

THE CONSTRUCTIVIST VIEW OF COMMUNICATION

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Heinz von Foerster had a knack for statements that sounded paradoxical. In fact, they made a lot of sense when they were unpacked. At the very beginning of our joint recollections in "Wie wir uns erfinden", a book we published together a few years ago, he said for example: "It's the listener, not the speaker, who determines the meaning of an utterance."

Taken literally, this seems to demolish any possibility of linguistic communication. The usual assumption is that the speaker has something to say, formulates it in words, and utters them as a piece of language; and then it's the listener's task to UNDERSTAND what the speaker intended. To say that it is the listener, who determines the meaning of the utterance, seems to eliminate the speaker.

Heinz had no intention of doing this. What he meant was: given the words a speaker has used, the listener can interpret the utterance only in terms of the meaning he, the listener, ascribes to these words.

This, of course, raises the question of how any listener - or speaker - has come to ascribe meanings to the sounds we call "words".

To answer this question is not nearly as easy as you might think. Meaning has been a topic of erudite writers ever since the Greek philosophers; but they usually presented it as something that

"exists" ready-made apart from the users, rather than something that has to be slowly built up by each new member of a linguistic community. The condition, that meaning must be MADE before it can be used, was not explicitly shown until Claude Shannon published his Theory of Communication in 1949.

Shannon's "Mathematical Theory" is a technical document covering engineering problems such as the design and capacity of communication channels, the interference of noise, and the use of redundancy in interpretation. Right at the beginning, however, Shannon makes a fundamental point that has enormous consequences for the understanding of how LINGUISTIC communication functions. His fundamental insight was that MEANING does not travel. In order to transmit something from one place to another, it must have the form of a "signal". A signal is something that can travel through space. It may be a change of energy in an electric wire or electromagnetic waves, modulation of sounds, marks on a piece of paper, anything, in fact, that can be sent from one place to another. To such signals messages can be related by means of a code. This is a sheet with two columns, one of which lists signals or combinations of signals, the other what the signals are to stand for. In the case of telegraphy, a code was designed in 1837 by a Mr. Morse.

If you wanted to be a telegraphist, you had to learn the Morse code. This was not particularly difficult because it had been internationally agreed on and was readily available all over the world. Side by side there were two columns in the Morse code. On the left were the letters of the alphabet, on the right dots or dashes or combinations of the two. Once you had acquired the code, you could translate the words of a message into sequences of dots and dashes and send them to anyone who was in possession of the code.

You may know, for instance, that in the Morse code a single impulse or dot stands for the letter "E". But it is not the dot that tells you this - you know it only because you know that much of the code.

Norbert Wiener used a very simple example to illustrate communication and the role of the widely abused term "information". Flower shops, he said, can send flowers anywhere in the world, without sending the flowers. They send them by cable. This was long before e-mail, and telegraphy was the way to do it. Flower shops had an international code that listed a variety of flowers and good wishes in the left column and a number, say between 1 and 100, in the right column. If you wanted to send a dozen red roses to a friend in the United States, the shop here in Vienna would merely cable the address and the code number corresponding to your choice of flowers. The INFORMATION transmitted, therefore, was simply an instruction to select a specific word or phrase from the right-hand side of the flower code.

The Morse code, of course, made it possible to send words. But what the words contained in a message are intended to MEAN, is not indicated by this code or any other system of communication. The receiver, as Heinz said, has to determine the meaning for him- or herself.

It is usually taken for granted that we can unravel the meaning of words, if we are speakers of the language that is being used. But the question of how we acquire the skill of doing this has not yet been satisfactorily answered. Chomsky's contention that the human animal has an innate language organ does not apply to the generation of meaning but only to syntax - and there it merely shifts the problem into the area of evolutionary

hypotheses that have little if any hope of ever being confirmed.

If we look a little more closely at HOW a listener may determine what meaning to attribute to something that was said, we can list at least four things that seem indispensable:

- 1) Sounds must be recognized as sound-images of words that evoke associations.
- 2) These associations are, in fact, re-presentations of elements of past experience.
- 3) These remembered elements of experience constitute the material for POSSIBLE meanings of the utterance.
- 4) Which of these possibilities the listener accepts, depends on the context in the widest sense including the listener's familiarity with the speaker.

