SPEAKING ABOUT THE INNER ENVIRONMENT

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ABSTRACT: This paper consists of comments on Wallace Chafe's article "Accessing the mind through language." The key notion is that of an "inner environment" which is the set of representations that are detached, i.e., standing for objects or events
that are neither present in the current situation nor triggered by some recent situation. The fundamental difference between a signal and a symbol is that the reference of a symbol is a detached representation, while a signal refers to a something that is present in the current external situation. It is argued that many of the properties of consciousness that Chafe highlights with various linguistic phenomena an be put in a broader setting with the aid of the notion of the inner environment. In brief, consciousness can be seen as perception in

1. THE INNER ENVIRONMENT

The task professor Chafe sets for himself is to show how language, directly or indirectly, can shed light on the structure of mind. This is clearly a central problem for the cognitive sciences. Language is, as Chafe amply illustrates, a rich source of evidence of the functioning of mind in general, and consciousness in particular. In my comments on his paper, I will discuss the properties of consciousness that he connnects to linguistic evidence. To some extent, my strategy will be the converse of Chafe's. I will present some speculations about the mechanisms of the mind that can explain certain aspects of language. On the whole, these considerations support Chafe's theses.

In order to improve our understanding of the properties of consciousness discussed by Chafe, I will begin by elaborating an idea introduced by Craik (1943, p. 61):

> If the organism carries a "small-scale model" of external reality and of its own possible actions witin its head, it is able to try out various alternatives, conclude which are the best of them, react to future situations before they arise, utilize the knowledge of past events in dealing with the present and future, and in every way to react on a much fuller, safer and more competent manner to the emergencies which face it.

Under the heading of the *inner environment* this kind of "small-scale model" has been made popular by Dennett:1 "the inner environment is simply any internal region that can affect and be affected by features of potential behavioral control systems" (1978, p. 79). Such an environment is necessary for representing objects (like food and predators), places (where food or shelter can be found), actions (and their consequences), etc., even when these things are not perceptually present. The evolution of this kind of representational power will clearly increase the survival value of the animal. As Dennett (1978, p. 77) puts it:

> Mutations equipped with such benign inner environments would have a distinct survival advantage over merely Skinnerian creatures in any exiguous environment, since they could learn faster and *more safely* (for trial and error learning is not only tedious; it can be dangerous). The advantage provided by such a benign inner environment has been elegantly expressed in a phrase of Karl Popper's: it "permits our hypotheses to die in our stead."

Like all theories of mind, the inner environment is a metaphor. Metaphors are neither true nor false, but they can be more or less productive. In what follows, I want to show that the metaphor of the

[1] However, Dennett does not refer to Craik. For a related, more constructivist idea, see Sjölander (1993).

inner environment can help us understand several of the properties of consciousness, including those listed by Chafe.

The idea of an inner environment should be connected to the capacity of the mind to *represent* information. In Gärdenfors (to appear), I distinguish between two kinds of representations: *cued* and *detached*. As will be argued below, this seems to correspond well with Chafe's distinction between immediate vs. displaced consciousness.

A *cued* representation stands for something that is present in the current external situation of the representing organism.[2] When, for example, a particular object is categorized as food, the animal will then act differently than if the same object had been categorized as a potential mate. I am not assuming that the animal is, in any sense, *aware* of the representation, only that there is some generalizing factor that determines its behavior.

In contrast, *detached* representations may stand for objects or events that are neither present in the current situation nor triggered by some recent situation. A memory of something, that can be evoked independently of the context where the memory was created, would be an example of a detached representation. Similarly, a chimpanzee, who walks away from a termite hill to break a twig in order to peel its leaves off to make a stick that can be used to catch termites, has a detached representation of a stick and its use.

As a tentative definition, the inner environment of an animal will be identified with the collection of all detached representations of the animal. Loosely speaking, the inner environment consists of all things the animal can actively "think" about.

It seems that many species of animals have inner environments. For example, the searching behavior of rats is best explained if it is assumed that they have some form of "spatial map" in their heads. Evidence for this, based on their abilities to find optimal paths in mazes, was collected by Tolman already in the 1930's. However, his results were swept under the carpet for many years since they were clear anomalies for the behaviorist paradigm. It is difficult to asses when the inner environment first appeared in the animal kingdom, but a wild guess is that it is coordinated with the development of the neocortex, i.e., roughly with the appearance of mammals.[3] Sjölander (1993) notes that mammals *play*, but reptiles don't. There is also evidence of *dreaming*, which clearly presumes an inner environment, only among the mammals.

