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A Semiotic View of Signed versus Spoken Language

Introduction

In this paper I will compare and contrast sign language (used by the deaf community) versus spoken language from the point of view of semiotics and linguistics (Tobin 1990, 1994). Both signed and spoken languages can be defined as: A system of systems -- revolving around the notion of the linguistic sign -- used by human beings to communicate. Both languages also share a common purpose and goal: to achieve maximum communication with minimal effort. Where they differ, however, is in the way that they create the meaningful signs they use to fulfill this goal of creating an efficient system of communication. Spoken language is based on the concept of sounds which are in opposition to each other -- as phonemes -- which are arbitrary and possess no meaning of their own -- but combine into larger meaningful units such as morphemes, words, etc. Thus spoken language is fundamentally **auditory** and **arbitrary** (Tobin 1997). Sign language, on the other hand, is based on a combination of hand-shapes and gestures which have an orientation and movement to various parts of the body -- which not only possess meaning -- but are iconic rather than arbitrary in nature. Thus sign language is fundamentally **visual** -- rather than auditory -- and **iconic** -- rather than arbitrary (Fuks and Tobin 2006). It is our contention that the traditional concepts of spoken language are therefore not always appropriate as a means to analyze sign language and a different approach to analyze sign language will be suggested in this paper.

Israeli Sign Language (ISL) is a relatively young language that developed in Israel in the 1930s, parallel to the development of the deaf community in the former British Mandate of Palestine, or what is today the State of Israel. ISL, like other sign languages in the world, is produced manually (with the hands) and perceived visually (with the eyes). The hand is primarily composed of bones and joints. Physiologically, this anatomical structure and its accompanying flexibility allow the hands to create different geometrical shapes and to move in space in alternative ways and in various directions with diverse orientations. The eyes are capable of perceiving several stimuli simultaneously: hand shapes, hand movements, hand-movement orientations and facial expressions. This variable manual flexibility paired with complex and multifarious visual perception are important tools for the creation of signs inherently based on (metonymic) iconic analogies that are indeed exploited for this explicit purpose by users of sign language. These metaphorical, metonymical analogies are created by the choice of a specific image that represents the entire concept. Each language chooses the specific image that can be representative of the larger concept within the medium of communication that it uses: "*kukuriku*" for example, is the acoustic image of the rooster in Hebrew while the rooster's crest is the visual image in Israeli Sign Language.

All the sign languages that have been studied (in the world) have been defined as natural -- but iconic -- languages. Signers throughout the world exploit the unique features of the communication channel to create analogies for phenomena that are found outside the reality of language. However the lexical signs of sign languages differ from each other on the level of their motivation and the type of iconicity they portray. Some of the signs are direct, obvious, mimetic pictures, for example -- in the sign for bird -- the index finger and the thumb represent the beak -- a mimetic picture). Others are indirect iconic signs that are only semi-transparent, for example -- in the sign for economics -- the shape of the hand in the sign is the iconic of parallel of the form for handling bills of cash and the partial rounding of the hands is the metaphorical equivalent of "merchants exchanging cash". There are also signs that have been classified in the literature as "opaque -- not transparent signs" because it is more difficult to detect their iconicity: i.e. the iconic elements do not give direct clues to the abstract elements of the concept. For example -- in the sign for "mistake" -- the palms of both hands face the shoulders - the hands change places -- the pinkie and the thumb remain straight and the other finger are bent -- it is the "crossing" of the hands with the straight + bent hand shape that clues a "mistake" -- one possibility in the place of another. The strong presence of obvious and transparent iconicity in the signs found across sign languages led to the unfortunate fact that until the late seventies, the full linguistic status of sign languages remained in doubt in the literature. Until the end of the seventies, American Sign Language (ASL) was considered by many educators and by the hearing community alike as a mere pantomimic language of gestures.

The 1960s and 1970s became an important turning point in the research of sign languages. At this time a number of research centers in the United States showed that the lexical sign in sign languages was controlled by linguistic laws in the same way as lexical signs in spoken languages. The classic studies of Stokoe (1960/1993) were the first indicators of this trend. His research showed that the lexical sign in sign language was more than a mere pantomimic gesture, but rather a complex structure composed of a number of parameters (hand shape, orientation, location and movement) which are joined together according to internal syntagmatic and combinatory rules. Thus, through this new revelation, the researchers persuaded the hearing community that sign language was indeed a bona fide natural language in every sense of the word and in all of its aspects.

