context the interpretant corresponds with the initial object. However, when there is a tension between this initial object and other active elements, *doubt* results. A 'judgment' has to be made. This can still lead to a confirmation of the initial object. Peirce speaks then of an *acritical inference*. But this tension can also lead to a reconsideration of the object.

So, doubt is the dynamic that leads to other blending processes than simplex blending. Such a process is analyzed by Peirce as a triadic sequence of *abduction*, *deduction* and *induction* (*logical argumentation*). The various forms of complex blending that Fauconnier & Turner discuss (mirror blending, single scope blending and double scope blending) are forms of *abduction*.

The triad *abduction*, *deduction* and *induction* (*logical argumentation*) is probably the best known part of Peirce's semiotic theory. A tension between the initial object and other active elements initiates a process of 'reasoning' (though often subconscious) that starts with forming a hypothesis about what an adequate object might be that does fit in the context (*abduction*). From this hypothesis expectations are deduced about what to expect in the context. These expectations are checked on that context (*induction*). If plausible the process will continue with the outcome as an interpretant.

Human cognition runs a continuous series of these interweaved semiotic cycles. Cognitive elements from former cycles are active when interpreting a (language) form. The two names under which Fauconnier & Turner's theory is known are well chosen; indeed the semiotic process is an ongoing process of *conceptual integration* which often has the creative aspect of *conceptual blending*. Peirce is also an early representative of what we now call connectionism (Elman et al., 1996); the doubt that triggers the process of logical argumentation starts from an attempt to integrate a new element with already active ones. These elements can be active because the outcome of former cycles or active because connected (*indicated*). Default hypothesis is that a 'new' element can be structured similar to the initial object. But when integration seems not possible following standard procedures such as type (initial object) *token* (interpretant), another hypothesis is formed and tested. Often an active construction scheme (such as [adjective noun], [A is a B], [A because B] or a narrative diagram) guides what hypothesis is plausible.

We saw that the iconic diagram *A doordat B* prototypically *indicates* a mechanical causality. So the interpretation that *B is a force that makes that*

mechanically A results functions as the initial object in the symbolic cycle. When it connects however to a prototypically voluntary context (here A), then an interpretant will be formed that relates to the initial object as well as to the active context: *B is a force that makes that decision A results as if it were mechanical.* Other processes such as processes of figurative speech are more complex but basically run in a similar way. A man is called a *garbage can*. The iconic diagram [A is a B] as an active sign indicates that B must applied to A as a quality of the genus. But the symbolic initial object activated by *garbage can* does not go with the active sign man. This tension indicates that garbage can must be applied differently. A plausible hypothesis is to interpret metaphorically, because such hypothesis is compatible with the active diagram [A is a B]. This way garbage can gets an interpretant that relates to the initial object as what we may call metaphorical extraction, which makes garbage can the vehicle in the metaphor (compare Haley 1988 for an elaborated Peircean analysis of the poetic metaphor). This analysis explains how the interpreter ends up with a metaphorical interpretation (interpretant) but stays aware of the fact that this is a metaphorical interpretation because there still is the dynamic relation with the initial object, the literal. The analysis also explains that some interpreters may be confused who do not form the 'adequate' hypothesis.

In every semiotic cycle (iconic, indexical or symbolic) we encounter an integration of the new with the given that may lead to direct confirmation of the sign (Peirce calls this a *percept*), or to a conformation after a hesitation (a *perceptual judgment*) or to a process of *logical argumentation* that result in an interpretant that deviates from the initial object. In case of a percept it may seem that 'nothing happens', as if Saussurean semiotics is entirely adequate to account for the semiotic process. There is a satisfying match with the signifier and therefore the signified is applied. But that is wrong. Actually in all cases a full triadic process is at hand. When the interpretant turns out to be equivalent to the initial object this *reinforces* the sign relations. When a sequence of iconic, indexical and symbolic cycles turns out to be confirmed time and again, it is predictable that contractions will be formed. *Reinforcement* is as dynamic as the processes in which the resulting interpretant deviates from the initial object and may even alter that initial object.

5. Learning through interpreting

During our entire life we continue to pass through experiences that relate to an icon (forming indexical relations) and extracting habits (forming symbolic relations) never ends. However, many signs in the cognitive network are and will be confirmed time and again and become settled. With relatively inexperienced young children however we sometimes encounter spectacular examples of

restructuring sign relations. Suppose that the accumulated habits that a child has related to the icon tunnel can be visualized as the following prototype.



