The difference in semiotic bases between visual and auditive language and its consequences for descriptive models

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Human language has evolved along two different lines, viz. as visual only communication, and as combined auditive and visual communication. The visual only evolution has resulted in the sign languages of the deaf and the other line has resulted in the spoken, including non verbal, communication, of the normally hearing.

There are important differences between visual and auditive communication with regard to semiotic bases. The most striking difference is the potential for motivated representation in visual communication and the lack of such potential in auditive communication. The possibility of motivated representation depends on the semiotic and perceptual nearness of representation and represented. Our perception of the world is to an important extent based on visual impression; form, colour, movement and visually perceived spatial relations are very important properties of our idea of the world. Other perceivable properties, such as sound and smell, are also important but probably less important. For other creatures, other sense impressions are more important. Bats probably base their idea of the world on sound perceptions and for dogs smell is a more important property of the world than visual properties.

Sign languages as well as the non verbal communication of spoken face-to-face interaction is based on visual gestures of different kinds such as, manual gestures, mimetic expressions and body posture. These kinds of expressive behaviours are extremely well suited for analogue representation of almost all the visual perceptions we have of the world; colour, of course, is an exception. Form and movement can easily be depicted by manual gestures. Spatial relations can be described by performing manual gestures in different places in the "signing space", moving one's hands around in space and/or pointing to different places and direction in space. Feelings and attitudes are naturally expressed by mimetics and body posture and such mimetic expressions and body postures can also be used to represent these feelings and attitudes, in contrast to expressing them when they are felt. For example, when describing an accident taking place between two cars, one can show the initial place of cars and their movements. By moving one's hands in different ways it is possible to show whether the cars are moving straight towards each other or if they are moving towards each other at an angle. Perhaps one of them stands still and only the other is moving. One can also show exactly how crash occurs, i.e.head on, or just a scrape, or if one of them was driving into the side of the other. By mimetic expression one can also show the severity of the crash, i.e. if it was fatal for the people involved or just an incident. Or one can show ones own reaction to the accident when it happened.

This potential is very much exploited in sign language for sign formation and for sign modulation corresponding to the inflectional and derivational morphology of speech. Syntax is another area which exploits this potential by use of spatial arrangement of signs.

This potential for analogue representation is not available to spoken languages or, at least only to a very minor degree. One can represent sound by imitating it, for example in onomatopoeic words, but this seems to be less needed than representation of visual facts. The visual properties of the word are instead represented in an unmotivated arbitrary way. Spoken words, with a few exceptions have no similarity to that which they represent. Likewise in spoken sentences or phrases the only possible order between the words is temporally linear, which makes it impossible to give the type of detailed analogue descriptions of spatial properties described above. This lack of analogue representation potential and the need for temporal linearity can be seen as a kind of strait-jacket which has forced spoken languages to invent all kinds of devices to represent visual facts. Spatial prepositions are such a device, instead of placing the words representing two objects, in space as they are place in the real world, as one does it in sign, one has to use a preposition plus a fixed temporal word order to represent the actual situation and the placement of the objects in question.

For example, a sign meaning "hare" consists of two outstretched fingers placed on the head. It clearly has a connection with the hare's long ears. The fingers and the place on the head or forehead are here by some analysis analysed as two different phonemes or phoneme like units which together form a word, or a sign in this case. However, an outstretched finger can also be a sign of its own and mean longish object as in the phrase "two persons meeting", or two outstretched can mean two longish objects, for example legs in signs and phrases such as "ride' and 'walk" and "walk here and there". All of these are best described as semantically complex units rather than as semantically simple units composed from semantically empty units, i.e. phonemes. In the same way a sign language such as, for example, "one came over on the wrong side and they crashed into each other head on" cannot easily be analysed into units corresponding to the units of a corresponding spoken phrase but rather in hand form and movement. This of course seems very like the analysis in words of the spoken phrase but unfortunately it misses much semantic information, e.g. the exact manner of movement and about which car was on the wrong side and which car braked before the collision.

As we can see it takes a lengthy description to describe all this in speech and is a question of adding several more discreet meaning units. In spoken interaction we often solve this dilemma by adding gestural descriptions of visual phenomena in order to supply the information which is difficult to catch in the discreet units of spoken languages. An important reason for use of non verbal communication is probably to complement with the kind of analogue information which cannot be expressed in speech.

Another important result of the lack of capacity for analogue representation in speech is that speech to a much higher degree than sign, is based on discreet units. A spoken phrase can be analysed into words which, in turn, can be analysed into phonemes which, in turn, can be analysed into features.

Although these units are not discreet on a phonetic, acoustic level, they are analytically clear. Also non-discreet phenomena of the world, e.g. movement, are represented by discreet units and this constitutes a discrepancy between description and described, which deaf people, who are used to sign language, find very annoying.

If one instead look upon the differences from the point of view of how to write rule systems, for example, phonological and grammatical descriptions for pedagogical purposes, or parsing algorithms for sign lanaguge, or sign synthetic speech, the signed languages constitute a problem. Although much effort has been made, by sign-language researchers, to find corresponding discreet units and to create sign-language grammars which are analogue to spoken language grammars, the result has been to create a heavy spoken language influence on the sign languages in question rather than creating new types of description which are based in the unique visual properties of signed language.

I am presenting these problems at the SSOMC in the hope that some creative suggestions and ideas will be made.

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