The existence of an inner environment can be used to explain many higher cognitive functions like planning, deception, and self-awareness (Whiten and Byrne 1988, Dennett 1991, Gulz 1991, Gärdenfors 1992, Gärdenfors to appear). And, as I will argue in Section 3, the inner environment is also a *sine qua non* for language.

However, before I proceed, I would like to emphasize the distinction between *mind* and *consciousness*. Being conscious of something involves *awareness*, with all its phenomenological aspects. But mind, in the sense of that which unites all the cognitive activities (like perception, thinking, memory, and language) is often unconscious. For example, much attention has recently been devoted to *implicit learning* and *implicit memory* (e.g. Lewicki, Hill and Czyzewska (1992) and Reber (1989)).

In order to underscore the distinction between mind and consciousness I will here put forward a bold, albeit mainly metaphorical, hypothesis: *Consciousness is "perception" in the inner environment*. In other words, conscious awareness is seeing with "the mind's eye."[4] This hypothesis will be further developed below.

2. ANALYSIS OF SOME PROPERTIES OF CONSCIOUSNESS

Chafe lists a number of properties of consciousness that are highlighted by various linguistic phenomena. In this section, my aim is to show that these properties can be put in a broader setting with the aid of the notion of the inner environment. I think this fits well with the definition provided in an earlier paper by Chafe: " … consciousness, which I take to refer to the activation of some available information in the service of the self" (1980, p. 11). Let us consider the properties one by one:
Consciousness has a focus: In the regular sensory input one can *attend* to particular aspects of a percept. For example, one can focus on one voice speaking at the other end of the room during a noisy cocktail party. Analogously, consciousness can focus its attention on certain parts of the inner environment. Conscious attention *scans* the inner environment. And as we will see in the next

[2] In general, the represented object need not be actually present in the actual situation, but it must have been triggered by something in a recent situation. Delayed responses, in the behaviorist's sense, are based on cued representations.

[3] Also *birds* seem to have cognitive capacities that presuppose something like an inner environment. For example, their spatial abilities are well documented. Interestingly enough, it is only mammals and birds who have a constant body temperature.

[4] It should be emphasized that I don't believe in any kind of homunculus theory, i.e., that there is something in the head "watching" the inner environment.

section, there is some evidence that when somebody describes a scene that has previously been visually present, the mental scanning that is reflected in the order of the linguistic presentation closely follows the actual movements of the eyes that took place during the visual inspection.

In the case of consciousness, it is perhaps more appropriate to speak of attention as *constructing* the relevant parts of the inner environment. However, such a constructive approach is also applied to normal perception by researchers like Maturana, Varela and von Glasersfeld.

Consciousness has a periphery: Analogous to the notion of figure vs. ground in ordinary visual perception, consciousness can only focus on something against a given background of things not attended to. In the studies of mental imagery by Kosslyn (1980) and others, phenomena described as mental scanning and focusing are well documented. And scanning, visual as well as mental, presumes a periphery that sets the boundary of the activity.

In cognitive semantics, the figure-ground distinction plays an important role in the theory of *image schemas*. Such schemas can be seen as the building blocks of the inner environment, and they are the carriers of meaning. Langacker (1986) and Lakoff (1987) both distinguish between the *trajector* of an image schema, which is its focus, and the *landmark* of the schema which can be interpreted as the periphery of the schema.

The prosodic phenomena discussed by Chafe also indicate that there is much more information about the speech situation available to the speaker than what is directly expressed in the spoken sentences. Thus the boundaries between intonation units reveal the existence of the periphery of what is focused upon in the utterances. Furthermore, this shows that a purely propositional analysis of speech will leave out important elements of the speech situation.

Consciousness is restless: Just as the eyes do not rest on any particular point in the visual scene but exhibit a complicated pattern of saccades, the focusing process in the inner environment is jumping from one "thought" to another. If the thinking concerns something like a "scene" in the inner environment, the processes may be basically identical. However, more generally, we may speak about consciousness *associating* from one idea (or mental state) to another. [5]

Consciousness has a point of view: The inner environment is not the only factor that determines the thoughts or the utterances of an agent, but the *motivation* of the agent functions as a motor driving the focus of attention in the inner environment. The motivation also helps in selecting *what* is to be said among all those potential utterances that can describe the inner environment of the speaker.