Fig. 8

When this child interprets “They went into the tunnel”, a sequence of iconic-indexical-symbolic semiosis may result in:

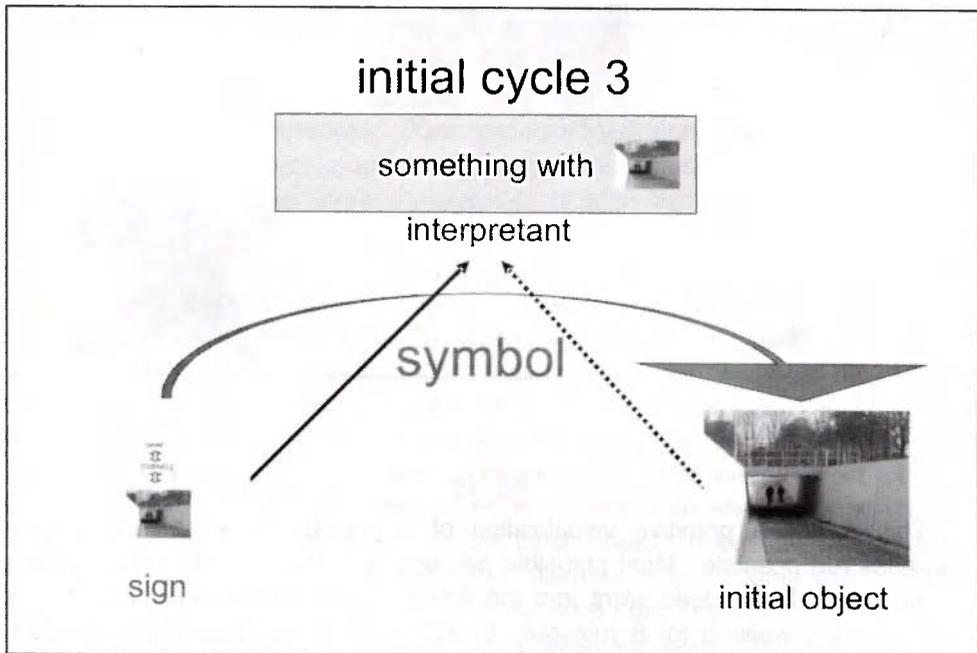


Fig. 9

Each time that the initial object fits in the context, a dynamic process of confirmation is at hand. The interpretant corresponds to the initial object, the sign is reinforced. But suppose that the text continues: “They went into the tunnel and after five minutes walking [...]”. This continuation may cause doubt and even confusion. *Five minutes walking* does not seem to be consistent with the features of the prototype that the child has developed on the basis of his experiences so far. In that prototype a tunnel is not an object in which one can walk for minutes. This doubt may lead to a process of logical argumentation. The child may form a hypothesis (a tunnel can be much longer, going under a much larger object than a road), deduce predictions from this and check these prediction by reading further, or by asking somebody.