This inevitably raises the question: How the sound-images of words were linked to elements of experience in the first place. Children are not handed a ready-made code that lists the word-meanings and the syntactic rules of their language.

In what follows I shall briefly describe a new pragmatic approach to language acquisition, developed by Michael Tomasello at the Max Planck Institute for Evolutionary Anthropology at Leipzig. This approach is not based on any particular linguistic theory but focuses on the question of how children learn to use language in practice.

Norbert Wiener tentatively suggested the fundamental feature of the pragmatic approach long ago when he discussed communication in different species of animals and with strange people.

Suppose I find myself in the woods with an intelligent savage who cannot speak my language and whose language I cannot speak. Even without any sign language common to the two of us, I can learn a great deal from him. All I need to do is to be alert to those moments when he shows the signs of emotion or interest. I then cast my eyes around, perhaps paying special attention to the direction of his glance, and fix in my memory what I see or hear. It will not be long before I discover the things which seem important to him, not because he has communicated them to me by language, but because I myself have observed them. (1948, p.157)

In his book "Constructing a Language", Tomasello explains that it is "the ability to share attention" that furnishes the basis for the inception of meaning. It is the sort of claim that seems obvious the moment it has been stated. But because the whole problem of attention had for a long time been ignored by psychologists, its role in language acquisition was not acknowledged.

From the constructivist point of view, it is important to stress that it does not matter if the thing I perceive when I follow the direction in which the other is looking is not quite the same as the thing he or she perceives. What DOES matter, in order to link a word to a percept, is that, whenever he or she utters a specific word, I see something that I can consider the repetition of what I saw on similar previous occasions. The crucial feature is the coordination of attention.

Tomasello stresses a second factor that is even more important: "... the ability to understand that other persons have intentional and mental states like one's own" (2003, p.40). He speaks of "intention reading" and this implies, among other

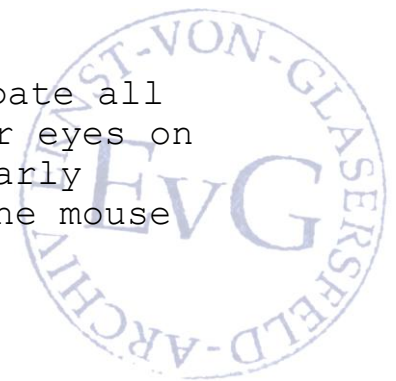
things, the desire to anticipate what the other is going to do.

I do not think that "intention reading" is an unwarranted assumption. Many animals behave in ways that suggest it. A scene that I described many years ago in another context may serve as example.

One thing visitors to the famous Yellowstone Park usually want to see is an elk. The elk is a large rather bulky kind of stag with huge, very solid antlers. At mid-day, when most of the tourists are at Yellowstone, the elk is usually resting almost invisible in the middle of a field of high grass. A front of people gingerly approaches, their cameras ready to click. When they come to about thirty meters from the elk, he raises his head as though he were getting up to charge. But he does not have to stand up, let alone charge. He has learned that raising his head and antlers is sufficient to stop the intruders. It works every time they attempt to get closer. If they want a picture of more than just the elk's antlers sticking out above the high grass, they have to buy a postcard at the tourist center.

Why does the elk raise his head? He anticipates that, if he does nothing about it, the people will come closer than he likes. Raising his head is a reliable way to stop them. I am not suggesting that the elk has a concept of intention, but he acts on what experiential sequences have taught him in the past.

Intelligent animals are able to anticipate all sorts of things. Cats patiently keep their eyes on the hole where the mouse disappeared, clearly anticipating that it is the place where the mouse will come out again.



The poodle we once had got bored when I spent too much time at my desk. He would fetch his leash and shake it at the side of my chair. Knowing that I always put him on the leash when we went out, he anticipated that I would understand his suggestion. If I did not react, he would drop the leash on the floor and walk off in a way that left no doubt about what he thought of me.