Consciousness must be oriented: In a sense, this is trivial since any inner environment is carried around in somebody's brain and this somebody determines its orientation in space and time etc.

Less trivially, a speaker can adopt somebody else's point of view, by including the other person's inner environment as a part of her own consciousness. And by adopting the other person's inner environment as the basis for speech, the setting of the speech situation will change. Fauconnier (1985) analyses in detail the linguistic tools that are used to express such position changes and presents a model based on "mental spaces" that is congruous with the assumption of an inner environment.

This ability to simulate other agents' inner environments is, in my opinion, required for the emergence of a "you-awareness" and thus for anybody being a truly social being (see Mead 1934). In Gärdenfors (1992) it is argued, firstly, that this kind of you-awareness is a foregoer of self-awareness and, secondly, that the existence of both you-awareness and self-awareness is necessary for symbolic linguistic communication to develop (see the next section).

3. SIGNALS AND SYMBOLS: LANGUAGE REFERS TO THE INNER ENVIRONMENT

In my opinion, thinking does not presume a language. Humans, as well as animals, can simulate sequences of actions in their inner environments. Such simulations are, among other things, necessary for planning. For example, consider the high jumper who mentally penetrates his bodily movements before actually performing the jump.[6]

In contrast, I believe language presumes the existence of an inner environment. In order to make this clear, I will introduce a distinction between *signals* and *symbols*. Both signals and symbols are tools of communication. The fundamental difference between them is that *the reference of a symbol is a detached representation, while a signal*

[5] It is possible that the neurological mechanisms underlying the restlessness of the brain are dependent on fatiguing effects of the neurons that are firing when a certain mental state is present.

[6] For a fascinating account of the neural representation of motor intention and motor imagery, see Jeannerod (1994).

refers to a cued representation. In other words, a signal refers to something in the outer environment, while a symbol refers to the inner environment. Language consists of symbols — it can be used to talk about things not present in the current situation. Sjölander (1993, pp. 5-6) puts it elegantly as follows:

> The predominant function of language is to communicate about that which is not here and not now. A dog can 'say': I am angry, I want water, I want to go out, I like you, etc. But it has no communicative means enabling it to 'say': I was angry yesterday, nor can it 'say': I will be angry if you lock me up tonight again, and I will chew up the carpet. Likewise, the dog can 'say': There is a rat here! but it cannot 'say': There is a rat in the next room.
>
> […] Clearly, if you live in the present, communicating mainly about how you feel and what you want to do in the moment, the biological signals inherent in each species are sufficient. A language is needed only to communicate your internal representation of what could be, what has been, and of those things and happenings that are not present in the vicinity.

Symbols refering to something in one person's inner environment can be used to communicate as soon as the listeners have, or are prepared to add, the corresponding references in their inner environments.[7] The actual conditions of the outer situation need not play any role for the communication to take place: two prisoners can talk fervently about life on a sunny Pacific island in the pitch dark of their cell.

Even though I claim that language refers to the inner environment, this does not preclude that a speaker can distinguish between talking about something that is present in the speech situation, i.e., cued, and talking about something that is detached from the actual situation. On the basis of some fascinating examples from American Indian languages, Chafe introduces a distinction between the "immediate" mode and the "displaced" mode of reporting (manuscript, p. 13). This seems to be a special case of my distinction between cued and detached representations.

Many animals have intricate systems of signals, for example, the dances of bees. However, even if their dances seem to have a kind of grammar, it still consists only of *signals*. The bees categorize places where nectar can be found in a sophisticated way. The crucial point is that they only use their dances in a cued manner, and thus the dances are not symbols according to my criterion. The same point is made by von Glasersfeld (1976, p. 222): "In my terms, the bees do not qualify for symbolicity, because they have never been observed to communicate about distances, directions, food sources, etc., without actually coming from, or going to, a specific location."

As a matter of fact, human linguistic communication presumes an advanced kind of inner environment. To see this, let us turn to Grice's (1957, 1969) theory of meaning. His initial definition in the second paper is as follows (1969, p. 151):[8]

> "U meant something by uttering x" is true iff, for some audience A, U uttered x intending
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> (1) A to produce a particular response r.
> (2) A to think (recognize) that U intends (1).
> (3) A to fulfill (1) on the basis of his fulfillment of (2).