Ironically, however, the research perspective on iconicity marched in opposite directions in the fields of sign language versus spoken language. Even though it was openly recognized that linguistic iconicity also existed in spoken

languages and was exploited as an economic and efficient tool to support and induce memory, a great deal of effort was invested by generative grammarians to show that iconicity played no role in sign language, and they further claimed and supposedly "showed" that iconicity did not provide an advantage to the language acquisition of deaf children (Kantor 1980, Newport and Meier 1987).

The search for universal phonological features led the same linguists to adopt all the concepts, tools and tests available at the time for phonological research in spoken languages to sign language. The parameters for sign language (hand shape, location, movement and orientation) were described in terms of their distinctive articulatory and visual features. The test for minimal pairs used to discover phonemes in spoken language was adopted (by the definition of *noblesse oblige*) to the study of sign language phonology in order to determine which features [of arbitrary abstract phonemes] were "distinctive" and created differences in meaning and which features were "secondary" or allophonic and did not change meaning.

Despite this, the few studies that studied the influence of iconicity on the phonology of sign languages revealed that what suited the phonology of an arbitrary language, or on a spoken language grounded in arbitrariness, was not necessarily suitable for a figurative language, or a language based on figurative iconicity. In spoken language, the phonemes are arbitrary, and their distinctive features signal "mere otherness" (Sangster 1982:4). Alternatively, Boyes-Bream (1981) showed that hand shape in ASL had a specific iconic meaning that influenced its distribution in the lexicon. For example, arched hand shapes always appear in lexical items that refer to entities that are either visually arched-shaped or round: a glass/cup, a grapefruit, an egg). Boyes-Bream claimed that the articulatory and visual features were not sufficient to describe hand shape, and therefore she added another dimension of features that were essentially more semantic-perceptual: grasping, linearity, pairedness, and so forth.

Brennan (1992, 2005) reported that in British Sign Language (BSL) not only did the feature of hand shape have iconic or metaphorical meaning, but so did all the other parameters of the lexical sign. For example, their location on the body such as: the temple and the heart, are almost always perceptually connected with intelligence and feelings, respectively, and tend to appear in lexical signs related to, or associated with these areas. Brennan further showed that users of BSL exploit the isomorphism that exists between the phonemic and the morphemic levels in order to create new signs and/or to make creative additions on already existing signs. For Brennan, the sign in sign language is the comprehension of the cognitive reality. The ways in which signers exploit the morphophonemic units to produce new metaphors and signs in the language reflect the ways in which they perceive and interpret the world.

Van der Kooij (2002) who researched the structure of Dutch Sign Language (DSL) also claimed that the "phonological" parameters of the lexical sign in DSL are not without meaning. More importantly, and contrary to the popularly held claim that iconicity did not influence the deep phonological rules of the lexical sign, van der Kooij found that iconic motivation neutralized phonological rules: e.g., the possibility of dropping the use of the second hand in symmetrical signs.

Despite all of the above, most of all phonological research on sign language was, and still is influenced by the idea that language is composed of independent and autonomous levels prevalent in formal generative and other linguistic approaches. This view includes the idea that the fundamental impact of iconicity in sign language is dwarfed by phonological rules and the building blocks of lexical signs are without meaning like the phoneme, the arbitrary building blocks of the lexeme in spoken language (Sandler and Lilo-Martin 2006).

The present research presents an alternative theoretical and methodological framework of phonology to analyze the structure of ISL: the semiotic or sign-oriented linguistic approach which includes the theory of Phonology as Human Behavior (PHB) developed by William Diver (1979) and applied to the speech and hearing clinic by Yishai Tobin (1997) of the Columbia School (CS). The sign-oriented approach is based on the integrity of the linguistic sign where form and meaning are interlocked together, and, therefore this approach is holistic in its point of view, and rejects the idea of separate and autonomous linguistic levels inherent in other theories. Thus, this approach is especially suitable for the study of sign language where, as we claim, the fundamental unit of language is the sign which integrally combines a visual signal and a meaning. Furthermore, because the basic unit in sign language is visual, it makes sense that the role of iconicity, which economically and efficiently connects form and meaning, will dominate the use of sign language.

