

The words and signs that make us human

“It is nothing other than words which has made us human”

(I. P. Pavlov, 1927-1960)

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Introduction

The specificity of human communication, spoken or signed, has been the subject of great interest, speculation and research. The biological and social factors upon which the human language ability lies leads us to try to understand why we acquire language, when we do it and if we share that competence with other species. The failure to meet any group of human beings without language added to the fact that there are regular patterns of language development in all the languages lead us to believe in the universality of this human faculty (cf. Pinker, 1994; Chomsky, 1975).

Indeed, human beings have biological characteristics that are functionally operative to produce language as well as for language perception and understanding. These characteristics are anchored in the human nervous system, both the central nervous system (CNS) – responsible for processing information, and the peripheral nervous system (PNS) – in charge not only of the production and (motor) execution of the information provided by the central nervous system but also of the transmission to the CNS of the verbal stimuli received at the periphery (see Castro-Caldas, 2000). Concomitantly with the development of these characteristics, the human brain evolved phylogenetically becoming heavier and with highly marked convolutions in humans when compared to other primates.

Recent studies have yielded interesting results suggesting that primates and humans share a neural basis for the understanding of socially relevant vocalizations in their species (cf. Gil da Costa, 2006). Nevertheless, the truth is that since associative areas are larger in humans, they allow a closer contact with the various types of information (auditory, visual), providing a real advantage for the relationship between language and verbal representations, including writing (cf. Mineiro et al. under revision).

The uniquely human capacity for language gives us uses of language that do not occur in other species, even if one accepts their capacity for learning a symbolic language¹. As Pettito (2000:42) noted:

“All chimpanzees fail to master key aspects of human language structure, even you bypass their inability to produce speech by exposing them to other types of linguistic input for example natural signed languages. In other words despite the chimpanzee’s general communicative and cognitive abilities, their linguistic abilities are not equal what we humans do with language, be it signed or spoken”.

The veracity of these observations support the hypothesis that humans possess a neurological privilege, from birth, that enables the production and perception of language and results from cognitive pre-adaptations from which language emerges. These pre-adaptations are linked to (i) pre-phonetic abilities, (ii) pre-semantic abilities, (iii) pre-pragmatic abilities, and (iv) pre-symbolic abilities (cf. Hurford, 2003: 40). As we can read in Steven Pinker’s work, contemporary thinking about the biological foundations of language is based on that assumption.

It is interesting to note, however, that our thinking about human language has been predominantly

1 The linguistic failure of Viki, a baby chimpanzee raised in a linguistic environment of spoken language, was to be expected given the limited conception of “language” as exclusively in the “oral modality.” Later projects including Washoe, trained by Alan and Beatrice Gardner, and Nim Chimpsky, trained by Laura Ann Pettito yielded different results. These two primates learned ASL signs as symbolic and arbitrary representations of language. They also learned sentence sequences. However, their productions at a syntactic level were clearly qualitatively inferior to the sentence sequences produced by deaf children during the process of language acquisition.

“dependent” on its association with the oral modality². The discovery of sign languages as equivalents to spoken languages in terms of structural complexity was a relatively recent finding that was based on linguistic studies of ASL by William Stokoe in the 1960s, setting researchers after him on a path devoted to linguistic, psycholinguistic, neurolinguistic and cultural aspects of sign languages.

The fact that the oral modality, for evolutionary reasons³, has prevailed over the signed modality in human language, plus the fact that deaf people are a minority in the human population, have led in the past to the creation of a language model centred on spoken language productions. These factors also led to inadequate paradigms of teaching and learning for the population which rejected signed language of the deaf as natural languages.

Studies the early acquisition of sign languages as a different modality of human language offer us the opportunity to understand the biological bases of language. If on one hand, spoken and sign languages use different perceptual modalities (hearing versus vision), on the other hand the motor control of the tongue and the hands obey different neural substrates. Thus, the comparative analysis between the two modalities can lead us to new clues related to neural architecture underlying early language acquisition.

Works like Pettito and Marentette’s (1991) study of manual babbling were inconclusive regarding the stages of language acquisition and development in the two modalities. Deaf children exposed to sign language from birth are seen to acquire language at the same maturational rate as hearing children in spoken language environments, and the stages of acquisition in both modalities are very similar. Thus, deaf and hearing children go through the same developmental stages, from monosyllabic babbling,

to the holophrastic stage in which they associate a word or gesture to an utterance that can be simple or complex (corresponding to a sentence), to the two-word or two-sign phase of simple sentences. These are followed by the telegraphic stage in which some function words of the language (without semantic content) are omitted, reaching a substantial level of natural language development (in morphological, syntactic and semantic domains) by the age of 22 months.