Altough Grice's definition primarily covers the concept of "meaning", it has often been used as a general analysis of *communication* (see Gomez 1994). The feature I want to focus on here is that condition (2) expresses a *third-order intention* (see Dennett 1978, p. 277-278): U intends A to think that U intends something. Now in what kinds of inner environments can such higher order intentions be formed? In Gärdenfors (1992), I argue that the road to self-awareness must go via *you-awareness*. On my account, if an organism has you-awareness, it cannot only have a representation of another individual as an object, but it must also represent *the inner environment of the other individual*. This capacity is often expressed as an organism possessing a "theory of mind." On this level, an organism can have goals concerning the intentions of other individuals, e.g., *want* somebody to *believe* that an attack would fail. This is an example of a second-order intention. It is only when this level is achieved that *deception* becomes possible.[9]

The next step in the evolution of the inner environment of an individual U is for U to realize that the inner environment of another individual A may in turn contain a representation of the inner environment of U. Only then can one meaningfully

[7]For a model theoretic account of how such communication can be established, see Gärdenfors (1993).

[8]This definition is revised several times in the second paper, but the more complicated versions have the same general structure as the definition given here.

[9]For an analysis of deception among animals in the wild, see Whiten and Byrne (1988).

express third-order intentions, e.g., that "U intends A to think that U intends something."

In my opinion, *self-awareness* then can develop as a shortcut in this representation: I can in my inner environment have a representation of my own inner environment.[10] However, I submit that this kind of self-awareness could never develop without the previous establishment of a you-awareness (see Mead 1934 and the discussion in Gomez 1994).

The importance of this analysis with respect to language, however, is that communication in Grice's sense presumes an elaborate nesting of inner environments. The upshot is, if I am correct, that *symbolic communication* presumes a mind that is capable of you-awareness as well as self-awareness. This constraint, rather than anatomical limitations, is the main reason why animals other than humans have no language. On the contrary, language, in the normal sense, is most likely a *very* recent phenomenon in the evolution of human thinking.[11]

What is the relation between consciousness and language? Is it at all possible to think consciously without language? We all have the experience of something like an omnipresent inner monologue (or dialogue) while we are engaged in thinking. I believe this experience is deceptive. Firstly, we can "think" without language. Consider, for example, the previously mentioned mental simulation of a high jumper. Secondly, and more importantly, the inner speech is best interpreted as just parts of the *simulations* in the inner environment. The inner soliloquy is part of what we *perceive* in the inner environment. The *production* of the monologue is, however, hidden in the unconscious, just as we are not aware of how we find our words when we actually speak in the outer environment. As Chafe notes himself, "language itself provides evidence that not everything in consciousness is verbal. Disfluencies show that people often experience difficulty in turning thoughts into words, suggesting that there is more to thought itself than inner speech" (p. 16).

I want to generalize this conclusion by repeating the claim made above: *Consciousness is perception in the inner environment*. Just as we can focus our senses on certain aspects of the outer environment, we can shut off this outer environment and "perceive" events in the inner environment. And, to some extent, we can also "act" in the inner environment, i.e., imagine the consequences of different potential actions. This kind of perception occurs in a variety of cognitive processes — in day-dreaming, fantasizing planning, remembering, etc. Real dreaming is also a kind of "perception." Dennett (1978) argues convincingly that dreams are *experiences*. To be sure, "perception" in the inner environment is again a metaphor, but an extremely productive metaphor — our language is replete with visual metaphors for mental phenomena (see Hörmander 1990).

As a matter of fact, a related claim has been presented by Chafe himself in an earlier paper (Chafe 1980). He says that "[i]t is tempting to suppose that both vision and consciousness reflect the same basic strategy for information processing" (1980, p. 13). As intriguing empirical evidence for this thesis, Chafe reports a study performed by Charlotte Baker at Berkeley. She showed a subject various pictures and monitored the eye movements of the subject during the viewing of the picture. The subject was then asked to provide a verbal description of the picture from memory. The ordering and content of the description corresponded remarkably well to the eye movement patterns. On the basis of this, Chafe hypothesizes

> "that similar principles are involved in the way information is acquired from the environment (for example, through eye movements), in the way it is scanned by consciousness during recall, and in the way it is verbalized. All three processes may be guided by a single executive mechanism which determines what is focused on, for how long, and in what sequence" (1980, p. 16).

In conclusion, I agree with Chafe that language is a rich tool for accessing the mind. However, we cannot speak about everything that goes on in our minds, only about our inner environments.

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[10] The representation of the inner environment is, as always, a simplification and idealization of the "real" inner environment.

[11] For further discussion of this, see Donald (1991).

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