In fact, all learning entails a form of anticipation. As Humberto Maturana expressed it:

"A living system, due to its circular organization, is an inductive system and functions always in a predictive manner: what happened once will occur again. Its organization (genetic and otherwise) is conservative and repeats only that which works." (1970)

Even Skinner's behaviorist notion of reinforcement implicitly requires the organism to anticipate that what had a pleasant result in the past will have a pleasant result in future, and that what had unpleasant consequences will have them the next time. The fact that this anticipation probably is not conscious in rats and pigeons - or even in my late poodle - does not stop me from using the anticipatory pattern as a description of their behavior; because at higher levels of cognitive development it certainly IS conscious and leads to deliberate action.

In his book on the attainment of consciousness (*La prise de conscience*, 1974), Piaget showed two things on the basis of a series of empirical studies carried out by members of his team. First, consciousness appears gradually in children and, second, its attainment in one context does not necessarily entail its presence in others.

Tomasello has made a solid case for the idea that "intention-reading" plays an important role in children's acquisition of word-meaning, that is, of semantics. I now want to suggest that anticipation is a key factor in the development of syntax.

In the first months of their life, infants begin to exploit if-then relations. If a switch is placed under their pillow so that a bell rings every time they turn their head to the left, they will repeat the turn to the left until they get bored with the sound of the bell. In other words, infants behave as though they knew about causal connections. At that age, however, they are only beginning to separate themselves as an entity from the experiential field and it would be absurd to claim that they have already abstracted what philosophers call "knowledge that"; but their behavior indicates that they are able to act on what they might later call "knowledge how". By the time they have lived for four or five years, they are wondering whether it is the wind that moves the branches of trees or the moving branches that cause the wind. Sometime in between they have created the notion that there are agents whose actions can be expected to have certain consequences.

Some of my colleagues will say: Of course they have that kind of notion! But they have it only because, since their infancy, they have been immersed in language. In my view this is putting the cart before the horse. If there were no prior experiential foundation, the meaning of the agent-activity connection and the activity-result connection could not possibly be grasped.

The behavior of cats shows that they associate being fed with an adult of the family and not with a three-year-old. And the behavior of my dear old poodle made it quite clear that he had associated going for a walk with me, and not our daughter, who

was his favorite playmate. For all we know, neither cats nor poodles have what we would call language. Nevertheless, their behavior indicates that their experiential world comprises relatively stable elements that are analogous to what we, humans, abstract as concepts and speak of as "agent", "activity", and "result".

Linguists have only fairly recently used more descriptive terms such as "agent" and "patient". The entities these terms designate were included in the large grammatical categories of *subject* and *object*. In linguistics, these terms refer to parts of a sentence and in no way to parts of anyone's experience. Subject, verb, and object are syntactic terms and refer to the structure of sentences, not to the links we have created among the things we perceive and live with. It was a long-standing tradition in linguistics to separate syntax from semantics, as though the two domains had nothing to do with each other. In my view, it was this rigid separation that made it very difficult for linguists to develop a viable theory of language acquisition.

As Tomasello and a few before him noticed, Children do not produce their utterances with the help of grammatical rules. Even adults rarely rely on abstract syntactic rules to guide their speech. They know how they have segmented their experience and the praxis of living has shown them useful ways of linking the segments.

In many cases it is simply the way the connection between experiential elements has actually been made that determines the kind of link between them. Let us assume that your attention is caught by the color red. As such the redness is not confined, has not yet a specific shape in your visual field, and is not a discrete thing. But as you focus on it, you are able to fit the color into the pattern you

have learned to call "house". If you were asked to describe what you see, you would most likely say: "there is a red house". You choose the adjectival connection because the color and the thing were produced in a continuous application of attention. If, on the other hand, you recognize in your visual field a pattern that fits your concept of "house" and only then, scanning it more closely, you focus attention on its color, you would most likely say: "the house is red". This syntactic structure clearly expresses that the concept of "house" was brought forth independently of the color that was subsequently attributed to it.

Note that the experiential sequence does not DETERMINE a particular syntactic order or marker, but differences in the experiential sequence are likely to be expressed syntactically in SOME way.

Piaget suggested that the child's organization of space is topological before it acquires the three-dimensional Euclidean structure. I think the development of the conceptual links by means of which we weave the fabric of our experiential world is analogous. Like surfaces in topology, the first links the child establishes between elements of experience are somewhat shapeless and stretchable. Only later, through the practice of communication in interaction with others, do they become more definite and turn into specific syntactic relations.