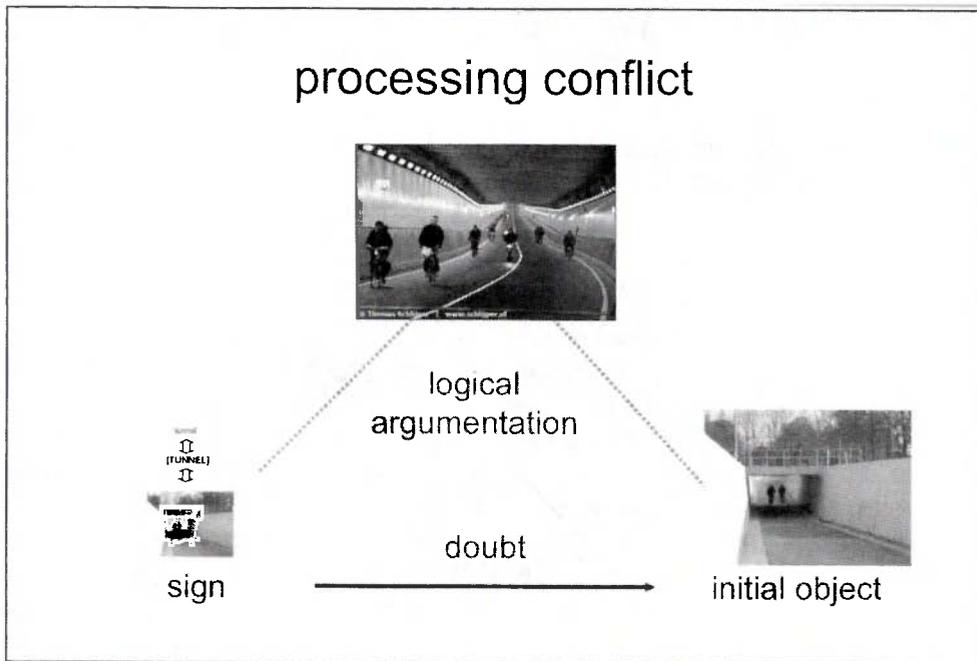


Fig. 10

This is just a primitive visualization of a possible process. Many other responses are possible. Most plausible perhaps is that the child in first instance interprets that they indeed went into the tunnel, came out after 10 meters and then continued walking for 5 minutes. In that case the confusion comes later, when the story makes clear that they still are in the tunnel. A response can also be awareness that something in the text is not clear, without further deep processing of this disturbance (if the text in relation to the reader's goals permits

to neglect the disturbance). But if the visualization reflects the cognitive system of this child, namely that the interpretant deviates from the initial prototypical object, this experience may lead to a temporary instability in this segment of the semiotic network. The discrepancy between the interpretant and the initial object seems to require a rather dramatic readjustment of the sign tunnel and perhaps also of some relations to other signs. We should not be surprised if the child asks “Can a tunnel be that long that you can walk in it for more than five minutes?”

This pronounced example illustrates how the relation initial object—interpretant refers to the object again. The object is *dynamic*. This explains how a case in which the interpretant is equivalent to the initial object *confirms* the sign. It explains how a case in which the interpretant deviates from the initial object on the basis of the fact that a logical argumentation can develop the sign.

A 5-year old boy was told by his father that they walked in a tunnel. The child shouted but did not hear an echo. He told his father that this could not be a tunnel because there was no echo. The father assured him that it was a tunnel because they went under the railway tracks. The boys muttered “Oh”. One could almost see on his pondering face how the cognitive semiotic system was running.

The formation of signs is not entirely based on this ‘referential’ use of a sign in a specific situation. The formation of a sign and its relations in the cognitive network is largely based on interpretation of texts in which these relations are explicitly discussed, *definitions*. Such (educational) texts make use of relations of comparison, contrast, association, part-whole, class-specimen, et cetera. We frequently encounter explicit processes of sign development in institutional contexts such as the law in which we have authorities appointed to determine the semiotic system. There we find theories about this semiotic process, using a wide variety of terminologies (Endicott, 2000). Many of these theories wrestle with the tension that reflects the Saussurian structuralism—Peircean pragmatism debate. They need to account on the one hand for a clear and fixed meaning, on the other hand for the dynamics that can be observed in actual use. Often such theories absorb this tension a priori. Hart for example states that a (legal) term has a *hard core of meaning with a penumbra of vagueness* (Hart, 1958). Peircean theory replaces this unsatisfactory solution with an articulated dynamic process in which the ‘hard core’ is the initial object. A deviating interpretant, resulting from logical argumentation, is an element in the ‘penumbra’. Such a penumbra-decision may or may not alter the hard core (dynamic object).

Reflecting upon these ‘learning’ processes we can distinguish between a series of consequences that a tension between initial object and context may have for the resulting interpretant. We can look at the consequences that the interpretant may have for the (dynamic) object and therefore for the sign. We

sum up four possibilities. There may be more.

Cases which stay within the margins of the initial object will not lead to adjustments of the object. These margins can be quite wide, depending on the type of sign. Construction diagrams (we discussed [A because B], [A is a B], [adjective noun]) as a sign often have a rather low level of specificity, as we saw with *safe beach*. So, although a specific instance in a specific context will end up in a more specific relation between adjective and noun (interpretant), it is not expected that this will lead to a specification of the diagram as such (object). However, when the process of specification of the interpretant often leads to a similar result, this may lead to forms of subcategorization. For example, where [color-adjective noun] may form as a default prototype a subcategory in which the adjective indeed specifies a quality of the noun, cases such as *safe beach* might develop a subcategorization in which default—because most frequent—the adjective specifies an implicated third element (the child is safe, not the beach).

Cases in which the interpretant deviates from the initial object in a rare and exotic way are not expected to influence the initial object as a prototype. It can be expected however that these cases enrich the prototype with some kind of ‘annotation’, at least temporarily, that will also be *indicated* as soon as an iconic similarity is at hand. While reading this article the icon *signify* may now activate a very specific semiotic meaning. For professional semiotician this may be a regular form of subcategorization, but for others it may be an annotation on their prototypical meaning to mean (the initial symbolic object) that will disappear to a background soon after finishing this reading.