Research Methodology

A stratified sample was randomly selected from the index of the Dictionary of ISL. A random stratified sample preserves the relative weight of the various content word classes in the dictionary and also assures that even the smallest category will have at least 50 lexical signs. A minimum of lexical signs even for the smallest category assures the possibility of carrying out quantitative statistic analyses which will be significant within and across all lexical categories. As a result of this, the category of noun includes 356 lexical signs, the category of action words includes 96 lexical signs, the general category includes 57 lexical signs and the category for features includes 51 lexical signs. The total number of lexical signs in the random stratified sample in our research is 560 lexical signs.

An adult deaf male, the son of two deaf parents, whose native language is ISL, was asked to sign the lexical signs in the sample which was then recorded and filmed on video. The Liddle and Johnson (1989) phonetic transcription

system which has been used to transcribe sign languages throughout the world was used as the basis of the transcription of the internal structure of the lexical signs in our study. Three deaf advisers, the children of deaf parents, whose native language is ISL, accompanied our research and aided us with various content questions.

Results

1. All of the parameters of the lexical sign in ISL have meaning.
2. The distribution of the sub-parameters in the lexicon was not random but rather motivated by the iconic meanings connected to them. The following are examples of the metaphoric iconic motivation of lexical units:
Examples:

A. Hand Shape

Hand Shape 1. (First)

Meaning: Firm

- 1.1 Firm GRASP: this hand shape appears in signs that represent their parameters through firm GRASPING: pot, motorcycle, row boat, suitcase, car, clothes iron.
- 1.2 This hand shape is exploited for passing on a metaphorical message of power/strength/stability in signs: religion, (government, synagogue, official, security, certainty, support, strong, work, democracy,
- 1.3 This hand shape is used to express a metaphorical message of "hardness/ difficulty" (Firm=Hard): to make difficult/difficult, regret, sadness, miserable, poor, complain, stubborn, stupid.

Hand Shape: C

Meaning: Arch-like

1. This is an iconic hand shape with a very specific meaning that appears only in lexical signs that represent referents with arch-shaped visual features: egg, lemon, tomato, flashlight, banana, bag of cocoa, a person who talks a lot (the hand shape represents the mouth).

Hand Shape: 4 ("paying")

Meaning: Functional holding

This hand shape which is extremely problematic for traditional linguists because it has a highly marked structure but it also appears very frequently in sign languages throughout the world (because of its functional iconic meaning).

In all of the lexical signs in which this hand shape appears it represents "holding on to something":

Gardener = holding tools

Tennis = holding the racquet

Tear = holding a piece of paper

Brush = holding a brush

Money – holding a bill. In ISL as in other sign languages in the world a whole paradigm of lexical items related to "money" has developed around the image of holding a bill: buy, sell, be extravagant waste money, cash, economy, sell, expensive. The common denominator for all of these lexical items is the appearance of hand shape: T representing the image of holding on to a bill of paper money.

B. Locations

An iconic meaning that motivates the distribution of the feature of Locations was found in ISL just as it was for the feature of hand shape. The following are a few examples:

1. The temple

Meaning: Representing mental activities:

remember, know/not know, idea, invent, dream, learn, forget, think, worry, genius

2. mouth/ears/eyes

Meaning: Sensory activities:

mouth: eating and communication:

eat, Swallow, vomit, say/tell, ask, answer/respond, reply, communication

Eyes: look, criticize, cry

Ears: deaf, hear, noise, hearing loss, telephone

3. torso – Locus of Emotional and individual experience

Love, happiness, become excited, be insulted, want, regret, hurt, be patient, comfort/feel comfortable, alone

C. Path Movement

Movement and its associated features like location and hand shape were also found to have meaning in our study. Direction of Movement: Each direction of the movement of the hand in space had a different specific meaning e.g.:

- 1.1 Upward Movement – Up Is Good- promotion, rehabilitation, director, new, education, success

- 1.2 Downward Movement: Down is Bad – failure, loss, lazy, weak, rude, inferior,

2. The Shape of the Movement

- 2.1 Convex Arch – meaning: passage to, passing X over

to pass, wander, postpone, beginning, to/towards..., next year, ask, help, give

2.2 Repeated Circular Movement – meaning: an activity which lasts a long time or a continuing situation look for, lonely/isolated, nothing, lecture, tradition, trips, arrangements, used, complicated

Additional Results

1. Iconicity was responsible for the appearance of irregular hand shapes and locations that cannot be represented or described by means of the standard features of the language. The appearance of irregular units is generally limited to one or two lexical signs.