I see a parallel to this in the way most languages use prepositions. Traditional linguistics did not ascribe a syntactic function to words such as "in", "on", "at", and "by", but treated them as rather insignificant particles. It was my friend and early mentor Silvio Ceccato, who first recognized that prepositions indicate conceptual links between parts of speech just as syntactic markers do. And just as for instance the verb-

object relation comprises a number of conceptually different links, so prepositions are as a rule ambiguous in that they indicate not one, but a group of POSSIBLE conceptual relationships.

Take as an example some of the different uses of the English preposition "by":

"A tree by the house",

"A book by Hemingway",

"We came by bicycle",

"We came by the high road",

"We'll be ready by Sunday".

The conceptual links indicated between the two experiential items in these expressions are all different. This multiplicity causes a problem for translators, because the links covered by ONE preposition are rarely quite the same in two languages. Try to translate my five examples into German. Each of them requires a different word in that language: "bei", "von", "mit", "auf" or "über", and "am" respectively. We can roughly characterize the differences by saying "by the house" indicates a spatial location, "by Hemingway" authorship, "by bicycle" a method of locomotion, "by the high road" an itinerary, and "by Sunday" a point in time.

Detailed conceptual analysis may show, as Ceccato believed, that in each group there is an underlying generic relationship. It would take an enormous amount of time and effort to confirm this conjecture and there is no general benefit because it would have to be done for each individual language.

In any case, what translation shows is that there is no one-to-one correspondence of conceptual links and linguistic markers. In my view this confirms my assumption: We all develop a repertoire of conceptual items and connections, and learn to fit them to the syntactic structures that have become customary among the users of a given language. The fit is only APPROXIMATIVE.

If the meanings we have in mind when we speak, and those that are suggested to the listener by our utterance, are essentially subjective, communication is possible only because the experiences from which these meanings have been abstracted are as a rule fairly similar among the speakers of one language. The individual differences of meaning are such that they rarely cause serious disturbances in the everyday use of our language. But, of course, there are exceptions. An experience I had when we came to live in the United States in 1966 is a good example. A young man was helping us to move furniture on the first day in our new house. When he was leaving, I heard him say to my wife: "See you later." I was taken aback and looked at her rather questioningly. We were familiar with the English of Dublin and southern England; and there, the temporal relation indicated in this particular idiom by "later", was strictly limited to the ONE day and night. It took us some time to learn that for speakers of American English it seems to include an indefinite future.

I have followed one turn of the spiral of meaning and am coming back to Heinz's paradoxical statement that it is the listener who decides what an utterance means. I first suggested that Shannon's Theory of Communication confirms the statement, because it shows that it is not meaning that travels with a signal, but rather an instruction to choose a meaning from a pre-established repertoire. I then argued that the way we acquire language

shows that the repertoire of meanings which we attribute to words must be developed by each individual speaker on the basis of his or her own subjective experience. I stuck out my neck and asserted that, although it may not often appear on the surface, it is in my view not only semantics but also syntax that children must construct for themselves. No doubt the specific forms of syntax were developed throughout the history of each particular language. But children must create some conceptual links in the course of experience before these links can be attributed to specific syntactic markers of the language they are learning. Once this has happened, the construction of further syntactic elements will be suggested by the situational context of linguistic interactions. On the strength of this exposition I claim that linguistic communication is possible only thanks to the relative sameness of experience and intentions among the speakers of a given language.

These considerations lead to a conclusion that should be sobering for public speakers. Heinz claimed, and I agree, that it is the listener who determines the meaning an utterance has for him or her. I added that the elements that constitute that meaning are abstracted from the listener's own experience, not from the experience of the speaker. The speaker's experience is never directly accessible to anyone else. Therefore your understanding of what I have written in the text that Professor Mitterer kindly agreed to read to you, is YOUR interpretation of it in terms of YOUR experience -- and your experiences are unlikely to have been identical with mine.

Consequently, it would be a rather naive illusion for me to believe that you have understood what I have said in this talk exactly as I intended it.

I will be happy if I have given you some things to think about.

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