Cases of figurative extension such as *garbage can* projected on a *man* will not lead to a restructuring of the prototypical meaning of *garbage can*. This distinguishes such use from forms of polysemy. In principle an icon can perfectly *indicate* animate as well as non animate objects and thereby activate in the symbolic cycle related animate and non animate symbolic objects (compare Pustejovski 1995 from a semantic theoretical framework). Take for example school class, indicating a group of children (animate) as well a specific space (non animate). However, as a result of the metaphorical use in “That man is a garbage can”, *garbage can* is not going to indicate waste baskets as well as a subcategory of humans although it is used here to indicate such an animate subcategory. What may be ‘learned’ here is that this icon can be used this figurative way. This analysis explains that a young child may ‘misunderstand’ and ‘unjustly’ restructure its sign tunnel temporarily when the father, walking together in the wood, says: “Look; now we enter a tunnel”. When the child misses the figurative use, it may wrongly lead to a restructuring similar to the one that follows the new experience that a tunnel can be 5 minutes walking long, or a tunnel does not necessarily echo.



Fig. 11

That would be the fourth possibility. Sometimes indeed the object that initially is activated in a semiotic cycle gets a restructuring. We saw the example of the child with tunnel. There are many more, especially in contexts in which we encounter entirely new situations. When an interpreter for the first time encounters the indexical relation between the icon green-grey film and the index night vision, he will probably in first instance hypothesize under water scene, but will soon adjust this to the adequate interpretant under the influence of connected contextual elements. It is easy to find numerous historical examples in the rapid development of the 'film language'. The objects that are indicated by many specific editing techniques (iconic diagrams) and that are meant get a conventional symbolic object have been 'learned' by most interpreters several times during their lifetime. These rapidly developing sign systems may even lead to sub-categorizations that make it possible to interpret moving picture forms different times and cultures adequately. This drastic restructuring of the initial object because of a deviating interpretant will often lead to a (temporarily) instability of the sign.

Peircean semiotics helps us to understand these four different responses. The theory explains why a discrepancy between (initial) object and interpretant not always result in a radial adjustment and instability. The Hart-concept of a static *hard core of meaning with a penumbra of vagueness* is replaced by a dynamic process that starts from a set of confirmed initial objects but can lead through a process of logical argumentation to deviating interpretants.

6. Balance and perspectives

We have argued that a semiotic analysis may deepen our understanding of internal relations within text linguistic models. It also suggests relations between seemingly unrelated issues in text linguistics. And it uncovers basic philosophical

positions that are implied in the text linguistic theories, of which the most important one is that text linguistic theories presuppose a triadic Peircean semiotics with an in principle unlimited connectivity that is dynamic and adaptive.

The insight that all semiotic interpretation of forms follows the sequence of an iconic-indexical-symbolic cycle (although contractions can be formed frequently) may explain a lot of empirical observation as we hope to have shown. Clearly we had to simplify the analysis of the examples discussed. Especially from a Peircean point of view it should be stressed that semiosis is a continuous process of interweaved cycles.

There are many issues that we only touched upon but that deserve further elaboration. We mention one that seems to us especially important for text linguistics. In Peircean ontology we tend to characterize language signs as *symbolic*. In the cognitive theory this seems to be reflected in a tendency to neglect the iconic and indexical cycle (also due to contractions). This may lead to a neglect of the fact that form interpretation starts with a simile, starts from the iconic quality. To recognize this is important because as we saw the iconic cycle starts from whatever sign is available. That means that differences between interpreters may come from this difference in *iconic* mental signs available.

Besides that it is not correct that in (text) linguistics we tend to say that we only deal with (ontologically) symbolic signs. We touched upon the fact that on higher levels of aggregation we interpret diagrams and schemata, according to Peirce iconic signs. This is compatible with recent developments in construction grammar and frame semantics. Certainly this is valid for narrative schemata. This ontology seems to be reflected in the cognitive theory too, but now in a tendency to deny the indexical and symbolic cycle. This may lead to a lack of understanding of the sources of deviating interpretations. The symbolic cycle attaches often culturally inspired habits to the recognized form, the indexical cycle individual experiences that may be determined by the environment in which a person lives (Van den Hoven, 2010).

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