For example, location – lateral space near the arm pit. An infrequently used location that appears only in two signs: to gossip and to steal. The location also receives the meaning of "from the side/behind one's back" on the semiotic level.

2. These irregular features are problematic for traditional linguists who have to deal with the questions: How should one explain these irregular units? and Should the phonological be able to represent them? The traditional generative phonological model could not adopt specific features to explain each irregularity individually

3. In abstract lexical signs basic units with a wide and neutral iconic meaning were generally used. Units with very specific iconic meanings like the various arch shapes never appeared in abstract lexical signs.

4. Iconicity was more dominant than the human factor (ease of production) for explaining the phenomenon of specific units such as: B-Bent.

There is disagreement regarding the status of the hand shape B-Bent in the literature. Some researchers (such as van der Kooij 2002) claim that it is a phonetic allophone of the hand shape B, that appears in phonetic articulatory environments where the wrist joints at the root of the palm of the hand has to be bent. The argument is that instead of bending the wrist joints that requires much effort, the bending is passed on to the first knuckle of the fingers (Metacarpophalangeal joints). Alternatively, there are other researchers (such as Pizzuto et al 1995) who claim that this hand shape has a more narrow and specific meaning that the hand shape B and it is: the marking of boundaries or delimitations and our research supports this latter claim: in 50% of cases where this hand shape appeared it outlined boundaries: amount, a raise/rise, a storey/floor, tall/high, early/late, proceed, expand, make smaller. In 20% of the cases this hand shape iconically represented the visual appearance of the lexical referent (e.g., camel). In the remaining 30%/In the rest of the cases one can explain the appearance of the B-Bent hand shape by the human factor as an attempt to limit the bending of the wrist joints which is more difficult than to bend than the knuckle.

The appearance of the hand shape B-Bent also appeared in phonetic environments where according to the hypothesis of "allophones" it should not have appeared since the bending of the wrist joints was not required: In the lateral dimension (right – left). Finally, a minimal pair was found for the hand shape B versus the hand shape B-Bent for the signs: wide/expansion and tall (high) / terrible.

Summary and Conclusions

The results of our research reject the separation of semantics and phonology in ISL. Iconicity is the basis for all aspects of ISL including phonology. Arbitrariness, on the other hand, used only in those cases when iconicity – direct or indirect metaphoric – cannot be used to describe the characteristics of the abstract concept. Paradoxically speaking, in the tension between arbitrariness and iconicity sign language is quite similar to spoken language. In both cases the human factor is striving for maximum economy and minimal effort:

Spoken language strives for maximum communication with minimal effort through the auditory channel –through hearing – thus, arbitrariness reigns supreme in spoken language. Sign language, on the other hand strives for maximum communication with minimal effort through the visual channel - through sight – thus, iconicity reigns supreme in sign language. The synergetic principle for the search for maximum communication with minimal effort is the common denominator for both language systems and it is the different channel of communication which provides the source for their individual preference for either arbitrariness or iconicity.

Linguistic research in sign language has to pay more attention to the influence of the channel of communication to the structure of the language. Instead of using theoretical and methodological tools adopted from an arbitrary auditory based system that only partially contributes to the understanding the linguistic phenomena, research in sign language should develop tools that are more suitable for a visual language. In the last few years more research has reported that the iconic meanings of the basic units of sign language are psychologically real for language signers and these iconic meanings are used to productively produce new metaphorical signs in the lexicon.

This means that signers are aware of the basic iconic meanings of the various components of the sign and exploit them when constructing new signs (especially in abstract signs where they create metaphorical parallels between the concrete iconic meaning of the unit and the metaphorical meaning: for example, in the sign for "informing" the hand shape is composed of all the fingers that are bent and touch the tip of the thumb. Iconically, this hand shape directly indicates grasping or having something at the tip of your fingers. Therefore the sign for "informing" implies the metaphoric message that ideas-information-thoughts- knowledge are objects that can be grasped or held on to physically and passed on to others. Today there are researchers like Taub (2001) who analyze the iconicity of sign language and the metaphoric use of the basic units of the sign in the theoretical framework that began with Lakoff and Johnson (1980) in metaphor and cognitive linguistics. Future research that will further increase our knowledge on the metaphorical exploitation of basic units in the process of building new signs will even further contribute to our

understanding of how a visual language is realized in space.

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