Also reported in the literature (see Chamberlain, Morford & Mayberry, 2000; Schick, Marschark & Spencer, 2006) is the parallelism of the predominance in late acquisition of irregular structures, such as irregular verbs (*fazi* instead of *fiz*, in Portuguese), with a motor correlate in sign languages relating to immaturity insuring certain articulatory configurations.

According to Reilly (2006), language development is remarkably similar for hearing and non-hearing children. One of the common factors is the acquisition of phonological peculiarities of each language, that is, when the same type of error occurs, for example in the tendency for simplifying the articulation of the word or sign. These similarities are molded in the early production of signs, around the first year of life.

The effective use of the first signs, just as with the first symbolic words, takes place around 20-24 months. Globally, we can grasp the existence of two temporal boundaries demarcating the development of deaf children. The first concerns the first year of life, during which the child is seen as a competent affective communicator, using emotional expressions both at the expressive and at the receptive level, and at the age of 18 months, when the child begins to articulate sounds, signs and facial expressions simultaneously. This is what the authors refer to as the simple stage. From this stage, children developing sign language increase both their utterances – mean length of utterance – as well as utterances complexity, managing and manually incorporating phonology and morphology.

It is also important to look at language acquisition in deaf children in a more directed way, less focus on the comparison between modalities. Researchers like Marschark (2007) and Spencer and Harris (2006) talk about differences in the acquisition processes for signed and spoken languages, anchored in different developmental consequences and evident in studies involving deaf adults.

The recognition that spoken and sign languages are not strictly comparable, allow us to anticipate the unique development of the languages based in

2 Strangely enough, for a long time, linguists conceptualized language basically as “une langue articulée.” with the heritage of structuralism and more specifically of Martinet. Even Chomsky (1967), when defining language, did so based on the concept that language is “a specific sound-meaning correspondence”. A presentation by Ursulla Bellugi in a conference they were both attending and the advances made in ASL led him to redefine the concept of language, as “a specific correspondence sign-signified”, therefore including sign languages as true linguistic systems.

3 Literature on the subject show that the brain of newborns is not “stuck” under any rigid genetic “instruction” to receive and produce language in a predetermined modality. For evolutionary reasons and in anthropobiological terms, oral language might have been a more appropriate modality for the modern man (cf. Mineiro & Castro-Caldas: 2007:18).

the visual modality as a window onto the potential developmental differences between deaf and hearing people.

Our conference aims at sparking the debate on these issues. We intend to cross and thus enrich varied research activities on sign language acquisition and development. Among the main topics of the *1st Symposium on Sign Language Acquisition* are efforts to understand the specific processes of monolingual and bilingual acquisition, emerging sign languages, the consequences of the increasing effectiveness cochlear implants, cognitive processes that accompany language development of deaf children (and may differ in the two modalities), atypical language development in sign languages, presenting instruments used in the research field of language acquisition, and introducing educational proposals for deaf students to recognize the centrality of effective language. This symposium is one result of the first funded Portuguese project in the area of language acquisition, the project AQUILGP: Longitudinal Corpus of Portuguese Sign Language Acquisition, Ref. PTDC/LIN/111889/2009, which had as principal investigator Ana Mineiro. Ph.D., with the collaboration of many researchers who are presenting papers and posters at the conference and helping with the organization of the event. These include Alexandre Castro-Caldas, Ronice Müller de Quadros, Sara Carvalho, Sofia Lynce de Faria, Mara Moita, João Barreto, Jorge Rodrigues, Patricia Carmo, Marta Morgado, Cristina Gil, Isabel Morais, Joana Castelo Branco and Maria Vânia Nunes. Some of these researchers are deaf and have had their first research experience through this project. To all of them, we extend our thanks. We would also like to kindly thank Marc Marschark for his contribution and his tireless effort on helping us.

Planning for this symposium followed all the best practices of a scientific meeting, announced, reviewed, and organized in a fully international effort to bring to Portugal the best research on sign language acquisition.

In holding this conference it has been our pleasure to have contribute to sharing the results of Portuguese research efforts in this area with international academic peers. We hope that it will be as useful for you as the sharing of your work will be for us.

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